

**Understanding nutrition policymaking dynamics in the
United States: The case of product reformulation**

Courtney Anne Scott

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ABSTRACT

Background: Voluntary food and beverage product reformulation is a prominent example of how self-regulation and public-private partnerships have become part of the public health nutrition policy landscape. This thesis aims to understand the emergence of reformulation in the nutrition policy system in order to provide insights into nutrition policymaking dynamics in the US.

Methods: The methods of this study were based in applied policy research. It focuses on how stakeholders influence the nutrition policy process, including by shaping the framing of reformulation and nutrition policy. The methods consisted of a literature review and qualitative analysis of documents, including submissions to a government-led consultation on reformulation, in-depth stakeholder interviews, and the media.

Results: Reformulation's rise to prominence as a public health approach was the result of a confluence of factors, three of which were particularly important: (1) the consultation analysis revealed that it is a component of the food and beverage industry's corporate political strategy to avoid and pre-empt public health regulations, (2) the interviews identified that reformulation has the support of a cross-sector coalition, and (3) the media analysis found that reformulation is a chameleonic idea with multiple frames and meanings. Specifically, the framing of reformulation shifted from 1980-2015 to encompass business, health and political frames, and to embody a range of underlying values and beliefs. Synthesising the media analysis with the consultation analysis and interviews showed that the political emphasis of reformulation became common in the early 2000s, when the food and beverage industry was responding to increasing pressure from governments and public health advocates as part of their political strategy. The interviews also found that non-industry stakeholders were fractured in their support for reformulation because they questioned the belief of 'working with industry' and whether nutrition policies should be formulated based on nutrients or foods. These fractions, and the lack of a unified counter policy agenda, also contributed to the industry's ability to promote a voluntary reformulation approach.

Conclusion: Voluntary reformulation initiatives form part of the food and beverage industry's political strategy by building collaborative relationships and establishing a participative role in policymaking. This research therefore points to the need to study the dynamic interactions of stakeholders within the nutrition policy system, rather than conceptualizing industry involvement as an external influence.

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ABBREVIATIONS

ACF – Advocacy Coalition Framework

CFBAI – Children’s Food and Beverage Advertising Initiative

CPS – Corporate Political Strategy

CSR – Corporate Social Responsibility

DGAs – Dietary Guidelines for Americans

DGAC – Dietary Guidelines Advisory Committee

FDA – Food and Drug Administration (US)

MSF – Multiple Streams Framework

NCDs – Noncommunicable Diseases

NGOs – Non-governmental or not-for-profit organizations

OECD – Organization for Economic Co-Operation and Development

PPF – Political Priority Framework

UN – United Nations

US – United States

USDA – United States Department of Agriculture

WHO – World Health Organization

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1 INTRODUCTION

Nutrition policies are a central component of the policy response to obesity and diet-related noncommunicable diseases (NCDs). However, adopting and implementing nutrition policies in the US is politically challenging for a number of reasons, including the type and nature of the policies proposed and strong opposition posed by the food and beverage industry (Nestle 2002). Industry self-regulation and public-private partnerships have become prominent alternatives to legislative approaches in public health nutrition policy (Mello et al. 2008; Sharma et al. 2010; Roberto et al. 2015). An example of the voluntary approach to nutrition policy is product reformulation, the reduction or removal of key nutrients of concern from food and beverage products (van Raaij et al. 2009). In high-income countries, where ultra-processed foods dominate the food system (Luiten et al. 2016; Monteiro et al. 2013), product reformulation is argued to be a “pragmatic” approach to improving the public’s nutrition (Winkler 2013), particularly in reducing salt and trans fat intake (Legetic & Campbell 2011; He et al. 2014; Trieu et al. 2015; Unnevehr & Jagmanaitė 2008; Mozaffarian & Clarke 2009). Reformulation is reflective of and thus an informative case through which to understand nutrition policymaking processes in the US. Therefore, this thesis aims to better understand the emergence of reformulation in the US nutrition policy system, with a particular focus on the food and beverage industry, in order to inform understanding of nutrition policymaking dynamics in the US.

This chapter will begin by positioning nutrition policies such as reformulation in the context of rising obesity and NCDs in the US and globally. It will go on to discuss nutrition policymaking in the US, including its history and evolution, as well as presenting an overarching paradigm in nutrition policy (foods versus nutrients) and corporate influence over nutrition policy in the US. This leads into a section on voluntary or partnership-based nutrition policy mechanisms, such as those used in product reformulation initiatives. The chapter ends with an overview of the effectiveness of product reformulation as a public health nutrition policy, and the gaps in knowledge addressed by this research.

THE NEED TO PREVENT OBESITY AND NCDs

The major causes of death and disability worldwide are noncommunicable diseases (NCDs), including cardiovascular disease, diabetes, stroke, cancer and chronic lung disease (Lozano et al. 2012). In the United States, seven of ten leading causes of death are NCDs, with heart disease responsible for the most deaths in 2010, in part driven by the fact that more than two-thirds of adults in the US are overweight or obese (Heron 2013; Ogden et al. 2014).

The prevalence of NCDs has risen in the US and globally in concurrence with decreasing levels of physical activity and the nutrition transition, characterized by a shift away from whole, nutrient-dense foods, toward a diet high in refined or processed foods which are high in fat and sugar (Popkin & Gordon-Larsen 2004). However, evidence is now strong that NCDs are largely preventable and avoidable through healthy diet, weight management, physical activity, moderate alcohol consumption, and avoidance of tobacco (World Health Organization Regional Office for Europe 2013; World Health Organization 2013).

Preventing obesity and NCDs would be the most cost-effective approach to reducing the burden of NCDs in the long-term, particularly in comparison to treatment-based approaches (Kavita et al. 2011; Beaglehole et al. 2011; Swinburn et al. 2005; Moodie et al. 2013). Yet, globally, government priorities and funding remain primarily directed toward treatment and disease management (Beaglehole et al. 2011; Singh et al. 2011), and government spending on NCD prevention programs is deemed grossly insufficient (Alleyne et al. 2013; Beaglehole et al. 2007). This is illustrated by OECD research in 2005 which found that government spending on population-wide prevention programs, of any type, only accounts for about 3% of the total health funding in those countries (World Health Organization 2006).

Part of the reason that prevention-focused government policies and programs are challenging to implement is that preventing obesity and NCDs requires addressing a complex matrix of behavioural and societal causes, including overconsumption of calories and the contributory factors of an unhealthy food environment, sedentary behaviour and genetics (Gortmaker et al. 2011). Obesity and NCD prevention policies focus on decreasing consumption of calorie-dense, unhealthy foods and beverages and increasing physical activity (Mozaffarian 2016a); adjusting these factors requires addressing a combination of individual actions and agency along with establishing enabling conditions in the community, thereby requiring a comprehensive approach comprised of a number of interconnected and wide-reaching policies. No one policy or initiative will be able to reverse the nutrition-related causes of obesity and NCDs (Beaglehole et al. 2011; Gortmaker et al. 2011). Broad actions are needed that will address the “physical, economic, and social environment, and support population-level movement towards healthier behaviour” (Kumanyika et al. 2013, p.3), which is an important factor underpinning the challenge of nutrition policymaking in the US.

NUTRITION POLICIES FOR OBESITY AND NCD PREVENTION

As evidence grows that unhealthy diets are a major driver of the NCD epidemic, public health nutrition policies have become the subject of intense political focus (Beaglehole et al. 2007; World Health Organization 2004; Moodie et al. 2013). The political attention on nutrition is evident in the fact that over the past decade the UN held a high level meeting on NCDs and the World Health Organization adopted one regional and two global action plans on nutrition and NCDs (World Health Organization 2013; World Health Organization 2004; World Health Organization Regional Office for Europe 2013).

There are several taxonomies or ways of categorizing public health and nutrition policies (Swinburn et al. 2004; e.g. Lang & Rayner 2007; Swinburn et al. 2013), however the broadest of these places nutrition policies to address NCDs into two general categories: those targeting consumers and their decision making, and those targeting the market environment (Table 1.1) (Mazzocchi et al. 2009). Policies targeting consumers include nutrition education, food labelling, nutrition counselling, mass media campaigns and dietary guidelines. In contrast to these individually targeted or downstream approaches, an upstream policy approach to improving nutrition and NCDs aims to improve nutrition for the entire population. These policies aim to improve conditions and opportunities, or what is called the nutrition environment, so that the majority of Americans can improve their dietary intake. Interventions to change the market environment include fiscal measures such as subsidies and taxes, modifications to the food environment such as zoning laws and advertising restrictions, food fortification and product reformulation (Brambila-Macias et al. 2011a).

A number of these public health nutrition policy interventions have been found to be cost-effective. Gortmaker et al. (2011) found eight nutrition policies or interventions to be cost saving, including taxes on unhealthy food and beverages, front-of-pack traffic light nutrition labelling, and reduction of junk food advertising to children. However, those policies that target the market environment, such as taxes and reformulation, have been found to be more effective than those targeting individuals. In this way, nutrition policies have been substantially informed by tobacco control policy, in which focusing on environmental factors such as affordability, availability and acceptability have proved highly successful (Chapman 2007). Yet, this effectiveness comes at a price, as market environment policies are “more intrusive” and require significantly more political will and resources to implement (Brambila-Macias et al. 2011a).

Table 1.1. Effectiveness of nutrition policy interventions (Adapted from: Brambila-Macias et al. 2011a)		
<i>Area of Intervention</i>	<i>Specific Intervention</i>	<i>Level of Effectiveness</i>
Informed Choice	Advertising control	Weak positive effect on improving diets
	Public information campaigns	Raise awareness but less effective at changing behaviour
	Nutrition education	Non-homogenous impact on unhealthy eating and overweight
	Nutrition labelling	Not directly related to healthier dietary choices
	Menu labelling	Recent initiative with no conclusive evidence
Market Environment	Fiscal measures: taxes	Not yet implemented, but modelling suggests positive effect *NB: since 2011, a number of jurisdictions have introduced taxes on sugar sweetened beverages which have been shown to reduce consumption (Colchero et al. 2016; Falbe et al. 2016)
	Fiscal measures: vouchers	New policy; early signs of effectiveness
	Regulation of meals: schools	Improving school food environment is effective
	Regulation of meals: work	Healthy meal provision can have positive effect
	Nutrition-related standards	Not many policies implemented and limited studies
	Reformulation	Lack of studies on effects on healthy eating and obesity

THE ISSUE OF ULTRA-PROCESSED FOODS IN THE US

Nutrition policy has recently paid particular attention to and expressed concern over the contribution of ultra-processed foods and sugary drinks (Moodie et al. 2013; Swinburn et al. 2011; Cutler et al. 2003; Monteiro et al. 2011). Ultra-processed products are “inventions of modern industrial food science and technology” and are typically ready-to-eat products (Pan American Health Organization 2015, p.5). They are usually dense in calories, sugars, salt and fats, and low in fibre and micronutrients and include “burgers, frozen pizza and pasta dishes, nuggets and sticks, crisps, biscuits, confectionary, cereal bars, carbonated and other sugared drinks, and various snack products” (Stuckler & Nestle 2012; Monteiro et al. 2011; Monteiro & Cannon 2012; Martínez Steele et al. 2016). They are considered “hyperpalatable” due to being high in fat, sugar and salt (Kessler 2009; Moss 2013). Furthermore, ultra-processed foods are profitable products for the food and beverage industry, and they are often accompanied with aggressive and pervasive marketing and

promotion (Monteiro et al. 2013). It is argued that their hyperpalatability, in combination with their high availability, affordability and aggressive marketing, makes moderate consumption of ultra-processed products a challenge for most consumers (Moodie et al. 2013).

There is strong and growing evidence of the contribution of ultra-processed foods to obesity and other NCDs globally (Moodie et al. 2013; Monteiro et al. 2011; Monteiro et al. 2013; Poti et al. 2015). In the US, ultra-processed foods have been found to have a large impact on dietary intake: more than three-quarters of the calories purchased in the US are from ultra-processed foods, of which the majority came from products exceeding recommended levels of fat, salt and sugar (Poti et al. 2015). Close to 90% of calories from added sugar in the US come from ultra-processed foods, and ultra-processed foods contain five times the amount of sugar than minimally processed foods – defined as “unprocessed foods altered in ways that do not add or introduce any new substance (such as fats, sugars, and salt) but may involve the removal of parts of the food” (Martínez Steele et al. 2016; Pan American Health Organization 2015, p.2).

Therefore, nutrition research and policies have begun to focus on ultra-processed foods as an important topic for policy intervention. For example, the 2014 Brazilian dietary guidelines included recommendations to limit consumption of processed foods; in 2016 the Pan American Health Organization issued a food processing classification system for governments to use in setting policies to reduce the consumption of ultra-processed foods; and recent studies have begun to track the nutritional impact of ultra-processed foods and model the potential health impact of policies to reduce the consumption of ultra-processed foods (Brasília Ministério da Saúde 2014; Moreira et al. 2015; Martínez Steele et al. 2016; Pan American Health Organization 2016). It is in this context that product reformulation, the policy focus of this thesis, has come into prominence; reformulation aims to improve the nutrition profile of ultra-processed foods.

NUTRITION POLICYMAKING IN THE US

The setting for this research is the US and the focus is federal-level nutrition policymaking, which is comprised of the three branches of the federal government – legislative, executive, and judicial – as well as a variety of federal agencies and departments that deal with health, nutrition and agriculture. Therefore, federal policymaking in the US is a complicated mix of the federal government and its agencies, public health and scientific communities, including NGOs and academia, and the food, beverage and agriculture

industries (Nestle 2002). Federal policy making can also be influenced by the policy developments at the levels of cities and states.

Many nutrition policies and programs relevant for this research are set and implemented by the federal agencies, including the US Department of Agriculture (USDA) and the Department of Health and Human Services, which includes the Food and Drug Administration (FDA) and the Centers for Disease Control (CDC). In particular, the USDA is responsible for defining the Dietary Guidelines for Americans (DGAs), which go on to influence the nutrition standards used in federal nutrition assistance programs such as the Federal School Meal Program, and for administering the federal nutrition assistance programs. In setting the DGAs, the USDA is influential in identifying the nutrition concerns and priorities of the nation, including identifying the nutrients and food products that Americans should consume more or less of. The FDA is a regulatory agency responsible for providing oversight and approval to the creation and use of dietary supplements and food additives, as well as regulating certain categories of food products, including their safety and health impact.

Historically, for much of the 1900s, nutrition policy in the US focused on alleviating undernutrition and hunger. This included funding and implementing the seminal nutrition assistance programs of the US in the late 1960s: the National School Lunch Program, the Supplemental Nutrition Assistance Program (formerly called Food Stamps), and the Women, Infants and Children Supplemental Nutrition Program (WIC) (Kennedy 2008).

As obesity and NCDs became increasingly prevalent from 1980-2000, the focus of nutrition policy in the US began to include provisions for overnutrition and healthfulness, in addition to undernutrition. In 1980, the federal government released the first Dietary Guidelines for Americans, which reviewed existing evidence on diet and health and collated it into dietary recommendations; they have been revised and published every five years since. However even for the early editions of the dietary guidelines, politics mired the process, with vocal opponents challenging the idea of the government providing dietary advice; this opposition was particularly from the food and beverage industries whose food products were discouraged or not recommended in the guidelines (Nestle 2002; Oppenheimer & Benrubi 2014).

In May 2000, President Clinton, alongside the USDA and the Department of Health and Human Services, hosted a National Nutrition Summit, with the goal of fostering

collaboration between the federal and local governments on nutrition issues (Picciano et al. 2003; Kennedy 2008). The summit focused on both food security and undernutrition and overweight/obesity, further marking a change in the US policy agenda around nutrition.

The federal government's focus on overweight and obesity continued in 2001 when the Surgeon General released his 'Call to Action to Prevent and Decrease Overweight and Obesity' (Office of the Surgeon General (US) et al. 2001). The report was notable for highlighting the role of environmental changes in reducing the prevalence of obesity, and identifying potential actions and interventions in five settings or areas: "families and communities, schools, health care, media and communications, and worksites" (Office of the Surgeon General (US) et al. 2001, p.15). Following this report, political attention on obesity grew in the US, and from 2001 to 2010 numerous federal nutrition policies in the US were adopted. They largely focused on clinical or behavioural aspects of nutrition, obesity and NCDs, including the USDA's 'TeamNutrition' policy, which featured a '5-a-day' fruit and vegetable campaign, as well as development of clinical guidelines for obesity (Novak & Brownell 2012).

However, progress via these individually-targeted programs was slow, and beginning in 2010, nutrition policy in the US began to shift towards including a focus on the environmental and societal causes of obesity and NCDs (Novak & Brownell 2012). In 2010, First Lady Michelle Obama launched a nationwide initiative focused on childhood obesity called Let's Move!, which encompassed initiatives aimed at improving the nutrition environment in schools and the wider community. In 2010, the US legislature adopted the 'Healthy, Hunger Free Kids Act', in part because it was championed by Michelle Obama and Let's Move!, which empowered and funded the USDA to revise and improve the nutritional standards for the federal food assistance programs to be more encompassing of the need to prevent obesity, including the school meal program (United States Congress 2010). Also in 2010, nationwide menu and calorie labelling for restaurants was adopted as part of the Affordable Care Act, however this policy has yet to be implemented and the industry has until May 2017 to comply (U.S. Food and Drug Administration 2010; U.S. Food and Drug Administration 2016c).

The policies described above collectively aim to improve population-wide access to healthy foods. However, notably absent from these federal level policies are policies aimed at decreasing the availability, affordability, and consumption of unhealthy foods and beverages, such as fiscal policies (e.g. sugary drink tax) and reducing marketing to children

(Novak & Brownell 2012; Sisnowski et al. 2015). This is not to say these policies have not been on the agenda, but they have not been successful, in part because of the “integral position” of lobbyists in US policymaking (Nestle 2002, p.95). For example, in 2009, the US congress appropriated funds to establish an ‘Interagency Working Group’ (IWG) on marketing to children, comprised of four federal agencies including the Federal Trade Commission (FTC) – responsible for regulating trade and advertising. This group was tasked with identifying voluntary standards and guidelines on food and beverage marketing to children, and in 2011 they released their draft proposal (Interagency Working Group on Food Marketed to Children 2011). However, this proposal – for *voluntary* guidelines – was never adopted, which may have been due, in part, to the fact that the food and beverage industry is reported to have spent \$37 million lobbying against the standards (Nestle 2011). The industry subsequently adopted their own self-regulated voluntary guidelines on marketing to children, The Children’s Food and Beverage Advertising Initiative (CFBAI), which are notably more permissive than those proposed by the IWG and have been found to be ineffective in an independent evaluation (Schermbek & Powell 2015; Kunkel et al. 2015).

Similarly, in 2009 President Obama was publically quoted supporting a national tax on sugar sweetened beverages, but “quickly backed off and has been silent on the subject since” (Bittman 2014). In 2014, House Representative Rosa DeLauro introduced a bill to place a one-cent per ounce tax on sugar-sweetened beverages nationwide; the bill was referred to the health committee but never made it to a vote (DeLauro 2015). It is notable that in the time between 2009 and 2015, the beverage industry spent \$114 million lobbying the federal government, with a peak in 2009 when President Obama was supporting a federal soda tax (Center for Science in the Public Interest 2015). This level of lobbying is a significant increase compared to years 2000 to 2005, when the beverage industry spent less than \$5 million per year in lobbying the federal government (Center for Science in the Public Interest 2015).

Corporate Influence on US Nutrition Policy

As described above, the national and multinational food and beverage industry, including trade organizations, is a powerful stakeholder in nutrition policymaking in the US. For any corporation that manufactures and sells products known to have a negative health impact, such as tobacco, alcohol, and ultra-processed foods and beverages, there is an inherent tension between their profit making practices – namely selling more products – and the health concerns surrounding their products. Freudenberg (2012, 2014) examined how

corporations, in an attempt to promote their business and profits, “shape lifestyles” which produce disease by: manufacturing products that go on to promote disease, influencing consumer wants and desires through advertising and media, structuring physical environments (e.g. where products are sold), altering social environments (e.g. through social media campaigns), and through involvement in the political process to create a “favourable business climate” (e.g. limited government regulation on their sales and marketing processes) (Freudenberg 2012; Freudenberg 2014).

Despite a long standing history of corporate involvement in nutrition policymaking in the US, such as the process to define the Dietary Guidelines for Americans (Hobbs et al. 2004; Oppenheimer & Benrubi 2014), research explicitly looking at the role of the food and beverage industry in the nutrition policymaking process is growing but still limited (see: Chapter 6).

Much has been learned about corporate involvement in public health policy from studying the strategies of the tobacco and alcohol industries (Brownell & Warner 2009; Koplan & Brownell 2010; Dorfman et al. 2012; Savell et al. 2016; Savell et al. 2014; Gilmore et al. 2011; Fooks & Gilmore 2013). The food and beverage industry uses similar strategies to that of the tobacco and alcohol industries (Brownell & Warner 2009; Savell et al. 2016; Savell et al. 2014), for example by placing the “responsibility on consumers rather than the corporation” and using corporate social responsibility as a means of trying to prevent government regulation (Dorfman et al. 2012).

Chapter 6 presents an in-depth discussion of the common political strategies of the food and beverage industry – referred to in this thesis by the term corporate political strategy (Hillman & Hitt 1999) – however to introduce them briefly here, they include:

- Influencing the policy relevant evidence through funding research and ghost writing studies (Lesser et al. 2007; Knai et al. 2010; Laverty et al. 2014; Chapman 2005; Tierney & Gerrity 2005; McHenry 2010)
- Influencing the policy debate and wider public discourse (e.g. through the creation of front groups like the Center for Consumer Freedom) and deflecting criticism by promoting efforts outside of the topic of discussion (e.g. food and beverage industry talking about physical activity) (Moodie et al. 2013; Koplan & Brownell 2010; Gomez et al. 2011)

- Participating in the policy process and policy consultations, e.g. International Food and Beverage Alliance participation in Roundtables related to the UN High Level Meeting on NCDs in 2011 (Moodie et al. 2013; Bakke & Endal 2010; Lavery et al. 2013; World Health Organization 2011)
- Providing funding and setting up partnerships, e.g. co-opting policy makers and health professionals through financial support, lobbying politicians and public officials through direct lobbying and campaign funding, and associating themselves or partnering with a health organization (Moodie et al. 2013; Mckee 2003; Koplan & Brownell 2010; Brownell & Warner 2009).

Furthermore, a number of public-private partnerships or initiatives have been set up between private companies and the federal government or health non-profit groups (Kraak & Story 2010), and play an increasingly important role in how the food and beverage industry influences the nutrition policy process (Freedhoff & Hébert 2011; Miller & Harkins 2010; Freedhoff 2014; Nestle 2015; Nixon, Mejia, Cheyne, Wilking, et al. 2015). Of particular significance to this research is the Partnership for a Healthier America (PHA), a non-profit group that partners with private organizations on multiple public health initiatives, including food and beverage product reformulation (Partnership for a Healthier America n.d.). It was established in conjunction with Michelle Obama's Let's Move! campaign, and was designed to encourage collaboration between the government and the industry, as described on the Let's Move! website:

In collaboration with Let's Move!, the Partnership will work alongside the Federal government to build targeted industry-specific solutions to fight obesity that can be measured and tracked (Let's Move! n.d.).

PHA, therefore, is a de facto intermediary between the food and beverage companies and the federal government. Furthermore, the act of industry partnering with health groups and/or the government influences public acceptance of the food and beverage industry's legitimacy as part of the solution to childhood obesity and therefore their legitimacy in participating in the nutrition policy process (Ken 2014). Through involvement with health organizations and through "framing corporations as vital community partners poised to 'work together,'" the food and beverage industries seek to manage perceived regulatory challenges to their business "using both structural and discursive strategies" (Ken 2014). This has also been illustrated in the media, an important influence on public opinion, where the industry, themselves, has increasingly emphasized their being part of the solution to obesity and NCDs (Nixon, Mejia, Cheyne, Wilking, et al. 2015).

NUTRITION POLICY IN THE US AND A FOCUS ON NUTRIENTS

Further adding complexity to the US nutrition policy process is an on-going and significant debate about whether nutrition policies should be based on reducing single nutrients or ingredients of concern (e.g. salt, sugar, fat, trans fats), or whether nutrition policies should focus on encouraging consumption of so-called ‘whole foods’, which would be naturally lower in the nutrients of concern. The nutrient-focused approach to nutrition and dietary guidelines in the US is particularly relevant to this research, as it is a contributory factor to nutrient-focused nutrition policies such as product reformulation. As the healthfulness of diets is primarily determined by nutrients, instead of foods, it is rational to improve diets by decreasing certain unhealthy ingredients in existing food products by product reformulation.

The nutrient-focus of nutrition has been named “nutritionism” by Gyorgy Scrinis, who defines it in his 2013 book as:

Nutritionism – or nutritional reductionism – is characterized by a reductive focus on the nutrient compositions of foods as the means for understanding their healthfulness, as well as by a reductive interpretation of the role of these nutrients in bodily health (Scrinis 2013, p.2).

To give an example, this debate is acutely reflected in the Dietary Guidelines for Americans and the process to define them. It is well-documented that the American food, beverage and agricultural industries are actively lobbying policy makers, participating in consultation processes, and attempting to influence which recommendations are included in the Dietary Guidelines (Nestle 2002; Oppenheimer & Benrubi 2014; Hiltzik 2015). In particular, the industry influenced a significant and lasting shift in the debate about nutrition during the dietary guidelines committee proceedings in 1977 (Oppenheimer & Benrubi 2014). In an effort to protect their business, the meat industry leveraged a lack of scientific consensus on the relationship between meat consumption and heart disease to lobby for the recommendations to say eat less saturated fat and not eat less meat, thus beginning an avoidance of the phrase “eat less” and a focus on nutrients which continues in the Dietary Guidelines today (Oppenheimer & Benrubi 2014; Nestle 2002). Many of the recommendations in the 2010 guidelines, for example, were nutrient based, such as the recommendation to limit saturated fats to 10% of calories (U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010). By contrast, a food-based approach would recommend eating less red and processed meats which are high in saturated fat and may be detrimental to health in other ways such as increasing the risk of certain cancers (Rohrmann et al. 2013). The 2015 Dietary Guidelines began to shift towards

a foods approach, by focusing its recommendations on dietary patterns, however many nutrient-based recommendations remained within (U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015a).

The nutrient focus in US government dietary guidelines has been referred to as “scientific euphemism,” and is argued to have created a state of “nutritional confusion and anxiety” which serves to benefit three parties: “the food industry, those working in nutrition science and journalists” (Pollan 2007). For example, Scrinis (2013) argues that a nutrient-focus serves the interests of the food and beverage industry, as it can be used to “conceal or override concerns with the production and processing quality of a food and its ingredients” (Scrinis 2013). The connection between nutrient-based approaches and the food and beverage industry’s corporate political strategy will be explored further in Chapter 8.

VOLUNTARY AND PARTNERSHIP BASED POLICY APPROACHES IN NUTRITION POLICY

It is in this context described above that a voluntary and partnership-based approach to nutrition policy has come into favour (Institute of Medicine 2012). These approaches, however, are not only supported by the food and beverage industry, but have been supported and adopted by the government, public health groups and advocates. For example, the 2001 Surgeon General’s report on obesity emphasized the “vital role” that industry can play in reducing obesity by saying:

Industry has a vital role in the prevention of overweight and obesity. Through the production and distribution of food and other consumer products, industry exerts a tremendous impact on the nutritional quality of the food we eat and the extent of physical activity in which we engage. Industry can use that leverage to create and sustain an environment that encourages individuals to achieve and maintain a healthy or healthier body weight (Office of the Surgeon General (US) et al. 2001).

Voluntary and partnership-based approaches can encourage collaborative progress in the highly political and contested context of nutrition policymaking in the US in which the food and beverage industry can otherwise become a significant political opponent (Institute of Medicine 2012; Majestic 2009; Kraak et al. 2012). Therefore, they have come to represent an opportunity for progress (Majestic 2009), as they side step the usually lengthy and complex process of enacting legislation or mandatory regulations.

Voluntary and partnership-based approaches are at one end of a policy mechanism continuum, with mandatory or government regulation at the other end (Table 1.2). These mechanisms vary in the way and extent to which they engage with the food and beverage

industry. As product reformulation policies or initiatives are commonly voluntary or self-regulatory in nature. Therefore, these types of engagement are important to understand for this research, and each will be explained in the following sections.

Table 1.2: Examples of nutrition policy mechanism of engagement Sources: Haufler, 2001; Sharma, 2010; Moodie, 2013

	<i>Voluntary self-regulation</i>	<i>Public-Private partnerships</i>	<i>Government Regulation / Market Intervention</i>
Description	Industry-led and defined initiatives, self-monitored – no engagement with public health community	Collaborative effort between private industry and government	Action required by government regulated by public authorities
Argument For	Market forces will correct issues; quicker and easier than government intervention	Collaboration is more likely to be effective than acting independently	Conflicts of interest between industry and public health require government intervention
Argument Against	Could be tactical move to stall legislation; efforts may not be uniform or to necessary extent	Creates opportunity for industry to influence public policy	Difficult to change government policy, slow to enact

PUBLIC-PRIVATE PARTNERSHIPS

A public-private partnership in health involves collective work between “at least one private for-profit organization with at least one not-for-profit organization” in “joint sharing of efforts and of benefits” and with a common “commit[ment] to the creation of social value” (Reich 2000). The rationale for public-private partnerships in obesity and NCD prevention is that the determinants of NCDs and their solutions lie in multiple areas and industries and therefore will require broad initiatives by all actors and stakeholders (The United Nations General Assembly 2011). Partnerships, it is argued, would foster “open discourse” and dialogue between the various sectors involved in public health policy and promote further progress (Yach 2014). Furthermore partnerships provide a means for public health groups and bodies to access the wealth of resources and collaborative opportunities that accompany private-sector partners (National Institutes of Health 2012; Kraak & Story 2010; Majestic 2009). However, the fundamental purposes of being in such a partnership may diverge significantly between the public and private sectors (Marks 2013). For the public sector, partnerships can be a way to supplement or replace funding lost for food and nutrition research and interventions. For the corporate sector, partnerships open opportunities to promote their brand and image and “enhance corporate authority and

legitimacy,” as well as to gain access to new markets, influence decision making processes, and deflect and distract from their less publically-favourable business practices (Buse & Walt 2000).

These differences in motivation between public and private sectors have raised questions about the potential effectiveness of public-private partnerships for public health, and highlight issues of conflict of interest. While public-private partnerships and voluntary agreements have had some success in other fields, particularly in the field of environmental policy (Bryden et al. 2013), their role in public health policy has been contentious. For example, Stuckler and Nestle (2012) argued that there is no “legitimate mechanism” whereby a partnership could fulfil the fiduciary profit making goals of the industry and remain in the best interest of public health (Stuckler & Nestle 2012). Likewise, Moodie et al. (2013) also argued that there is no evidence of the effectiveness of public-private partnerships for NCDs (Moodie et al. 2013); indeed, evaluations since have shown limited positive impact of public-private partnerships in nutrition (Knai et al. 2015; Jensen & Ronit 2015b; Kunkel et al. 2015; Ronit & Jensen 2014).

REGULATION: VOLUNTARY OR SELF-REGULATED VERSUS MANDATORY

A government regulation is an initiative, rule or action by government in which participation is required and there is public sector enforcement (Haufler 2001). By contrast, voluntary or self-regulation is when corporations (or other actors who could potentially be regulated) create and/or enforce their own initiatives or rules (Haufler 2001). In the case of the food and beverage industry, voluntary self-regulation often involves the setting of nutrition standards – for example around which products the industry will or will not market to children – or creating pledges to improve that status of nutrition – including reformulating their products to reduce the amount of salt, sugar or fat (Kunkel et al. 2015; Elliott et al. 2014; Alexander et al. 2011; U.S. Food and Drug Administration 2016b).

Self-regulation and government regulation are not dichotomous but are rather on a continuum, and actions can fall between the two. For example, an industry could, in theory, choose to voluntarily self-regulate to a more stringent standard than that of a government regulation or a system of co-regulation could be set up. However, industry self-regulations are commonly established in areas where there is no government regulation or when government regulation is in discussion– for example the food and beverage industry created their own front of pack nutrition label concurrent to government discussions of new national labelling regulations in the US (Nestle 2014a) (however, the

government subsequently adopted their own new labelling regulations in 2016 (U.S. Food and Drug Administration 2016a)). While self-regulation initiatives are voluntary, they are often enacted in a formalized way with agreements and mechanisms between and within companies (Haufler 2001). Voluntary agreements can also be part of a public-private partnership in nutrition, and can arise out of the threat of legislation or litigation (Sharma et al. 2010).

Self-regulation initiatives can be successful if they follow a certain set of prerequisites and requirements regarding monitoring, evaluation and accountability (Bryden et al. 2013). However, voluntary agreements have also been criticized for they are seen to favour to the interests of the industry over public health, and are argued to put the industry in a position to exert undue influence over the public policy process (Bryden et al. 2013; Freudenberg 2012). Likewise, public health actors have argued that voluntary pledges or actions are a strategy of companies or industries when they perceive a threat to their business (Sharma et al. 2010; Saloojee & Dagli 2000).

In the US, food and beverage industry self-regulation came onto into prominence in 2006 when the beverage industry, together with the Alliance for a Healthier Generation, self-created guidelines for beverages sold in schools (Sharma et al. 2010; American Beverage Association 2014). The beverage industry has calculated that since putting these voluntary standards in place 90% less calories from beverages were “shipped to schools” (Wescott et al. 2012). In 2007, the Children’s Food and Beverage Advertising Initiative was established to coordinate voluntary industry standards for marketing of products to children less than 12 years of age. Seventeen companies have signed up to the pledge (Council of Better Business Bureaus n.d.). In 2011, a group of 16 food and beverage companies voluntarily committed to reduce the number of calories in the food supply by 1.5 trillion as part of the Healthy Weight Commitment Foundation (Slining et al. 2013).

As the above initiatives demonstrate, there is reason to believe that voluntary or partnership-based approaches may improve the nutrition environment. However, there is a notable lack of evidence in order to assess whether voluntary or partnership-based approaches for nutrition policy are as effective as mandatory regulation (Moodie et al. 2013). For example, Bryden et al. (2013) reviewed voluntary agreements in a number of industries, including outside of public health, and found little evidence about the effectiveness of voluntary approaches versus regulative ones. They did find, however, that those voluntary agreements that were the most effective had financial incentives and

sanctions for not meeting the terms of the agreement (Bryden et al. 2013). Furthermore, in the control of alcohol and tobacco, products of public health significance that are addressed with similar policy approaches to that of food, it was regulation and taxation that proved extremely effective. Therefore, public health stakeholders argue that government regulation is the governance mechanism most likely to be effective (Moodie et al. 2013; Laverty et al. 2013; Ahmed 2009).

VOLUNTARY PRODUCT REFORMULATION IN THE US

Product reformulation is the process of altering the recipe or composition of a food or beverage product to change, increase or improve its function or health properties (van Raaij et al. 2009; World Health Organization 2004; Brambila-Macias et al. 2011a; Kersh 2009). While manufacturers continuously reformulate food products for a variety of reasons – including cost drivers, changes in consumer preferences and new or changing technologies – this research is specifically about reformulations targeting health-related concerns, which typically aim to reduce or remove salt, sugar or fat, particularly trans and saturated fats, from food and beverage products. These health-targeted reformulations are herein referred to as reformulation.

Globally, product reformulation has been recommended by numerous governments, government bodies and UN agencies (World Health Organization 2013; World Health Organization Regional Office for Europe 2013; Commission of European Communities 2007). In the US, reformulation was included in the 2011 National Prevention Strategy, was the focus of the New York City Health Department's 2011 National Salt Reduction Initiative, and was recommended in the 2015 Dietary Guidelines for Americans (DGAs) (National Prevention Council 2011; U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015a; New York City Health Department n.d.). Furthermore, in 2016 the US Food and Drug Administration (FDA) proposed a voluntary salt reduction program for foods and beverages; the proposal is currently under consultation, but if implemented it would be the first reformulation initiative in the US led by the federal government (U.S. Food and Drug Administration 2016b).

THE CASE FOR REFORMULATION AS AN NCD POLICY IN THE US

The case for reformulation as an NCD prevention policy is strongest in countries where the market is saturated with ultra-processed products (Moodie et al. 2013), such as the US (Poti et al. 2015). In these settings, product reformulation has the potential to reach large proportions of consumers (van Raaij et al. 2009). Furthermore, economic evaluations have

found that reformulation would be a cost-saving intervention for obesity (Dobbs et al. 2014). It is also argued that product reformulation is a “pragmatic” nutrition policy, for it changes the products individuals are consuming most frequently, rather than requiring individuals to change their diet (Winkler 2013). However, reformulation has also received criticism for only resulting in small changes to otherwise unhealthy products (Mozaffarian 2016b), and for being reductive or representative of the “nutritionism” approach described above (Scrinis 2016).

Reformulations can range from minor to major recipe changes – which may present technical and economic challenges to producers and manufacturers (White et al. 2002) – and therefore the potential health impact of product reformulation is variable and depends on which nutrient is targeted and how much it is reduced. Salt reduction targets hypertension, a main risk factor for cardiovascular disease, stroke, and kidney disease. Reformulation around fats, and trans fat in particular, is primarily targeted at changing blood lipid profiles, a main risk factor for heart disease. Sugar and total energy reduction would target obesity, diabetes and heart disease.

PRODUCT REFORMULATION INITIATIVES IN THE US

Product reformulation initiatives in the US have ranged from quasi-regulatory public-private partnerships with government institutions, co-regulatory mechanisms in partnership with non-profit or non-government organizations, to voluntary corporate pledges or alliances on reformulation; the majority have been self-regulated (The NYC Health Department n.d.; Alliance for a Healthier Generation n.d.; Partnership for a Healthier America n.d.; Slining et al. 2013; Mars Inc. n.d.; McDonald’s n.d.; The Hershey Company n.d.). The key product reformulation initiatives in the US are summarized in Table 1.3, and the reformulation initiatives of 10 large US food and beverage companies are described in Table 1.4.

Reformulation has also been a priority of First Lady Michelle Obama’s obesity prevention campaign, Let’s Move!, and she is the honorary chair of the reformulation focused Partnership for a Healthier America (Let’s Move! n.d.; The White House - Office of the First Lady 2010; Partnership for a Healthier America n.d.). Most recently, in June 2016, the Food and Drug Administration issued proposed guidance on a set of voluntary salt reduction targets (U.S. Food and Drug Administration 2016b).

Table 1.3 Reformulation partnerships or policy initiatives in the US			
Name	Year	Description	Type of Regulatory Mechanism
Alliance for a Healthier Generation	2006	Agreement with Campbell Soup Company, Dannon, Kraft Foods, Mars and PepsiCo; established voluntary guidelines for improving the nutrition profile of snacks and beverages sold in schools (Alliance for a Healthier Generation 2006)	Co-regulatory mechanism with non-profit health group
	2014	Agreement with the American Beverage Association, The Coca-Cola Company, Dr Pepper Snapple Group and PepsiCo; voluntary commitment to reduce calories consumed from beverages, per person, by 20% by 2025 (Alliance for a Healthier Generation 2014)	Co-regulatory mechanism with non-profit health group
New York City Health Department - National Salt Reduction Initiative	2008	Voluntary targets for salt levels in packaged and restaurant food; “the Initiative’s goal is to reduce Americans’ sodium intake by 20% by 2014 through voluntary corporate commitments to lower sodium in packaged and restaurant food.” (New York City Health Department n.d.)	Public-private partnership with government institution
Partnership for a Healthier America	2010	Formulates voluntary commitments with partner companies; commitments are specific to each partner company. Partners include: Dannon, Sodexo, The Mushroom Council “...in conjunction with – but independent from – Let’s Move!” (Partnership for a Healthier America n.d.)	Co-regulatory mechanism with non-profit health group
Let’s Move!	2010	Group of collective activities organized and launched by First Lady Michelle Obama; reformulation is one of the approaches promoted by Let’s Move!, and though not officially a Let’s Move! initiative, Michelle Obama was closely involved in Walmart’s reformulation efforts (see Table 1.4.) (Let’s Move! n.d.)	Voluntary alliance
Healthy Weight Commitment Foundation	2011	Voluntary alliance of food and beverage companies; pledged to reduce calories in the US food supply (Slining et al. 2013)	Voluntary alliance
FDA Voluntary Sodium	2016	A proposed set of voluntary salt reduction targets for food and beverage manufacturers	Voluntary and self-regulated

Reduction Goals (Proposed)		and restaurants in the US; as of September 2016 was in the consultation stage and has not yet been adopted. (U.S. Food and Drug Administration 2016b)	approach initiated by government agency
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Table 1.4: Self-reformulation initiatives of 10 large US food and beverage companies in the US	
PepsiCo	<p>“Reduce the average amount of saturated fats per serving in key global food brands, in key countries, by 15 percent by 2020, against a 2006 baseline.”</p> <p>“Reduce the average amount of added sugars per serving in key global beverage brands, in key countries, by 25 percent by 2020, against a 2006 baseline.”</p> <p>“Reduce the average amount of sodium per serving in key global food brands, in key countries, by 25 percent by 2020, against a 2006 baseline.”</p> <p>(PepsiCo. n.d.)</p>
Coca-Cola	<p>“Offer low- or no-calorie beverages in every market.” (Coca-Cola 2015, p.9)</p> <p>“Reduce beverage calories consumed per person nationally by 20% by 2025” (Alliance for a Healthier Generation 2014)</p>
Nestle	<p>“By 2016, reduce sugar content by an average of 10% from 2013 levels in all relevant products that do not meet the Nestlé Nutrition Foundation (NF) criteria for sugar.” (Nestlé n.d.)</p> <p>“By 2016, reduce salt content by an average of 10% from 2012 levels in all relevant products that do not meet the Nestlé Nutrition Foundation (NF) criteria for salt.” (Nestlé n.d.)</p> <p>“By 2016, zero foods and beverages will have trans fat originating from partially hydrogenated oils (PHOs) used as functional ingredients.” (Nestlé n.d.)</p>
Kraft Foods Group Inc. (Now: KraftHeinz)	<p>“Kraft does not appear to have a strategic commitment to delivering more nutritious foods across its two key markets of the U.S. and Canada.” (Access to Nutrition Index 2016)</p>
Kellogg’s	<p>“We have made substantial strides over the last few years in responsibly reducing the sugar, sodium and fats in our products around the world. This continues to be a primary area of focus for us. Between 2007 and 2012, for example, we reduced the average amount of sodium in our ready-to-eat cereals in our core markets by 18 percent. In the past few years, we have also reduced the sugar in our top-selling U.S. kids’ ready-to-eat cereals by 20 – 30 percent.” (Kellogg’s n.d.)</p>
Mars Inc.	<p>“We reformulated all Mars chocolate products globally between 2002 and 2010, removing all trans fats apart from those that occur naturally or are made during processing. Our efforts have removed 97 percent of all trans fats.”</p>

	<p>“On-going target: All chocolate & confectionary products below 250 kcal per portion”</p> <p>“2015 target: Reduce sodium in Mars food products globally by 25 percent”</p> <p>(Mars Inc. n.d.)</p>
General Mills	<p>“Reducing calories, fat, saturated fat, trans fat, sugar or sodium by 10 percent or more”</p> <p>“Increasing beneficial nutrients including vitamins, minerals and fibre by 10 percent or more”</p> <p>“Formulating products to include at least a half-serving of whole grain, fruit, vegetables, or low or nonfat dairy”</p> <p>“Formulating/reformulating products to meet specific internal requirements, including limiting calories, and meeting health or nutrition claim criteria as defined by the US Food and Drug Administration”</p> <p>(General Mills n.d.)</p>
McDonalds	<p>“Serve 100% more fruit, vegetables, low-fat dairy or whole grains”</p> <p>“Reduce salt/sodium, sugar, saturated fat or calorie across the menu”</p> <p>(McDonald’s n.d.)</p>
Dannon	<p>“In 2014, the Dannon Company announced a landmark commitment to further improve the nutrition profile of its yogurt products with Partnership for A Healthier America (PHA). As part of its four-part commitment, Dannon will further improve by 10 percent the nutrient density of its products in part by increasing nutrients that are encouraged in a healthy diet, while reducing total sugar and fat, and will invest in nutrition education and research focused on healthy eating habits.” (Dannon.com n.d.)</p>
Walmart	<p>“Reformulating thousands of everyday packaged food items by 2015. We're reducing sodium by 25%, reducing added sugars by 10% and removing all remaining industrially produced trans fats.” (Walmart n.d.)</p>

EFFECTIVENESS OF REFORMULATION INITIATIVES

This section will review the effectiveness of reformulation initiatives by their governance mechanism and study type. It will first review evidence of government-led reformulation initiatives, then voluntary initiatives and lastly present findings from modelling studies on reformulation.

GOVERNMENT-LED INITIATIVES

Salt was one of the original nutrients targeted by product reformulation (Webster 2009). It has been particularly successful because it has typically included “some form of government involvement” (Trieu et al. 2015) – even if the reformulation targets themselves were voluntary – and featured multiple components beyond reformulation such as

consumer education and front-of-pack labelling (Trieu et al. 2015). To date, 75 countries have adopted national salt reduction strategies, of which nine have set mandatory salt reduction targets – primarily for bread products – and a further 36 have established voluntary targets. Of the 75 countries, 12 had a corresponding reduction in population salt intake – however none of these 12 had mandatory reformulation targets (Trieu et al. 2015).

Similar success has been shown with reformulations to reduce trans fatty acids as these reformulations have typically followed mandatory government policy for labelling or legal limits for trans fat content (Ratnayake et al. 2009). In the US, mandatory trans fat labelling came into effect in 2006, and resulted in significant reductions in the trans fat content of US food and beverage products (Otite et al. 2013). Trans fat labelling is also mandatory in Canada and South Korea (Downs et al. 2013). Most recently in 2015 the US government ruled that partially hydrogenated oils – the source of industrially added trans fats in foods – are no longer ‘generally recognized as safe’ and therefore trans fats have been effectively banned in the US food supply (U.S. Food and Drug Administration 2015). The collective effect of the trans fat policies in the US has been a significant improvement in the amount of trans fat in American’s diets. However, it is important to note that in this same period diets overall remained poor and sodium intake rose (Wang et al. 2015).

In Denmark, the government set an upper limit for trans fats in 2003 which led to trans fats being virtually removed from the Danish food supply (Leth et al. 2006). The Danish success has been highly influential in Europe (Bech-Larsen & Aschemann-Witzel 2012), and following their lead Switzerland, Austria, Iceland, Norway, Hungary and Sweden have since passed similar limits on trans fat content in food products (WHO Regional Office for Europe 2015). Evaluations of trans fat reduction programs have found mandatory limits for trans fats to be widely successful, and that while labelling and voluntary measures show reductions they leave more trans fat in the food supply than mandatory limits (Downs et al. 2013; WHO Regional Office for Europe 2015).

VOLUNTARY INITIATIVES

Research from a number of countries has found limited effectiveness of voluntary reformulation. In Australia, the Food and Health Dialogue (a voluntary initiative convened by government) failed to achieve its reformulation targets for eight nutrients, including sugar, in its first four years (Elliott et al. 2014). Likewise, further evidence from the Food and Health Dialogue found that 80 of 120 products (67%) targeted at children had undergone reformulations from 2009 to 2011. However only 45 (35%) of these products

were “substantially reformulated” by reducing at least one nutrient by 25% or more (Savio et al. 2013). Furthermore, 15% of products analysed in this study underwent both positive and negative reformulations, meaning that as one or more of concern went down, another was increased, and that the calories, sugar and fat were reduced less often than salt (Savio et al. 2013).

In the UK, the Responsibility Deal (RD) is a public-private partnership between the government and the private sector, including food and beverage companies. It established voluntary pledges that companies could sign up to including reformulation of food and beverage products. Evaluations of the RD have found that while many companies signed up to the pledges to reduce salt and calories in foods, the majority of these were pre-existing company actions (rather than initiated by the RD) and only a limited number of companies reported their progress in meeting the targets (Knai et al. 2015). The RD has also had negligible impact on inciting companies to reduce trans fats in their products (Knai et al. 2017). Furthermore, the RD’s voluntary salt pledges replaced a government-led system of salt reduction targets, and shifting to the voluntary pledges of the RD slowed down the previously promising progress in reducing salt intake in the UK (MacGregor et al. 2015). It is also argued that though reformulation in the UK did lower salt intake, it was not sufficient enough to lower overall sodium consumption to below the national salt reduction target of 6g per day (Reeve & Magnusson 2015, p.5299).

In the US, the self-regulation approach to product reformulation poses challenges for evaluating the health impacts of reformulation and enforcing sanctions should targets not be met. As they are self-regulated, the majority of progress data available on reformulation comes from the industry’s own reporting, which is variable in nature and level of detail. Independent evaluations of reformulation have been limited; however, there have been three notable exceptions, which will be presented here.

In 2009, through the Healthy Weight Commitment Foundation, an industry-led partnership addressing obesity, 16 food and beverage companies pledged to collectively remove 1.5 trillion calories from the food supply by 2015. In 2014, researchers at the University of North Carolina evaluated the efforts of this group and found that the companies had removed 6.4 trillion calories from the food supply, thereby significantly surpassing their initial pledge (Ng et al. 2014). However, this equates to only a 78 calorie reduction per day per capita (Ng et al. 2014), and in addition to being small relative to total daily calorie

consumption, these results have been criticised as being reflective of a general decline in consumer purchases, rather than due to the industry's reformulations (Mozaffarian 2016b).

The large American retailer Walmart has also undertaken reformulation efforts, however, recent research found that while Walmart had achieved small gains, they were not beyond what would be expected given existing trends (Taillie et al. 2015). Specifically, they found that packaged foods sold at Walmart had decreased by 74 kcal/100g from 2000 to 2013, but that much of this decline was achieved by the late 2000s, before the official launch of Walmart's reformulation initiatives in 2011. The authors of this evaluation found that "these results are contrary to what we would expect to find if the healthier food initiative truly marked a turning point in how Walmart formulated, priced and marketed its foods" (Taillie et al. 2015, p.1874). They concluded that "while food retailers should be engaged in efforts to create a healthier food environment, more systemic shifts in the underlying characteristics and preferences of the population may be needed to meaningfully improve the healthfulness of food purchases" (Taillie et al. 2015, p.1875) – conclusions which raise questions about the potential effectiveness of voluntary reformulation in achieving health aims.

In 2009, the New York City Department of Health launched the National Salt Reduction Initiative (NSRI), a series of voluntary salt-reduction targets for the food and beverage industry (The NYC Health Department n.d.). Since that time, salt content has been reduced in products by about 7%, however the reductions made by industry were significantly below the 20% and 25% goals set by NSRI, as well as below that which would be necessary to achieve dietary sodium recommendations (Curtis et al. 2016).

In reviewing the global evidence of product reformulation initiatives and policies, the National Heart Foundation of Australia (2012) reviewed 123 peer-reviewed and grey literature articles/reports, and concluded that product reformulation programs or policies would be more effective if:

- They are mandatory
- Change is incremental
- The reformulation is category-specific and addresses multiple nutrients
- They are part of a wider program with front-of-pack labelling and consumer awareness campaigns
- They are government-led with stakeholder engagement; and

- There is a commitment to monitoring and evaluation (National Heart Foundation of Australia 2012)

Likewise, an evaluation of voluntary initiatives in a variety of industries found that they are more likely to be successful if there are meaningful penalties for non-compliance coupled with incentives for compliance, specific targets with time frames, and progress measured as compared to a specified baseline (Bryden et al. 2013).

MODELLING STUDIES

Leroy et al (2015) conducted a modelling exercise on reformulation for sodium, fat, fibre and added sugars, and found that depending on the amount of reformulation undertaken, mortality due to diet-related diseases could be reduced by 3.7-5.5% (Leroy et al. 2015).

Based on their results, the authors of this study concluded:

Although food reformulation alone would not be sufficient to markedly reduce the prevalence of chronic diseases related to food consumption, it can have an important role in that direction (Leroy et al. 2015, p.698).

Yet, the authors also concluded that reformulations undertaken to date by the food industry have not yet reached that level, that they were at a “half-way stage” and would need “to be generalized to the whole food sector” (Leroy et al. 2015, p.698).

Likewise, economic modelling by the McKinsey Global Institute (MGI) suggests that in the UK reformulation could potentially be cost saving and effective in contributing to reducing obesity. However, they cite that there is limited existing evidence about reformulation’s impact on obesity (Dobbs et al. 2014, p.38). Importantly, in the MGI modelling study, reformulation is only one of 44 interventions included in the study, and the study concluded that all 44 interventions would need to be implemented in order to achieve a 20 percent reduction in overweight and obesity (Dobbs et al. 2014, p.39).

Therefore, in summary, there is evidence to suggest that population nutrition and health could be improved if significant reformulations were undertaken in commonly consumed food and beverage products. However, the reformulations undertaken to date have been largely voluntary, and therefore, on their own, they are unlikely to achieve significant health improvements.

GAPS IN KNOWLEDGE TO BE ADDRESSED IN THIS RESEARCH

This chapter has demonstrated that product reformulation is exemplary of the challenging political process for nutrition in the US, in which numerous actors with divergent interests and political ideologies have fostered voluntary and self-regulated approaches in public

health nutrition over mandatory regulations. Reformulation, therefore, serves as a prime example through which to study the complexities of the nutrition policy process in the US, as well as the various stakeholders involved and their strategies in influencing the process. Yet, though there is an emerging body of research on the food and beverage industry's corporate political strategy, the political dynamics and implications of reformulation, including its relationship to the food and beverage industry's corporate political strategy, have been little researched (see Chapter 5).

Furthermore, little is known about how and why product reformulation came to be on the public health agenda in the US, and if or how stakeholder interests influenced that process. There are two issues at hand in seeking to answer this question: the factors that motivated the food and beverage industry to voluntarily reformulate their products, and the factors that encouraged reformulation as a public health policy to be supported by public health advocates and policy makers. As described above, the industry may have been motivated by a desire to influence or shape the public health nutrition policy process, however commercial factors and strategies may have also been motivating factors, and this research will seek to provide insights into the variety of industry motivations in reformulating. Likewise, a number of factors may have encouraged public health advocates and policy makers to support reformulation over other policy options, including a pragmatic desire to achieve positive changes for health in the food system, as well as aligning with underlying competing paradigms and framings in nutrition policy (Chapter 8). However, analysis of frames in nutrition policy in this way has also had minimal application in the existing literature (Chapter 5).

Studying the political conditions, stakeholders, and underlying paradigms and framings that encouraged product reformulation to become a prominent public health nutrition policy is the unique contribution of this research. In studying reformulation in this way, this study will help to elucidate some of the complexities in the nutrition policymaking process in the US, and, in particular, the role of the food and beverage industry in influencing both the policy options on the agenda and their governance or implementation mechanisms (e.g. voluntary or partnership-based versus mandatory).

2 THESIS OVERVIEW

AIMS AND OBJECTIVES

This research was undertaken to assess how and why product reformulation became a prominent public health nutrition policy. It aimed to explore the circumstances in the US that contributed to the increasing prominence of product reformulation as a public health nutrition strategy. In doing so, it sought to provide insights into the nutrition policymaking process and dynamics in the US, and help elucidate the increasing role of the food and beverage industry in that process.

Product reformulation is an apt case to study the dynamics of nutrition policymaking in the US as it encompasses many of the contexts and complexities facing nutrition policy today, as described in the background: voluntary policies, food and beverage industry self-regulation, nutrient-defined nutrition goals and policies, corporate political strategy, weakening of government regulation and purview over both public health and science, and increasing public-private partnerships. However, most importantly it is one of the few nutrition policy options with an inherent business case for the industry, which means it has a particularly strong appeal in the political system in the US, which is largely protective of economic and business interests.

The aims and objectives of this research follow on from the gaps in the literature identified in the previous chapter. Specifically, this research sought to:

- 1) Explore how and why product reformulation came to be on the public health agenda
- 2) Assess underlying frames and paradigms in nutrition policy and how these encouraged product reformulation over other policies
- 3) Analyse the position held by key policy actors in the US on reformulation, and how they sought to preserve their interests, including through strategic framing
- 4) Understand the role of commercial drivers, government policy and corporate political strategy in motivating the food and beverage industry to reformulate their products
- 5) Inform understanding of nutrition policymaking dynamics in the US

SCOPE OF THE THESIS

This thesis focuses food and beverage reformulation as a way of providing insights into nutrition policymaking in the US. Therefore, it looks at the political process and dynamics

surrounding product reformulation becoming a public health nutrition policy in the US. It makes the assumption that in order to assess and appraise product reformulation as a public health policy, we need to understand the context and situations that initially generated product reformulation as a public health policy, as well as the potential implications of reformulation on the nutrition policymaking dynamics. In particular, it takes the position that in order to judge the value of product reformulation as a public health policy it is necessary to understand why different policy actors support reformulation (e.g. their aims in undertaking reformulation), and whether or not the priorities of various stakeholders are equally considered in undertaking reformulation. This research applies a political science lens and sought to understand how and why reformulation became a public health policy, including which policy actors and contextual factors supported it, in order to better inform research and policy debates about reformulation and nutrition policy more broadly.

The thesis explicitly does not seek to answer whether or not reformulation is effective as a public health policy nor if it is effectively governed or implemented. However, though not a specific objective of this research, aspects of effectiveness and governance were themes coming out of the research and, as such, are incorporated in the results and discussion. All discussions of effectiveness are based on what was described by the interview participants and through the literature, media and documentary analysis. Furthermore, this thesis does not assess nor take a stand on the technical debates surrounding product reformulation. In particular, it does not take a stand on whether or not the substitutes used in reformulation are healthy (e.g. artificial sweeteners), though this was raised as a key concern by many participants, and will be discussed in that context.

POSITIONALITY

This research is heavily focused on the food and beverage industry, rather than the strategy and actions of the public health advocacy community. The focus on industry was explicit in the intimal impetus for taking on this research, and is justified by a number of facts:

- Focusing on the industry, as an actor within the policy subsystem, is warranted by the Advocacy Coalition Framework, one of the policy theories applied in this research as described in the next chapter (Sabatier 2007, pp.4–5)
- There is limited research on the food and beverage industry's corporate political strategy, and even less research on how voluntary initiatives like reformulation fit into that strategy (Chapter 5)

- The food and beverage industry is a powerful actor in the nutrition policy subsystem, and there are numerous examples of their influence over the policy process (Chapter 6), therefore focus on the industry is an avenue of research justified by previous findings

It could be argued, however, that this research did not focus enough on the political strategy of the public health community, but this is countered by arguments from a personal/professional perspective and from the findings of this research. Personally, I am a professional in the public health community and before beginning my PhD I was employed in public health advocacy for a number of years. Therefore, I have first-hand knowledge of public health advocacy strategies, and while this would be an important area of research, it was not my aim in undertaking this research. Furthermore, though this research did not set out to study the public health community, it has nonetheless generated a number of key findings about how the public health community could strengthen their approach to policy advocacy (see Chapter 11). Indeed, there is a significant amount of material in this thesis about factions and divisions within the public health community, and the ways in which the public health community has promoted product reformulation (Chapters 7 and 10).

DEFINITION OF PRODUCT REFORMULATION USED IN THE THESIS

The term 'product reformulation' is used in the thesis to denote food and beverage product reformulation. It refers to the *reduction or removal* of nutrients from processed and packaged foods, such as the reduction of sugar in breakfast cereals, or the lowering of salt in bread (Kersh 2009). Reformulation as a term can also apply to the addition of ingredients/nutrients to a product, such as the addition of fibre to grain products. At times, participants discussed these 'addition' reformulations, but by and large they were not the focus of this research.

DEFINITION OF NUTRITION POLICY USED IN THE THESIS

The definition of policy used in this research is broad and most closely aligned to that of Page (2006), who defines policy as:

Policies can be considered as intentions or actions or more likely a mixture of the two. It is possible for a policy to be simply an intention. The proposals of a party unlikely to gain office or participate in a coalition are 'policies' even though they have no chance of being put into action. Moreover, it is possible for a policy to be simply an action or a collection of actions (Page 2006, p.208).

Public health nutrition policy specifically refers to the policies – intentions, actions, proposals – which pertain to improving nutrition, and included within these are policies

aimed at reducing the risk of obesity and diet-related NCDs. Public health nutrition policies are typically concerned with the nutrition and health of the population as a whole, rather than any one individual. It is from this perspective that reformulation is assessed: how and why did it become a *public health nutrition* policy?

STRUCTURE OF THE THESIS

The overarching structure of the thesis is that of a 'paper style,' whereby methods and results are largely presented within four papers. The thesis begins with a summary of the theoretical and conceptual approaches that were used to guide and inform this research, and a summary of the methods applied in seeking to answer the aims and objectives. The chapter on methods is a purposefully short overview, as each method is discussed in detail in the relevant paper.

The results chapters are summarized in Table 2.1. They begin with an overview of the scoping review and a brief presentation of the type/nature of reformulation initiatives in the US (Chapter 5). Chapter 6 is on the relationship between product reformulation and the food and beverage industry's corporate political strategy, and contains within it Paper 1 on evidence of the industry's strategy from data in this research and existing literature. Chapter 7 focuses on identifying belief systems and coalitions within the group of interview participants, which forms Paper 2, and if these coalitions help to explain why reformulation became a prominent public health policy. Chapter 8 is about a defining paradigm in nutrition policy – that of foods versus nutrients – and how this paradigm supported reformulation being taken up as a public health policy (Paper 3). Chapter 9 assesses the framing of reformulation in the media over time and by various stakeholders (Paper 4), as well as the role these framings of reformulation played in securing its position of prominence. The last results chapter (Chapter 10) is a cross-analysis of the data as analysed through the lens of the Political Priority Framework. Chapter 10 therefore serves as a summative chapter, and makes reference to the results that are presented in detail in the previous chapters. After presentation of the results, the discussion chapter briefly summarizes the results of the previous chapters, reflects on the findings, methods and theories of the research, and lays out a set of policy recommendations based on the findings.

Table 2.1: Summary of the Results Chapters						
Results Chapter	Paper	Status of Paper	Primary stakeholder analysed	Primary Data Source	Additional Data Source(s)	Theory/ Framework Applied
5: Results of the Scoping Review	n/a	n/a	n/a	Literature	n/a	n/a
6: Reformulation as a Corporate Political Strategy	1: Food and Beverage Product Reformulation as a Corporate Political Strategy	Published Social Science and Medicine, November 2016	Food and beverage industry	Documents	Interviews, Media Analysis	Corporate Political Strategy Narrative Political Strategy Framing
7: Evidence of Coalitions and Role of Public Health Actors in Encouraging Reformulation	2: Work with the Food and Beverage Industry? A Dividing Line in Public Health Nutrition Advocacy Coalitions	Not yet submitted Intended for Food Policy	Cross-sectors	Interviews	Documents, Media	Advocacy Coalition Framework Ideas in policymaking
8: The Food/Nutrient Paradigm	3: Is Product Reformulation Fit for Purpose? The Foods versus Nutrients Paradigm in Nutrition Policy	Under Review Public Health Nutrition	Cross-sectors	Interviews	Documents, Media	Framing Ideas in policymaking
9: Framing of Product Reformulation	4: The Shift in Framing of Food and Beverage Product Reformulation in the United States from 1980 to 2015	Under Review Critical Public Health	Cross-sectors	Media	Interviews, Documents	Framing Ideas in policymaking
10: Reformulation as a Prominent Public Health Strategy	n/a	n/a	Cross-sectors	All	n/a	Political Priority Framework Multiple Streams Framework Advocacy Coalition Framework Ideas in Policymaking

3 THEORETICAL APPROACHES AND CONCEPTUAL LENSES

The overarching approach to this research is that of policy analysis, and in particular, analysis of the policy process. Policy process research is defined as “the study of the development of public policy over time and the context, events, and individuals surrounding this development” (Weible et al. 2012, p.3).

Weible et al. (2012) argue that in order to understand the policy process, there needs to be in-depth understanding of three areas: (1) policy subsystems, (2) the macro policy system, and (3) factors that “grease the wheels” of policy change (Weible et al. 2012, p.7). In this research the policy subsystem – which brings together actors who are concerned with the same issue – is that of nutrition, obesity and NCD policy at the federal level in the US. The macro policy system is the federal US political system, which has many potential points of entry for change, but also numerous policy actors who are able to exert influence over the process. The third context– the “grease the wheels” factors – is, in part, what this research hopes to elucidate in the context of product reformulation.

A linear view of the policy process outlines four stages of the policy cycle: problem definition and agenda-setting, decision making and policy implementation (Buse et al. 2012). However, while the policy stages approach is a useful heuristic tool, the policy process is complex and one of the major criticisms of this linear approach is that it does not seek to explain “causal mechanisms” (Weible et al. 2012; Sabatier & Weible 2007; Nowlin 2011). Therefore a number of theories and frameworks, some of which will be employed in this research, have been developed as alternatives to the policy stages approach (Nowlin 2011). These include those focusing on a single stage of the policy cycle (e.g. implementation framework or multiple streams framework), those that focus on multiple processes (e.g. diffusion and innovation framework), and those that focus on the policy process from the perspective of policy agents or actors and their goals (e.g. institutional analysis and development framework and advocacy coalition framework) (Sabatier 2007).

Multiple theoretical frameworks and conceptual lenses guided this research, each of which contributed specific aspects towards answering the question of how and why product reformulation became a prominent public health policy in the US. The use of multiple frameworks was deliberate, in that it would enable a critical view through which to challenge the assumptions within any one particular framework, and in a study such as this

one that also uses multiple methods, using several frameworks helps to assess if there is an “accumulation of evidence in favour of one perspective over another” (Sabatier 2007, p.6).

This research seeks to assess how and why reformulation came to be a prominent public health policy in order to shed light on the dynamics of nutrition policymaking in the US. In order to answer these questions, the research needed to be guided by theories that explain how and why an issue comes to be on the policy agenda and the role of actors in that process. The theories or concepts were each chosen for they helped to answer at least one aspect or component of the two research questions, and a number of the theories/concepts were applicable to both research questions. In particular, the Advocacy Coalition Framework was chosen for its focus on *actors* seeking to influence the policy process; the Multiple Streams Framework was chosen for its focus on why certain policies come to be on the *policy agenda* at a particular point in time. Overarching these theories was the conceptual lens of ideas and how they influence the policy process. Table 4.1 in Chapter 4 shows how these theories/concepts are connected to the objectives and methods.

THEORIES

ADVOCACY COALITION FRAMEWORK

A core theoretical component of this research is the Advocacy Coalition Framework (ACF) developed by Sabatier (1988). Actors with vested interests play a key role in the nutrition policymaking process in the US, and therefore, this theory was chosen as it focuses on *how* actors within a policy system influence the policy process in contexts, like the US, that consist of multiple actors and levels of government (Sabatier 1988b).

In particular the ACF “emphasizes the role of human agents, [and] looks at processes that emerge through conflict or competition among two or more coalitions over a period of time” (Weible et al. 2012, p.4). It is based on the assumption that individuals act in collective groups to advance their goals, and that the policy process “unfolds around periods of intractable political conflicts or efforts to negotiate agreement” (Weible et al. 2012, p.4). Since the noticeable uptick in obesity began in the 1980s, there has been a long standing conflict between the goals of those acting in the food and beverage industry, and the goals of those concerned with the health implications of poor nutrition, obesity and NCDs (Nestle 2002). Therefore, the Advocacy Coalition Framework is applicable in helping to understand how this conflict between stakeholder/advocacy groups influences the

policy process to define solutions to obesity and NCDs, and how this in turn has influenced the emergence of product reformulation as a prominent public health policy in the US.

A defining feature of ACF is that it assumes policymaking occurs through specialized policy subsystems (e.g. a nutrition policy subsystem in the US), and that any subsystem will generally have two to five advocacy coalitions (Sabatier & Weible 2007). Coalitions form around beliefs, which span three levels: deep core beliefs, policy core beliefs and secondary beliefs (Sabatier & Weible 2007). Deep core beliefs are not specific to a policy subsystem and are the normative beliefs and values that typically form in early life, and usually align with the right/left values of political parties. These include “values such as liberty and equality” and “the proper role of government vs. markets in general” (Sabatier & Weible 2007, p.194). Policy core beliefs refer to those that are specific to a policy subsystem and the application of deep core values within that subsystem; for example: “the relative seriousness and causes of policy problems in the subsystem as a whole” (Sabatier & Weible 2007, p.195). Within policy core beliefs are policy core preferences, which “are normative beliefs that project an image of how the policy subsystem ought to be” and which are typically “the stickiest glue that binds coalitions together” (Sabatier & Weible 2007, p.195). The third level of beliefs are called secondary beliefs, which are specific beliefs that are not subsystem-wide and have to do with rules and applications of specific policies or programs. Importantly, disagreement on secondary beliefs does not preclude formation of a coalition, as policy stakeholders may agree on policy core beliefs but not specific secondary beliefs within that core belief. Therefore, it is typically possible to identify advocacy coalitions by comparing and contrasting the policy core beliefs and policy core policy preferences between groups of actors (Sabatier & Weible 2007).

A functioning coalition will employ a number of strategies so that their preferred policies, those that align with their core beliefs, are enacted before that of another coalition. Coalitions engage in coordination in order to achieve their policy objective, whether that be weak (such as monitoring ally activities) or strong (such as implementing a common action plan)(Sabatier & Weible 2007). They are typically made up of decision makers, legislators, interest groups, researchers and journalists (Sabatier & Weible 2007). The ACF also conceptualizes and seeks to explain policy actor behaviours. According to the ACF, actors within a policy subsystem behave in a certain way due to stable and dynamic factors such as the “basic attributes of the problem,” “fundamental sociocultural values and structure,” and “changes in the governing coalition,” among others (Sabatier & Weible 2007, p.193).

This research sought to identify core beliefs and interests in the nutrition policy subsystem, if coalitions had aligned around those core beliefs, and if those coalitions contributed to the emergence of product reformulation on the public health agenda. It was undertaken with the assumption that food and beverage industry stakeholders would share common beliefs, particularly that nutrition policy should not infringe upon the ability of the corporation to conduct their business (Dorfman et al. 2005; Kersh 2009). Meanwhile it was assumed that public health groups and academics might align along the belief that nutrition policy should protect the interests of the public rather than corporate actors. For other actors in the policy system, such as within the government and actors who belonged to multiple sectors, I did not attempt to make assumptions about their core beliefs.

The ACF is applied most prominently in Paper 2, found in Results Chapter 7, which analyses the interview data for evidence of core beliefs and advocacy coalitions among the interviewees. It is also used in Chapter 10, which crosscuts the data according to the categories of the Political Priority Framework (explained below) – of which advocacy coalitions are considered a component of actor power.

MULTIPLE STREAMS FRAMEWORK

The Multiple Streams Framework (MSF) was chosen for this research as it seeks to understand why a particular policy comes to the fore at a particular time. It refers to these opportunities for specific policy options to become prominent and enacted as policy windows (Kingdon 1984). The MSF is particularly suited to investigating the aims of the research, as it seeks to explain “how policies are made by national governments under conditions of ambiguity” (Zahariadis 2007). There is no single policy that would solve the NCD and obesity epidemics, and the course of nutrition policymaking is fraught with uncertainty. In these conditions, the MSF provides a useful perspective by which to understand how and why product reformulation became a prominent public health policy in the US when it did.

The MSF was developed by Kingdon in 1984 as part of his work investigating policymaking in the US (Kingdon 1984). It is divided into three streams: problem, politics and policy. The problem is an issue or condition that policy makers need to address (Kingdon 1984). The policy stream “includes a ‘soup’ of ideas that compete to win acceptance in policy networks” (Zahariadis 2007, p.72). In the policy stream, any number of initial ideas may be generated by policy specialists, however only a few are seriously considered depending on the acceptability and feasibility of the proposal (Kingdon 1984). The politics stream is the

policy environment in which decisions are made (Kingdon 1984). Key factors influencing this include the political climate, political turnover, and the views or values of politicians and stakeholders involved in policy decisions. Of the elements in the politics stream “national mood and turnover in government exerts the most powerful effect on agendas” (Zahariadis 2007, p.73).

In the MSF, policies can only be decided when the elements from the three streams come together at a particular point in time called “policy windows,” and when interested parties, called “policy entrepreneurs” utilize the open window. Key factors that affect the opening of a policy window are summarized in Table 3.1. According to the framework, policy stakeholders have difficulty when they attempt to advance their policy at the wrong time (Kingdon 1984; Zahariadis 2007).

Table 3.1: Key Concepts of Kingdon’s Definition of a Policy Window (Adapted from (Zahariadis 2007))	
Problem Stream	Indicators, focusing events, feedback, load
Politics stream	Party ideology, national mood
Policy stream	Value acceptability, technical feasibility, integration
Policy entrepreneurs	Access, resources, strategies (e.g. framing)

In this research, the problem is nutrition-related NCDs and obesity, and high intake of key risk factor nutrients and foods/food groups. The multiple and divergent nutrition policy options for NCDs and obesity fits the “soup” description used by Kingdon to describe the policy stream. The politics stream for this research is the federal government of the US, and the views or beliefs of politicians, institutions, and stakeholders involved in that system, including policy advocates, academics and the food and beverage industry.

The MSF informed data collection and analysis in this research. In particular, the MSF was instrumental in designing the interview guide, and was used especially when formulating interview questions about when or why reformulation became a public health nutrition policy, rather than simply a business-related process of the food and beverage industry (see Chapter 4: Methods Overview). In the analysis, the MSF aided assessing the context and situations that led to a policy window for reformulation in the early 2000s, which is discussed in results Chapter 10, as a component of establishing the political priority of reformulation.

CONCEPTUAL LENS: EVIDENCE AND IDEAS IN POLICY

This research was also conceptually informed by the work of Katherine Smith, Deborah Stone, Patrick Fafard and George Lakoff, and others who argue that despite the importance of evidence within the public health field itself, evidence is only one, relatively minor, influence on the public health *policy* process (Smith 2013; Stone 2012; Fafard 2015; Lakoff & Rockridge Institute 2006). In particular, this research focuses on the power of ideas over that of evidence (Smith 2013).

The power of ideas is a closely related concept to that of framing and narratives, and is a core category of the political priority framework. Ideas are also important to consider in the context of the ACF and corporate political strategy, as ideas can serve as a tool or resource through which policy actors or coalitions can influence the policy process (Schrاد 2010). Therefore, this research focuses on the idea of reformulation itself, but also how the idea of reformulation is incorporated into stories (narratives), how it connects to deeper belief systems (framing), and how reformulation is used politically, as an idea, by competing stakeholder groups. This is particularly relevant for Chapter 6, on reformulation and its relationship to corporate political strategy, for corporations have the capacity to use their substantial “material resources” in order to construct and promote powerful ideas (Schrاد 2010). The “ideational power” of corporations has been particularly influential in shaping global health governance more broadly (Shiffman & Smith 2007; Smith et al. 2015), however it has not been extensively explored in US nutrition policy (see: Scoping Review, Chapter 5). This research sought to explore whether ideational characteristics of reformulation were used by actors or coalitions to promote it as a public health nutrition policy.

The opening chapter of Katherine Smith’s *‘Beyond Evidence Based Policy’* (2013) is called “The Fluctuating Fortunes of ‘Evidence-Based Policy,’” which is an apt and succinct way to describe the challenges of incorporating evidence into the policy process. The core argument of Smith’s work is that public health actors would be more successful at incorporating evidence into policy if they “focus[ed] on the influence of ideas” rather than evidence (Smith 2013, p.5). The reason to focus on ideas in policy processes is that they have a powerful influence on political discussion by invoking both emotional and cognitive reactions (Jones & Williams 2008). Furthermore, the persuasive, story-like elements of ideational discourse means that ideas are “very hard to dissuade...with mere facts” (Jones & Williams 2008, p.325; Schrاد 2010, p.209). Smith also argues that unlike evidence, ideas

are “malleable” and “move between actors;” though evidence “may play a role in making particular ideas more or less persuasive,” it is the ideas themselves that are influential (Smith 2013, p.5). While Stone (2012), focuses on narratives and their underlying values and argues that “the model of policymaking as rational problem solving” fails to consider that “all political conflict revolves around ideas” (Stone 2012, p.13).

Smith (2013) outlines “three levels of ‘ideas’ commonly identified in political science” (Table 3.2), which closely relate to the three levels of beliefs identified in the ACF and the three levels of framing (Smith 2013, p.74). This level system informed the data analysis, and features prominently in Chapters 8, 9 and 10, which discuss the power of reformulation as an idea and the policy paradigm of foods versus nutrients.

Table 3.2: Levels of ideas in political science. Source: (Smith 2013, p.74)

Policy paradigms	Policy frames	Policy solutions
Overarching ideas tied to “values, ideologies and causal beliefs”	“Ways of packaging and positioning policy issues”	Ideas about specific policy options
Underlying “assumptions about economics, politics and society”	“...ideas that help define what is and what is not considered to be a ‘policy problem’”	To gain attention on the policy agenda, these ideas “need to be linked to a policy problem and framed in a manner enabling them to fit within dominant policy paradigms”
Function as “organizing frameworks”	“...inform who is, and who is not, considered a legitimate stakeholder...”	

In public health policymaking, however, the concept of ideas cannot be divorced from the evidence informing public health policy. In this research, both evidence and ideas were used as guiding concepts in helping to explain how and why product reformulation became an important public health policy. It was important to consider the evidence supporting reformulation as evidence remains a “fundamental” part of public health policy and practice, and an evidence-based approach to policy is seen as a means of increasing the effective implementation of research that results from the “significant sums” the U.S. government spends on health research (Brownson, Chiqui, et al. 2009, p.1581; Brownson, Fielding, et al. 2009). The evidence-based approach to public health policy has been criticized, however, for heavily relying on evidence from randomized control trials at the expense of other forms of data, such as long term observational studies which are particularly relevant for ascertaining causality in complex public health issues (Victora et al. 2004). Similarly, it has been argued that an evidence-based approach has been narrowly

interpreted, and has potentially limited the extent to which innovative research and policies can be conducted and implemented (Smith 2013).

In public health nutrition specifically, a field with significant contestation about the evidence-base (Mozaffarian 2016a), evidence has been seen as a means of increasing “clarity” about which nutrition policies should take priority and therefore helps “produc[e] public health gains” (Brunner et al. 2001, p.1299). While, Margetts et al. (2001) proposed that consensus around nutrition evidence will “give little or no room for debate” and minimize the ability of “vested interests” to use evidential uncertainty as a basis for arguing against unfavored policies (Margetts et al. 2001, p.1395). In nutrition, this level of evidential certainty may be feasible from randomized control trials assessing the health impact of specific nutrients (Blumberg et al. 2010), however establishing irrefutable evidence about dietary habits and patterns in a real-world setting is significantly more challenging (King 2007). Following on from this complexity, the call for evidence-based nutrition policies also implies that policies themselves need to be shown to be effective through evidence, rather than merely for the evidence to establish which components of the diet to encourage or limit (Margetts et al. 2001). However, obtaining such evidence is often not possible until sufficient modelling evidence is available or a policy has been implemented, thereby creating a natural experiment (Petticrew et al. 2005). This circular argumentation is a reflection of the “restriction” that Smith (2013) demonstrates can arise from evidence-based policy in public health (Smith 2013, p.216). Furthermore numerous works and frameworks have placed evidence as only one of many potential influence on the policymaking processes (Smith 2013; Liverani et al. 2013; Smith & Katikireddi 2013; Weible et al. 2012).

In light of the limitations of evidence in influencing public health policy, this research also utilizes the power of ideas and framing in order to explain how and why reformulation became a prominent public health policy. It also critically assesses how the public health participants in this research frequently discussed the important of evidence, rather than ideas or framing, in their judgments of reformulation as a public health policy, and how this has further strengthened the position of reformulation. The tension between evidence and ideas in public health nutrition, broadly, and in reformulation, specifically, is a key component of Chapter 10, assessing the political priority of reformulation, in explaining coalitions for/against reformulation in Chapter 7, and in the framing of reformulation in Chapter 9.

SUMMARY OF THEORIES AND CONCEPTUAL LENSES USED IN THIS RESEARCH

In summary, this research used multiple theories and underlying concepts that attempt to explain how and why policy change occurs, and the role of actors and ideas in that process. The role of policy actors is a crosscutting emphasis through the policy frameworks chosen. Taken together, the theories and the concept of ideas provide a strong foundation for answering the question of how and why product reformulation became a prominent public health nutrition policy and the role of actors and the food and beverage industry within that process.

4 METHODS OVERVIEW

The methods of this study were based in applied policy research, as described by Ritchie and Spencer (1994), which aims to assess the policy context: the scope of public policy; policy means or instruments; evaluate the dynamics between actors and institutions; understand the drivers of public health strategy or policy initiatives; and assess the potential for actionable outcomes (Ritchie & Spencer 1994).

The research required all of the above facets of applied policy research to facilitate the understanding of how and why product reformulation emerged on the public health agenda in the U.S. and the role and dynamics of policy actors within that process. These aims were achieved by identifying connections between the circumstances and motivations surrounding reformulation's emergence, and by seeking to identify and interpret explicit and implicit explanations for a stakeholder's interest in product reformulation as a public health approach.

The methods included: (1) literature review; (2) document analysis; (3) in-depth interviews with stakeholders; and (4) framing analysis and media analysis. The methods were distinct but complementary, applied separately and triangulated to fulfil more than one objective and sub-question. A number of analytical concepts and tools were used in analysing the data, which will be described in this chapter, including: (1) narratives; (2) framing; (3) corporate political strategy; and (4) the Political Priority Framework (Shiffman & Smith 2007). Table 4.1 shows the research objectives and the specific research questions, associated methods, and questions for analysis for each objective, as well as the applicable theoretical frameworks from Chapter 3.

Table 4.1: Research sub-questions and methods by objective and applicable theoretical/analytical framework				
Objectives	Sub-question	Method	Analysis Questions	Applicable Theoretical Framework
<p>Objective 1 Assess the factors which explain how and why product reformulation came to be on the public health agenda</p>	When, how and why did product reformulation become a prominent public health nutrition policy?	Document analysis Interviews Media Analysis	<ol style="list-style-type: none"> 1. When did reformulation emerge as a policy issue and come onto the public health agenda? 2. What was the role of the food and beverage industry, public health actors and governmental processes in promoting product reformulation as a prominent public health policy? 	<p><u>Political Priority Framework</u> The powerful actors, ideas, contexts and characteristics which supported reformulation becoming a prominent public health policy</p> <p><u>Multiple Streams Framework</u> Context that facilitated “policy window” for product reformulation (agenda setting) When did the “policy window” open, and who were the policy entrepreneurs?</p> <p><u>Advocacy Coalition Framework</u> Who were/are the main policy actors involved in reformulation initiatives, and have they acted together in a coalition?</p>
<p>Objective 2 Understand the underlying framings and paradigms in nutrition policy – nutrients versus foods in particular – and how this encouraged product reformulation over other policies</p>	What is the relationship of a nutritionism approach to product reformulation, and what are its implications on the policy process?	Literature review Interviews	<ol style="list-style-type: none"> 1. What is the rationale for a focus on nutrients versus foods in nutrition policy? 2. What does the literature say about the implications of a nutrient-based approach to nutrition policy (e.g. nutrient-based dietary guidelines)? 3. Which nutrition policy options fall under a nutrient approach, and which fall under a foods approach? 4. How is nutritionism related to product reformulation and nutrient profiling? 	<p><u>Framing</u> Does a nutrients v. foods paradigm or individual v. environmental responsibility frames encourage a product reformulation approach?</p>

			5. How pervasive is nutritionism discourse in the US?	
<p>Objective 3 Identify the position held by key policy actors in the US on reformulation, and how they seek to preserve their interests, including through strategic framing</p> <p>Objective 4 Understand the role of commercial drivers, government policy and corporate political strategy in motivating the food and beverage industry to reformulate their products.</p>	<p>Who are the key actors driving reformulation policies and what factors might explain their interest in reformulation?</p> <p>How do stakeholders shape the debate and promote their position on product reformulation via framing?</p>	<p>Documents</p> <p>Interview</p> <p>Media analysis</p>	<ol style="list-style-type: none"> 1. Who are the key actors driving reformulation policies? 2. What is the position/interest of the key stakeholders on product reformulation as a policy for NCD and obesity prevention? 3. Has the framing of reformulation shifted over time or from a focus from one ingredient to another? 4. What factors explain industry support for product reformulation? What factors support the NGO/Government position on product reformulation? 5. How do non-industry actors view industry involvement in nutrition policymaking in general, and as related to product reformulation in particular? 	<p><u>Multiple Streams Framework</u> Who were the entrepreneurs, and if/how/why they created/used the “policy window” for product reformulation versus another policy option?</p> <p><u>Advocacy Coalition Framework and Corporate Political Strategy</u> Whose interests/beliefs are aligned? Did they organize into coalitions? If so, what role did the coalitions play in rise of product reformulation? How does product reformulation align with previous research on corporate political strategy? Does this help to explain the presence or absence of coalitions?</p> <p><u>Framing and Narrative Political Strategy</u> How do different actors frame reformulation, has the framing shifted over time, and do the frames help to explain when and why reformulation became a prominent public health policy? Which stakeholders align in their discourse and what are the beliefs underlying their framing strategy? (Reinforced by Advocacy Coalition Framework)</p>

TIME PERIOD

This study focused on the period from 1985 to 2015. These dates were selected so as to be wide enough to capture the emergence or evolution of product reformulation as a public health approach. For example, Kersh (2009) argued that up until 2009 product reformulation had been a “little-publicized move by a number of food producers” (Kersh 2009, p.309). These dates were also selected in order to capture the attention paid to food products when the prevalence of obesity in the US was beginning to rise. Historical data on obesity prevalence in the US identified that the sharp rise in obesity began in the 1980s (Wang & Beydoun 2007), while obesity and nutrition-related diseases secured their place as a political issue, following a series of events and publications in the late 1990s and early 2000s, including the surgeon general’s warning about obesity in 2001 (Office of the Surgeon General (US) et al. 2001). Taking these factors into account, and extending the time frame in order to capture the emergence of product reformulation as a policy, 1985 was defined as the early time bound for this research, and most data collection occurred in 2015, thereby serving as the upper time bound. The time period is also supported by the policy theories used in this research (Chapter 3), which are typically applied over at least a decade (Sabatier & Weible 2007).

OVERARCHING APPROACH

In seeking to answer the question of how and why reformulation came to be a prominent public health approach in the US, a number of potential methods and data sources were available. The chosen methods and data sources needed to shed light on how nutrition policy develops in the US, the role of stakeholders in that process, including the food and beverage industry, and when and why reformulation came to prominence through those processes.

Ideally, this information would have been gleaned directly from the records of various policy actors in the form of internal documents. However, while internal documents from the government, non-profits and academia might have been possible to obtain – for example through a freedom of information request – due to the proprietary nature of industry, it would most likely not have been possible to obtain relevant internal documents from the food and beverage industry. Therefore internal documents were ruled out as a potential data source as they would not have been uniformly accessible for all stakeholder groups. However it was possible to obtain information directly from stakeholders through interviews and published documents, including publically available responses to a government consultation, and these were chosen as two of the data sources for this study.

As the project progressed, however, it became increasingly clear that the majority of food and beverage industry stakeholders were unwilling to be interviewed for this research – only four of 25 industry participants contacted agreed to participate (Chapter 7). Thus, the documents became an important source of the industry’s voice, and the consultation analysis – which was heavily populated by industry actors – evolved to focus specifically on the industry’s responses.

Furthermore, to answer the research question of why reformulation came into prominence *when* it did, the methods and data sources needed to establish a clear temporal order of reformulation’s development as a policy option. This was partially gleaned from the interviews, by asking participants to reflect on this question directly, but was largely established by a media analysis assessing the coverage of reformulation in US newspapers during the study time period. The newspapers served as a record of public reporting on the issue of reformulation, and through content and framing analysis the articles demonstrated the timing and circumstances of reformulation’s rise to prominence as a public health policy.

While a range of methods and approaches were available to analyse each of these data sources, qualitative data analysis was the most appropriate in that it facilitated a process of detection and interpretation (Ritchie & Spencer 1994). Qualitative methods are often used in applied policy research, and were used here to explore the contexts, factors, stakeholders and motivations that supported the rise of product reformulation on the public health agenda. Quantitative methods, while applicable to research seeking to identify the number and type of product reformulation policies or for an analysis of the health effects or cost-effectiveness of product reformulation initiatives, were largely unsuitable for the aims of this research. However, descriptive statistics are used in some chapters to aid the qualitative analysis.

The literature review and document analysis were conducted first, followed by the interviews and lastly the media analysis. This order was chosen so as to identify the key themes and issues arising in the literature and documents and to explore and interpret them through the interviews and the media. In particular, the media analysis was done last in order to use the themes and nuances identified in the documents and the interviews to help identify and interpret the frames in the media. The qualitative coding framework developed in analysing the documents served as a backbone for the framework used in the interviews and media analysis, ensuring that key themes were assessed in all three sources

of data, though it was adapted as the research progressed. The tools of analysis described below (narratives, frames, corporate political strategy and the political priority framework) were applied at various points in the data analysis process as will be described in the specific methods for each data source (below and in the relevant papers).

LITERATURE REVIEW

The literature review aimed to elucidate the broader context in which product reformulation is taking place. In particular, it sought to understand the evidence of reformulation's effectiveness as a public health policy and to assess the existing literature on the food and beverage industry's corporate political strategy. As outlined in the background, the industry employs a number of strategies to influence the nutrition policy process, and previous research into the food and beverage industry, as well as the tobacco and alcohol industries, provides reason to believe that reformulation may be one component of the food and beverage industry's political strategy. The review was composed of two smaller scoping searches on these topics.

A scoping review was chosen after initial attempts at a systematic review failed to produce enough literature suitable for informing the aims and objectives of this research. Scoping searches are recommended in situations where a topic has not been extensively examined (Mays et al. 2001), and can be used to inform further research or later systematic reviews. They differ from systematic reviews in that they aim to identify and understand the breadth and range of information available on a particular topic, but do not critically appraise the methods or quality of the available research (Bryden et al. 2013). Therefore, the literature review did not intend to be exhaustive, but to provide an overview of outstanding questions and issues about reformulation from which to build the subsequent methods of this research.

Medline and Scopus were initially searched for research and reviews on food or beverage reformulation plus its derivative terms of reformulated, reformulating, and reformulate. In addition, as it is a key component of the research question, all relevant papers from a search on food and beverage industry corporate political strategy were included. The search terms used were: [(food industry or beverage industry) AND (political strategy or voluntary regulation or politics or policy or regulation) AND (obesity or noncommunicable) AND NOT (food security)]. Lastly, Google was searched to identify relevant grey literature and check for missing papers.

The articles were screened for relevance by title, and were included if their abstract (or full text as necessary) indicated the paper would help to answer the research questions. To be included, articles had to focus on the US or global context; articles were excluded if they specifically focused on another country. Articles were also excluded for having a focus on non-nutrition related topics (e.g. pharmaceutical reformulation).

An overview of the results from the scoping review is presented in Chapter 5. In addition, the findings from the scoping review on the effectiveness of reformulation as a public health strategy were largely presented in the background information in Chapter 1, but the findings from this search are also used and referenced throughout the thesis. Details on the scoping review on food and beverage corporate political strategy are further reported on in Chapters 5 and 6. The scoping review also informed the design of the research tools and methods of analysis, including the qualitative coding frameworks (described below) and defining the semi-structured interview schedule.

DATA SOURCES FOR QUALITATIVE ANALYSIS

This research used three sources of data, which were all analysed qualitatively: documents, interviews and the media. What follows is a brief overview of the methods, as each method is subsequently described in the relevant papers found in the results chapters.

DOCUMENTS

The document analysis consisted of two sources of data: publically available documents and websites, and analysis of stakeholder submissions to a government-led consultation on product reformulation. The documents reviewed focused on the food and beverage industry, and this was done to compensate for limited industry participation in the interviews (see Paper 2 and Paper 3 in Chapters 7 and 8 for more information on industry participation in the interviews). A broad range of industry documents were sourced from company websites, press releases, and reports, primarily from the major, multinational food and beverage companies who have their headquarters in the US. However, the consultation analysis was the central component in the document analysis. Government consultations are a known entry point for corporations to interact with government processes and representatives, to promote their preferred framing of the issue at hand, and to influence the interpretation of evidence for or against the policy being discussed (Hawkins & Holden 2013).

The general industry documents were read with the researcher's understanding of nutrition and nutrition policy, so as to pay attention to what had been included as well as

what had been omitted, what nutrition policy solutions were included, and how they were presented, including reformulation. The documents were also used to inform the other analyses, including generation of the interview questions, and to provide background and context throughout the thesis.

The consultation responses were separately analysed using a content analysis method (Pope & Mays 1995), and this analysis primarily aimed to assess the relationship between product reformulation and food and beverage industry corporate political strategy. The consultation responses were read and coded for frames and narratives, and how those demonstrated the industry's political strategy – the full coding framework from the consultation analysis can be found in Appendix 1. The specific methods of the consultation analysis are described in Paper 1, Chapter 6. The findings from the consultation analysis were also used to support and triangulate the findings from the interviews and media analysis.

SEMI-STRUCTURED INTERVIEWS

Semi-structured interviews were conducted with stakeholders from four broad categories of stakeholders: government, public health NGOs/public interest groups, academia and the food and beverage industry. Semi-structured interviews were chosen as a method for this research as they enable coverage of key themes but allow for other views and topics to emerge that might have not been previously identified or considered. Interview methods are also useful in allowing the interviewee to respond to topics and questions in detail, and allowing the interviewer to seek clarification where necessary (Green & Thorogood 2014).

Methods for the interviews are described in Paper 2 (Chapter 7) and Paper 3 (Chapter 8). Briefly, interviews were anonymised using a four-digit code, transcribed and qualitatively coded using a coding framework for dominant themes derived from open reading of the interviews and themes from existing literature, as well as the themes and codes generated in the consultation analysis described above. The full coding framework from the interviews can be found in Appendix 2.

Two themes that emerged from the interviews were particularly salient – policy governance belief systems (Chapter 7) and the foods/nutrients paradigm (Chapter 8) – and for these themes a framework analysis was used to elucidate deeper cross-participant understanding of these issues. Framework analysis involves organizing data into purpose-built matrices or categories, and using the resulting charts to help describe the findings and generate explanatory patterns (Ritchie & Spencer 1994; Green & Thorogood 2014). Data

from the interviews was also used throughout the thesis to support and triangulate other findings, but formed the primary basis for identifying belief systems and advocacy coalitions among stakeholders (Chapters 7 and 8).

MEDIA

A media analysis was chosen as a method for this research as the media plays an important role in information dissemination, and in facilitating stakeholder groups to promote their policy positions. The media, therefore, can influence the policy process by what and how they choose to cover (Scheufele & Tewksbury 2007; McCombs & Shaw 1972). The interpretation and coverage of product reformulation in the media was particularly important to this research in identifying the framing of product reformulation, and in making connections between the frames of reformulation and relevant nutrition policy events.

The methods for the media analysis are described in Paper 4 (Chapter 9). Briefly, newspaper articles on food and beverage product reformulation from 1980 to 2015 were collected using the Nexis database and were qualitatively analysed to identify the framing of reformulation. The frames identified within were then used to re-analyse the data from the consultation analysis and interviews. The coding framework for the media analysis was generated through open coding of the articles, and which was informed by the coding framework for the document and interview analysis as well as existing literature on framing of food and nutrition policy issues. The full coding framework can be found in Appendix 3. The framing analysis also supported the identification of belief systems and coalitions from the interview data, and the information from the newspaper articles was instrumental in assessing the events and context that led to the policy window for voluntary reformulation as a public health policy in the US (as set forth by the Multiple Streams Framework described in Chapter 3).

TOOLS OF ANALYSIS

NARRATIVES

A study of narratives is one of many approaches commonly applied to identify and analyse stakeholder tension, policy preferences and their effect on the policy process (McBeth et al. 2005). Narratives “are a way of presenting and re-presenting the world, or particular aspects of it, in textual forms which interpret that world in a particular way” (Atkinson 2000, p.213). Narratives provide a structural arch – a story, or plot line – to political debate, and convey the policy beliefs and political strategies of competing policy interest groups (McBeth et al. 2007). Narratives are also a “visible outcome of political strategizing”

in that interest groups will construct a particular narrative as part of the overall political strategy (McBeth et al. 2007, p.88).

In moving from a study of narratives to using narratives to theorize about policy change, McBeth et al. (2005) found that narratives “contain core policy beliefs and are a legitimate source of policy change analysis” (McBeth et al. 2005; McBeth et al. 2007, p.88). They propose that narratives “add to the ability of more traditional policy change theories to understand the strategic representation of values in framing the conflict” between competing interest groups (McBeth et al. 2007, p.89). In this way, a study of narratives is closely related to the Advocacy Coalition Framework (Chapter 3). The building of narratives is a key component of political strategy, and thus the study of narratives can be used to identify stakeholder group strategies in political contexts (McBeth et al. 2005). In particular, narratives contain strategies such as “...identification of winners and losers, framing who benefits and who sustains costs in the policy conflict, the use of condensation symbols, the wrapping of issues in larger policy surrogates, and the use of scientific uncertainty” (McBeth et al. 2007, p.90).

One of the seminal works on narratives in policy is the Policy Paradox by Deborah Stone (2012), and key within this book is the concept that narratives serve to define causality and “assign responsibility for problems” (Stone 2012, p.206). Stone outlines four types of causal policy narratives (Table 4.2), ranging from intentional causes to accidental, which are used in understanding the narratives identified in the consultation analysis (Chapter 6).

Table 4.2: Types of Causal Policy Narratives. Source: (Stone 2012, pp.208–213)		
	Features of the Story	Associated Responsibility
Accidental Cause	Acts of fate, natural disaster, or bad luck	“no one can be held responsible” (p.209)
Mechanical Cause	Machines caused the harm, people acting automatically or rigidly	“functions ambiguously” because “the very nature of human control over people and machines becomes hard to sort out” (p.213)
Intentional Cause	Oppressors and victims, conspiracies, “bad apples” within an organization	“direct consequences of wilful human action” (p.209)
Inadvertent Cause	Unintended harms of “well-intended” policy, ignorance, carelessness	“unintended consequences of purposeful human action” (p.211)

The concept of narratives was specifically applied as a tool to deepen the analysis of the food and beverage industry’s corporate political strategy (presented in Chapter 6).

Identification of narratives also informed the analysis of the interviews (Chapter 7) and the media analysis (Chapter 9).

FRAMING

The concept of framing was applied in this research in three ways: (1) as a lens through which to understand how stakeholders (and advocacy coalitions) construct and promote their policy goals, (2) as a tool of analysis, particularly for the media analysis (Chapter 9), and (3) as part of the political priority framework (explained below).

Frames are “interpretive schemata” (Snow & Benford 1992, p.137) that present “a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Entman 1993, p.52). The way an issue is framed dictates whether or not the issue comes onto the public policy agenda, and how to respond to that issue once it is on the agenda (Hawkins & Holden 2013). Lakoff (2006) further describes frames as “mental structures that allow human beings to understand reality – and sometimes to create what we take to be reality” (Lakoff & Rockridge Institute 2006). Analysing frames in a public health policy context is particularly important as they provide insights to the “current understanding and assumptions that are essential to know in order to develop appropriate responses” (Dorfman & Wallack 2007).

Similar to the ACF, beliefs and values underline framing (Dorfman et al. 2005), and like the levels of beliefs in the ACF, frames work on multiple levels: Level 1 pertains to core values, like in the ACF, such as responsibility and equity; Level 2 is about the topic or issue at hand (e.g. nutrition); and Level 3 pertains to the specific details of the policy (e.g. reformulation). Frames that invoke Level 1 values are particularly powerful as they connect to an individual’s deeply held values and belief (Lakoff & Rockridge Institute 2006; Dorfman et al. 2005). These core values are also referred to as master frames (Benford 2013), and such core beliefs are deeply embedded in policy and politics. Value systems align with particular causal arguments and problem definitions, which determine the scope and direction of policy options, and they serve to bind coalitions (Weible et al. 2012). Therefore, the concept of framing was used in this research as an analytical tool to help develop a deeper understanding of the belief systems of actors involved in product reformulation, and how those belief systems fostered the formation of coalitions and furthered the importance of reformulation within the nutrition policy subsystem (Weible et al. 2012).

The predominant frame of nutrition, NCDs and obesity in the US has been one of personal responsibility and individual freedoms, in line with the frame of “rugged individualism”

found in general in the US (Dorfman & Wallack 2007; Dorfman et al. 2005; Kersh 2009). In the individualism frame, these problems arise due to an individual's lifestyle habits, such as diet, physical activity, and willpower – or, as is often implied, lack thereof (Dorfman & Wallack 2007). In this frame, freedom of choice is an embedded value, and the food and beverage industry often invokes this frame in their public relations campaigns (Dorfman et al. 2005; Nixon, Mejia, Cheyne, Wilking, et al. 2015). Policy options that follow-on from this frame include individualized nutrition education and counselling, food labelling, and public education campaigns.

A focus on the environment is the second and competing frame of obesity (Dorfman & Wallack 2007; Kersh 2009). In this frame environments, be they physical or social, promote or protect against disease. For example, 'obesogenic' environments have been established in the literature as those with aspects promoting obesity, and include, among other factors, the availability and affordability of food and food marketing and advertising (Swinburn et al. 1999; Lake & Townshend 2006). Policies that follow on from this frame would include removing unhealthy items from supermarket checkouts (Sigurdsson et al. 2014), providing funding and equipment to enable local corner stores to offer fruits and vegetables (Cavanaugh et al. 2014), and restricting where and when fast food can be sold within a city (Khan et al. 2009). The framing of reformulation, in particular, can align with both the individual and environmental frames depending on how, and by whom, the term is used, as will be described in Chapter 10.

Framing can also be used as a tool for influencing policy, and is used strategically in advocacy and lobbying by both the food and beverage industry and public health groups (Dorfman et al. 2005). Public health advocacy groups have created frame-based talking points on the food environment in an effort to counter the personal responsibility frame of nutrition and obesity. The individual frame of nutrition benefits the food and beverage industry as it takes the responsibility for the problem off of their actions (Dorfman & Wallack 2007). Active attempts are also made by the food and beverage industry to divert attention away from food and onto physical activity, such as the industry's frequent emphasis of energy "balance" and "calories out" (Koplan & Brownell 2010). The food industry also spreads the notion that government nutrition actions fall under the "nanny state" derogative, which not only reinforces the personal responsibility frame of nutrition but also works in concert with their political strategy (Koplan & Brownell 2010).

In this research, framing was a core tool in analysing the newspaper articles included in the media analysis. Analysing the media is a typical method of assessing frames, as will be explained in Paper 4 (Chapter 9). The framings of reformulation identified in the media analysis were then applied to the document and interview data in order to assess if those frames carried through, and how those frames might help to explain how and why product reformulation became a prominent public health policy. The methodological aspects of this framing analysis are discussed in the methods section of the media analysis paper (Paper 4), found in results Chapter 9.

CORPORATE POLITICAL STRATEGY

This research was undertaken, in part, to assess whether product reformulation forms part of the food and beverage industry's corporate political strategy. This aim was informed by personally witnessing how the food and beverage industry frequently referred to their product reformulation efforts in policy contexts, and by a number of key arguments raised within the academic literature on this topic. Firstly, product reformulation is frequently given as a justification for public-private partnership with the food and beverage industry (Freedhoff 2014), which promote long-term collaborative relationships with policy makers and the public health community more broadly (Moodie et al. 2013; Hillman & Hitt 1999). Secondly, the food and beverage industry invokes product reformulation as an example of the work they are doing to be part of the solution to obesity and NCDs, which may act as a mechanism of deflecting criticism and political pressure (Ken 2014; Nixon, Mejia, Cheyne, Wilking, et al. 2015). Finally, nutrition policies like product reformulation that focus on nutrients rather than food categories help to frame nutrition and obesity so as to keep public focus on the nutrient composition of the product rather than the actions of the food and beverage industry. Brownell and Warner argued that this framing strategy was also used by the tobacco industry to avoid shifts in public opinion "that would permit a barrage of legislative, regulatory and legal actions that would erode sales and profits" (Brownell & Warner 2009).

In addition to the political theories described in the previous chapter, addressing this aim of the research required assessing the data for evidence of corporate political strategy. A corporation's political strategy encompasses any activities undertaken with the aim of influencing the political process in a particular jurisdiction. A corporation can respond to policies in a number of ways, which fall on a spectrum from reactive to proactive approaches (Weidenbaum 1980). Of the three categories of corporate policy responses outlined by Weidenbaum (1980), positive anticipation and public policy shaping are most

relevant to the politics of product reformulation. Corporate political strategies that fall under positive anticipation seek to predict future policies and identify how to adjust their business accordingly (Weidenbaum 1980, p.8). Or, as Hillman and Hitt (1999) describe it: “turning regulation into a business opportunity” (Hillman & Hitt 1999, p.827). Whereas public policy shaping involves activities which corporations undertake to proactively shape - or even pre-empt - public policy proposals and outcomes. Activities in this realm involve establishing relationships with politicians (e.g. by establishing government relations offices in Washington D.C.), and directly participating in the policy process (Weidenbaum 1980, pp.9–10). From a business perspective, product reformulation can be seen as a positive anticipation to regulations which would restrict the marketing or sale of food and beverage products with high levels of sugar, salt and/or fat, as products may be reformulated to comply with the anticipated restrictions and therefore can continue to be marketed. For example, in leaked emails from Coca-Cola reformulation was described as taking place in markets where taxes on sugar-sweetened beverages were likely (Pfister 2016). Likewise, in so far as reformulation is voluntary and undertaken in partnerships, and as will be argued in Chapter 6, it can be seen as public policy shaping in that it fosters close relationships with political actors and public health groups and helps to legitimise the food and beverage industry’s participation in the nutrition policy process (Ken 2014).

Hillman and Hitt (1999) describe three decisions corporations make in determining their public policy shaping strategies: the approach, the level of participation, and specific strategies or tactics. Table 4.3 summarizes these decisions, which will be reflected upon in analysing the data supporting the argument that voluntary reformulation is one corporate political strategy of the food and beverage industry. In particular, Chapter 6 will discuss how voluntary product reformulation can be seen as a collective, relational strategy aimed at constituency-building, and may be part of the industry’s informational strategies (shaping the framing of the debate and generating/interpreting evidence).

Results Chapter 6 summarizes the body of research on food and beverage industry corporate political strategies and uses the data from the consultation analysis to assess how product reformulation aligns with this previous research on their strategies.

Table 4.3: Corporate Political Strategy: Types of Decision, Strategies, and Variables in Choosing Strategy (Adapted from: Hillman and Hitt, 1999)		
Type of Decision	Strategies within the Type of Decision	Variables in Choosing Strategy
Approach to Political Strategy	<ul style="list-style-type: none"> - Transactional: build strategy in response to specific policy issues - Relational: build long-term, collaborative relationships with policy makers 	<ul style="list-style-type: none"> - How much the corporation will be affected by a policy decision - The level of diversification in the company's portfolio - The political context in which the corporations are operating, and how corporatist/pluralist they are.
Level of Participation	<ul style="list-style-type: none"> - Individual action - Collective action 	<ul style="list-style-type: none"> - Level of resources available (financial and 'intangible') - The political context in which the corporations are operating, and how corporatist/pluralist they are - How much public attention and visibility is surrounding an issue
Specific Strategies and Tactics	<ul style="list-style-type: none"> - Information strategy <ul style="list-style-type: none"> o E.g. lobbying, commissioning research, producing white papers - Financial incentive Strategy <ul style="list-style-type: none"> o E.g. Contributions to politicians or political campaigns - Constituency-building strategy <ul style="list-style-type: none"> o E.g. public relations, advocacy advertising, grassroots mobilization 	<ul style="list-style-type: none"> - Where the issue is at in the policy cycle - If the firm is using a transactional or relational approach

POLITICAL PRIORITY FRAMEWORK

The Political Priority Framework (PPF) is a tool of analysis that combines a number of the political theories and concepts used in this research into an overarching analytical framework. It was developed to answer the question: "Why do some global health initiatives receive priority from international and national political leaders whereas others receive little attention?" (Shiffman & Smith 2007, p.1370). It was initially applied at the global level to understand why maternal health had not achieved political priority despite its high global disease burden. This research used the framework in its reverse: as a guiding structure to explore why product reformulation has gained political priority in the US.

The political priority framework has four main categories: actor power, ideas, political contexts, and issue characteristics (Table 4.4).

	Description	Factors Shaping Political Priority
Actor Power	The strength of the individuals and organizations concerned with the issue	Policy community cohesion: coalescence among network
		Leadership: individuals uniting the policy community
		Guiding institutions: effectiveness of organizations coordinating
		Civil society mobilization
Ideas	The ways in which those involved with the issue understand and portray it	Internal frame: “the degree to which the policy community agrees on the definition of, causes of, and solutions to the problem”
		External frame: “public portrayals of the issue that resonate with external audiences”
Political contexts	The environments in which actors operate	Policy windows: “opportunities for advocates to influence decision makers”
		Global governance structure: provide a platform for collective action
Issue characteristics	Features of the problem	Credible indicators: “clear measures”
		Severity
		Effective interventions: solutions are “clearly explained, cost effective, backed by scientific evidence, simple to implement and inexpensive”

Central to the framework is the concept of power: the power of actors and their “collective capacity to confront opponents”, the power of ideas and how they are framed in garnering broad support, the power of the political context and if it allows for policy windows to open (policy windows are defined and discussed above in the multiple streams framework), and if the issue has powerful characteristics, such as credibility and severity, which make it an appropriate and appealing problem to address through policy (Shiffman & Smith 2007, p.1372) . The term power is not explicitly defined by Shiffman and Smith (2007), but this research adopted the conceptualization of power as put forth by Lukes (1974), who defines three faces of power: that of decision making, that of controlling what appears on the

political agenda, and that of controlling information and the power of influencing the ideas and values which underline all political debates (Lukes 1974). Political priority is defined by Shiffman and Smith (2007) as:

We know that global political priority is present when: (1) international and national political leaders publicly and privately express sustained concern for the issue; (2) the organisations and political systems they lead enact policies to address the problem; and (3) these organisations and political systems provide levels of resources to the problem that are commensurate with its severity (Shiffman & Smith 2007, p.1370).

Thus, these factors were assessed in each of the three methods described below and will be reported on primarily in results Chapter 10. One of the reasons for incorporating the political priority framework as an analytical tool is that it enabled drawing connections between the multiple frameworks included in this research, and was therefore particularly suited to answering the research questions. Specifically, the framework incorporates the Multiple Streams Framework (Chapter 3) and framing into the ideas and political context categories respectively. Shiffman and Smith (2007) also use the concept of policy community cohesion in the actor power category, which is closely aligned to the Advocacy Coalition Framework (Chapter 3), another theory applied to this research, and therefore the ACF was also incorporated into assessing the political priority of reformulation in Chapter 10. The political priority framework played a central role in the data analysis, and is used as a backbone to the results sections in this thesis. In particular, it aided in analysing across all three sources of data, and is used as structuring tool through which the results are presented in Chapter 10.

ETHICS

Ethical approval for this research was obtained through the London School of Hygiene and Tropical Medicine. A condition of ethical approval was maintaining anonymity of the interview participants. Therefore, interview participants were assigned a random four-digit numerical code, and the only key linking the code to the name was kept in a password protected document on a password-protected computer. Any quotes used in the thesis have been edited so as not to contain identifying information, and quotes are given attribution by their numerical code and stakeholder category (e.g. 3331 – Government).

The data was stored separately from the list of participants, both of which were password protected. Backups of the data, including audio and transcribed interviews, were maintained in a separate, password protected external hard drive. The data will remain on

the external hard drive for potential future use, but will remain password protected with the password changed regularly.

SUMMARY OF METHODS

In summary, this research sought to understand how and why reformulation became a prominent public health policy by using a series of interconnected methods from three sources of data – interview, document and media. The data was qualitatively analysed using a number of analytical tools including narratives, frames, corporate political strategy and the Political Priority Framework. The findings were triangulated in order to gain a full picture of the emergence and implications of product reformulation. Simply put, this research used methods to identify what was said and written about reformulation as a public health policy (content), how was it being said, written and discussed about in the media (framing), and by whom (stakeholders/coalitions).

5 RESULTS OF THE SCOPING REVIEWS

Two scoping reviews were conducted in order to inform the research and its findings: one on reformulation and its potential as a public health policy, and one on the food and beverage industry's corporate political strategy. The methods of the reviews are described in the previous chapter (Chapter 4). The searches resulted in a total of 1921 articles, of which 117 were relevant and included. The findings of the scoping review will be reported on briefly here, as well as explored in later chapters of the thesis.

REFORMULATION

The aim of the scoping review on reformulation was to elucidate the type of research conducted on reformulation (e.g. evaluation, political, etc.), as well as to identify previous studies on the political aspects of reformulation as a public health policy.

The reformulation search yielded a wide variety of articles but the majority of which were commentaries or reviews (n=37). The remaining articles (n=22) were divided between evaluations of previous reformulation initiatives and modelling studies evaluating the potential effectiveness of reformulation on population health. The articles were also focused on a variety of nutrients and foods, but the majority of articles were on multiple nutrients or reformulation in general as an approach (n=28), followed by trans fat (n=12), salt/sodium (n=9), sugar (n=4), calories (n=4), total fat and whole grains (n=1 each). Though no explicit time bound was set for this search, no relevant articles from the US or global context before 2006 were found.

The 37 commentaries and reviews on reformulation provided a range of views and insights into product reformulation as a public health nutrition policy, but the articles centred around four themes: (1) arguments in favour of reformulation or description of reformulation initiatives; (2) commentaries or analyses on the mechanism or approach of reformulation; (3) commentaries or analyses on the need to conduct reformulation along with other policies/approaches; and (4) descriptions of the implications of reformulation on the food and beverage industry. These are summarized in further detail in table 5.1.

The 22 articles describing evaluations or modelling studies of reformulation as a public health policy are reported in the background section of the thesis, as well as in the 'effective interventions' section of Chapter 10 on the Political Priority Framework. To give a brief summary here, there is evidence to suggest that reformulation may be successful in reducing population consumption of key nutrients of concern. However, the evaluations raise issues about the need for further monitoring and accountability of reformulation

initiatives. In particular, reformulation's effectiveness as a public health nutrition approach is dependent on the extent to which it is implemented as well as how it is governed. The evaluations and modelling studies reviewed are summarized in Table 5.2.

It is important to note that a number of studies in Tables 5.1 and 5.2 were produced with industry funding or were written by industry actors. These studies are highlighted in grey in the tables. To highlight only two examples, Buttriss (2013) argues that reformulation is difficult for the industry; Buttriss works at the industry-funded British Nutrition Foundation. Likewise the article by Yach et al. (2010) was written when David Yach was employed by PepsiCo. Interestingly, these two articles demonstrate similar tensions in the industry arguments around reformulation as will be demonstrated in the next chapter – that reformulation is difficult but it can also be part of the solution. As the next chapter will outline, industry involvement in generating research evidence is well established as part of their corporate political strategy for avoiding mandatory policies against their products (e.g. Bes-Rastrollo et al. 2013; Kmietowicz 2015).

ARTICLES WITH A POLITICAL FOCUS

Importantly for this thesis, of the 59 articles included from the reformulation searches, only 7 discussed political or policy-related factors of reformulation. These included two articles on how to use policy to strengthen the accountability and effectiveness of voluntary reformulation initiatives (Kraak & Story 2015; Magnusson & Reeve 2015), one commentary on using policies such as labelling to influence food and beverage industry reformulations (Schleifer 2013), and one commentary supporting reformulation as a policy approach (Winkler 2014). The remaining three articles employed concepts or methods similar to this thesis: One article looked at the 'framing' of obesity in the US and discussed how reformulation is a promising approach in the context of individually framed US politics (Kersh 2009), another assessed stakeholder views on reformulation (Vivica I. Kraak et al. 2014) and a third assessed how reformulation is a strategic action on the part of the food and beverage industry (Scrinis 2016). However, unlike this thesis none of these three articles used political science approaches or theories to understand the political process of how or why reformulation became a public health policy, or the implications of it on nutrition policymaking dynamics.

Main Theme	Authors	Summary	Nutrient of Focus	Political focus?
Arguments in favour or reformulation or description of reformulation initiatives	(Zandstra et al. 2016)	Reformulation needs to be accompanied by consumer education to be successful	Multiple	
	(Vlassopoulos et al. 2015)	Describes an industry approach to voluntary reformulation	Multiple	
	(Trieu et al. 2015)	Systematic review of salt reduction initiatives globally; 75 countries have national salt strategies; 12 have reported reduced population intake and 19 reduced salt in foods	Salt	
	(Campbell et al. 2015)	Review of salt reduction reformulations in the Americas	Salt	
	(Combet et al. 2014)	Foods can be engineered to meet nutrition standards, and be accepted by consumers	Multiple	
	(Winkler 2014)	Argues in favour of reformulation	Multiple	x
	(Legetic & Campbell 2011)	Recommends reformulation to reduce salt intake in the Americas	Salt	
	(Webster et al. 2011)	Review of salt reduction initiatives globally; 32 countries identified as having salt reduction policies	Salt	
	(L'Abbé et al. 2009)	Review of trans fat reduction policies globally	Trans Fat	
	(van Raaij et al. 2009)	Argument in favour of reformulation	Multiple	
	(Unnevehr & Jagmanaite 2008)	Argues for reformulation as a policy option for reducing trans fat consumption	Trans Fat	
	(Loh 2006)	Describes trans fat reformulations in the industry	Trans Fat	

Commentary or analysis on the mechanism or approach of reformulation	(Scrinis 2016)	Voluntary reformulation is strategic on the part of the food and beverage industry	Multiple	x
	(Kraak & Story 2015)	Recommendations on govern voluntary nutrition policies, including reformulation	Multiple	x
	(Reeve & Magnusson 2015)	Commentary on using responsive regulation to improve voluntary reformulation initiatives	Multiple	x
	(Ziauddeen et al. 2015)	Products have variable nutrition content in different countries, so more reformulation may be possible	Multiple	
	(Vivica I. Kraak et al. 2014)	Analysis of stakeholder views on reformulation	Multiple	x
	(Antman et al. 2014)	Salt reduction by reformulation championed by charities in the US; reformulation requires a multi-sectoral approach	Salt	
	(Campbell et al. 2014)	Reformulation for sodium reduction requires targets in order to be successful	Sodium	
	(Schleifer 2013)	Commentary on the use of food labelling as policy tool for incentivizing reformulation	Trans Fat	x
	(Ng & Dunford 2013)	Monitoring and evaluating reformulation is difficult	Multiple	
	(Champagne & Lastor 2009)	Reformulations to reduce fat content may result in a need for increased sodium in the product	Fat	
	(Goyens & Ramsay 2008)	Argues for participatory approach in reformulation; and that reformulation would be 'more effective than behavioural change'	Multiple	
	(Wansink 2007)	Argument in favour of working with industry on reformulation	Multiple	

	(Eckel et al. 2007)	Describes a multistakeholder meeting on reformulation for TFA; concludes that the best approach is to work with the industry	Trans Fat	
Commentary or analysis on the need to conduct reformulation along with other policies/approaches	(Marotta et al. 2014)	For reformulation to be effective, it has to be done in conjunction with education	Multiple	
	(Rowe et al. 2011)	Makes the case for reformulating products in line with the DGAs, but concludes reformulation alone would not be enough	Multiple	
Descriptions of the implications of reformulation on the food and beverage industry	(Kuczora 2014)	Industry is motivated to reformulate as it aids in achieving health claims on their products	Multiple	
	(Buttriss 2013)	Reformulation is difficult for the industry	Multiple	
	(Cooper 2012)	Sugar reformulation poses technical challenges	Sugar	
	(Kleiman et al. 2012)	The beverage industry is reformulating in some markets but not others; profitability is an issue	Sugar	
	(Kemp & Bui 2011)	The industry is motivated to reformulate as it can attract new customers	Multiple	
	(Yach et al. 2010)	The food industry can contribute to addressing NCDs, including through reformulation	Multiple	
	(Mancino et al. 2008)	Dietary guidelines and “inter-firm competition” prompted companies to reformulate for whole grains	Whole grains	
	(Sleator & Hill 2008; Sleator & Hill 2007)	Reformulation can have food safety implications	Multiple	
Other	(Kersh 2009)	Review commentary on the politics and framing of obesity, including reformulation	Multiple	x

Note: Grey shading indicates the study was produced with industry funding or by an industry actor

Evaluation of voluntary reformulation initiatives	(Vlassopoulos et al. 2017)	The food and beverage industry has reformulated their products and succeeded in reducing key nutrients	Multiple
	(Taillie et al. 2015)	External evaluation of Walmart's evaluation program and finds there have been reductions but that they mirror pre-existing trends	Multiple
	(Storey & Anderson 2015)	Industry has reduced trans fats in frozen potato products in the US through product reformulation	Trans Fat
	(Urban et al. 2014)	External evaluation finding little evidence of consistent reformulation of fast foods in the US	Multiple
	(Ng et al. 2014)	External evaluation of the calorie reductions achieved by the Healthy Weight Commitment Foundation, and finds their target was met and exceeded	Calories
	(Hooker & Downs 2014)	Labelling of trans fat resulted in reformulation to reduce levels of trans fat reformulation in the US and Canada	Trans Fat
	(Slining et al. 2013)	Baseline external evaluation for the Healthy Weight Commitment Foundation calorie reduction pledge	Calories
	(Otite et al. 2013)	Evaluation of reductions in trans fats following labelling in the US	Trans Fat
	(Van Camp et al. 2012)	Trans fat reduction successful but it may have increased saturated fat content of foods	Trans Fat
	(Mozaffarian et al. 2010)	Reformulation to remove trans fats in the US has not resulted in increases in saturated fats	Trans Fat
Modelling studies	(Ma et al. 2016)	In the UK, it is projected that reduction of sugar in sugar-sweetened beverage by 40%, without use of artificial sweeteners, would reduce per capita calorie consumption by about 40kcal/day, and result in an average weight loss of 1.2 kg	Sugar
	(Leroy et al. 2015)	A modelling study in France predicts that reformulation would lead to modest reductions in mortality	Multiple

	(Allen et al. 2015)	A modelling study in the UK; estimates that total ban on trans fats would prevent 7200 CHD deaths without raising socioeconomic inequalities	Trans Fats
	(Dotsch-Klerk et al. 2015)	Modelling study on salt reduction criteria; conclude that reformulation has potential for positive health impact	Salt
	(Combris et al. 2011)	Modelling study from France; reformulation's impact would depend on the amount undertaken	Multiple
Other evaluations	(Curtis et al. 2016)	Evaluates salt reduction achieved underneath New York City's National Salt Reduction Initiative; finds progress was "modest"	Salt
	(Markey et al. 2015)	A trial of sugar reduced products resulted in lower sugar consumption but not weight loss	Sugar
	(Hendry et al. 2015)	Review of effectiveness of policies to reduce trans fats; maximum limits and mandatory labelling are successful in reducing trans fat content in food products	Trans Fat
	(Yon & Johnson 2014)	Children accepted lower calorie flavoured milks in school meal programs	Calories
	(Mitchell et al. 2013)	Salt reductions up to 48% in soups would be acceptable to consumers	Salt
	(Perlman et al. 2012)	Reformulation has been successfully undertaken in schools in the US	Multiple
	(O'Sullivan et al. 2010)	Consumers report liking reformulated lower calorie products less over time	Calories

Note: Grey shading indicates the study was produced with industry funding or by an industry actor

FOOD AND BEVERAGE INDUSTRY CORPORATE POLITICAL STRATEGY

The purpose of the food and beverage industry search was to identify articles on their corporate political strategy. An initial literature search was conducted in 2014 and again in early 2015, which formed the basis of a taxonomy of Corporate Political Strategy presented in Paper 1 (Chapter 6). This 2014/15 search used the search string: [(food OR beverage industry) AND [strategy OR policy OR politics OR voluntary OR regulation OR regulate]]; it resulted in 36 research papers and pieces of grey literature and is reported on in Paper 1.

In 2016, an additional search was conducted in order to ensure all relevant literature had been reviewed. This later search used a similar search string as the above but refined it to be related to political *strategy* and to be specifically related to obesity or NCDs. The search string was: [(food OR beverage industry) AND (political strategy OR voluntary regulation OR politics OR policy OR regulation) AND (obesity OR noncommunicable) AND NOT (food security)]. The search in 2016 resulted in 28 papers, of which 22 were new or not previously identified in the 2014/15 search used in Paper 1. These 22 new papers were added to the previous 2014/15 searches, and the broader literature reviewed in 2016 is reported on in the introduction to Chapter 6. Importantly, however, the 2016 search did not result in the identification of any new specific food and beverage industry corporate political strategies, and therefore the taxonomy proposed in Paper 1 did not need to be changed.

6 REFORMULATION AS A CORPORATE POLITICAL STRATEGY

Product reformulation is an interesting case in the field of nutrition policy for a number of reasons, including that it has primarily been conducted voluntarily and that it has the support of the food and beverage industry. There are a number of potential reasons for this industry support, including that reformulation presents an opportunity to create and market new products, and to appeal to increasingly health-conscious consumers (Jensen & Ronit 2013; The Hudson Institute 2011). However, as the political pressure on the industry has grown in concert with rising obesity and NCDs (Ahmed 2009), the industry may also support voluntary reformulation for political and public relations reasons (Foxhall 2006; Durand et al. 2015; Mozaffarian 2016b). In particular, voluntary initiatives, like the reformulation initiatives currently underway by the food and beverage industry in the US, have been identified as a strategy of multiple industries for avoiding mandatory or restrictive regulations on their business (Saloojee & Dagli 2000; Haufler 2001; Daube 1993). Furthermore, voluntary and self-regulations are preferable for an industry entity as they can have significant input and control over the specific measures and actions taken within them (Haufler 2001). Thus, these voluntary initiatives may not only serve to pre-empt the need for mandatory regulations, but the industry is able to construct them in such a way so as to protect, or even benefit, their business interests. This chapter describes how evidence from this research supports the notion that voluntary product reformulation may be one component of the corporate political strategy of the food and beverage industry, which helps in explaining how and why reformulation became a prominent policy.

This chapter begins with a review of the literature on food and beverage industry corporate political strategy. It then presents Paper 1, which collates the components of the industry's corporate political strategy identified in the existing literature into a taxonomy, and then uses documentary data from the consultation analysis to assess how product reformulation may be one part of this strategy. The literature that underpins the food and beverage industry taxonomy is only briefly described in Paper 1; however, a more detailed summary of the literature has been included in Table 6.1. The chapter ends by presenting additional data from the consultation analysis, looking at the consultation submissions from the public health community.

INTRODUCTION TO PAPER 1

There is a growing body of literature on the corporate political strategy of the food and beverage industry in the US and globally, including the ways in which voluntary pledges or

initiatives function as part of that strategy (Table 6.1). It is well documented that industry stakeholders are active participants in the policy process in the US, and the food and beverage industry is no exception (Nestle & Wilson 2012; Nestle 2002). Similar to the tobacco and alcohol industries, the food and beverage industry employs a number of strategies or tactics in order to shape and define the policy landscape so that their business interests are protected and promoted (Moodie et al. 2013; Jenkin et al. 2012; Nestle 2002; Mialon et al. 2015; Stuckler et al. 2011; Brownell & Warner 2009; Shelley et al. 2014; Miller & Harkins 2010; Wiist 2011). These activities are collectively referred to as 'corporate political strategy' or 'nonmarket strategy'. While separate and distinct from the industry's 'market strategy' (e.g. sales, marketing, competition, etc.), 'nonmarket strategy' or corporate political strategy is considered an integral part of ensuring that an industry or company is able to carry out their 'market strategy' (Bach 2015; Hillman & Hitt 1999).

The corporate political strategies used by the food and beverage industry include many strategies which take place outside of the realm of traditional lobbying, policy negotiations and discussions in the legislative process, as summarized in Table 6.1 and Figure 6.1 in Paper 1. In particular, the industry works to create favourable conditions for policymaking by undertaking initiatives to improve their public image (e.g. entering into partnerships with community and health organizations, or by sponsoring community physical activity and other programs), by framing or shaping the nutrition policy debate away from industry responsibility and towards policy options which favour their interests, and by creating and influencing the interpretation of scientific research in order to create doubt about the connection between their products and negative health outcomes (Table 6.1).

Furthermore, once an unfavourable policy has been adopted, the industry may challenge its legality in the courts (Ries & von Tigerstrom 2010; Shelley et al. 2014).

Table 6.1: Evidence underpinning the Taxonomy of Food and Beverage Industry Corporate Political Strategies (see: Figure 6.1, Paper 1)

Category	Type	References
Influence the framing of the debate	Strategic discourse e.g. part of the solution	(Dorfman et al. 2012; Dorfman et al. 2005; Bødker et al. 2015; Nestle 1993; Brownell & Warner 2009; Elliott 2012b; Ken 2014; Koplan & Brownell 2010; Kersh 2009; Jou et al. 2014; Nixon, Mejia, Cheyne, Wilking, et al. 2015; Miller & Harkins 2010)
	Deflect	(Gomez et al. 2011; Bødker et al. 2015; Kearns et al. 2015; Freedhoff 2014; Myers 2006)
	Front groups/'astroturf' organizations	(Koplan & Brownell 2010; Yanamadala et al. 2012; Bailin et al. 2014; Goldman et al. 2014; Miller & Harkins 2010; Nestle & Wilson 2012)
	CSR	(Dorfman et al. 2012; Gomez et al. 2011; Freedhoff 2014)
Participate in the policy process	Lobbying	(Cannon 2004; Bødker et al. 2015; Oppenheimer & Benrubi 2014; Nestle 1993; Nestle 2002; Brownell & Warner 2009; Koplan & Brownell 2010; Freudenberg 2012; Dietz 2013; Goldman et al. 2014; Center for Science in the Public Interest 2015; Miller & Harkins 2010; Vallgarda et al. 2015; Hobbs et al. 2004; Nestle & Wilson 2012; Kurzer & Cooper 2013)
	Voluntary pledges	(Lewin et al. 2006; Brownell & Warner 2009; Slining et al. 2013; Sharma et al. 2010)
	Influencing drafting of gov't policy	(Kearns et al. 2015; Oppenheimer & Benrubi 2014; Nestle 1993; Nestle & Wilson 2012; Fleischhacker 2007; Simon 2005; Nelson 2004)
	Consultations	(Kearns et al. 2015; Goldman et al. 2014)

Funding and Partnerships	Partnerships	(Hawkes & Buse 2011; Shelley et al. 2014; Kraak et al. 2012; Ken 2014; Koplan & Brownell 2010; Freedhoff & Hébert 2011; Miller & Harkins 2010; Nestle & Wilson 2012; Freedhoff 2014)
	Financial support	(Gomez et al. 2011; Goldman et al. 2014; Miller & Harkins 2010; Hobbs et al. 2004)
	Campaign funding	(Goldman et al. 2014)
Influence the Evidence	Fund research	(Brownell & Warner 2009; Nestle 2016; Lesser et al. 2007; Knai et al. 2010; Bes-Rastrollo et al. 2013; Kearns et al. 2015; Kmietowicz 2015; Nestle & Wilson 2012)
	Ghost authorship	(Kearns et al. 2015; Goldman et al. 2014)
	Create doubt	(Oppenheimer & Benrubi 2014; Bødker et al. 2015; Brownell & Warner 2009; Koplan & Brownell 2010; Bailin et al. 2014; Goldman et al. 2014; Miller & Harkins 2010; Nestle & Wilson 2012)

To give only one example of how these strategies influence the policy process, the food and beverage industry creates and promotes an individual or personal responsibility framing of nutrition and obesity (Kwan 2009; Dorfman & Wallack 2007). This frame serves to minimize the responsibility and blame which can be placed on the industry (Kersh 2015; Stone 2012; Kwan 2009). Framing nutrition and obesity in this way creates challenges for nutrition policymaking as in the individual responsibility frame government intervention is not seen as necessary or acceptable. In this frame it is the responsibility of the individual, not the government, to improve their own nutrition and health (Dorfman & Wallack 2007; Novak & Brownell 2012). This frame is frequently evidenced by industry discourse emphasizing consumer choice and individual education (Dorfman & Wallack 2007; Nixon, Mejia, Cheyne, Wilking, et al. 2015). While the individual responsibility frame is commonly employed directly in policy or legislative debates, it is also pervasive in the industry's press releases and other materials, in their quotes and comments in the media, as well as in the messages and materials surrounding their corporate social responsibility programs (e.g. industry funded community outreach programs) and public-private partnerships (Powell & Gard 2015; Freedhoff 2014; Kersh 2009). Furthermore, this frame is often promoted by industry front groups or coalitions, falsely giving the impression that the argument is coming from community members or groups rather than the industry (Nixon, Mejia, Cheyne & Dorfman 2015; Jou et al. 2014). All of these factors serve to influence the opinions and actions of policy makers and their constituents.

Of particular importance to this research is the industry's strategy of adopting voluntary or self-regulated nutrition initiatives. Specifically, the food and beverage industry has established their own voluntary standards for marketing to children, as well as for reformulation (Harris et al. 2015; Schwartz et al. 2010; Jensen & Ronit 2015b; Ng et al. 2014; Knai et al. 2015; Foxhall 2006). These self-regulation efforts are argued to form part of the food and beverage industry's corporate political strategy as they help to frame the nutrition policy debate away from mandatory regulations and influence the policymaking process by setting precedent and pre-empting the need for mandatory regulations (Mello et al. 2008; Ken 2014; Freedhoff 2014). The food and beverage industry has been found to use self-regulation for a variety of purposes, including as a "defensive strategy" to control the attribution of blame in the policy process, as well as serving as an "offensive strateg[y] to promote their products" (Jensen & Ronit 2015a). Furthermore, in undertaking voluntary efforts, the industry maintains considerable flexibility over the extent and nature of the changes they agree to make, while generating a positive public image among policy makers

and the general public (Jensen & Ronit 2015b; Durand et al. 2015). However, despite these positive outcomes for the industry, voluntary marketing pledges are widely considered ineffective from the public health perspective (Ronit & Jensen 2014; King et al. 2011; Harris et al. 2015). This is in part because they have been highly variable in nature, have lacked the monitoring and accountability that accompanies mandatory regulations (Sacks et al. 2015), and have lacked adequate stakeholder input and participation (Reeve 2013). Likewise, while voluntary reformulation has shown some success, it has typically been successful when championed or initiated by a government (National Heart Foundation of Australia 2012; MacGregor & Hashem 2014), and similar criticisms have been raised about voluntary product reformulation efforts as that of voluntary marketing restrictions (Mozaffarian 2016b; MacGregor et al. 2015; Panjwani & Caraher 2014). As the above section demonstrates, assessing voluntary industry action in nutrition from the public health perspective raises two separate but interrelated issues: whether or not the voluntary actions are effective, and whether or not they form part of the food and beverage industry's corporate political strategy. This chapter focuses on the latter.

Paper 1 presents a taxonomy of food and beverage industry corporate political strategies that was created in 2014. It was developed by reviewing the existing literature on food and beverage industry corporate political strategies (Table 6.1) and was informed by similar taxonomies in the tobacco and alcohol fields (Savell et al. 2014; Savell et al. 2016), as well as the theoretical work on corporate political strategy by Hillman and Hitt (1999). In June 2015, researchers in Australia published a similar "framework for categorizing the corporate political activity of the food industry," (Mialon et al. 2015) also building on the work by Savell (2014). The framework proposed by Mialon et al. (2015) is consistent with the taxonomy presented in Paper 1, and the two taxonomies have considerable agreement in the type and nature of the industry's strategies. In particular, there was significant agreement in the "practices" or tactics identified in the framework and the taxonomy, though many of the "practices" identified by Mialon et al. (2015) were grouped under different categories of strategy. As Mialon et al. (2016) acknowledge between their work and similar work in the field of tobacco, it is possible for specific tactics to be categorized under multiple strategy categories and this helps to explain the differences between the taxonomy and the Mialon et al. (2015) framework. For example, in creating and promoting doubt about the evidence, it could be argued that the industry is therefore helping to frame the debate, and therefore this tactic could fall under both the evidence and framing categories of the taxonomy.

The significant agreement between the two frameworks demonstrates a growing convergence in the field toward an understanding of the food and beverage industry's political strategies, and suggests that future work in developing a joint taxonomy would be eminently plausible.



Registry

T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

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Principal Supervisor	Cecile Knai
Thesis Title	Understanding nutrition policymaking dynamics in the United States: The case of product reformulation

If the Research Paper has previously been published please complete Section B, if not please move to Section C

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Corresponding author: Ms. C. Scott
E-mail address: courtney.scott@lshtm.ac.uk
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PAPER 1: FOOD AND BEVERAGE PRODUCT REFORMULATION AS A
CORPORATE POLITICAL STRATEGY

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Food and beverage product reformulation as a corporate political strategy



C. Scott^{*}, B. Hawkins, C. Knai

Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine, 15-17 Tavistock Place, WC1H 9SH, London, UK

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ABSTRACT

Product reformulation— the process of altering a food or beverage product's recipe or composition to improve the product's health profile — is a prominent response to the obesity and noncommunicable disease epidemics in the U.S. To date, reformulation in the U.S. has been largely voluntary and initiated by actors within the food and beverage industry. Similar voluntary efforts by the tobacco and alcohol industry have been considered to be a mechanism of corporate political strategy to shape public health policies and decisions to suit commercial needs.

We propose a taxonomy of food and beverage industry corporate political strategies that builds on the existing literature. We then analyzed the industry's responses to a 2014 U.S. government consultation on product reformulation, run as part of the process to define the 2015 Dietary Guidelines for Americans. We qualitatively coded the industry's responses for predominant narratives and framings around reformulation using a purposely-designed coding framework, and compared the results to the taxonomy.

The food and beverage industry in the United States used a highly similar narrative around voluntary product reformulation in their consultation responses: that reformulation is “part of the solution” to obesity and NCDs, even though their products or industry are not large contributors to the problem, and that progress has been made despite reformulation posing significant technical challenges. This narrative and the frames used in the submissions illustrate the four categories of the taxonomy: participation in the policy process, influencing the framing of the nutrition policy debate, creating partnerships, and influencing the interpretation of evidence. These strategic uses of reformulation align with previous research on food and beverage corporate political strategy.

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1. Introduction

The food and beverage industry regularly changes or reformulates its products' recipes or composition, for example to improve taste or decrease costs. However, reformulations intending to improve the health profile of food and beverage products have recently gained prominence as a public health approach (Combris et al., 2011; World Health Organization, 2004). Health-specific reformulations typically aim to reduce salt, sugar and fat in highly processed foods and sugary drinks, well-established as drivers of the obesity and noncommunicable disease (NCD) epidemics (Monteiro, 2009). Health-focused reformulation of food and beverages (herein referred to as reformulation) is increasingly considered a nutrition policy intervention or initiative in and of

itself, but has also been conducted in response to other nutrition policies such as food labeling — as was demonstrated by the industry-wide reformulations following mandatory *trans*-fat labeling in the United States (U.S.) (Otite et al., 2013).

A variety of food and beverage reformulation initiatives are currently underway in the U.S.: quasi-regulatory public-private partnerships with government institutions, co-regulatory mechanisms in partnership with non-profit or non-governmental organizations, voluntary corporate pledges initiated by alliances of food and beverage companies, and codes of conduct or commitments at individual food and beverage companies, some of whom are also participating in collective corporate reformulation pledges/alliances (Alliance for a Healthier Generation, n.d.; Mars Inc., n.d.; McDonald's, n.d.; Partnership for a Healthier America, n.d.; Slining et al., 2013; The Hershey Company, n.d.; The NYC Health Department, n.d.). Reformulation has also been a priority of First Lady Michelle Obama's obesity prevention campaign, Let's Move, and she is the honorary chair of the reformulation focused

^{*} Corresponding author.

E-mail address: Courtney.Scott@lshtm.ac.uk (C. Scott).

Partnership for a Healthier America (Let's Move, n.d.; Partnership for a Healthier America, n.d.; The White House – Office of the First Lady, 2010). Most recently, in June 2016, the Food and Drug Administration issued proposed guidance on a set of voluntary salt reduction targets (U.S. Food and Drug Administration, 2016). Taken together, these initiatives illustrate food and beverage reformulation's prominent position on the industry and health policy agendas in the U.S.

All of the above reformulation initiatives in the U.S. are voluntary, and the majority are self-regulated. Literature on corporate political strategy – the variety of ways corporations seek to influence policy decisions and the regulatory environment (Hillman and Hitt, 1999) – has identified such voluntary initiatives as a mechanism used by industries facing political and social pressure to preempt or avoid restrictive or mandatory regulations on their activities (Hauffer, 2001; Saloojee and Dagli, 2000). The food and beverage industry has increasingly been under such pressures as obesity and NCDs continue to rise and governments adopt policies and issue policy recommendations which would impact the food and beverage industry's business (Ng and Dunford, 2013; Sacks et al., 2013; The PLoS Medicine Editors, 2012). For example, taxation and other fiscal measures feature in numerous nutrition policy documents, including the World Health Organization's 2013 NCD Action Plan, which, if implemented, would be considerably more intrusive on the industry's business than a voluntary program such as product reformulation (World Health Organization, 2013).

This paper is part of a larger research project exploring the political aspects of product reformulation from multiple viewpoints, in order to inform the broader debate about effective solutions and policies to address obesity and NCDs in the U.S. This paper in particular aims to provide insights into food and beverage product reformulation and its relationship to industry political strategy around obesity and NCD policies. It examines the narratives and frames contained within food and beverage industry responses to a U.S. government consultation on reformulation and compares them against a taxonomy of food and beverage industry political strategies collated for this research.

2. Methods

Nutrition policy is a value-laden, political process, and subject to inherent tensions between stakeholders' beliefs, motives and desired policy outcomes (Nestle, 2002; Weible et al., 2012). In order to identify the political strategies and tensions within voluntary product reformulation, we conducted an analysis of frames and narratives.

A frame is a way of “select[ing] some aspects of a perceived reality in order to make them more salient...” so that a problem, and therefore its solution, are defined in a certain way (Entman, 1993). The way an issue is framed dictates whether or not the issue comes onto the public policy agenda, and how to respond to that issue once it is on the agenda (Dorfman et al., 2005; Mah et al., 2014). Importantly, frames can “construct policy decisions even before a decision per se has been made...” (Mah et al., 2014) – therefore frames used by the food and beverage industry may be strategic in attempting to shape future nutrition policy decisions in a particular direction.

A study of narratives is one of many approaches commonly applied to identify and analyze stakeholder positions and their effect on the policy process. Narratives provide a structural arch – a story, or plot line – to political debate, and the building of narratives is a key component of political strategy (Atkinson, 2000; Stone, 2012). In particular, narratives are able to “frame who benefits and who sustains costs in the policy conflict” (McBeth et al., 2007). In the case of nutrition policy, the food and beverage

industry may be using narratives in order to shape on-going discussions about how to address the obesity and NCD epidemic toward policy options in which they are the constituent who benefits.

Frames and narratives are closely interrelated but distinct concepts. They both imbue texts and discourse with underlying values and convey broader implications and meanings to policy debate. Frames, as used in this research, are more specifically concerned with how a problem, and its solutions, are defined in order to shape policy processes. While narratives may contain frames within them, or even help to define the frames themselves, they refer more specifically to the story being told within the text or discourse. When this paper refers to a narrative, it is referring to the overarching line of argumentation or storyline of the food and beverage industry submissions.

2.1. Taxonomy of food and beverage industry corporate political strategies

To create a taxonomy of food and beverage industry corporate political strategies, we first reviewed the work on such strategies by Brownell and Warner (2009), Miller and Harkins (2010) and Goldman et al., (2014). We then searched Scopus and Medline for additional papers, using the search string: ([food OR beverage industry] AND (strategy OR policy OR politics OR voluntary OR regulation OR regulate)). If the title or abstract indicated the paper was specifically about the food and beverage industry, we read the full text (n = 36) and extracted any political strategies identified within. We then grouped the strategies into categories, and cross-checked the categories identified against those discussed by Brownell and Warner (2009) as well as those identified in two prominent books in this field (Freudenberg, 2014; Nestle, 2002). The resulting categories in the taxonomy were: influencing the framing of the debate, influencing the evidence, providing funding and participating in partnerships, and participating in the policy process (Fig. 1). This taxonomy of industry tactics is intended to be an evolving tool through which to interpret food and beverage industry political strategies. Furthermore, it is noted that a number of the strategies identified within the taxonomy and within this paper could be categorized under multiple taxonomy categories. For example, the use of voluntary pledges and codes can be seen as participating in the policy process, as well as framing the nutrition policy debate away from mandatory regulations, among others.

The frames identified in this taxonomy and in this research were also informed by the literature reviewed on food and beverage industry corporate political strategy. In particular, these include the frame that the industry is ‘part of the solution’ to obesity and NCDs and the individual responsibility/consumer choice frame frequently employed by industry (Dorfman and Wallack, 2007; Kwan, 2009; Nixon et al., 2015). However, two of the frames identified in this paper – focusing on ‘positive’ nutrients in products and emphasizing the cost/effort of reformulation – were unique to and generated from this research.

This taxonomy was originally generated from a literature search in 2014, when this research commenced. In the time since that literature search, further academic work has been completed on the corporate political strategies of the food and beverage industry. In particular, Mialon et al. (2015) published a framework for monitoring the corporate political activity of the food and beverage industry. The categories and strategies contained within the framework proposed by Mialon et al. (2015) are largely overlapping with that of the taxonomy proposed here; however, the taxonomy presented here contains fewer categories of strategies.

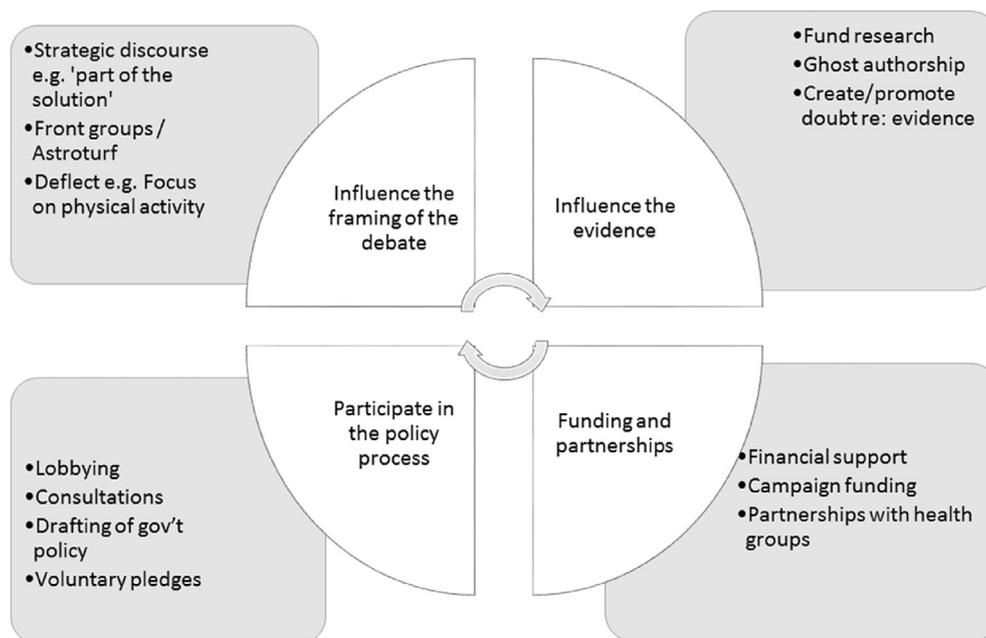


Fig. 1. Taxonomy of key food and beverage industry corporate political strategies.

Figure by author; building on the work of: (Bailin et al., 2014; Bes-Rastrollo et al., 2013; Bødker et al., 2015; Brownell and Warner, 2009; Cannon, 2004; Center for Science in the Public Interest, 2015; Dietz, 2013; Dorfman et al., 2012, 2005; Elliott, 2012; Fleischhacker, 2007; Freedhoff, 2014; Freedhoff and Hébert, 2011; Freudenberg, 2012; Goldman et al., 2014; Gomez et al., 2011; Hawkes and Buse, 2011; Hobbs et al., 2004; Jou et al., 2014; Kearns et al., 2015; Ken, 2014; Kersh, 2009; Kmietowicz, 2015; Knai et al., 2010; Koplan and Brownell, 2010; Kraak et al., 2012; Kurzer and Cooper, 2013; Lesser et al., 2007; Lewin et al., 2006; Ludwig and Nestle, 2008; Miller and Harkins, 2010; Myers, 2006; Nelson, 2004; Nestle, 2015, 2002, 1993; Nestle and Wilson, 2012; Nixon et al., 2015; Oppenheimer and Benrubi, 2014; Sharma et al., 2010; Shelley et al., 2014; Simon, 2005; Slining et al., 2013; Vallgarda et al., 2015; Yanamadala et al., 2012).

2.2. Consultation analysis

To apply the taxonomy to empirical data, we analyzed publically available food and beverage industry responses to a consultation on food and beverage product reformulation (health.gov, 2015), run by the 2015 Dietary Guidelines Advisory Committee (DGAC) in conjunction with the U.S. government's formulation of the 2015 Dietary Guidelines for Americans (DGAs). Government consultations are a known entry point for corporate lobbying activities and therefore – in and of themselves – are an illustration of industry participation in the policy process (Hawkins and Holden, 2013; Hillman and Hitt, 1999). In addition, they provide an opportunity for industry to influence regulatory debates and lobby policy makers, as well as to insert doubt around the evidence underpinning un-favored policy approaches. In this case in particular, as will be shown, the DGAC consultation also allowed the industry to highlight their reformulation work done in partnerships – which have been identified as a strategy the industry uses to gain legitimacy and credibility with policy makers, the community and consumers (Ken, 2014).

2.2.1. Dietary Guidelines Advisory Committee: Consultation 2.1

The role of the DGAC is to: “provide independent, science-based advice and recommendations for development of the Dietary Guidelines for Americans, 2015, which forms the basis of Federal nutrition programs, nutrition standards, and nutrition education for the general public” (The Secretary of Health and Human Services, 2013). The report of evidence reviewed by the 2015 DGAC was delivered in February 2015 to the secretaries of Health and Human Services and the U.S. Department of Agriculture, who then used the findings of the DGAC to inform the official 2015 DGAs, which were released in January 2016.

The 2015 DGAC was organized into five subcommittees, each of

whom accepted public comments through an online platform. Across all subcommittees, a total of 971 comments were submitted online, and the DGAC accepted 918 as relevant to their work (2015 Dietary Guidelines Advisory Committee, 2015a). All responses to the DGAC consultations are available in an online archive (health.gov, 2015).

Within the general consultation, subcommittees 2 and 5 issued specific calls for comments on topics of interest to their work. This research solely examined responses to Request 2.1: Food and beverage industry approaches to reducing sodium, added sugars and fats. The Chair of Subcommittee 2 described the aim of Request 2.1 as: “understanding a little bit more than what might be published out there in those steps that the food industry is doing to reduce sodium, added sugars and fats in the food supply...[and] understanding what types of evaluations have gone on, and what the outcomes are of those programs...” (Siega-Riz, 2015).

All responses submitted to Request 2.1 from 1 February to 13 November 2014 were downloaded from the consultation website (health.gov, 2014) and archived into a database. An additional key word search of the entire DGAC consultation platform was also conducted using the search terms “product reformulation” and “reformulation”, which resulted in one response being added to the sample.

2.2.2. Coding

The consultation responses were indexed according to type of responder and coded in NVivo10 (QSR International Pty Ltd., 2012) using a coding framework created for this research. The coding framework was primarily inductive (e.g. emerging from the data), however, in line with the basis for this research, we began the coding process with a skeleton of potentially important themes or concepts from the literature on corporate political strategy and food and beverage industry tactics. We then read and open-coded a

Table 1
Number of submissions, analyzed by sector and sub-type.

Sector	Sub-type	Total per sector
Food and Beverage Industry	Individual Company: 15	41
	Trade Association: 21	
	Research Institute: 2	
	Partnership: 2	
Academia	Consultant: 1	12
	Professor: 2	
	Student: 4	
Public Health/Public Interest	Unknown role: 6	6
	Individuals/professionals: 4	
	Association: 1	
	Website: 1	
Other	Unknown role: 5	6
	Individuals, unknown: 5	
Total	Foundation: 1	65

sub-sample of the responses to generate a set of codes specific to this consultation process. These codes were analyzed for similarity and grouped into themes, many of which were the themes identified in the literature used to create the taxonomy. We then used this initial set of themes and codes to code all of the responses, however the coding framework was continuously updated as new codes emerged from the responses. After coding was completed, the results were compared to the taxonomy. A full copy of the coding framework can be found in [Appendix 1](#); the main themes were:

- Reformulation approach (e.g. voluntary, partnership, etc)
- Type of progress reporting
- Motivation to reformulate
- Limiting factors or risks of reformulating
- Benefits or opportunities of reformulating
- Reasons not to reformulate
- Legitimacy in participating in the policy process
- Use of evidence
- General discussion about nutrition problems and policies
- Responsibility/accountability of various actors (e.g. individual responsibility and informed choice)

As is standard practice in qualitative research of this type ([Dorfman et al., 2012](#)), the minimum unit for coding was a sentence, however we primarily chose to code entire paragraphs to ensure relevant context was included with the specific code. If a paragraph or sentence contained multiple codes, they were all coded.

To test the reliability of the coding framework, two researchers (CS and CK) coded a subset of 10 submissions. Disagreements

between researchers were identified and discussed, and were found to primarily result from coding different lengths of text and differences in the depth of coding. There were no major disagreements between the two coders in terms of interpretation of content, main themes or codes, and one researcher (CS) coded the remainder of the submissions. After the coding process was completed, all submissions were checked for consistency and re-coded as necessary.

2.3. Notes on methods

It is important to note that though we refer here to “industry” as a whole, we recognize that this sector is not homogenous and contains a wide variety of actors, who have varying businesses, positions and political priorities. Furthermore, in order to focus on the narratives and framing surrounding reformulation – rather than pinpointing the actions of individual companies or sectors of the industry – we have blinded corporation and product names in this paper. However, all quotes used in this paper are publically available on the consultation archive website ([health.gov, 2015](#)), and a list of the respondents whose submissions were analyzed can be found in [Appendix 2](#).

The non-industry submissions to consultation 2.1 were smaller in number and came from a variety of groups and perspectives. Given the limitations of the non-industry sample, and to allow for a more in-depth consideration of the industry submission, we decided to exclude their responses from this analysis and reserve for further work.

3. Results

Sixty-five responses were submitted online to request 2.1 on reformulation by 13 November 2014 ([Table 1](#)). Thirty-one food and beverage industry actors submitted 41 unique submissions (7 entities submitted more than one response); 12 submissions were from academic actors; 6 public health or public interest actors; and 6 from other or unknown groups. Of the 41 industry contributions, half (21/40; 52%) came from trade associations.

3.1. Illustration of the taxonomy of food and beverage industry political strategies

The themes and frames we interpreted from the industry's consultation submissions mapped onto the categories of the food and beverage industry corporate political strategy taxonomy ([Fig. 1](#)). These are summarized in [Table 2](#) and presented in further detail below.

Table 2
Food and beverage industry political strategies and illustrative examples from the 2015 DGAC reformulation consultation.

Category of food and beverage industry political strategy (Fig. 1)	Illustration from 2015 DGAC consultation request 2.1
Participate in the policy process	41 of 65 submissions from industry actors
Funding and partnerships	Frequently cited voluntary reformulation partnerships
Influence the framing of the debate	Positioned the industry as part of the solution
	Argued for voluntary governance mechanisms
	Emphasized costs/effort of reformulation
	Focused on “positive” nutrients in products
	Reinforced individual responsibility and consumer choice
Influence the evidence	Used extensive academic style references
	Cited data created or sponsored by the industry
	Argued there is insufficient evidence against their products
	Raised doubts about existing evidence against their products

3.1.1. Participate in the policy process

The results from this consultation analysis demonstrate industry participation in the policy process to define the dietary guidelines, with 41 of the 65 responses analyzed from request 2.1 coming from food and beverage industry actors, seven of whom contributed more than once. Furthermore, of all 971 responses to the entire DGAC online consultation, 286 came from food and beverage industry actors. However, this is likely an underreporting, as a further 50 submissions that were categorized as “other” came from known industry partnerships and industry funded entities.

3.1.2. Funding and partnerships

The voluntary reformulation pledges referred to in the industry's responses frequently involved partnerships with health or public interest groups, either in their design, implementation or evaluation. For example, multiple food companies described being a “founding member” of the Healthy Weight Commitment Foundation, a coalition that includes NGOs and government, whereas this trade association described its “genuine partnerships” with policy makers:

The association and its member companies are committed to meeting the needs of consumers through product innovation, responsible business practices and effective public policy solutions developed through a genuine partnership with policy-makers and other stakeholders. (CID 358)

3.1.3. Influence the framing of the debate

The industry consultation responses framed the issue of reformulation, and nutrition policy more broadly, by using a highly similar narrative. The majority of industry submissions used the following narrative structure or story line:

- (1) That a product or industry is not a large contributor to consumption of the nutrient of concern or obesity/NCDs and/or that it contributes beneficial nutrients to the diet of Americans;
- (2) That even though they or their products may not be a large contributor to obesity or NCDs, the industry is ‘part of the solution’ and reformulating at-will;
- (3) That reformulation is underway despite it being a significant challenge for a number of reasons, among them technical difficulty, lack of substitutes, and taste and safety concerns.

Two of the three narrative aspects above were found in 83% of the industry submissions ($n = 34$), and more than a third ($n = 15$; 36%) contained all three narrative aspects. The second narrative point, that industry is ‘part of the solution’ and reformulating at-will, was the most common and was present in all but four industry submissions (90%). Narrative aspect one (positive nutrients or not part of the problem) was present in 33 submissions (80%). Relatively, narrative aspect three (difficulty of reformulation) was the least common, but was still identified in close to half of the submissions ($n = 20$; 49%).

Lastly, the industry submissions argued for voluntary governance mechanisms and emphasized individual responsibility and consumer choice. Each of these narrative points and frames will be explored further below.

3.1.3.1. Focusing on “positive” nutrients. The industry frequently highlighted the beneficial nutrients that their products provide to the American population. Their submissions argued that positive nutrients, such as calcium, justify the presence of components to limit, such as sugar. For example:

[Products] are nutrient-rich, providing significant levels of calcium, protein, vitamin A, vitamin D and many other beneficial nutrients to the overall diet. While some [products] do contain some fat, added sugars or sodium, the presence of these nutrients to limit is outweighed by the nutrients to encourage naturally present in (products). (CID 372)

Similarly, a food company argued that ingredients designed to increase palatability, such as sugar, were necessary to ensure children would consume the product and thereby increase their consumption of “positive nutrients” (CID 431).

3.1.3.2. Industry is part of the solution, not the problem. Food and beverage industry submissions consistently used arguments to position themselves as “part of the solution” to NCDs and obesity, and cited reformulation as an example of fulfilling their commitments. For example:

Our members have expressed their shared commitment to working with the federal agencies to advance the important public health goal of reducing sodium intake. This is evidenced by the voluntary strides our members have made, and continue to make, to reduce sodium contents of their foods... (CID 817)

While another says:

The [industry] is focused on responding to consumer demands and we are passionate about serving our guests and ensuring their happiness. We are working hard and engaging our members to do our part in addressing nutrition. (CID 366)

3.1.3.3. Emphasizing the cost and effort to industry. The food and beverage industry also framed the issue of reformulation by emphasizing the difficulties and costs involved. A multitude of reasons were given for why reformulation is challenging, how it will take a long time, require a significant investment of resources, and will be most successful if implemented gradually. For example, this trade association stated that companies are making changes but that they take “decades” and “extensive work”:

Companies react to the demands of their customers, including products that have lower levels of fat, sodium, and added sugar. However, product development of new better-for-you product options takes years of extensive work, market testing and understanding consumer acceptance to taste, texture and function in various uses such as cooking. (CID 372)

In addition, the submissions cited multiple business consequences of reformulation including safety concerns, altered product functionality, lost efficiency, and a lack of return on investment or decreased sales. For example:

...our members have not identified available technology that will allow for a significant reduction in sodium without flavor loss, dramatic cost increase, or adding additional questionable ingredients, both from a consumer and restaurant perspective. (CID 255)

3.1.3.4. Arguing for voluntary governance mechanisms. The industry consistently argued for voluntary governance of reformulation in their responses, for example by stating that voluntary and flexible approaches are not only the preferred and most viable option, but

also shown to be effective through existing voluntary efforts. For instance, this food company said:

We were successful in our voluntary efforts because we were able to slowly implement changes at a rate that did not impact liking of the product or outpace technological challenges. Therefore, [company] believes that voluntary, gradual, step-wise reductions in sodium across the food industry is the most sustainable and realistic approach. (CID 370)

Another food company argued that mandatory reformulation efforts would be impossible because of the wide variety of products and recipes in the food and beverage industry (CID 372). Whereas, a third plainly stated that government intervention is not necessary:

The industry is currently working to improve the nutritional of our product, without government mandate. (CID 369)

3.1.3.5. Reinforcing individual responsibility and consumer choice. In addition, industry responses emphasized the importance of individual responsibility and consumer choice and cited their reformulations as a means of providing choice for consumers. For example:

In conclusion, the [industry] is responsible and is dedicated to providing meaningful choices and useful information for consumers when making purchasing decisions. (CID 378)

In another example, a food and beverage company placed consumer responsibility at an equal level with the changes required of industry:

It is equally important to help consumers make smart food and beverage choices in order to benefit from efforts by [company] and food industry peers to reduce fat, sugars and calories. (CID 341)

3.1.4. Influence the evidence

As the DGAC's work is primarily scientific, the industry's submissions to consultation request 2.1 also focused heavily on the scientific evidence related to reformulation and the health impacts of their products. This is demonstrated by the fact that industry actors used 391 citations of the 429 cited in total by all responses analyzed. The extensive use of academic-style references lends credibility to industry submissions, however the references cited included among them industry's own data or studies funded by industry, which have been shown to be biased towards results that are favorable for the industry (Lesser et al., 2007; Bes-Rastrollo et al., 2013).

The food and beverage industry also used recurring arguments to call into question evidence linking their product or industry to NCDs or obesity. Most argued that the quality of evidence was not sufficient, that more evidence was required or highlighted doubt and uncertainty in the existing evidence. For example, a typical industry discussion is illustrated by this trade association highlighting conflicting evidence on the relationship between snacking behavior and weight:

Although there are studies suggesting snacking increases body weight, there are also several studies showing an inverse or neutral relationship between snacking and body weight. (CID585)

3.2. Policy process outcome: reformulation in the 2015 DGAC and DGAs

Product reformulation appeared in six unique places in the DGAC report released in February 2015. In particular the report issued strong support for reformulation of processed foods to lower sodium content, saying reformulation should be the "primary strategy for decreasing sodium intake in the U.S. population" (2015 Dietary Guidelines Advisory Committee, 2015b).

Reformulation was also subsequently included in the 2015 DGAs – the final recommendations released in January 2016 by the USDA and HHS – in the form of pop-out boxes in the sections on the "Socio-Ecological Framework" and on "Meeting People Where They Are" (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015a). However, the DGAs recommendation for reformulation was hedged as compared to that of the DGAC, for example:

...Food manufacturers are encouraged to consider the entire composition of the food, and not just individual nutrients or ingredients when developing or reformulating products...care should be taken to assess any potential unintended consequences so that as changes are made to better align with the Dietary Guidelines, undesirable changes are not introduced. (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015b)

4. Discussion

Previous research has found that the food and beverage industry attempts to influence the nutrition policy process through multiple strategies, which we grouped into a taxonomy consisting of participation in the policy process, influencing the framing of the debate, providing funding and establishing partnerships, and influencing the evidence. This taxonomy aligns with the broader literature around corporate political strategy (Hillman and Hitt, 1999), and the well-established research on the political strategies of the tobacco and alcohol industries – with which the food and beverage industry is often compared (Brownell and Warner, 2009; Freudenberg, 2014; Hawkins and Holden, 2013; McCambridge et al., 2013; Miller and Harkins, 2010; Saloojee and Dagli, 2000; Savell et al., 2016, 2014).

This consultation analysis has shown that when the food and beverage industry argued in favor of voluntary product reformulation, it did so in a way that aligned with these previously established political strategies. Furthermore, the industry submissions to this consultation were highly internally consistent and employed a markedly similar narrative structure, coalescing around arguments for reformulation to be voluntary. Interest groups have been shown to strategically use narratives to influence policy discussions for a particular problem towards their preferred solution (McBeth et al., 2007; Stone, 2012). Therefore, the consistent narratives in the food and beverage industry's consultation responses further suggest that voluntary reformulation may be one part of the industry's political strategy to preempt future policy debates and processes from moving towards mandatory approaches.

The respondents to this consultation consisted primarily of food and beverage industry actors, which is not unexpected as it specifically aimed to elicit the industry's perspective. However, the consultation provided an opportunity for the industry to publicly employ their framing of reformulation, including the use of numerous arguments to cast doubt on the scientific literature about the health effects of their products, a known political strategy of several industries (Oreskes and Conway, 2010). Furthermore, the

industry framed themselves, and their reformulation initiatives, as part of the solution to obesity and NCDs, further reinforcing the industry's preference for voluntary partnership-based initiatives. By focusing on being 'part of the solution', the industry also shifted the debate away from the increasing evidence of the industry's contributions to the problems of obesity and NCDs (Monteiro et al., 2011; Moodie et al., 2013; Nestle and Wilson, 2012). This research reinforces previous findings that the food and beverage industry emphasizes being 'part of the solution' to obesity in their messaging, as well as publically employing arguments for voluntary governance mechanisms (Nixon et al., 2015).

The industry also used their consultation responses to emphasize consumer choice – a well-established frame emphasizing individual responsibility for nutrition – in order to minimize industry responsibility for poor nutrition (Dorfman et al., 2005; Kersh, 2009; Nixon et al., 2015) – and to argue that their products are not a large contributor to the problem. However it is worth noting that any one product in isolation would be unlikely to do so. Furthermore, this research has identified that the industry focuses on “positive” nutrients in their products, which served to deflect attention away from the high levels of nutrients of concern (sugar, salt, and fat) also found in their products, and deflected attention away from the need to reformulate. This deflection is inconsistent with the arguments presented above that voluntary food and beverage reformulation is 'part of the solution' to obesity and NCDs. However, the focus on positive nutrients is logically consistent with the narrative found in the consultations responses that the industry and their products are not a large contributor to the problem. Though these framings of reformulation are contradictory, they each independently align with the taxonomy of food and beverage industry political strategies.

It is impossible to know whether reformulation would have appeared in the 2015 DGAs without the DGAC holding consultation 2.1, or to say if the food and beverage industry narratives and frames identified in this analysis influenced the recommendations of the DGAC. However, the 2010 Dietary Guidelines did not mention or recommend reformulation, while the 2005 Dietary Guidelines only used the word reformulation twice as an explanation as to why *trans*-fat consumption has decreased in the U.S. ((U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2005) p.30). Therefore, in issuing explicit support for reformulation the 2015 DGAs represent a departure from the two previous editions of the guidelines and may indicate that the industry's participation in the DGAC consultation process was influential.

Product reformulation has been praised as a rare example of a “win-win” for the food and beverage industry and public health efforts to reduce obesity and NCDs, and has been described as a “pragmatic” nutrition policy (Winkler, 2014, 2013). However, the industry submissions analyzed here provided numerous reasons to suggest that voluntary reformulation also plays a role in the industry's strategy to avoid unfavorable regulatory conditions, and this finding warrants significant consideration.

4.1. Limitations

This analysis did not intend to be representative of all industry actors and their reformulation efforts, and therefore does not claim to document all of the potential aspects of food and beverage industry reformulation that may or may not be politically relevant. Furthermore, the consultation responses analyzed represent a self-selected cross-section of some of the industry actors interested in nutrition policy, however those that did respond are among the major industry actors in the U.S. It is also likely that individuals or companies who responded to this consultation request were

already interested in reformulation, and therefore was not inclusive of the opinion of companies who do not participate in voluntary food and beverage reformulation.

5. Conclusion

The results of this consultation analysis suggest the food and beverage industry in the United States is using a highly similar narrative around voluntary product reformulation, and demonstrated the taxonomy of corporate political strategies collated from previous research: participating in the policy process, influencing the framing of the nutrition policy debate, establishing partnerships, and influencing the interpretation of evidence on nutrition. The food and beverage industry may be undertaking voluntary reformulation, in part, to subtly shift the public health regulatory environment towards voluntary agreements and partnerships that suit their interests. However, further research is necessary in order to fully understand the political strategy aspects of voluntary reformulation efforts.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.socscimed.2016.11.020>.

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SIGNIFICANCE OF PAPER 1

Reflecting on the classification of corporate political strategies proposed by Hillman and Hitt (1999), the evidence presented in Paper 1 would suggest that reformulation is a relational approach – one which “attempts to build relationships” so that “when policy issues arise that affect their operations, the contacts and resources needed to influence this policy are already in place” (Hillman & Hitt 1999, p.828). It also appears to be a collective strategy – one which involves the “collaboration and cooperation of two or more individuals or firms in the policy process” (Hillman & Hitt 1999, p.830). The specific strategies proposed in the taxonomy of strategies (Figure 6.1) and identified in the analysis broadly align with Hillman and Hitt’s taxonomy of political strategies: information strategy, financial incentive strategy, and constituency-building strategy (Hillman & Hitt 1999, p.835). This research also suggests that reformulation enables a number of political strategies in concert, which is in line with previous research findings that multiple political strategies are likely used simultaneously (Mahon 1993; Hillman & Hitt 1999).

In addition to identifying the ways in which reformulation connects to the industry’s corporate political strategy, the consultation analysis identified a highly similar reformulation narrative within the industry submissions. This narrative presents reformulation as part of the solution, despite the industry and its products not being a large contributor to obesity/NCDs and reformulation posing numerous technical challenges. This narrative contains elements similar to those described by Stone (2002) in describing stories of causation. In particular, by claiming to be both part of the solution and not part of the problem, the industry’s narrative appears to be emphasizing an “inadvertent cause” story line. This type of a narrative emphasizes the “unintended consequences of purposeful human action” (Stone 2012, p.211). By straddling being part of the solution, and deflecting blame for the problem, it can be argued that, through this narrative, the industry is admitting their products need improvement, but that it was not their intention to be part of the problem. This type of narrative is weaker than an “accidental cause,” in which the industry would assume no blame for the problem (Stone 2012, p.209), but evidence would suggest that the industry’s products have been knowingly created and promoted in such a way as to encourage their consumption (e.g. the industry seeks to create products with a “bliss point” – the “precise amount” of sugar, salt and/or fat to make food and beverage products “most enjoyable” (Moss 2013)). However, as health advocates seek to attribute responsibility for obesity and NCDs to the industry, an

“intentional cause” (Stone 2012, p.209), it is preferable for the industry to construct a narrative so that the cause remains in the realm of inadvertent (Stone 2012, p.211). The “inadvertent cause” also serves to legitimise the industry’s argument that they are part of the solution to obesity, as it can “empower particular actors as ‘fixers’ of the problem” (Stone 2012, p.204). The “inadvertent cause” story also enables “new political alliances among individuals and groups who stand in the same relationship to the causal agent” (Stone 2012, p.224), and this may help to further explain the alignment of belief systems and formation of coalitions presented in next chapter.

ADDITIONAL DATA FROM THE CONSULTATION ANALYSIS

NUTRIENTS TARGETED BY INDUSTRY REFORMULATIONS

In addition to the thematic analysis of the DGAC consultation analysis, presented in Paper 1, the responses to the consultation provided an opportunity to assess the type and nature of the US food and beverage industry’s reformulation initiatives, including the nutrient/ingredient they target and if they are new or completed initiatives. The submissions from individual food and beverage companies, trade associations, and industry partnerships were analysed for the nutrient or ingredient targeted by the product reformulation initiatives discussed (sugar, salt, fat, calories, etc.), and whether or not the reformulations were completed or on-going/planned.

The initiatives were included as read, and not investigated further for veracity or extent of implementation. For example, this section of a submission would have been counted in the sub-analysis as an initiative on calories and fat:

[Company name] has successfully reduced calories by the introduction of new technology to develop [products], which gave us the ability to make [product] with half the fat and one-third fewer calories per serving than regular [product]. (CID 379)

Only the first instance of an initiative was counted per submission (e.g. the first mention of a salt reformulation action), although individual initiatives were often mentioned many times per submission. If a particular initiative or commitment targeted multiple nutrients, all were counted. The initiatives were categorized as ‘new, proposed or continuing effort’, or ‘previous or completed effort’:

- New, proposed or continuing reduction effort: e.g. “On March 14, 2014 [company name] announced a landmark commitment with the [partnership] to continue to improve the nutrition profile of our [products]. Specifically, we pledged to further

improve by 10 percent the nutrient density of the volume of products offered to consumers in part by increasing nutrients that are encouraged in a healthy diet, while reducing total sugar and fat.” (CID 431)

- Or, previous or completed reduction effort: e.g. “[company name] has successfully reduced calories by the introduction of new technology to develop [products], which gave us the ability to make [product] with half the fat and one-third fewer calories per serving than regular [product].” (CID 379)

Three industry submissions were excluded from this sub-analysis for not reporting specific information on their own reformulation efforts (e.g. industry could do this versus our company did x sodium reduction). Therefore, of the 31 unique industry entities/actors who submitted to this consultation, 29 described their specific reformulation efforts (completed or planned). As is shown in Table 6.2, sodium/salt was the most commonly targeted nutrient for reformulation among respondents to this consultation, followed by calories, fat and sugar. The majority of initiatives were completed, rather than new or proposed.

Table 6.2: Reformulation efforts reported by food and beverage companies, trade associations, and industry partnerships in the DGAC consultation on reformulation (n=29 industry entities)		
Reformulation Target	Previous or completed reformulation efforts	New, proposed or continuing reformulation efforts
Salt/Sodium	16	8
Calories	11	4
Sugar	10	3
Fat (all)	9	6
Trans Fat	4	3
Portion size	5	0
Whole grains	5	2
Adding nutrients	2	3
Total	62	29

SUBMISSIONS FROM PUBLIC HEALTH ACTORS

While Paper 1 focuses on the industry submissions to DGAC consultation 2.1, a number of non-industry participants also submitted responses. However, in contrast to the industry submissions, those from other stakeholder groups were lower in number (n=24 v. n=41), and the content of those submissions was considerably more varied. Therefore, it was not

possible to identify a cohesive narrative pattern in non-industry submissions; that said, however, some recurrent themes were found.

Non-industry actors primarily described reformulation as arising out of concern over obesity/NCDs and the health qualities of foods in the US. These factors were discussed by industry actors as well, however the industry actors also discussed non-health rationales for product reformulation, such as consumer demand, joining partnerships, and/or being seen as a leader within the industry.

The voluntary approach to reformulation was largely not supported by non-industry actors, who cited concerns about subsequent marketing on food packages and lack of progress made to date by voluntary initiatives. For example, one submission from academia said:

I don't think that the food industry has made much of an effort to reduce the amounts of sodium, added sugars, and fats in their foods. They may promote one factor of their food as healthy, while other factors of their food may be unhealthy, such as putting "A great source of Calcium" on their product, while putting a large amount of fat, sugar or salt in it. (CID455)

Likewise, submissions from non-industry actors were are concerned about the potential for unintended consequences resulting from product reformulation. This included concerns that the health profile of reformulated products may not be healthier and concerns over the health-effects of substitute ingredients. For example, this submission from academia said:

Some interventions have been sought to alter the composition of food, items such as fats or sugars, in order to decrease calorie intake and prevent chronic disease development from the high intake of these components. However, once a component is taken out, some other component is generally added for a variety of reasons, such as flavor or texture. This leads to low fat items loaded with sugar, or low sodium items with high amounts of fats or other processed agents to alter flavor. (CID 451)

Another submission, from a prominent public health entity, also commented that reformulation may have the consequence of focusing consumer attention to a single component of their diet rather than focusing on improving the overall healthfulness of the diet:

[Organization] is concerned that continued emphasis on one food component 'added sugars' may distract consumers from the more important issues of total calories, large portion sizes and sugar sweetened beverages with high calorie content but no nutrients. (CID 590)

Furthermore, non-industry actors were concerned that reformulation may impart a “health halo” to what they see as unhealthy products. For instance, this individual/professional commented:

You also see many snack food companies cooking their foods in healthier oils (avocado oil, etc.) and they are promoting this fact – which is a good thing in one way but then the food is looking “healthy” to unknowing consumers and consumers are thinking these potato chips, etc., are now “healthy” when in fact they are still not “healthy, every-day foods”...they are just a lesser evil as compared to before. (CID 265)

They further argued that reformulations and subsequent marketing of those products might confuse consumers. For example, this nutrition student commented:

Unfortunately, much of the population is unaware of what they are consuming and it is rarely an option to find out. Even foods typically considered “healthy” often contain high amounts of added sugar and sodium. One of these foods that I’ve recently discovered as being far from healthy are certain brands of yogurts. I recently purchased a 99% fat free [yogurt] from my local grocery store when it was on sale, and upon reading the nutrition label, I discovered that one serving contained 27 grams of sugar. I was appalled. (CID 452)

Non-industry actors also raised concerns over conflicts of interest between reformulation and the need for companies to maintain rising profits, as demonstrated by this individual who contributed anonymously:

Food industry approaches to reducing sodium, sugar and fats!? That’s a joke, right? You know that, right?...There is simply no justification for the kinds of processed ‘foods’ Big Food would like the public to consume. It’s all about the bottom line and has NOTHING to do with nutrition. (CID 303) (NB: emphasis was in the submission).

They also expressed concern that the business motives of the industry threaten the potential for reformulation to achieve public good. For example, this anonymous submission said:

The food industry will not do it on it’s (sic) own as profit margins and the bottom line are it’s (sic) biggest concern. Not the health of Americans...As silly as people think banning trans fats from restaurants and politicians taxing/prohibiting Big Gulp sizes soft drinks, it almost has to be done for people to eat healthier. Education of the general population is futile. (CID 673)

In summary, the non-industry submissions to DGAC consultation 2.1 described reformulation as being motivated by health, but were largely critical of it as a public health approach. They raised a number of concerns about reformulation, including: concerns over

the voluntary approach, the potential for unintended consequences, and the potential for conflicts of interest between industry and health goals in undertaking reformulation. These concerns and caveats were closely echoed by public health actors in the interviews, as will be discussed in the next chapter.

7 STAKEHOLDER VIEWS ON REFORMULATION AND EVIDENCE OF COALITIONS

As the previous chapter has demonstrated, following increased evidence of the role that processed and packaged foods play in obesity and NCDs, the products and activities of the food and beverage industry, including their corporate political strategies (Chapter 6), are under increasing scrutiny. However, health-related policy is made in a dynamic system with many actors (Buse et al. 2012), and though the food industry is a powerful actor within that system (Nestle 2002), it is not theoretically correct to conclude that a particular policy or approach is prominent solely because it is part of the food and beverage industry's political strategies. In order to more fully understand the factors that contributed to the prominence of product reformulation as a public health approach, it is necessary to assess the role played by all actors in the policy subsystem (Sabatier 1988b; Weible et al. 2012), including stakeholders from government, academia, NGOs, advocacy groups and think tanks, as well as the food and beverage industry.

This chapter primarily presents data from the stakeholder interviews. First, it presents the overarching findings from the interviews. Then, in Paper 2, it will apply the Advocacy Coalition Framework to the interview data in order to delve into stakeholder beliefs about nutrition policymaking and reformulation and how these beliefs have contributed to the emergence of reformulation as a public health approach.

After Paper 2, the chapter turns its attention specifically to the interviewees from the public health community (Public Health/NGOs, Academia, Government), in order to interpret the actions and beliefs of the public health community and how these have encouraged reformulation as a public health approach. This includes examining evidence-based policy as the dominant approach through which public health participants in this study portrayed reformulation, the way in which the public health community has supported nutrient-based nutrition guidelines, and how these factors have contributed to the rise of product reformulation as a public health policy.

INTRODUCTION TO PAPER 2

The stakeholder interviews covered a range of topics, from questions about the definition of reformulation to complex queries on the role and responsibility of stakeholders in nutrition policy processes. Content analysis of the interviews revealed a number of topic and themes and sub-themes, which were directly derived from the interview questions and

the answers supplied by the participants. A detailed summary of the themes, sub-themes and example quotes can be found in Appendix 5.

Four overarching findings emerged from the interviews:

1. Non-industry respondents are divided on the value and role of reformulation in public health nutrition policy, and some are sceptical about the potential efficacy of voluntary industry reformulations and the industry's motivation for undertaking reformulation;
2. The credibility of the industry as a partner in public health nutrition policy and reformulation has been built, in part, through partnerships with public health actors, which themselves have come about from a broader political belief about the importance of working with industry;
3. While the industry has been an important driver of reformulation, the public health community has also played a role in encouraging reformulation initiatives by not considering how the industry would respond to nutrient-specific recommendations and policies; and
4. Those stakeholders who do not support a reformulation approach feel that that a broader government-led policy framework is necessary for nutrition policy to be successful.

As is evident from these overarching findings, stakeholder views on reformulation are interconnected with a range of issues in nutrition policy including the role, credibility and legitimacy of industry actors in the nutrition policy process, and the governance mechanism employed in nutrition policy initiatives (e.g. voluntary versus mandatory) (Points 1, 2, and 4 above). Stakeholders held overarching beliefs about both of these issues, which influenced their position and views on reformulation, and these views also fostered the formation of a coalition of stakeholders in favour of reformulation initiatives, as will be presented in Paper 2. Paper 2 also presents the specific arguments and views made by participants for and against reformulation as an initiative in and of itself (e.g. irrespective of the industry role and governance mechanism). An additional key division in the interview sample was that support for reformulation depends on the position of the interviewee with regards to the paradigm of foods versus nutrients, which will be presented in Paper 3 in the next chapter.

After Paper 2, this chapter will also explore the findings from the interviews that, in addition to the food and beverage industry, the public health community has also directly

and indirectly supported reformulation initiatives (Point 3 above). The chapter ends by presenting the views of industry interview participants, and how these views support the findings of the consultation analysis (Chapter 6).



Registry

T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

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Principal Supervisor	Cecile Knai
Thesis Title	Understanding nutrition policymaking dynamics in the United States: The case of product reformulation

If the Research Paper has previously been published please complete Section B, if not please move to Section C

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PAPER 2: WORK WITH THE FOOD AND BEVERAGE INDUSTRY? A DIVIDING LINE IN PUBLIC HEALTH NUTRITION ADVOCACY COALITIONS

ABSTRACT

Multisectoral participation in public health nutrition policy – including that of the food and beverage industry – is both encouraged and contentious. This research sought to explore these tensions in public health nutrition policy by applying the Advocacy Coalition Framework to data from semi-structured interviews about product reformulation, a prominent public health nutrition policy frequently undertaken in partnerships with the food and beverage industry. Thirty-four in-depth interviews were conducted in 2015 with nutrition policy stakeholders in the US. Two core policy beliefs were identified by using the framework method of analysis; one group of participants believed nutrition policy would be more efficient and effective if undertaken with the food industry ('work with industry' core belief), while another other felt nutrition policy would be best led by government ('government-led' core belief). These two beliefs were frequently interrelated with stakeholder views on voluntary versus mandatory implementation of reformulation initiatives. Furthermore, there was evidence that the 'work with industry' group has aligned into an advocacy coalition, whereas the 'government-led' group has not. Support for reformulation as a public health policy was largely tenuous; half of the participants said they would support reformulation only if it met certain preconditions or caveats, including how it is governed and implemented. However, the extremes of support for reformulation (fully yes or fully no) aligned with the core beliefs identified above; participants who were fully supportive of reformulation were primarily in the 'work with industry' industry group, while those who were fully against reformulation held the 'government-led' core belief. The strength and cohesion of the views held by the 'work with industry' coalition, and that reformulation is one of their supported approaches, may help to explain how and why reformulation has become a prominent public health policy. The findings of this research suggest that a 'work with industry' belief may be a dividing in line among nutrition policy stakeholders in planning and advocating for future public health nutrition policy initiatives.

INTRODUCTION

In the United States and globally, debates around obesity and NCD policy have increasingly focused on the added value of multi-stakeholder and multisectoral efforts (Institute of Medicine 2012; Hospedales & Jané-Llopis 2011). As a major stakeholder in the food system, the food and beverage industry (herein referred to as the industry) are included in such

multisectoral efforts. The industry has become a credible partner, often participating in formalized partnerships or platforms with governments and health groups (Hawkes & Buse 2011), bringing with them diversified expertise and a wealth of resources and connections (Kraak & Story 2010). However, the industry's participation in such public-private endeavours has also been contentious and raised questions of conflicts of interest (Ludwig & Nestle 2008). By applying the Advocacy Coalition Framework to data from semi-structured interviews about product reformulation, this research sought to explore these tensions in public health nutrition policy.

Product reformulation is the reduction or removal of nutrients or components of concern from food and beverage products. It has come into prominence as a public health nutrition policy in the US, most recently being included in the 2015 Dietary Guidelines for Americans and supported by the Food and Drug Administration in 2016 with their proposal for a voluntary sodium reduction program for the food and beverage industry (U.S. Food and Drug Administration 2016b; U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015a). However, as a public health approach, reformulation has also received criticism, particularly as it has typically been undertaken as a voluntary initiative in collaboration with the food and beverage industry, particularly in the US. It has been argued that the reformulations undertaken in the US have favoured the industry's interests over public health goals (Mozaffarian 2016b). To further explore these arguments, this research sought to examine the relationship between an individual's position on working together with the industry and their views on reformulation as a public health approach. As a so-called win-win and "pragmatic" public health policy (Winkler 2013), product reformulation has become an important public health policy option, and understanding the positions and support for this policy within the policy community is an important factor in understanding how and why product reformulation came into prominence, and if or how the policy moves forward. This paper is one part of a larger research project assessing product reformulation through a political science lens in order to inform understanding of nutrition policymaking dynamics in the US.

METHODS

Thirty-four in-depth qualitative interviews were conducted in 2015 with US nutrition policy stakeholders. Stakeholders were considered those who have experience with product reformulation and nutrition policy in the US, and were from one of four categories: the food and beverage industry, the government, public health NGOs or public interest groups, and academia (Table 7.1). They were identified using a snowball technique, starting with

professional networks and an Internet search, and then based on the recommendations of other participants. Participants were recruited until a saturation point was reached whereby interviews were not contributing new themes. Stakeholders were recruited by email, and interviews were conducted in-person where possible and by Skype as necessary. Interviews typically lasted between 20 and 60 minutes and were audio recorded and transcribed verbatim.

Sector	Interviews conducted	Did not respond	Declined interview	Lost in follow up	Total contacted	Response rate
NGO / Public Health Interest	12	6	4	0	22	54%
Academia	12	0	2	3	17	71%
Industry	4	17	2	2	25	16%
Government	6	0	2	0	8	75%
Total	34	23	10	5	72	47%

The analysis was conducted in a framework method, which consisted of organizing thematically analysed qualitative data into a matrix (Gale et al. 2013). Analysis was conducted with the aid of Nvivo10 to collate and organize the data (QSR International Pty Ltd. 2012). Themes and codes were identified through close reading of five transcripts, and the initial coding framework generated through this open coding was applied to the remaining transcripts. However, the framework was revised as necessary during the coding process, and all transcripts were re-read at the end of coding to ensure consistency throughout. Key questions or topics covered in the interviews and the main categories of the coding framework are listed in Table 7.2. The full coding framework can be found in Appendix 2.

This paper then assesses if, or to what extent, participants' beliefs about working together with the industry interrelated with their support of reformulation as a public health approach. According to the Advocacy Coalition Framework, policy coalitions form within a certain policy subsystem (topic area) around core beliefs, and act together in order for their preferred policy option to be put into place (Sabatier 1988a; Sabatier & Weible 2007). Thus this analysis sought to identify the underlying core beliefs that could explain the themes found in the interviews, and to assess if there was evidence that coalitions had formed around those core beliefs.

Table 7.2: Interview questions and associated coding framework categories	
Question	Relevant Coding Framework Categories
Definition of reformulation Position or stance on reformulation	Support for or against reformulation Foods versus nutrients
Challenges or implications of voluntary or self-regulated reformulation	Reformulation approach (e.g. stealth, voluntary, mandatory) Accountability Credibility – Legitimacy
Benefits or beneficiaries of reformulation	Benefits and beneficiaries
Problems or disadvantages with reformulation	Concerns or consequences Deflecting or hesitating Scepticism Why reformulation is difficult
Why reformulation has become a public health approach	Timeline of reformulation Evidence Reasons to reduce nutrients of concern Reformulation and its relationship to other policies Motivation to reformulation
- Actors who are responsible for improving the public’s nutrition and how reformulation fits in with that view - Key actors driving reformulation efforts - Potential role for government in reformulation initiatives	Responsibility Accountability Timeline of reformulation
Implications of the nutrient-based approach of reformulation	Foods versus nutrients Alternative or whole-foods approaches

Initial thematic analysis of the interviews identified four overarching themes as particularly important: dividing lines within the public health community on the value of reformulation as a public health approach and how it could or should be governed, contestation over the credibility and legitimacy of partnership-based reformulation initiatives, the role of the public health community in encouraging reformulation initiatives, and the need for greater accountability in reformulation initiatives. In unpacking these themes, it became evident that participants held fractured beliefs on whether or not to work with the industry in achieving public health goals, and that this divide helped to explain when and why participants expressed the above themes. The core beliefs were identified through framework analysis of specific codes from the analysis (Table 7.3), however evidence of coalitions was also informed through publicly available information about existing reformulation partnerships and advocacy groups. A participant was identified as having a particular core belief if their interviews only contained codes from one category or another; if their interview contained codes from both groups, they were identified as ascribing to

both belief systems. It is important to note here that the sample of interview participants was purposive and not intended to be representative. Therefore the numbers and proportions used in this paper are provided for the reader to gauge of predominance of the theme/belief in the sample but not intended to be generalizable.

Table 7.3: Codes used to categorize interview participants by belief systems	
Core Belief	Associated Codes from the Coding Framework
'Work with Industry' Core Belief	<ul style="list-style-type: none"> Industry has a role to play Have to make nutrition policy manageable for companies Apologizing/justifying/excusing on behalf of the industry Industry 'isn't bad' Individual responsibility Consumer choice
'Government-led' Core Belief	<ul style="list-style-type: none"> Government has a responsibility to act Government needs to hold industry accountable Industry is responsible for poor nutrition Food industry is 'in charge' (negative) Food industry needs to be held accountable Industry mistrust or industry is deceptive Industry profit motives Industry doesn't actually want to reformulate

Quotes used in this paper have been anonymised and stakeholders assigned a random four-digit number. Any potentially identifying information has been blinded. This research received ethics approval from the London School of Hygiene and Tropical Medicine.

RESULTS

Of the total sample of 34 participants, 11 participants expressed views in support of working with the industry on nutrition initiatives, while 18 primarily supported government-led nutrition policies, and five participants argued both sides (Table 7.4). Importantly, eight of the 11 participants who argued in favour of working with industry were current members of the industry or had current or former formalized relationships with the industry. As will be presented later in the paper, there was also evidence that those who believe in working with industry have aligned into a coalition.

	Total	Sector	# Per Sector	Relevant notes about Participants
'Work with Industry' Core Belief	11	Academia	1	Receives research funding from industry
		Public Health	5	3 were in formalized partnerships with the industry or were former industry members
		Gov't	1	
		Industry	4	
'Government-led' Core Belief	18	Academia	8	
		Public Health	6	
		Gov't	4	
		Industry	0	
Argued both beliefs	5	Academia	3	
		Public Health	1	
		Gov't	1	Former industry member
		Industry	0	

Overall, support for reformulation as a public health policy was largely tenuous; half of the participants said they would support reformulation only if it met certain preconditions or caveats (Table 7.5). However, the extremes of support for reformulation (fully yes or fully no) aligned with the core beliefs identified above; participants who were fully supportive of reformulation were primarily in the 'work with industry' group, while those who were fully against reformulation held the 'government-led' core belief (Table 7.5). Of the caveats or preconditions identified by participants, the most common were that their support for reformulation depended on how it was governed or implemented (e.g. voluntary versus mandatory), the substitute used, and that it needed to be part of an overall strategy with multiple policy approaches used.

	Yes	No	Unclear	With Caveats	Caveats Given (Number of Participants)
'Work with Industry' Core Belief	6	0	0	5	<ul style="list-style-type: none"> • Needs to also reduce calories (1) • Needs to be part of an overall strategy (2) • Has to be a 'real food' to begin with (1) • Doesn't mean the product is overall healthier (1) • It is good, but more needs to be done (1) • Government can set a cap/targets but not define the details (1)
'Government-led' Core Belief	1	6	1	10	<ul style="list-style-type: none"> • Doesn't address 'real causes' (4) • Overall product not healthier (6) • Depends on the substitute used (9) • Requires targets/enforcement to be effective (7) • Needs to be part of an overall strategy (5) • Doesn't discourage consumption of ultra-processed foods (2) • Reformulated foods have high levels of nutrients of concern, and reductions made are small (4)
Argued both beliefs	3	0	0	2	<ul style="list-style-type: none"> • Depends on the nutrient targeted (1) • Needs to be part of an overall strategy (1) • Requires targets/enforcement to be effective (1)
Total	10	6	1	17	

WORK WITH INDUSTRY COALITION

ARGUMENTS IN FAVOUR OF WORKING WITH INDUSTRY

The interview participants who supported the idea of working together with the industry frequently argued that this approach is reflective of the belief that multisectoral actions will be more impactful. For example, this participant from a health-focused NGO said:

I think that there is increasing awareness more broadly that all stakeholders have a key role to play, and that the food and beverage industry should be doing something, it's not just all about personal responsibility...I think the primary strategy for changing the food supply is in working with the industry and encouraging them to reformulate their products. – 8284 (Public Health/NGO)

Other public health participants highlighted that the food industry typically opposes government regulatory proposals, and that working together with industry on business-friendly or voluntary approaches, like reformulation, is one way to overcome their opposition. This NGO participant, who did not support working together with industry, discussed this view by saying:

I mean it is part of a whole political outlook now a days...once a company can say that this measure will lead to a loss of jobs, it has a huge impact on the willingness of policy makers to do anything. So taken in this perspective, it's like the focus is really on working together with business, in order to achieve results. – 6045 (Public Health/NGO)

Likewise, another participant discussed how multistakeholder engagement helps “get buy in” and in identifying potential consequences of policy decisions.

I think when stakeholders are having conversations about this [reformulation], it really is important to engage with industry quickly and consistently...Because you should have conversations that go on between a lot of different groups that can identify what they might think would happen with consequences, whether those are unintended or intended...I think successful policies are ones that try to get buy in and try to mitigate some of those unintended consequences. – 8260 (Public Health/NGO)

Participants from the industry also promoted a narrative of working together and argued that identifying win-win solutions, like reformulation, was important. For example, this industry representative said:

... I think the government can bring together subject matter experts on nutrition and health, together with industry. Here's some science, here's some points that need to be addressed, let's figure out the right way to address them...Let's create an environment where everybody can be operating off of the same sort of strategic priority and then execute against it. I think that could work very, very well. – 8329 (Industry)

Similarly, this NGO participant, who was a former industry executive, argued in favour of win-win public health policies and approaches that would not threaten the industry's commercial pursuits:

So again, my purpose is basically to be a middle builder here. And have [a] win-win. I mean obesity is a problem, our eating habits are a problem, but industry still has to make money and grow its consumer base. So how do you do those two together? – 9507 (Public Health/Former Industry)

Among the ‘work with industry’ participants, a counterpart argument to ‘work with industry’ was also present in arguing against government regulation. However even within

this ‘work with industry’ group, particularly among the three participants who were not industry members (current or former) or in a reformulation partnership, the arguments for and against government regulation were not definitive. For example, one Public Health/NGO participant described how “the role of government is to work with industry and maybe incentivize for the greater good” but then vacillated and went on to say:

I don’t see this as, well, maybe I’m wrong. Maybe it is, maybe at this point like the amount of sodium in processed food is just so outrageous that the government does need to step in and start trying to regulate. I don’t know. – 8260 (Public Health/NGO)

While another of these participants raised the concern that praising the industry for voluntary actions may weaken the pressure on industry to take further action, and that such praise should be dependent upon the extent to which the reformulations meet public health aims.

I think to some extent that allowing industry to say, look what we’re doing, does take the pressure off them to do be doing more. But I think it’s important to make sure that what they’re doing, what they’re praising themselves for doing is meaningful, and if it is in the public health community’s eyes actually significant, they should be praised for that. – 8284 (Public Health/NGO)

Even one member of the food and beverage industry argued that government “involvement” might be needed “to have absolute change” but in the next sentence went on to criticize past government involvement in nutrition policy:

Well as soon as the government is involved, we wind up with something where baked [chip], gets into an elementary school because of its absolute fat content and a few other things. You know what I mean? It becomes a joke. – 1775 (Industry)

WORK WITH INDUSTRY’ GROUP UNITED ON REFORMULATION

Those within the ‘work with industry’ group were largely united in their support for reformulation. For example, one industry group described how they were “committed” to their reformulation initiatives.

...we are committed to working, to help further improve the [nutrition] profile of what we make. And to make our portfolio better health options. Because we believe that they are today good health options but we are on this journey to continually improve. – 1389 (Industry)

Another participant described that they supported reformulation for solving obesity, and attempted to counter the argument that reformulated products weren’t “perfect”:

...if its obesity, that's [reformulation] the way I'd do it. The argument against that is, well, that doesn't guarantee the product is healthy. Now, I get that. But it will sure be a lot better than they are today. Yeah they might, in fact they won't be perfect, but they'll be a lot better than they are today. – 9507 (Public Health/Former Industry)

However, many caveats about reformulation were raised in this group as well (Table 7.5). For example, this public health NGO participant, who is in formal partnership with food and beverage industry actors, supported reformulation but said more of it needed to be done:

We'd love to continue to see reformulation and reduction of the big three, which is sodium, sugars and fats in general, in all products...I think everybody is doing it pretty slowly, but I think certain sectors are a little behind. – 7730 (Public Health/NGO)

Likewise, two participants in this group argued that they supported reformulation, that it is “an important strategy” but that it should be part of an overall strategy.

...my ideal policy intervention would include product reformulation, but it wouldn't be the end all be all. – 8260 (Public Health/NGO)

I think that it is one of many things that need to happen. I wouldn't say that that is the exclusive strategy, But I think that it should be an important strategy. – 8284 (Public Health/NGO)

However, though this group was in favour of reformulation, participants also highlighted the limitations of a reformulation approach. For example, one industry representative argued that reformulation will not “solve the problem of obesity” but that it “contributes”:

I will say it [reformulation] is not going to solve the problem of obesity. It will not. No single thing that we do will solve the problem...All of which is to say, this contributes, but you'd probably not detect any significant benefit of any one of those things. – 4282 (Industry)

Likewise, another industry representative argued that not all products need reformulation:

I think that there should be a robust amount of low sugar products...[but] I believe of everything in moderation. I don't think that sugar needs to be reduced in everything...I mean ice cream is always going to be high in sugar, right? That's why I believe in the importance of having a variety of nutritious and great tasting low sugar products. Absolutely. – 1775 (Industry)

EVIDENCE SUPPORTING THE PRESENCE OF A 'WORK WITH INDUSTRY' COALITION

In addition to the overall similarity of beliefs and arguments presented above, there is additional evidence to support the claim that a coalition has formed. Namely the ‘work with industry’ interview participants discussed and provided evidence of internal consultation and coordination. In particular, the ‘work with industry’ coalition cross-

referenced each other within the interviews, indicating a high level of familiarity with each other. It is not possible to use quotes to demonstrate this finding under conditions of anonymity, but 6 of the 11 participants identified as belonging to the 'work with industry' group directly mentioned other 'work with industry' participants or reformulation partnerships. This was frequently done when praising or critiquing examples of reformulation initiatives, and as part of the snowball recruitment process, whereby participants recommend others to interview (It is recognized that this latter point could also be also a potential limitation of this research, and will be addressed later). Participants in this group also discussed examples of cross-sectoral strategizing on nutrition issues. For example, one industry representative discussed how they would actively consult with the public health sector to inform their company's nutrition strategy.

When I was at [company] it wouldn't be unheard of to talk to people in the, you know opinion leaders in the nutrition community and the public health community to get a sense about what trends they saw that would make a difference in consumers lives. – 1389 (Industry)

The presence of a 'work with industry' coalition is also evidenced by the formalized multisectoral partnerships working on reformulation in the US – the Partnership for a Healthier America, the Healthy Weight Commitment Foundation and the Alliance for a Healthier Generation – in which a number of the interviewees participated in and discussed their participation in the interviews. For example, this industry participant described their company's involvement in establishing one of these partnerships:

...so [company CEO] connected with [CEO of health group] and they said, what can we do? Because [company] was the number [x] food and beverage company in the world, in terms of size, you were able to get some pretty key players around the table. There was a lot of back and forth, a lot of conversations around it. – 4282 (Industry)

SUPPORT FOR BOTH GOVERNMENT-LED AND INDUSTRY PARTNERSHIP APPROACHES

Five participants interviewed argued both sides of the 'work with industry' dividing line: for industry involvement and for government regulation; this section outlines their arguments.

One of these participants believed that policy should be government led, but with industry input at specific points in the policy process.

I think it has to be led by the government, but without, with a little influence from industry, but without industry influencing how they proceed. They certainly can have a role in determining what the actual targets should be, but you know I'm very wary of industry's power over governments. – 7650 (NGO/Academia)

Likewise, this academic participant said that industry has “got to come on board” as a “partner” in improving diets in order to “actually change policy”:

...And you know how can we actually change policy, get the food industry to come and work with us and be our partner in trying to have healthier individuals across the globe...I think because of the fact that we've all gotten to that point in our understanding that we've seen a greater consensus that there's a, we've got to work with industry, they've got to come on board, they have the capability of changing what they're both selling and how they're producing the food. – 6112 (Academia)

Whereas this participant argued in favour of voluntary reformulation as “a good start” because it is a “common ground”, but that voluntary approaches alone would not be “enough”:

Well, it's [reformulation] a good start. It's part of like ok where's the common ground, where can we negotiate some change. I think we should pursue it, I think we should evaluate it independently, so that we can see, ok where have we come over this period of time, and where do we need to be. And is this going to be a voluntary approach, only? Is that going to be enough? I don't think it is. I think we do need stronger policy approaches combined with voluntary approaches. – 7842 (Academia)

Another participant from the government – who formerly worked in the food industry – argued that there were specific regulatory roles for the federal government to play in the realm of food, such as labelling, and that in doing so the industry would voluntarily reformulate. However, the regulatory roles described by this participant were notably aimed at informing individuals, rather than regulating companies, and they emphasized that any regulations put in place should serve to “level the playing field” for the industry. While this argument is clearly in favour of a government-role in food policy, it remains on the softer, and more industry friendly, side of regulatory options, such as encouraging voluntary action by the industry.

When you think about the role the government plays in food regulation, the purpose has always been because there is some societal good that we're trying to promote. And also that there's a level playing field that is going to be a benefit to the industry and that consumers are also, and the great public, are going to get a benefit from that. So in the case of reducing the sugar component, the public health reason for doing a labelling of added sugars, the underlying purpose would be to alert consumers with the overall goal of reducing sugar consumption. And that by having any kind of labelling requirement, that it will have the same kind of effect on the industry that the trans fat labelling had, of companies wanting to avoid having to label, and so voluntarily changing their products. – 4665 (Government / Former industry)

Likewise, another participant only argued in favour of certain government regulations, such as a “cap and trade approach”, because “government shouldn’t be dictating the details”:

I think there are arguments for and against having government intervene in very specific ways. I’m not of the opinion that the government should be dictating the details. I’ve always thought that for certain nutrients, not all, but certain nutrients like sugar, it would be interesting to think about something like a cap and trade approach...so there is a limit for every year per capita, or a per day average should be x amount, whatever the metric you want to use, worth of added sugars in the food supply. And companies are allocated different quotas, and they can trade across companies, [but] there’s a cap, or if they exceed the cap they pay a fine. – 6388 (Academia)

GOVERNMENT-LED POLICY CORE BELIEF

This section presents the core arguments of the participants who believed that public health approaches like reformulation should be led and overseen by the government (n=18, herein referred to as the ‘government regulation’ group). It then assesses the diversity of views within this group regarding reformulation.

ARGUMENTS AGAINST WORKING WITH INDUSTRY

Arguments against working together with the industry centred on the grounds that it is normally based on voluntary governance mechanisms, and subject to conflicts of interest between business and public health goals. In particular, these participants raised concerns about the goodwill and political capital that reformulation partnerships generate for companies, especially when it may not be accompanied by what they see as meaningful progress. For example, this academic participant said:

Well, I think they’re [reformulation initiatives] incredibly limited. Because on the one hand they’re voluntary and companies are doing it, setting their own targets and meeting them in their own timeframe. And [yet] some companies are not doing much at all. So there’s incredible variation...But at the same time they get all the kudos of actually participating in this and we’re part of the solution...and you know they’re strenuously opposing mandatory regulations. But quite vigorously promoting their own voluntary systems, and celebrating their achievements. – 6017 (Academia)

Another participant argued against working with industry because they saw partnerships as a strategy of the food and beverage industry to increase the legitimacy of their actions and promote positive public perceptions of the industry.

Right I mean imagine that a food company puts out an ad on Saturday morning cartoons that says our profits are down and you haven’t been buying enough [cereal]. So we went to the lab and scientifically engineered a different sort of product that we’re now going to flash bright colours and cartoon characters to get you to buy. You know? I mean that’s absolutely what they’re doing, but of course they don’t say that. So legitimacy for what they’re actually doing comes in the form

of these partnership...they need to create an impression among the public that they're not the bad guys, they're the good guys. They're helping us, they're in our communities, and they're partnering with us for our health. – 1088 (Academia)

There was also a sense of exasperation among some public health participants about voluntary reformulation initiatives, and one participant audibly sighed when the question about partnerships was raised, to which they answered that past voluntary initiatives have not worked:

...The voluntary stuff that I know about is the CFBAI. So [colleague] has written a couple of papers saying it's not working. They're not doing what they said they would do. They're still marketing to kids. So in that sense it's not really working. – 5397 (Public Health NGO) [Note: CFBAI = Children's Food and Beverage Advertising Initiative]

ARGUMENTS IN FAVOUR OF GOVERNMENT-LED APPROACH

Among the 'government-regulation' group, some participants expressed concern that nutrition policy is being heavily influenced by actors in the private sector, including food and beverage corporations, rather than those in the government. They saw voluntary reformulation initiatives as exemplary of this dynamic. For example, this NGO participant who described "ownership" of policies being "with the private sector":

...obviously it's absolutely ok to work together on solving the issues, but it needs to be put in a clear framework in terms of what we want to achieve, by when we want to achieve it and so on. Which is at the moment, the ownership is no longer with the public authorities but it's with the private sector. – 6045 (Public Health NGO)

Others in this group echoed the concerns raised by the above participant, often accompanied by calls for government involvement and oversight of product reformulation. This view was interwoven with concerns that without the accountability of government-led policy reformulation would not result in meaningful changes to food and beverage products. For example, this NGO participant argued that given the industry's need to protect their business ventures, government regulation was necessary for "real progress":

I mean if you look at the indicators, you can talk as much as you want about self-reformulating and so on, but the indicators aren't showing real progress yet. And that's a problem. And there's a very basic conflict of interest here. I mean it really goes to the core business of many companies, so the, they're very obviously reticent to go too far. And it's very understandable. But that's why you have regulation there in the first place. That's why you have policy makers there in the first place. – 6045 (Public Health NGO)

In line with the conflict of interest concerns raised by the above participant, another participant from academia argued that reformulation was a “policy ploy” by the food industry, saying that:

...they've worked out how to crack that code, the reformulation code...initially they worked out how to do it as a marketing ploy, now they're working out how to do it as a policy ploy. – 6017 (Academia)

Whereas another NGO participant described a voluntary partnership reformulation commitment as “just a PR scam”:

You know when, oh which one is it the [partnership], we put out a statement that said something like this is just a PR scam. And that one was so easy, because they were talking about a 2% reduction a year over 10 years, and that 2% reduction is already happening. So it was complete bogus [expletive]...I think if it's done voluntarily the chances that it's meaningful is virtually nil. – 6343 (Public Health NGO)

However, this same participant went on to say that if reformulation were to follow as a result of another policy, labelling for example, it was more likely to be meaningful than voluntary initiatives from the industry. Therefore, this participant felt that the relative strength of reformulation initiatives varied depending on the governance situation that that reformulation arises from.

But I think there are going to be some policy efforts that end up leading to product reformulation that's going to be meaningful. – 6343 (Public Health NGO)

Similarly, another participant questioned the progress made under voluntary reformulation schemes, describing how products marketed to children using mascots had not been reformulated enough.

And there are very few ready to eat cereals that have been reformulated by the big players who are using all of these mascots, so that could be one thing they could do. And that's only one food category target. And I think we need targets across all these categories of concern. For candy, for SSBs, for children's meals, we need like OK 600 calories if you're going to use a mascot. I mean that's a low hanging fruit issue. If the companies can't even do this for kids, then how can we trust them on all the other stuff? – 7842 (Academia)

It was also suggested that reformulation provides loopholes for the industry, which was even alluded to in an interview with a representative from the industry, who described the “room” allowed for by reformulation commitments:

I mean our commitment, our [partnership] commitment, it touches every product, every [company] branded product we sell. And there is room in there, if you really

understood it, if you hear carefully what I said, there is room in that for sugar sweetened and full fat products. Directionally it requires us to move towards less fat, less sugar. – 1389 (Industry)

In recognizing that government regulation around reformulation is likely to be politically challenging, some participants in this ‘government-regulation’ group argued for government intervention only if voluntary reformulation was not successful. It was felt that such an approach, referred to by other researchers as a responsive regulatory approach (Magnusson & Reeve 2015) or performance based regulation (Sugarman & Sandman 2007) would allow for better accountability and result in more significant change, without ignoring the challenge and market risk the industry would face in undertaking significant reformulation.

...Steve Sugarman has done this really very interesting work on I think what he calls performance-based regulation. And his idea is that when government gets in and micromanages changes industry can make, it might be less effective than giving the industry an overall goal and then letting the industry decide how best to accomplish that...And you might accomplish the overall goal but with less government trying to guess how to best do it. – 1151 (Academia)

Whereas, another participant from academia described an alternative approach to reformulation which would involve the public health community telling the industry which products to reformulate or create, rather than the other way around:

...this notion of coordinating product reformulation with public health people, so that it's not so strictly an accountability oversight thing, but also a sort of collaborative thing of you know, what do we really need? Rather than them coming up with the products and convincing us that we need them...I mean it would make sense in that we're the ones telling people what they should be eating, not that they listen to us that much, but so it would make sense that we'd be talking to the food industry and we'd be trying to coordinate. And I think a lot of industry people would be up for that. – 4487 (Academia)

In describing this approach, this participant also highlighted some of the fears that public health actors have about working with the industry, by saying that encouraging such entrepreneurship doesn't necessarily mean “greedy capitalism” or that “you sold out” (4497 Academia).

However, within the ‘government-regulation’ group there was general consensus that government regulation was necessary because the industry would not make significant changes that could compromise their commercial interests. For instance, this participant from academia described reformulation as being primarily about “maintain[ing] their space

on the supermarket shelf” rather than being about health, and that companies are “act[ing] with the needs of their stockholders in mind”:

Yes. It [reformulation] is [expletive]. I hope I can be clear about that. It's ok, like if, if we can imagine in our minds that a food company had you know like the old story of the Kellogg's guy who really just wanted people to eat healthy and wanted to create a way for them to do that based on whatever information he had, and you get some feedback from your customers and you realize, oh I need to make a change here. If that were really what was going on in these major food companies, then reformulation, fine. And maybe there are small companies out there that really are doing that. They really want their product to be better in some way, and you know and they're doing this sort of in good faith. But I think what's going on with these large corporations is that it's always about maintaining their space on the supermarket shelf, it's about maintaining their contract with whoever they're retailer or food service management company is, or whoever they're selling to. It's about profit. So if [cereal] isn't meeting its benchmark and they need to develop [cereal] with chocolate berries, you know, in order to keep sales up, then they'll do that. So I don't trust them. I think they, these big companies, have not had a good track record of acting in good faith, and acting with the actual interests of the public in mind. They act with the needs of their stockholders in mind. – 1088 (Academia)

Other participants referenced competition within the industry as a reason that government intervention would be necessary, and would help to create an equal playing field. For example, this participant from academia justified government intervention by citing competition constraints within the industry:

Well I believe government has a significant role here. Because the companies are competing with each other in the marketplace, a company that reformulates products in a way that is disadvantageous to their profitability will find, will have new leadership in no time at all. – 1151 (Academia)

This view was also expressed by a participant from the government who alluded to industry competition being a constraint on the potential progress made by reformulation, saying, “nobody is going to want to take the first move” (5898 – Government).

The belief that government policy can help create a ‘level playing field’ was also reinforced by one food industry representative who reluctantly admitted that government involvement in product reformulation was going to be necessary to “challenge manufacturers to be more healthy”:

There's a part of me that wants to say no government involvement, but there's another part of me that says it isn't bad to challenge manufacturers to be more healthy. You know, that there is, that is happening, but what is the role of government in that? I hate to not really answer you but I just think to have

absolute change there has to be government involvement. I wish that were not the case. – 1775 (Industry)

Participants in the government-led group also felt that self-regulated or voluntary reformulation was a means for industry to control the process so that it suited their needs, rather than the needs of public health. For example, this NGO participant described how the industry prefers self-regulation so they can ensure that changes occur at a slower speed than those in the public health community would advocate for:

So you sit together, you discuss, there is some pressure. But the pressure is only, yeah it's kind of, its only lead by the industry, or at least completely absorbed in this narrative of kind of doing things together. Of doing a self-regulation, and like just let us do and you don't need to do anything. And it just doesn't go with the speed things need to go if you look at the various indicators. – 6045 (Public Health NGO)

DIVISIONS ON THE VALUE AND ROLE OF REFORMULATION

Though it is possible to identify common beliefs among the 'government-regulation' group, as the above section demonstrated, the participants within were divided about the value and role of reformulation as a public health policy approach, and there is no evidence that this group has aligned into a coalition on this issue. These variations in opinion are encapsulated within the following quotes, which centre on the argument that reformulation as an approach would be supported but that there were concerns about how it was undertaken (e.g. voluntary versus mandatory) and that it should not be the only approach taken.

Well I'm all for product reformulation but there are really interesting questions about how it can best accomplished. But to the extent that foods can be reformulated to be healthier I think we'll be far better off. – 1151 (Academia)

No strong feelings one way or the other. I applaud those manufacturers who are really taking reformulation seriously. And recognizing that consumers are demanding change in the food supply here in this country. And that we are starting to see some of these success stories as well which is very exciting. However, on the other hand, I'll throw this out there because this always comes up in these discussions, the whole 'all foods fit' mantra. There are some extremely processed foods that I really don't think should fit anywhere. They're not contributing any positive nutrient value and you know the things such as the energy drinks and the caffeine drinks and you know that type of thing where it's not something that anyone would promote for good health. And so yeah I think there's a threshold there. I'm not sure where that line, so no I don't feel strongly one way or another. – 5078 (Government)

Yes, in principle certainly we support it, I mean for sure. I mean that's without doubt we support the idea of product reformulation and at the same time you can't stare yourself blind on product reformulation... – 6045 (Public Health/NGO)

Some of the participants who rejected the reformulation approach did so because they felt that reformulation failed to change the type or mix of foods being sold, marketed and consumed. For example, this NGO participant critiqued reformulation for promoting products rather than discouraging their consumption.

The problem with product reformulation is that it is, in my view, to encourage, to maintain the consumption of those products. So if you can advertise to parents that your sugar sweetened breakfast cereals have got less sugar in, they may be less likely to stop consuming them. Whereas I would argue that that family should be on a pathway to not having those kids of cereals at all. – 9593 (Public Health/NGO)

Another participant who also held this view summed up reformulation as “playing with nutrients”, and felt that the “degree of processing” is what we should be concerned about:

So for me reformulation is both what's been added in and what's been taken out. And so to me that's the basis of how I would view the concept of reformulation, as opposed to playing with nutrients. You know adding this, or how many grams of sugars in this, or how many teaspoons of vitamin D did you add to this, or nutrients like that. To me that's not what the issue is, it's not about nutrients. It's about the degree of food processing. – 9872 (Academia)

Whereas others in this group, for example the academic participant below, felt that reformulation wasn't meaningful because the foods targeted with reformulation start with a very high level of unhealthy nutrients, so decreasing it by a little does not significantly improve the product.

And clearly some product categories are just built out of sugar like confectionary and so on. So companies are very mindful of that, not wanting to commit wholeheartedly to sugar reduction. Having said that I guess we are seeing some, we're seeing considerable levels of sugar reduction in some products, but they're coming off a high base. And this is kind of the whole problem with reformulation. – 6017 (Academia)

Others were concerned that reformulation might result in misleading or deceptive marketing. For example, this government participant said a reformulated product may not actually be healthier “but it can be marketed as better”:

So you can try to come up with an artificially sweetened one or you can try to sell people on the idea that certain sweetened products or sweeteners you know are better and therefore good substitutes. Like for example a quote-unquote honest tea

that's sweetened with honey. I mean as a dietitian would you say it's better in a nutritional sense? But it can be marketed as better. – 5898 (Government)

Similarly, this academic interviewee said that reformulation is “undermined by allowing companies” to make “nutrient-health” claims on their products, which incentivizes people to consume the product:

...trying to get the components, the bad stuff out, but that's completely contradicted and undermined by allowing companies to make a whole lot of other positive claims on their labels. So how are you going to get people to eat less of this junk food if that's what we're trying to do. I mean it's all these claims. So before you even penalize, or try to get companies to reformulate or put traffic light labels, the easiest thing is to stop them making the claims on the labels. Because people are being encouraged to eat them or they're being given a green light to eat them because of all these nutrient-health claims. – 6017 (Academia)

Likewise, another academic participant felt that reformulated products might encourage overconsumption if consumers were misled into thinking they were healthy.

...it depends on the branding and how they promote. For example, if they, basically if there are products that for example have less sugar but they have high calories...people [might] think that these products are healthy and they start to consume more and do some kind of overconsumption which might have unintended consequences as well. – 4549 (Academia)

However, others within the ‘government-regulation’ group supported reformulation, though their support was accompanied by numerous caveats or qualifications. Most prominently, participants were concerned about the types of substitutes used during the reformulation process, a concern summed up by this participant from academia.

...The second issue for me is what those components are being replaced with. Are they equally highly processed components of dubious health impacts... – 6017 (Academia)

As in the ‘work with industry group’, a number of participants said they would support reformulation if it were one part of an overall strategy, but that it is unlikely to succeed on its own, or if not done in a meaningful and strategic way. For example:

So let's just say that one were to undertake a major effort on reformulation. It would be helpful, but itself probably wouldn't lead to a substantial change in something like obesity rates. So I think it has to be one of many things overall. – 1151 (Academia)

At [organization] I, we like to do both. And knowing that getting 50% less salt in food is not the whole ball game. It's getting people to eat good healthy foods. – 5883 (Public Health/NGO)

But you know if you could lower sugar consumption, or sugar levels by 10% no one would ever notice it and all of a sudden people would be less addicted and they could have less calories, right. And they could have less compulsion to eat other sugar, right. It's, I think it is one of those long-term goals. – 6343 (Public Health/NGO)

Likewise, this participant from academia gave conditional support for reformulation, depending on the nature and type of reformulation undertaken:

Well, I'll give examples on both sides of the spectrum. One, I think of it as possibly being a little sneaky, like injecting vitamins and minerals into a donut kind of thing, a super donut or whatever they called that, just to try to meet the needs. On the other hand, there was the whole thing with trans fats, and labelling, and I often use that as an example with students. I'm not sure what exactly the strategy was of the people who did that, but you know the outcome was that people didn't have to worry about reading the label, it just, it forced the companies to reformulate. So, I think that was a very positive outcome for public health. So I guess I see it both ways. – 4497 (Academia)

While another academic participant called for reformulation as a “sideline activity” to food systems changes, the latter of which would be their preferred approach:

So I don't think it's a bad thing for public health advocates to be focused on people where they actually are. I think it's realistic, it's smart, and I bet it's doing a lot of good. I just don't think that can be the only thing. That can't be where we stop. That has to be part of the sideline activity, while this much harder food systems push happens. Because as long as these for profit companies are involved, we're just, you know, we're just screwed basically. – 1088 (Academia)

However, others appeared to give their support to reformulation, if reluctantly. For example, one Public Health/NGO participant said their support of reformulation “depends” but that it is “hard to be against it” (9593). Similarly, this academic participant felt it was difficult to argue against reformulation because in a few cases reformulation might make the product “a little healthier,” even if only marginally.

And the thing that works in their [the industry's] favour is that sometimes I think when they reformulate their products, maybe the product is actually a little healthier. That's like out of a hundred possibilities, that's at least one possibility, you know. And so when that's the case they can really you know draw a lot of attention to that. But it's almost like happenstance. You know. – 1088 (Academia)

While one academic argued that for sugar in particular, reducing it has metabolic benefits that help individuals better regulate their diet, and so there is a case for reducing sugar in foods.

So, we have already shown that when you take the sugar out of the food, your leptin starts working again. So you don't need to eat so much. So what we do in our clinic,

every single day, is we get kids off sugar. And when we do, their insulin sensitivity improves. Now their leptin works, and then they can lose weight. And they're not substituting with anything. – 9872 (Academia)

However, this same participant also argued that reformulation is merely “playing with nutrients”, demonstrating the mixed opinions about reformulation, even within the same participants.

DISCUSSION

The participants in this research were fractured in their core beliefs about how to govern public health nutrition policy, and this division was illustrated in their beliefs about product reformulation as a public health policy. The interviews suggested there were tensions between achieving public health goals through government policy and working together in partnerships with industry. Furthermore, the majority of participants were only supportive of reformulation if it met certain preconditions, many of which revolved around the governance mechanisms of reformulation initiatives and how industry involvement weakens reformulation outcomes.

Participants who supported working with industry felt to do so would be an effective way to encourage the food and beverage industry to provide healthier foods, and a more efficient approach to policymaking. Interestingly, the 3 ‘work with industry’ coalition members who did not have present or former ties with the industry were all from Washington D.C. based NGOs or government institutions. Their views, therefore, may have been reflective of a pragmatic desire to overcome the difficulties of policymaking in Washington D.C; indeed, all three of these participants argued that industry participation would facilitate an easier political process.

The ‘government-led’ group argued their stance on the premise that the power or control over reformulation efforts is current residing with the industry, and that this has resulted in reformulations that are not meaningful for health but akin to industry public relations activities, particularly when the reformulations were voluntary. Furthermore, the industry has been shown to employ a number of political strategies so as to protect their business and profit interests from avoid mandatory regulations on their products (Mialon et al. 2015; Mialon et al. 2016; Scott et al. 2017). This is also the case for voluntary product reformulation specifically, which has been found to be one component of the industry’s political strategy to pre-empt and avoid mandatory regulations (Scott et al. 2017). Accordingly, the ‘government-led’ group was concerned about conflicts of interest arising from working together with industry in general and on reformulation initiatives specifically.

The 'government-led' group reflected fears of undue industry influence over a process that they believed should be led by actors without a vested interest, such as public health NGOs and government. It can be argued whether any actor within a policy system, including the government, can ever be completely free of bias or interest (Mahoney & Baumgartner 2015) – a point underscored by the NGOs included in this research who have formal relationships with the food and beverage industry – however half of the interview participants felt that there was less of a risk if nutrition policies were government-led. This group was united in the belief that government-led reformulation efforts would improve accountability, and help to overcome the competitive disadvantage and conflicts of interest that voluntary reformulation poses to the industry. However, some within the group argued that government-led reformulation did not necessitate mandatory regulation, but that innovative approaches, like the threat of responsive regulation (Magnusson & Reeve 2015), could be enough to ensure voluntary initiatives were held accountable. This approach is plausible, as demonstrated by the success of the UK salt reformulation program, which employed “progressively lower salt targets” (He et al. 2014).

According to the Advocacy Coalition Framework, coalitions are present when policy stakeholders “seek allies, share resources, and develop complementary strategies” based on common core beliefs and “engage in a nontrivial degree of coordination” (Sabatier & Weible 2007, p.196). There is evidence that those who believe in ‘working with industry’ have coalesced into a coalition and have crossed sector boundaries to form formal and informal relationships and partnerships with actors from multiple sectors, including through the Partnership for a Healthier America, Healthy Weight Commitment Foundation, and Alliance for a Healthier Generation (Partnership for a Healthier America n.d.; Healthy Weight Commitment Foundation 2016; Alliance for a Healthier Generation 2016). Coalitions are also defined by their collective resources, and these partnerships include among them current and former members of the federal government who have authority and power in the political system, as well as the financial resources of the food and beverage industry, which are both key resources for coalitions (Sabatier & Weible 2007, pp.201–2). Furthermore, the ‘work with industry’ coalition spontaneously cross-referenced each other within the interviews – indicating a high familiarity with each other– and collectively considered the problems of poor nutrition and obesity as amenable to a reformulation approach.

In contrast, the ‘government-regulation’ group did not have a clear or coordinated policy agenda on product reformulation. There was no evidence from the interviews that this

group was collectively advocating for a preferred policy option or set of policies, or that a coalition has formed. Within the 'government-led' group some supported reformulation as an approach but had numerous caveats or conditions to their support, including the way it is currently governed, whereas others rejected its utility and potential for success. The issue of governance was often intertwined with views on reformulation as a concept itself; if reformulation were governed from within the government, rather than voluntarily by the food and beverage industry, it may be that public health support of reformulation would increase. These divisions in the public health community about reformulation are reminiscent to those on the issue of electronic cigarettes – an issue that is also closely intertwined with the actions and political strategy of the cigarette industry (Blanding & Drexler 2016).

The above discussion is not to say that policy coalitions do not exist around other nutrition policy issues in the US. Indeed the public health community in the US is notably unified on and collectively advocating for excise taxes on sugar sweetened beverages (Nestle 2015; Jou et al. 2014). While the belief systems that underlie sugar sweetened beverage advocacy groups haven't been investigated, given that the groups and individuals doing so are working to influence local, state and national legislations (Nestle 2015) it is plausible that they also believe in a government-led approach to nutrition policy. However such a coalition was not present specifically for reformulation or in this particular sample of nutrition policy stakeholders.

LIMITATIONS

This research is limited by the fact that industry participation in the interviews was minimal, compared to other stakeholder groups, and thus the industry's views may not have been accurately captured here. It is further limited by its reliance on one data source, and that the findings have not been triangulated through other sources of data (e.g. documents, media). Lastly, this research is limited by the fact that interviewees were recruited using a snowball technique; therefore, it may be that participants referred other participants who shared their similar view points, and that this conflated the ability to detect common belief systems within the interview participants. For this reason, the numbers and proportions presented in this paper are not necessarily representative. However, participants were also recruited through literature and internet searches, thereby diluting some of the network effect contributed by the snowball recruitment. Furthermore, the participants recruited through other participants did not always share the

same beliefs, and there was wide variation, and shades of grey, between the participants and within belief system groups.

CONCLUSION

This analysis found a group of public health interview participants who aligned on a core belief around nutrition policy being government-led and regulation based, rather than through partnerships or industry self-regulation. However, though aligned on a core belief, this ‘government-regulation’ group held widely varying views on reformulation and did not appear to have formed into a coalition. A second group of interviewees aligned to the belief that the food and beverage industry is a legitimate and credible participant in the public health policy process. In contrast to the ‘government-regulation- group, there is evidence that this ‘work with industry group’ has aligned into a coalition and that product reformulation is one of their preferred policy approaches. The strength and cohesion of the views held by the ‘work with industry’ coalition, and that reformulation is one of their supported approaches, may help to explain how and why reformulation has become a prominent public health policy.

SIGNIFICANCE OF PAPER 2

Analysis of the interviews conducted for this research identified an overarching division in beliefs around working together with the food and beverage industry on public health nutrition initiatives and policies, including those for reformulation. This division in beliefs allowed one group, the ‘work with industry’ group, to unite and there is evidence that they can be considered a policy coalition, in line with the Advocacy Coalition Framework. Industry partnerships and multi-stakeholder approaches are emphasized in federal nutrition policy discussions in the US (The White House - Office of the First Lady 2010), including reformulation efforts among them, suggesting that the belief that unites the ‘work with industry’ coalition is also present in highest levels of policy in the US. Reformulation therefore, in addition to aligning with the beliefs of a powerful coalition, does not challenge the belief of the government – that working with industry is a preferred and expedient option – and policies are more likely to be successful if this is the case (Smith 2013). This helps explain, in part, why reformulation has emerged into prominence. However, policies which conform to the beliefs of the dominant coalition are less likely to be “paradigmatic” changes (Smith 2013) of the type called for by public health researchers looking into systemic causes of obesity and NCDs (Roberto et al. 2015), and certainly

reformulation has been criticized, by the participants in this research and others for encouraging only small changes in the food system (e.g. Mozaffarian 2016b).

This analysis has highlighted a number of factors within the ‘government-led’ group of interviewees that also help to explain why reformulation has been able to emerge as a prominent public health policy. Within the group who support government-led nutrition policies, opinions on reformulation varied widely, but a frequently suggested alternative to reformulation was a ‘whole foods’ approach (see: Chapter 8). However, there is no simple policy for a whole foods approach, which would require significant changes across the entire food system. In order for new policy ideas to be taken up into policy, they need be “charismatic” and “persuasive (or realistic) enough for policy actors to believe and (over time) help enact” (Smith 2013, p.148). Therefore, the ‘whole foods’ policy options suggested by the ‘government-led’ group would appear to fail to meet the charismatic criteria, for they are often large and vague policies which do not convey realistic or persuasive qualities.

ADDITIONAL FINDINGS FROM THE INTERVIEWS

PUBLIC HEALTH ROLE IN ENCOURAGING REFORMULATION

The presence of a multisectoral coalition arguing in favour of reformulation, and the fractured position of the public health community on reformulation is one reason why reformulation has gained prominence as a public health policy. However, in addition to the core beliefs and coalitions described above, the interviews also provided additional insights into the role the public health community may have played in directly encouraging reformulation as a public health approach. This includes by leading or being involved in reformulation commitments or pledges, by calling for and supporting win-win policies, and supporting reformulation as a pragmatic or practical approach, particularly by those public health actors in the ‘work with industry’ coalition. The public health community, including those who held the ‘government regulation’ core belief, have also encouraged reformulation by emphasizing the role of evidence in policymaking, and setting nutrient-based dietary guidelines.

PARTNERSHIPS AND WIN-WIN POLICIES

Public health actors have directly encouraged reformulation by entering into partnerships or hosting commitments/pledges for voluntary reformulation, which is additional evidence for the ‘work with industry’ coalitions identified above. For example, this participant from an NGO described their campaign to get companies to sign up to a salt reduction pledge:

Uh, look as a not for profit and an advocacy group, we don't partner with people to actually do the work. But we certainly partner with them to advocate or advertise when they have done something. So we have had many examples where we have, I guess done joint work in a sense with a food company to display or show what they have done in terms of reformulation. And we have had commitments from them...And that's a really good example of where you can kind of work with or encourage industry to reformulation as opposed to actually helping them do the reformulations. – 7560 (NGO/Academia)

Some participants also directly argued in favour of reformulation. For example, one participant said that the public health community should be encouraging moves by the industry such as reformulation, even though they are only “marginal improvements”, as processed foods will continue to be consumed.

You know I think one, the public health community should do two things: one is encourage these improvements that will lead to marginal improvements in health. And that's important because people are going to be eating these processed foods, restaurant foods, for a long, long time. So as long as people are eating them, let's make them healthier, or less harmful. – 5883 (Public Health/NGO)

EMPHASIS ON EVIDENCE AND FAILING TO CONSIDER THE MARKET RESPONSE TO DIETARY GUIDELINES

The interviews also highlight that the public health community has encouraged reformulation in subtler or indirect ways. For example, public health interviewees placed an emphasis on the role of evidence in policymaking, and because of the typically reductive nature of nutrition science this may encourage reductive nutrient-based approaches like reformulation. The public health community was also seen to encourage nutrient-focused approaches like reformulation by not considering how the market would respond to nutrient-based dietary guidelines. Both of these points are also related to the food v. nutrients paradigm, which will be presented in Chapter 8.

EMPHASIZING THE ROLE OF EVIDENCE IN POLICYMAKING

When public health actors were asked if they support product reformulation, they generally answered that the evidence of a nutrient's negative health effects would justify such an approach. The evidence cited was typically about the health effect of a nutrient, rather than if reformulation itself would be effective in reducing consumption of said nutrient. For example, this academic interviewee said:

So from my point of view, first of all you need to take a look at the evidence. I'm interested in the product reformulation for the effect on the health. And from that perspective, in order to comment on the importance of food reformulation for sugar, you need to see what [is] the evidence for the effect of added sugar or

basically sugar content of different food products and the relationship between [sugar and] health. – 4549 (Academia)

Evidence was also seen as a necessary prerequisite for government implementation of policies to reduce consumption of specific nutrients. For example, this interviewee from a public health/NGO said:

So in the same way that the government was involved in labelling of trans fats and you know saying you've got to reduce it down to what 0.5. I am encouraged that the more science that comes out about the direct connection of sugar to negative health effects, that the government will need to step in there. – 5397 (Public Health/NGO)

Evidence generated through reformulation partnerships was also seen to play a role in encouraging reformulation, however, as this participant demonstrates, such evidence was considered to be misleading.

They, these like Partnership for Healthier America uses all this language of rigorous independent third party analysis that does scientific investigations. They put it in this techno-scientific language that most of the public doesn't understand the difference between a random sample or a, you know, and what we are lead to believe, I think, is that they're doing an evaluation of how much difference this makes. And so when they say that their goal is to reduce childhood obesity you think in your mind, the connection you make as just a normal person in your mind is they want to reduce childhood obesity and they've got these scientists doing an independent evaluation to see how much change is going on. You think it's change in obesity? None of them has a dependent variable of obesity. Most of them have a dependent variable of change in sales, you know. So these independent scientists are tracking how much market share the company has gained, how much sales they're able to do, how much more profit they, you know, come into. So you get these, these companies get legitimacy through this through the techno-scientific discourse, through the partnerships with credible sources, and just through further publicity, and good will. – 1088 (Academia)

NUTRIENT-BASED POLICES AND A FAILURE TO CONSIDER MARKET RESPONSE

A number of participants from the public health community were self-critical of the role the public health community may play in encouraging reformulation of products. In particular, it was said that the public health community did not adequately consider how the market would respond with reformulation when making nutrient-specific dietary recommendations, such as to lower fat intake. This argument is directly related to the nutrient-foods paradigm discussed in Chapter 8, however this section will focus on the role of the public health community in *setting* nutrient-based standards and how the market responded to those with reformulation. For example, this government representative said:

And I think we did start to see the market responding. Some of that responding wasn't what nutritionists wanted. You know all the complaints about low fat cookies. And that may have been naivety on the part of nutritionists where they assumed a static market, or they just didn't really think about the market very much. They thought, ok, [people] will learn that this is high in fat, so instead they'll eat low fat products like fruits and vegetables. Instead of the market saying, well we can give you low-fat candy bars. And consumers saying well, I still like candy bars. – 5898 (Government)

Likewise, this academic participant described the 'naivety of the nutrition community':

You know we focus on regulating nutrients, whether it's through reformulation or taxes. And companies have worked this out. So I think everyone's in on it together. And I'm still, I'm gobsmacked at the naivety of the nutrition community, that they're just going to this again and they're not, you know, seeing at least the limits of it. – 6017 (Academia)

Other participants highlighted how the food and beverage industry had been influential in designing the dietary guidelines towards nutrient-based recommendations, as such recommendations mean products can be reformulated and tailored based on the nutrient *du jour*. For example, this government participant said:

We provide these guidelines that are exactly what they [the industry] want them to be. Because you know a cookie, is a cookie, is a cookie, and if they're making cookies and right at this point the low fat cookie is the thing to do, they can make those low fat cookies. And if it's time to make low sugar cookies, ok, here we can make low sugar cookies. – 3331 (Government)

However, this same participant went on to say that although the food industry is often criticized, the public health community is equally responsible for a proliferation in reformulation:

...I hear any number of people in the public health nutrition world really criticize sometimes the food industry for what they're doing, and for various reformulations that have happened, and there's a part of me that wants to say, but we told them to do it. They're doing exactly what we told them to do. Because if you read the dietary guidelines they really I mean in certain parts they will, they will actually say eat fruits, vegetables, whole grains, you know, but in general most of the dietary guidelines, they say replace saturated, well in the past they said replace saturated fat with carbohydrates now they say replace saturated fat with poly and monounsaturated fat, you know they'll say reduce sodium, reduce sugar. And by saying that then, if industry does exactly that, are they not doing exactly what we told them to do? – 3331 (Government)

Similarly, an academic interviewee echoed the view that reformulation is “getting exactly what we asked for” and claimed that evidence-based policy approaches have contributed to nutrient-focused policies:

Well I think it's [reformulation] exactly what nutrition scientists and public health nutritionists have been asking for. And in that sense we're getting exactly what we asked for, wished for...you know the problem has been identified as these particular components and that goes back to, I think, that goes back to a nutritionally reductive understanding of foods themselves. And because of that and because that's where the science is, the science is around the particular nutrients, and you can't put forward a policy position that's not backed by the science, supposedly, so that's where they've gone. – 6017 (Academia)

Likewise, another participant from academia positioned nutrient-based standards as a key factor in promoting reformulation, but that such reformulations do not necessarily make processed foods healthier.

The problem is, once the government sets standards for nutrients, whatever those nutrients are, the food industry just makes products that meet those standards. And they're still processed food products. So you're still stuck with the fact that you're dealing with processed foods. And at what point does a processed food become a health food? That's complicated; it's hard for me to think of any off hand. – 7982 (Academia)

This view – that the industry is merely responding to the nutrient-based standards set by the public health community – was reinforced by a participant who formerly worked in the industry, who said:

Well, yeah, I mean another classic example is 'we need a low fat diet'. So guess what, the marketers feel the heat on that, so what happens? So we end up having products like [low-fat cookie] and everything comes out and we've lowered the fat, and guess what we find out, that's not so good! That's not, look what we did! And that's, I have to tell you, uh and it's strictly a bandwidth problem for me, you know because industry gets a report card. And they get beaten to a pulp often. And I think the reverse ought to happen too. Let's have a report card for the proclamations coming out of the public health community. And let's see how good they were or how not so good they were. – 9507 (NGO/ Former Industry)

Other public health participants reinforced this criticism by arguing that the public health community did not do enough to understand the needs and constraints of the industry. For example, this NGO participant who is aligned with the 'work with industry coalition' said:

[Reformulation] is something that's been increasingly prominent over the last several years and I think that the public health community, I don't think, understands what goes on within the food company. And I don't think they really understand their perspective and you know we can recommend reformulating to reduce added sugar but I don't think, I certainly, I don't and I don't think many of my public health colleagues truly understand exactly what that means. – 8284 (Public Health/NGO)

Similarly, the same former industry actor quoted above, echoed the view that the public health community has not achieved its aims because they try to influence the business community using “public health principles” instead of framing their issue in terms of “growth and revenues”:

And I think there's a frustration in the public health community that they've been ineffective in getting industry to change...[but] what hasn't been done by the public health community is what I like to call to business-itize their research findings and the way they try to convince and persuade industry. They try to persuade them on public health principles as opposed to business principles. In other words, you want to persuade somebody who cares about growth. That's all companies care about is growth. Growth and revenues, growth and profits, growth and consumer base, growth and whatever it is. Whatever it is its growth, period. – 9507 (NGO/Former Industry)

However, another participant from the industry countered this view, saying that though influencing change within corporations is not simple, partnerships with the public health community have helped foster change.

... when you have a successful business, making a change to it is very uncomfortable. You know ‘it ain't broke, why are we fixing it?’ That is the challenge that we will occasionally hear. And you know moving beyond that discomfort, to seeing a possibility of an even better future, is where we have to push ourselves the hardest. And that's something we experience in both the [partnership] commitment and the [product] reformulation. But I think we're encouraged and strengthened as a team by the legacy of the commitments. It gives us more fuel and more confidence to try to do things a little better. Which means doing them differently. – 1389 (Industry)

Lastly, a former industry member said that the public health community is not clear what the problem is or the necessary solution, which contributes to a slowing of progress, a theme closely related to the coalitions described above and the framing paper in Chapter 9.

...the big mistake of the public health community is we combine two issues together. Fixing obesity, or reversing obesity, and getting people to eat healthier. They're not necessarily the same issue. One's more a caloric issue. And one is just better nutrition... And so what happens is we end up fighting those two issues concurrently...[and] what happens is that creates a lack of focus. And without focus you don't solve problems. – 9507 (NGO/ Former Industry)

In summary, the previous sections outlined how public health actors frequently expressed that nutrition policy should be driven by evidence, and that the strength of evidence linking obesity and NCDs to unhealthy diets should compel action. However, as discussed in the theory chapter as will be presented in the discussion on ideas in Chapter 9, the idea of reformulation, and how its framed, may be much more influential than the evidence of its

effectiveness. This seems particularly to be the case given the limited effectiveness of voluntary reformulation in the US (Chapters 1 and 10). By focusing on supporting or contesting the evidence for or against reformulation, rather than the idea or how it's framed, the public health community missed an opportunity to reframe the debate around reformulation.

The interviews were also surprisingly self-critical of public health community, and the role that it may have played in encouraging reformulated products. This criticism is particularly around the community's consideration, or lack thereof, of how actors in the market (and subsequently consumers) would respond to nutrition guidance to lower intake of one specific nutrient (e.g. fat, or sugar).

Therefore, building on the findings from Paper 2, there are three issues facing the government-led group within the public health community: (1) this group is fractured in their views on reformulation and does not have a clear policy option that emerges from their core belief, (2) they have focused on the notion that increasing evidence will compel the government to act and have not attempted to counter or reframe reformulation as an idea, and (3) they have inadequately considered how the market would respond to nutrient-based guidance and policies. All of these factors combined suggest that the group of actors who would be poised to argue against reformulation as a public health policy are relatively weak in their ability to do so, which has allowed the stronger 'work with industry' coalition and their support of reformulation to be more-or-less uncontested in the policy subsystem.

FOOD AND BEVERAGE INDUSTRY CORPORATE POLITICAL STRATEGY

As described in Paper 2, the interview participants from the food and beverage industry, along with those who believed in working together with industry, held largely similar and supportive views on the value and role of product reformulation as a public health nutrition policy. However, it was also possible to analyse the interviews from the food and beverage industry in the same manner as the consultation analysis (Chapter 6) in order to provide further evidence of the role of product reformulation in the food and beverage industry's corporate political strategy. Though only a small number of industry members were interviewed (n=4), their interviews demonstrate arguments directly in line with those from the consultation analysis, providing further support for the argument that reformulation may be one part of the industry's strategy. Due to the small sample size, however, the industry interview data presented here is not intended to stand alone, but to build upon

the consultation analysis presented in Paper 1 and the interview data already presented in Paper 2.

PARTICIPATE IN THE POLICY PROCESS

As in the consultation analysis, industry actors emphasized voluntary approaches to reformulation in their interviews. For example:

I'm a proponent of voluntary regulation as opposed to government regulation. But government regulation should be available if, you know, if the broader population can't and doesn't on its own. But you know, I'll ask you, just remember prohibition. Government said drinking is bad, people disagreed, and you know, people drink today. So I think to do it in a voluntary sense, and let government focus on the broader issues of food security and infrastructure and that type of thing. – 1389 (Industry)

Industry participants pursued this argument further, and built on the arguments from the consultation analysis, by contending that government may indeed have a role in health policy, but that it should not be a regulatory role.

...I think government plays an important role in convening conversations about health...I think the access to the info is the role for government to play, not determining what people eat. – 1389 (Industry)

...I think the government can bring together subject matter experts on nutrition, on health and bring industry together. Here's some science, here's some points that need to be addressed, let's figure out the right way to address them. I think the government can pull that together. – 8329 (Industry)

However, this same participant went on to say that “a company can pull that together as well” and that what matters is “creat[ing] an environment where everybody can be operating off of the same sort of strategic priority and execute against it” (8329), thereby affording no specific need for government-led efforts to improve nutrition.

INFLUENCE THE FRAMING OF THE NUTRITION POLICY DEBATE

As in the consultation analysis, industry interview participants shaped the framing of the debate by emphasizing that the industry is part of the solution to obesity and NCDs, highlighting the costs that reformulation poses for the industry, and focusing on the ‘positive nutrients’ within their products. Interview participants also argued that reformulation was being done in response to changing consumer demand, and emphasized the importance of ‘consumer choice’. For example:

The first point of view is, of course, companies are motivated by their top line and their bottom line, but they also realize that they're in the business to serve and satisfy customers. So if customer tastes are changing, if customer expectations are

changing, it is incumbent upon business to change with them. And if they don't, then they'll be left behind. – 8329 (Industry)

Another industry participant said: “I ultimately believe that consumers have choice” – 1775 (Industry). However, another industry participant cautioned, “we're [the general public] never going to give up taste for health,” and went on to say that this was the reason they did not publically announce their reformulations:

And so we didn't want to call out now with 25% less sugar because of the concern we expected Mom...or the kid at 5 or 6 who is reading and who is predisposed to believe that this food may not taste as good. – 1389 (Industry)

These statements reflect a concern of the industry that reformulated products will not sell well because they will be perceived as less palatable than the original product. This fear, while understandable from a business perspective, would appear to run counter to the industry's claim that they are reformulating in response to consumer demand. If consumers were demanding healthier and less sweet products, they would be expected to respond positively to such changes in their favourite foods and continue to purchase them.

Both of these sentiments, however, may be genuine, as suggested by another industry representative who reasoned that some segments of the population are increasing the demand for healthier – or 'substitute' - products, but that “that's not to say that people want the sugar reduced version of the product they like” (4282 – Industry). This sheds light on the consumer demand-sales risk tension present in the industry interviews as well as the consultation analysis; there may be consumer demand for some reformulated products, but reformulated best sellers, or consumer favourites, may pose a sales risk.

Likewise, one industry representative argued that the first goal of a product is to “meet consumer expectations” and that this goal is “combined with this sort of a balance in nutrition expectations” (8329 – Industry). This argument highlights how nutrition and health goals are often in tension with business goals, a theme that will be further discussed in Chapter 9 on framing.

Also as in the consultation analysis, interview participants from the industry focused on a nutrient framing of reformulation (rather than foods, see: Paper 3 in Chapter 8) and emphasized the positive nutrients within their products. For example, one participant argued:

The nutrient density of the food is most important, rather than focusing on any one ingredient, in this case sugar. – 1389 (Industry)

This participant went on to claim that their products contributed “good” nutrients, and that reformulation can take “concerns” like sugar “off the table for mom”:

...and still be a good source of calcium, a good source of vitamin D, in our [product], while at the same time taking concerns off the table for mom while making the product still taste great. And that requires a tremendous amount of research and development. – 1389 (Industry)

The industry also used reformulation to frame the debate in other industry documents. For example, on the HWCF website, they explicitly say that one of their goals is to change “the national and global dialogue about obesity”:

The Healthy Weight Commitment Foundation (HWCF) is changing the national and global dialogue about obesity by providing information and a support system that families can use to make real changes that will lead to a healthy lifestyle and collectively help roll back obesity rates in the U.S. and around the world (Healthy Weight Commitment Foundation 2016).

This directly relates to the concept of framing, and supports the notion that the industry may be using their reformulation initiatives in order to frame and shape discussion about poor nutrition, obesity and NCDs, one component of their corporate political strategy.

PROMOTE THEIR PARTNERSHIPS AND INFLUENCE THE INTERPRETATION OF EVIDENCE ON NUTRITION

As in their consultation responses, food and beverage industry actors discussed and promoted their reformulation partnerships and nutrition evidence in the interviews. However, particularly for evidence, this was a minor part of the interviews; three of the four industry participants discussed partnerships, while only one used evidence in the same way as the consultation responses.

On partnerships, one interview respondent discussed how they participated in an industry-group that issued voluntary guidelines on marketing to children, and used them as an example to argue against the need for government regulation (8329 – Industry). Another participant described their participation in a reformulation partnership as “very successful” (4282 – Industry). While a third said:

...we became introduced to the [reformulation partnership] and really have worked closely with them to develop a commitment that focused on nutrient density quite broadly, and improving the nutrient profile of our entire portfolio...– 1389 (Industry)

The one participant who used evidence in a similar manner to that of the consultation analysis did so to downplay or raise doubts about the significance of their products in obesity and NCDs. For example, they discussed the evidence around calorie reduction and

weight loss – and argued that it was a fallacy to use that evidence to tax or ban a particular category of food or beverage. They went on to argue against the connection between sugar consumption and dental caries, saying that it was a ‘stretch’, particularly notable as the company this individual works for sells a number of high-sugar products:

I don’t buy into the dental caries piece, which is what the WHO has come up with. The studies they based them on are all out of Japan and any place where the water is fluoridated, [sugar] doesn’t make a difference at that point, so they were stretching on that. – 4282 (Industry)

The fact that evidence was a relatively small component in the industry interviews may be a reflection of the types of individuals interviewed and the roles they play in the company, compared to those in the consultation analysis. The industry’s consultation submissions were largely written by employees with scientific expertise (from the departments of regulatory affairs, research and development, nutrition, etc.), while three of the four interviews were conducted with individuals from the public affairs, policy or marketing departments. The one industry interview participant who cited evidence was from a research and development department.

8 THE FOOD/NUTRIENT PARADIGM

The previous chapter outlined how stakeholder views and coalitions on reformulation were influenced by their views on whether or not to work together with industry. The stakeholders who supported a ‘work with industry’ belief system were cohesive in their support of product reformulation as a policy. This cohesiveness, along with the powerful stakeholders in this group, helps to explain how and why product reformulation has become a prominent public policy. However, the ‘work with industry’ belief system was not the only division within the stakeholders interviewed, and stakeholder views on reformulation were also influenced by an overarching paradigm in nutrition policy: foods versus nutrients.

The foods versus nutrients paradigm is pervasive throughout nutrition science and public health nutrition policy, and represents one of the most lasting debates in the field: should nutrition policies and programs, including dietary guidance, focus on nutrients or foods/food groups? The differences between these two conceptualizations of nutrition will be explored in Paper 3, which is currently under review at Public Health Nutrition. Likewise, Paper 3 presents the interview participants’ varying views on the foods/nutrients paradigm, and how this influences their position on product reformulation. The paper ends with a discussion about what these divisions can tell us about how best to move forward with public health nutrition policy more generally.

The foods/nutrients paradigm is an important thread connecting many of the aims and findings of this research; it helps to explain why a nutrient-focused policy like reformulation has become a prominent policy but, as will be discussed later in the chapter, it is also relevant to the food and beverage industry’s corporate political strategy, and to the framing of reformulation and nutrition policy (Paper 4, Chapter 9).

Registry

T: +44(0)20 7299 4646
F: +44(0)20 7299 4656
E: registry@lshtm.ac.uk

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Student	Courtney Scott
Principal Supervisor	Cecile Knai
Thesis Title	Understanding nutrition policymaking dynamics in the United States: The case of product reformulation

If the Research Paper has previously been published please complete Section B, if not please move to Section C

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Date: 13/12/16

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Date: 14/12/16

PAPER 3: IS PRODUCT REFORMULATION FIT FOR PURPOSE? THE FOODS VERSUS NUTRIENTS PARADIGM IN NUTRITION POLICY

Scott C, Brinsden H, Walls HL

ABSTRACT

Nutrition policy is widely recognized as an important step towards creating the conditions for preventing obesity and diet-related noncommunicable diseases. However, there is substantial debate about whether nutrition policies should focus on ‘foods’, food groups and food patterns or ‘nutrients’ within those foods and food groups – what we refer to as the foods versus nutrients paradigm. To explore this paradigm in nutrition policy, we conducted 34 in-depth interviews with nutrition policy stakeholders in the US about product reformulation, a nutrient-based policy. By qualitatively analysing interviews in a framework method, we found that whether or not a participant supported reformulation as an approach was influenced by their view on whether nutrition policies should be food or nutrient-based. A number of arguments were raised for and against both approaches, however the majority of participants argued in favour of implementing both food and nutrient-based nutrition policies. Nutrient policies were seen as pragmatic and politically feasible, but limited in scope; food-based policies were seen as better capturing the overall health properties of foods and diets, but large in scope and challenging politically. Given the limitations raised of both food and nutrient-based policies, the results of this research suggest nutrition policy would benefit from a tactical use of the two approaches.

INTRODUCTION

Unhealthy diets are a leading cause of preventable death in high, middle and low-income countries, contributing to 11 million deaths annually (Lozano et al. 2012). It is widely recognized by experts that improving diets and creating healthier food systems is an important step towards improving the health of populations globally. The importance of good nutrition is recognized by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), among other United Nations (UN) agencies, and the UN recently declared a Decade of Action on Nutrition from 2016 to 2026 (Food and Agriculture Organization of the United Nations & Organization 2014; The United Nations General Assembly 2016). Effective nutrition policies for the prevention of weight gain and noncommunicable diseases (NCDs) have been identified in a growing body of literature, and also promoted by global organizations such as the WHO (World Health Organization Regional Office for Europe 2013; Brambila-Macias et al. 2011a). However, there is

substantial disagreement and debate about which nutrition policy approaches are the most effective and would best improve a population's diet (Walls et al. 2016; Kiener 2014; Caraher & Coveney 2004).

This paper, using the example of product reformulation in the United States, explores whether two overarching paradigms in nutrition policy – the 'nutrients' and 'foods' perspectives – might play a role in propagating this debate. Defining nutrition in terms of nutrients focuses on the level of specific nutrients in foods consumed and their link to health (e.g. saturated fat, carbohydrates, etc.). In contrast, a foods-based approach to nutrition links health outcomes to patterns of food consumption (e.g. ultra-processed foods, 'whole foods', Mediterranean diet, etc.). These two differing perspectives are visible in the varying conceptualizations of nutrition policy within the package of nutrition policies recommended by leading health bodies, and have generated debate within the field (Monteiro 2009; Sievenpiper & Dworatzek 2013; Mozaffarian & Ludwig 2010). In the US and globally, the predominant public health nutrition policies are constructed around nutrients and meeting specific nutrient-level targets and daily-recommended values (DRVs) (Novak & Brownell 2012; King 2007). Nutrient-based policies often use nutrient targets or nutrient profiling to define which products are healthy and unhealthy, and a nutrient-approach is commonly applied to food labelling and marketing policies. In contrast, foods-based nutrition policies focus on groups or types of foods and include policies such as taxing or decreasing the price of a food category or removing certain categories of unhealthy foods from prime locations in supermarkets and other food environments (Table 8.1). However, these views on nutrition policy are not mutually exclusive, and numerous policy approaches can be viewed through both food and nutrient lenses; for example, taxation can target specific nutrients (e.g. a fat or sugar tax) or categories of food products (e.g. sugary drinks or ultra-processed foods).

	Nutrients	Foods
How are, or how could, nutrition policies/ guidelines defined?	Nutrient-based dietary guidelines (e.g. limit saturated fat intake, increase fiber)	Food-based dietary guidelines (e.g. decrease red meat consumption, increase fruit/vegetable consumption)
	“nutritionism”	Whole-foods approach
How is the nutrition problem defined?	Energy or nutrient balance	Imbalance in the types of foods consumed
	‘No bad foods, only bad diets’	Some types of products or foods should be limited or eliminated
Examples of nutrition policies that fit this problem definition	Nutrient criteria to establish limits on marketing of certain products	Change in food availability and affordability (e.g. grants to support sale of fruits and vegetables in corner stores)
	Product reformulation	Policies to support the growth and distribution of certain food categories (e.g. pulses, fruits and vegetables, etc.).
		Shifts in food subsidies/taxes

Product reformulation – the reduction or removal of ingredients and nutrients such as salt, sugar and fat from processed and packaged foods (Kersh 2009) – is a strategy that has been commonly included in policy packages for improving population diets and reducing obesity and nutrition-related NCDs. This strategy has been recommended in key policy documents such as the 2004 Global Strategy on Diet and Nutrition, the 2013 Global Action Plan for the Control of NCDs, and the 2015 Dietary Guidelines for Americans (World Health Organization 2004; World Health Organization 2013; U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015a). Reformulation is often advocated for in countries where the market is saturated with ultra-processed foods (Pan American Health Organization 2015; Monteiro et al. 2013), particularly for reducing sodium (He et al. 2014). Sodium reduction is one of the WHO’s ‘best buy’ policies for NCDs (World Economic Forum & World Health Organization 2011) and the 2015 US Dietary Guidelines for Americans recommended “reformulating foods and meals to reduce sodium content in retail and food service establishments” (U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015b). Reformulation has also been widely successful in reducing trans fats in the US and other countries (Otite et al. 2013; Temme et al. 2011;

Monge-Rojas et al. 2011), and is gaining attention as an approach for reducing sugar (Consensus Action on Salt & Health 2014; Public Health England 2015).

We chose product reformulation as the case study from which to explore the conceptualization of and tension between the foods and nutrients paradigm in nutrition policy. Product reformulation is an approach that focuses on changing the nutrients within a product, rather than decreasing overall consumption of that product. Framed in this way, the solution to poor nutrition does not need to involve restrictions on certain categories of foods, as long as the nutrients of concerns have been reduced or improved within those foods. For this reason, the nutrient-focus of reformulation, and nutrition-policy more broadly, has drawn criticism, particularly from proponents of food based-approaches to nutrition policy (Sievenpiper & Dworatzek 2013; Mozaffarian & Ludwig 2010). However, reformulation is also argued to be a “pragmatic” nutrition policy precisely because it targets nutrients rather than requiring consumers to modify their diets, and has strong proponents, including within the food and beverage industry (Winkler 2013; van Raaij et al. 2009; Vlassopoulos et al. 2015).

METHODS

In-depth qualitative interviews were conducted in 2015 with 34 nutrition policy stakeholders in the United States who have knowledge in or experience with product reformulation. Stakeholders are defined as “actors who have an interest in the issue under consideration, who are affected by the issue, or who – because of their position – have or could have an active or passive influence on the decision-making and implementation process” (World Health Organization 2006). The stakeholders were from four broad sectoral categories: food and beverage industry and relevant commercial organizations (e.g. trade associations/organizations), policy makers/government, public interest groups/non-governmental organizations, and academia.

Stakeholders were identified using existing professional networks, complemented by an Internet search, and through a snowball technique whereby contacts and participants referred additional interviewees. Included in the study were stakeholders who had a high level of involvement or interest in public health nutrition policy, who have worked directly on product reformulation (e.g. in a food or beverage company), had experience in or familiarity with partnerships that undertake product reformulation, or who had a high level of familiarity with product reformulation as a nutrition policy (e.g. researchers and public health advocates).

Stakeholders were recruited by email using a standard invitation letter, and were sent two reminder emails before being considered a non-responder. Upon agreement to participate in the interview, participants were sent additional details about the study. Stakeholders completed the informed consent process at the beginning of the interview, and all interviews were digitally recorded following consent from the interviewee. Table 8.2 summarizes participant recruitment by sector.

Sector	Interviews conducted	Did not respond	Declined interview	Lost in follow up	Total contacted	Response rate
Public Health NGO	12	6	4	0	22	54%
Academia	12	0	2	3	17	71%
Industry	4	17	2	2	25	16%
Government	6	0	2	0	8	75%
Total	34	23	10	5	72	47%

The interviews were semi-structured, lasting between 20 and 60 minutes, conducted in person where possible, or via phone or Skype when necessary. Stakeholders in each sectoral category were recruited and interviewed until a saturation point was reached, which was defined as “when the collection of new data does not shed any further light on the issue under investigation” (Mason 2010).

The analysis of the interviews for this paper followed the framework method, a type of thematic qualitative analysis originally proposed by Ritchie and Lewis (2003), consisting of organizing qualitative data into a matrix by coding theme and participant (Gale et al. 2013; Ritchie & Lewis 2003). Audio recordings were transcribed, and the data from the stakeholder interviews was organized and coded in NVivo10 (QSR International Pty Ltd. 2012). The interviews were analysed thematically, whereby themes and codes identified during the interview and transcription process were added to and edited through close and repeated reading of the transcripts. An initial “code manual” was developed after the interviews were completed, which was used to code five transcripts. After this initial coding, the coding framework was updated to account for emerging themes, and the updated framework was used to analyse the remaining 30 interviews. Throughout the coding process, new codes were added as they emerged, and after the last transcript had been initially coded, all transcripts were re-read and re-coded as necessary to account for the themes that had emerged throughout the coding process.

A number of key topics were covered in the interviews (Table 8.3), however material was only included in this paper if it was coded as specifically being related to foods or nutrient-based approaches to nutrition policy. This topic often arose when participants were asked for their position or stance on reformulation. However, if stakeholders did not spontaneously discuss this topic within their answers to this question, they were asked about it directly. Based on their answers, participants were categorized as supporting food or nutrient-based approaches, or both. For example, hypothetically, someone likely supportive of a foods-based approach would say: “focusing on a *nutrient* like sugar alone is too reductive, and would lead to negative consequences because of the substitutes used. Policies need to promote eating less high sugar *foods*.”

Table 8.3: Key Questions Covered in the Interviews	
-	Definition of reformulation
-	Position or stance on reformulation
-	Benefits or beneficiaries of reformulation
-	Problems or disadvantages with reformulation
-	Prominence of reformulation as a public health approach and why that might be the case
-	Key actors driving reformulation efforts
-	Challenges or implications of voluntary or self-regulated reformulation
-	Potential role for government in reformulation initiatives
-	Actors who are responsible for improving the public’s nutrition and how reformulation fits in with that view
-	Implications of the nutrient-based approach of reformulation

In order to protect participant identities, data were anonymised using randomly generated four digit participant numbers, and any quotes including potentially identifying information have been edited, particularly to remove the company or product name. We report findings in this paper by stakeholder category rather than individual stakeholders, although we recognize that stakeholder groups are not homogenous and not everyone in a stakeholder group will agree with the quotes and illustrative examples included in this case study. The LSHTM ethics committee approved this study.

RESULTS

Nine participants were supportive of reformulation, 18 gave conditions or caveats on their support (n=18), and 6 participants argued against reformulation as an approach to nutrition policy-making (Table 8.4). One of the dividing lines for their support of the reformulation approach was the foods-nutrients paradigm. The participants who had conditional support for reformulation primarily supported using both food and nutrient-based nutrition policy approaches, and frequently recommended they be conducted in concert with each other. However, among the smaller number of participants who did not support reformulation

were those who argued in favour of food-based approaches only (n=6). Meanwhile, those who fully supported reformulation primarily argued in favour of nutrient-based approaches (n=7).

Table 8.4: Preference for a food or nutrient-based approach to nutrition policy (n=34)

Supports Reformulation?	Foods	Nutrients	Both	Unclear	Total
Yes	0	7	2	0	9 (26%)
No	6	0	0	0	6 (18%)
Conditional	0	4	14	1	18 (53%)
Total	6 (18%)	11 (32%)	16 (47%)	1 (<1%)	

Support for food or nutrient-based approaches did not appear to follow a particular pattern by sectoral group, and within each sector there was a range of views on each perspective (foods/nutrients). However, no interviewees from the industry or public health NGOs argued solely in favour of foods-based approaches (Table 8.5).

Table 8.5: Support for food/nutrient approaches by sector (n=34)

	Foods	Nutrients	Both
Academia	4	4	4
Government	2	2	2
Industry	0	2	2
NGO	0	3	8
Total	6	11	16

This paper will first present the arguments raised for and against nutrient and foods-based approaches, and then provide illustrative examples of the position that both approaches should be taken.

ARGUMENTS AGAINST NUTRIENT-BASED APPROACHES

A number of participants argued that a focus on nutrients poses challenges because the nutrient of concern changes over time. One participant from the food and beverage industry, who was supportive of reformulation as an approach, described the situation as a swinging “pendulum” of nutrients:

There’s this pendulum of good and bad and it swings back and forth between sugar and fat, it swings back and forth between carbohydrates and protein. It swings back and forth between you know yesterday’s devil is tomorrow’s angel. – 1389 (Food and Beverage Industry)

Interview participants frequently referenced this “swinging pendulum” view of reformulation and nutrition policy in recounting how they believed reformulation to reduce saturated fat in the 1980s may have resulted in an increase in sugar consumption and

obesity. For example, a participant from academia described how the low-fat movement “did not have positive consequences”:

There are open questions. For example, go back to the [low fat] cookie example. You know that was an example of a product reformulation that ultimately did not have positive consequences because the fat was replaced with sugar. So one has to hold the industry accountable to make truly significant change. And to not make alternative changes simultaneously that would be harmful. – 1151 (Academia)

Similarly, another participant from an NGO described how the singular negative focus on fat had “backfired”:

I mean you know [researcher] talked about this beautifully and he warned everybody and he warned the USDA years ago, you know that you can’t just say all fats are bad. And look what happened. Sugar flooded the market in all these smart [brand of low fat cookie] kinds of things...it backfired on us. – 5397 (NGO/Public Interest)

A number of interviewees expanded on this view further, and expressed concern that by focusing on nutrients there may be unintended consequences that put the public health aims and goals of reformulation at risk. In particular, it was felt that when one nutrient or ingredient is singled out as unhealthy, food and beverage companies can respond by substituting some other ingredient or nutrient, which may be more or less healthy than the original ingredient or nutrient of concern. For example, one academic participant attributed the increase in trans fat consumption to the singular focus on reducing saturated fat in the 1980s and 90s.

...the concern is that just focusing on one nutrient at a time, actually just ignoring other nutrients, may lead to for example what happened in the 1990s and 1980s that basically the focus was on saturated fat only and industry started to replace saturated fat with trans fat. Which was the worst substitution. So here, again the concern of just focusing on one nutrient might lead to substitution of sugar with salt or with saturated fat and that might then give you a problem. – 4549 (Academia)

Likewise, a government representative recounted that the public health community’s “demonization” of saturated fat contributed to the widespread introduction of partially hydrogenated oils and trans fatty acids, which have been found to be more detrimental to health than saturated fat.

...there is a lot of trans fat in our food and we have to reduce it through reformulation, then you end up missing the, what I call the mistake that was made,

was this demonization of saturated fat, that the reformulation of all types of food with the insertion of trans fat into tons of food, and the quote unquote supposedly right thing to have done. So I think I tend...to look at the bigger picture of how the trans fat largely got in our foods by nutrition's own fault in some ways. By not thinking of the consequences of saying saturated fat is evil and needs to be taken out of everything, and not having a better message about what that meant should be done. – 3331 (Government)

Similarly, a participant from academia questioned whether the nutrient substitutes used in reformulation would be healthier or if they would indeed lead to “better” products.

I think with any kind of target there may be some, there's substitutions all kinds of different ways which can result, some of which might not be good...I mean some people are now talking about actually you should pay more attention to rather than added sugars is the ratio of carbs to fibre. Right. But well companies are now adding in all this artificial fibre basically. It's like, is that going to be any better? I don't know, we don't have the science behind it at this point. No one has done the studies for it. It's still too new. I don't know, is that really better? – 6388 (Academia)

Another academic participant argued that a single nutrient focus to reformulation allows food and beverage companies “a way out” because they can use substitutes rather than significantly changing the constituent components of the product.

The omissions I find interesting, that what's not included in this list [of reformulations] is things like refined grains...and vegetable oils. So these are some of fundamental building blocks of highly processed foods and there's some evidence that these are harmful components or ingredients in excessive quantities. And yet for some reason they're not included. That really gives the companies a way out in terms of how to reformulate their products. It's through substitution of other ingredients. – 6017 (Academia)

ARGUMENTS IN FAVOUR OF NUTRIENT APPROACHES

However, roughly a third of participants, from all sectoral groups, were clear in their support of reducing key nutrients of concern. For example, this participant from an NGO said:

We'd love to continue to see reformulation and reduction of the big three: sodium, sugars and fats in general, in all products. – 7730 (Public Health/NGO)

Participants also described the benefits of nutrient-specific approaches, particularly in terms of being more politically palatable and feasible, in part because they are typically quantifiable and work over the short-term. For example, one of the academic participants

described the nutrition focus as “helpful” in getting a particular policy on the political agenda:

Focusing on one nutrient is helpful because policymaking as you know is a political process, and given that we have limited resources in the public health area, and we have basically a number of non-governmental organizations and public interest groups and things like that, and we want to use our limited resources effectively, so we need to concentrate on just one or two dietary factors at a time. So that you can actually put pressure on policy makers and get these dietary factors on the agenda. This is good from a visibility perspective. – 4549 (Academia)

Likewise, this participant from academia argued that “small, sustained” nutrient-based improvements in products were favourable for being more feasible and acceptable to consumers:

...I believe in small, sustained reductions in the levels of adverse nutrients...so potentially for example 5 percent a year or every six months is feasible in terms of reducing the levels in the food without affecting consumer choice. Because that’s something that public health groups often forget about, is that consumers want things that taste good... – 7560 (NGO/Academia)

ARGUMENTS AGAINST FOOD-BASED APPROACHES

Arguments against food-based approaches often centred on them being unrealistic, elitist or politically unpalatable. For example, one academic participant described foods-based approaches as a “huge re-thinking” that would threaten the food industry’s business and therefore endure heavy industry lobbying in the political system.

It [whole foods] will require a humongous shift that frankly will limit these food companies’ power and reach and profits. And so for that to happen I don't know what you do to these food companies, because they are not, they do not go down without a fight. They're not willing to say, ‘well you know what our time has come, we've had a good run here, we've really been able to do something but I see that things are changing’. And then you know it's not as though it’s a panacea with whole foods either... the profit margin is much lower, the hassles are much higher, if we're talking about regional rather than international the limitations on what you can do are bigger. It's a huge re-thinking. – 1088 (Academia)

Another argument against food-based approaches is that they are associated with an antiquated way of life, which invokes a negative reaction against them, as illustrated by the following quotes.

...it’s a complicated discussion to say ‘well we should just go back to eating whole foods’. What does that mean? Does that mean you don't buy food on the run? Or purchase foods because you have to prepare it yourself? That's to some extent, I

think is a false dichotomy. Because you could be purchasing better quality prepared foods or processed foods. The catch is they cost more. They're out there but they cost more. – 6017 (Academia)

...when you talk about getting back to real food, there are a lot of very busy panicked people, [they] hear that and think you're asking us to go back to a time that doesn't exist anymore. We can't all cook from scratch for ourselves kind of attitude. And I realize sometimes when people say that to me, they actually think I'm suggesting that we go back to the days of homemakers. And really I am not. I think our world really has changed and the idea of going back to that is very unlikely... [but] I think we do need to think of it more from the perspective of there's something very different about these very highly processed foods...– 3331 (Government)

However, both of these participants argued that this negative view of foods-based approaches may be misplaced, and that the larger issue is that of affordability of healthy foods and the significantly different health profiles of minimally and highly processed foods and beverages. Nonetheless, other participants reinforced a negative view of foods-based approaches, for example this academic participant who argued that whole foods approaches are “not realistic” for most people:

...we all preach a whole foods diet, go to your farmers' market, all that kind of stuff. But the reality is for most of the population, that's not possible. It's not realistic. So my position is look, a lot of people are buying packaged foods. – 6388 (Academia)

ARGUMENTS FOR FOOD-BASED APPROACHES

Interviewees argued that food-based approaches are preferable for considering the context and foods in which nutrients are delivered. For example, high sodium intake is a public health concern, and salt reduction is the most common target of product reformulation initiatives (Trieu et al. 2015). However, the majority of sodium in modern American diets comes from processed foods, which suggests that an effective way to decrease sodium would be to reduce the consumption of processed foods. As one government participant said: “you have to think through why the nutrient needs to be reduced and therefore what to be done about it” (3331 - Government).

This same participant went on to question the “victory” of reformulating or changing frying oil to reduce the trans fat content, when consumption of generally unhealthy fried foods remains high.

So when people were doing the trans fat reduction and it was like ‘get that trans fat out of the frying oil’, at what point was there ever a question of, are we just consuming too much food that is fried with frying oil? And we are claiming a

victory, and I'm not necessarily opposed to the fact that the trans fat came out of the oil, but I think we have to ask that bigger question of: did we achieve a victory? Because people are still eating tons of food out of that frying oil. And does it matter that the oil doesn't have trans fat in it anymore if we're still eating a lot of fried food? And that's a bigger question. – 3331 (Government)

Likewise, a number of participants were concerned that processed foods and beverages are unhealthy for a number of reasons, and that it is important to consider the overall healthfulness of the product rather than that of a single nutrient. The perspective of the following academic participant, who felt that adding healthy nutrients or reducing unhealthy nutrients does not mean the product is healthy, typifies this view.

I think that's more the kind of injected donut thing, where just by adding the nutrient, and I guess along with it, communicating the idea that particular individual nutrients that we probably get plenty of anyway are necessarily the end all and be all to good nutrition. – 4497 (Academia)

Similarly, another participant raised the case of diet soft drinks, which when looked at through a nutrient lens appears minimally impactful, but raises important questions when considered more holistically.

So, is a diet cola better than a regular cola, because they reformulated it to take out the sugar, but then they put in artificial sweetener? I think that's all the issues that have to be grappled with. They are big issues, and there's a lot of food and nutrition professionals that would say that diet cola or diet beverages are no better than the sugared beverages. – 3565 (Public Health/NGO)

This same participant went on to argue that nutrient-based approaches do not typically target the products most recommended from a health perspective:

...if you're using the term formulate, then it's probably more than a single ingredient food. It's not an apple. You don't reformulate an apple...so you're talking about more packaged goods or beverages. Which tend not to be the healthiest foods in our diets anyway. – 3563 (Public Health/NGO)

Whereas another participant from an NGO argued that good nutrition encompasses more than just a specific nutrient.

If the end result of what we're measuring is better health, I think there's going to be, from a dietician's perspective, there's going to be some other things to focus on just besides a nutrient. – 8260 (Public Health/NGO)

ARGUMENTS IN FAVOR OF UNDERTAKING BOTH APPROACHES

While many participants argued for either side of the foods-nutrients paradigm, nearly half of participants (16 of 34) concluded that both food and nutrient-approaches were needed. These 'both' arguments primarily focused on the need to make short-term nutrient-based improvements to the foods currently in the food system while working to make broader, long-term food-based changes. For example, an NGO participant said:

...we like to do both. And knowing that getting 50% less salt in food is not the whole ball game. It's getting people to eat good healthy foods. – 5883 (Public Health/NGO).

Whereas this participant from the government, who argued for both foods and nutrient-based approaches, highlighted that processed and packaged foods are a mainstay of the food system and there remains a need to consider them.

...I'll throw this out there because this always comes up in these discussions, the whole 'all foods fit' mantra. There are some extremely processed foods that I really don't think should fit anywhere...[but] we recognize that we live in a day and age in our society in which we rely on a lot of companies to provide us food. And processing is a core component of that. – 5078 (Government)

Likewise, this participant from an NGO described how nutrient-based approaches like reformulation can "complement" other food-based approaches as long as unhealthy products remain a part of our food system.

...we should be moving people towards the food groups that we want people to eat, like fruits, vegetables, whole grains, lean protein sources...but as long as those other less healthy products are going to be out there, I think that reformulation is an important public health strategy that complements a number of other strategies to move people towards an overall healthier diet. – 8284 (Public Health/NGO)

Finally, this participant from a reformulation partnership argued in favour of a hybrid approach which uses reformulation to improve the nutrient-profile of products that could be considered minimally processed whole foods, such as canned fruits and vegetables or yogurts.

Our two partners that we have in the food arena are both working on sugar...I only allowed it because they're both real food to begin with. [Company A] only has fruits and vegetables. [Company B] only has yogurt. So, real food is already taken care of...We are using a nutrient index, but I always qualify it by the fact that it's because it's real, they're real food products. – 3563 (Public Health/NGO)

DISCUSSION

In discussing reformulation, the study participants articulated a range of views on nutrient and food-based approaches to nutrition policy. Some participants argued that nutrient-based policies would be more pragmatic and successful in gaining political will and support, and that they are easier to enact as they can be implemented within specific time frames and have measurable outcomes. In particular, and in line with the 2015 DGA recommendations and other nutrition policy documents (U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015a; World Economic Forum & World Health Organization 2011), participants were largely supportive of reformulation and other nutrient-specific approaches for sodium, although this support was not as clear for other nutrients such as sugar and fat. However, other participants were concerned that nutrient-focused approaches can lead to unintended consequences through ingredient substitutions and a failure to consider the overall health profile of a product.

Concern over nutrient-based approaches has also been raised in the existing literature, most notably by Scrinis (2013, 2016). He argues that a narrow focus on nutrients is in the interests of the food and beverage industry, and to the detriment of health, as it may “conceal or override concerns with the production and processing quality of a food and its ingredients” (Scrinis 2013). In the US, the industry’s preference for a nutrient-based approach is well evidenced by their attempts to influence the Dietary Guidelines for Americans. A significant and lasting shift toward a nutrient-focus occurred in the Dietary Guidelines for Americans following significant lobbying by the meat industry during the 1977 process to define the dietary guidelines. (Oppenheimer & Benrubi 2014) The meat industry claimed a lack of scientific consensus on the relationship between meat consumption and heart disease and successfully lobbied for the recommendations to say eat less saturated fat, and not less red meat, thus beginning a focus on nutrients which continues in the US Dietary Guidelines today. The nutrient preference of the industry has also recently been found in industry responses to a consultation about reformulation during the process to define the 2015 Dietary Guidelines (Scott et al. 2017).

Given these limitations and implications, some participants preferred a foods-based approach to nutrition policy. It was their view that food-based policies better capture the overall health-related properties of foods and diets, and that high nutrient consumption was a symptom of consuming high amounts of certain foods or food categories. However, food-based approaches were also seen as principled but unrealistic and impractical in the policy process. Nevertheless, in recognizing the benefits and limitation of both approaches,

the majority of participants supported a combination of both foods and nutrient-based approaches, particularly for achieving short and long-term improvements in nutrition.

Critically appraising nutrient- and food-based policies in this way, however, is not meant to imply that current approaches are immaterial, or that foods and nutrients are necessarily a dichotomy. Indeed, many currently recommended nutrient-focused policies could be refocused and reframed in terms of foods, and this research suggests moving towards a balance between the two approaches rather than a dominance of one approach. In Table 8.6, we have outlined how key nutrition policy areas recommended by INFORMAS (International Network for Food and Obesity Research, Monitoring and Action Support - (Swinburn et al. 2013)) could be adapted into both nutrient and food-based approaches.

Table 8.6: Reframing nutrition policies in terms of nutrients and foods, using the categories of policies from INFORMAS (Swinburn et al. 2013)		
	Nutrient approach	Food approach
Food marketing	Nutrient profiling to categories of foods which should be restricted/allowed	Active promotion/ restriction of types of food items (e.g. no processed products, only fresh foods)
Interpretative FOP labelling	Nutrient profiling to categories of food based on their levels of salt, sugar, fat, and others	Label foods based on their level of processing, component ingredients, or other qualities of the food as a whole
Taxes and subsidies	Tax or subsidize foods based on their levels of salt, sugar, or fat	Tax or subsidize food categories (e.g. sugar sweetened beverage tax, fruit & vegetable subsidies)
Food in public settings	Nutrient profiling and limits for product promotions	Limit or promote items based on their food category (e.g. ultra-processed, fruit and vegetables)
Food reformulation	Reduce or remove salt, sugar or fat within food or beverage products	N/a
Product price	Limit price promotions on products with high levels of salt, sugar or fat	Limit price promotions of food categories (e.g. crisps, candy bars, etc.); lower prices of other food groups (e.g. fruits and vegetables)

As discussed previously, there is inevitable overlap between these two conceptualizations of nutrition policy, as nutrients and food groups track together. However, there are important exceptions to this, or grey areas – such as highly processed products which are nonetheless low in fat and sugar, diet beverages, and other products with low levels of nutrients of concern but minimal contribution to the healthfulness of the diet – in which having both nutrient and food-based policies will ensure that the majority of food products are covered. A reliance on only nutrient-based policies is more likely to permit these products to be marketed and sold as healthy products, despite their low nutrition value and conflicting research on their impact on health.

Importantly, participants discussed how nutrient and food-based policies face differing benefits and challenges in the political system. Despite considerable limits to the influence of evidence on policymaking (Smith 2013), evidence remains an important factor informing decisions in nutrition policy. It is more straightforward to research nutrients than dietary patterns, which are fraught with methodological challenges (Jacobs & Tapsell 2007), and this contributes to nutrient-based policies having a stronger political position relative to food-based policies. Furthermore, policies are more likely to gain political priority if they have objective measures of success (Shiffman & Smith 2007), and it is relatively straightforward to set policy targets and standards for nutrient-based approaches (e.g. reduce sugar in a particular product by x% by x date). A foods-based approach, in contrast, is complex and not easily objectified into credible indicators of success. For example, it is a complicated task to define an ultra-processed food (Monteiro et al. 2010), or to say which processed and packaged foods fit into a particular dietary pattern. For example, would canned tomatoes or jarred tomato sauce fit into a Mediterranean diet? Some would argue yes to the former, being minimally processed, and no to the latter, being more heavily processed and often with added sugar; but again, this distinction is not as clear as nutrient-based criteria. Foods-based policy approaches, such as subsidies aimed at changing the mixture and price of crops and fresh products in the market, are large, long-term, and radical in nature, and therefore do not bode well in a political system that favours short-term incremental change (Walls et al. 2016). Furthermore, unlike nutrient-based approaches, and reformulation in particular, food-based approaches are less likely to be supported by the food and beverage industry and can be expected to elicit significant counter-lobbying by this powerful stakeholder group. Participants in this research also highlighted that a foods-based approach is ideologically similar to the so-called “foodie movement” (Johnston & Baumann 2010), which can be seen as elite and unattainable for

the general population, thereby further weakening the political position of food-based policies. Replicating this study in other countries and settings would be necessary to understand if these complexities of food and nutrient-based approaches are relevant in other policy jurisdictions.

Nevertheless, despite posing challenges politically, there may be advocacy benefits to a foods approach. While the nutrition community may debate and continue to research which nutrients are more important to address (e.g. fats versus carbohydrates versus fibre), it is well established that a diet high in vegetables and other minimally processed foods such as whole grains and pulses is health promoting (Mozaffarian 2016a). Similarly, the majority of nutrition policy advocates can agree that heavily processed foods and beverages are best minimally consumed. However, nutrition policy advocacy from civil society organizations and others has yet to unify around this issue. Furthermore, reframing nutrition policy to put more of an emphasis on foods-based approaches closely aligns with the issue of sustainable diets and food systems, which has risen in the global policy agenda alongside concerns over global warming and planetary food production boundaries (Lawrence et al. 2015; Merrigan et al. 2015). A foods approach to nutrition policy, therefore, also allows nutrition advocates to join together with sustainability advocates and further their common causes.

Ultimately, the tension between nutrient and food-based policies explored in this research is a debate about what constitutes a healthy diet, and how to best improve diets through policy. While reformulation and other nutrient-based policies are an important part of the package of policies needed to tackle nutrition, obesity and NCDs, they are part of a nutrient paradigm which fails to address diets and food systems as a whole. Nutrient-based approaches like reformulation are useful in making step-wise nutritional improvements to processed foods, which, for a variety of reasons, are a fixture of the food system. However, shifting towards healthier dietary patterns will likely also require broad sweeping food-based policies that make minimally processed foods available and affordable. Therefore, making progress on nutrition, obesity and NCDs will most likely require a tactical balance between pragmatic nutrient-focused policies and more ambitious food-based policies.

LIMITATIONS

The interview sample for this study was selected purposively, which introduces a risk of selection bias. However, significant attempts were made to ensure a wide-range of stakeholders from the four categories of respondents. Despite these attempts, the

response rate from industry actors was overall low, and as the industry is known to support reformulation and nutrient-based approaches (Vlassopoulos et al. 2017; Alexander et al. 2011), support for nutrient-based approaches may therefore have been inadequately captured. It is unknown whether the low participation rate of the industry is a result of not correctly identifying the individuals who would have been interested in being interviewed or if it reflects a reluctance to participate. On three occasions a potential industry informant responded positively to the first email request, asked for more information about the study, and then did not reply to further contact attempts, which may reflect curiosity in the subject and nature of the research rather than a desire to participate. However, although the number of participants currently working in the industry was low, two participants were former industry representatives who have transitioned to other sectors, two participants work for public health-industry partnerships, and one conducts research on behalf of the industry. In addition, the government officials who were interviewed had in-depth knowledge about the role and position of industry actors in policy discussions and initiatives.

SIGNIFICANCE OF PAPER 3

As demonstrated in Paper 3, the foods versus nutrients paradigm is an important factor underlying stakeholder views on product reformulation as a public health nutrition policy. The foods/nutrients paradigm, and the historical dominance of a nutrient-based approach to nutrition in the US (Elliott 2012a), is also helpful in explaining how reformulation came to be a prominent nutrition policy, as will be discussed in Chapter 10.

Similar to the division created by the ‘work with industry’ belief system (Paper 2, Chapter 7), the foods/nutrients paradigm can help to explain why stakeholders do or do not support product reformulation as a public health nutrition policy. In this way, the foods/nutrients paradigm can be seen as an overarching policy paradigm in which nutrition policy is made (Smith 2013, p.74). The participants who did not believe in a nutrient focused approach to nutrition policy also did not support reformulation, preferring instead a so-called whole foods or foods-based approach to nutrition policy. However, the majority of the interview participants felt that nutrition policy should encompass both foods and nutrient-based approaches, which is in line with the findings presented in the coalition paper (Paper 2), namely that a number of participants would support reformulation if it were part of a broader package of policies, which would presumably include some food-based policies.

Furthermore, the foods/nutrients paradigm and the ‘work with industry’ belief system appear to track together, particularly at the extremes of opinion. Support for nutrient-based approaches primarily comes from individuals in the ‘work with industry’ coalition and those who believed in both industry and government-led approaches (Table 8.7).

	Foods	Nutrients	Both	Unclear
Government-led	6	2	9	1
Work with industry	0	4	9	1
Both	0	4	7	0

Conversely, the individuals who were strongly in favour of foods-based approaches were only found in the ‘government-led’ group of participants. Or, to say it another way: no participants who believed in working with industry argued against a nutrient-based approach; they either strongly supported nutrient-based approaches or argued in favour of undertaking both foods and nutrient-based approaches. However, it is important to note here that the majority of participants supported both foods and nutrient based

approaches, and these participants are nearly evenly split between the governance belief systems (Table 8.7)

Lastly, in addition to its role in stakeholder views and reformulation's prominence, the foods/nutrients paradigm can also be seen as a type of frame that surrounds reformulation initiatives. The nutrient focus of nutrition policy, and of reformulation specifically, serves to focus the nutrition policy debate on nutrients rather than foods. In this frame of nutrition policy, the solution is to remove or reduce the nutrients within products rather than decrease consumption of the products as a whole. This frame is beneficial to the food and beverage industry as it enables the industry to position itself as part of the solution and simultaneously shifts the blame from the industry and its products to the inanimate object of nutrient. In doing so, it can be argued that a nutrient-focused nutrition policy like reformulation, and the nutrient-frame associated with it, works in concert with the food and beverage industry's corporate political strategy (Chapter 6). This argument is supported by the findings of the consultation analysis (Chapter 6, Paper 1), where the food and beverage industry typically focused on nutrients within its products, rather than the overall health contribution of its products. This was particularly evident in the industry's emphasis on beneficial nutrients in its consultation submissions and by the fact that submissions used multiple arguments to infuse doubt about the negative nutrients in their products and the contribution of their products to the overconsumption of specific nutrients of concern. The nutrient frame of reformulation, however, is only one of multiple frames that are invoked in the discourse around reformulation and helpful in explaining its rise to prominence, as will be presented in the next chapter.

9 FRAMES OF PRODUCT REFORMULATION

As discussed in Chapter 3 on theoretical approaches, framing is an important factor in shaping the direction and focus of the policy agenda. Framing techniques are also a core component of the food and beverage industry's corporate political strategy (Chapter 6). This chapter first presents Paper 4, which analyses newspaper articles from 1980 to 2015 and identifies the predominant frames of reformulation, how they have shifted over time, and how these frames have contributed to product reformulation becoming a prominent nutrition policy in the US. The competition of frames in the media were analysed for two main reasons: (1) to assess how reformulation was framed over time and if those frames aligned with corporate political strategy, or helped explain the opening of a policy window and the formation of advocacy coalitions; and (2) as an intermediary to assess "exertion of political power" and to identify "actors or interests that competed to dominate the text" (Entman 1993, p.55). Following paper 4, the frames identified in paper 4 will then be further evidenced using data from the interviews and consultation analysis.



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Thesis Title	Understanding nutrition policymaking dynamics in the United States: The case of product reformulation

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PAPER 4: THE SHIFT IN FRAMING OF FOOD AND BEVERAGE PRODUCT REFORMULATION IN THE UNITED STATES FROM 1980 TO 2015

Courtney Scott, MPH, RD¹

Laura Nixon, MPH²

¹ Faculty of Public Health and Policy, London School of Hygiene & Tropical Medicine, 15-17 Tavistock Place, WC1H 9SH, London, UK: Courtney.Scott@lshtm.ac.uk

²Berkeley Media Studies Group, 2130 Center Street, Suite 302, Berkeley, CA 94704; nixon@bmsg.org

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DISCLOSURE

The authors have no financial interests to disclose.

ABSTRACT

Food and beverage product reformulation is a public health nutrition policy of recent prominence; it is a so-called win-win policy, as unlike other nutrition policies it has the potential to also benefit the food and beverage industry. However, reformulation has also been criticized as being driven by industry interests. In order to inform future policy debates about reformulation, we sought to investigate how and why reformulation became a public health initiative by conducting a framing analysis on 278 US newspaper articles from 1980 to 2015. Frames are aspects of text that emphasise a particular definition of a problem or solution, and were chosen as the focus of this research as they help shape policy discourses and guide which policies come onto the public policy agenda. Three primary frames of reformulation were identified: business, health and political. Having multiple frames instils reformulation with the ability to assume different meanings in different contexts, which helps to explain how reformulation has garnered broad support from multiple sectors. The political frame of reformulation, however, only grew in importance after 2001, to describe reformulations occurring in response to public health policy initiatives aimed at obesity and noncommunicable diseases. The increasing use of a political frame, and the events described in the articles, suggest that voluntary reformulation followed a growing threat of policy change and litigation facing the industry, a finding that provides important context to debates about voluntary reformulation initiatives. Future reformulation initiatives will need to reconcile and negotiate the varying frames and aims of reformulation in order to ensure they are a success from the public health perspective.

KEY WORDS

Product reformulation; voluntary; framing; health policy; nutrition

INTRODUCTION

While questions remain about the specific health effects of particular nutrients, ingredients and foods, the core tenets of a healthy dietary pattern are well-established: high vegetable and fruit consumption, and low consumption of foods that are high in saturated and trans fats, added sugars and salt (U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015a). However, despite ample evidence and an acute need to address increasing obesity and diet-related noncommunicable diseases (NCDs), policies to improve nutrition are contested in the United States (US) (Trust for America's Health & Robert Wood Johnson Foundation 2015; Beaglehole et al. 2011; Levenstein 1996; Nestle 2002; Kersh 2009).

Following the US Surgeon General's report on obesity in 2001 (Office of the Surgeon General (US) et al. 2001), obesity became a central part of the public health agenda in the US, and therefore so too did nutrition policies (Kersh & Morone 2002). Public health nutrition policies can be divided into two general categories: those targeting consumers and their decision making, and those targeting the market environment (Brambila-Macias et al. 2011a). While policies in the market environment are likely to be more effective (Brambila-Macias et al. 2011a), nutrition policies that target the individual have historically been dominant in the US (Novak & Brownell 2012), including nutrition education, food labelling, nutrition counselling, mass media campaigns and dietary guidelines. Market environment policies place the locus of the problem with the retail and physical environments and the way they are constructed in order to influence consumers towards certain consumption and behaviour patterns (Swinburn et al. 1999). They frequently aim to limit the availability, affordability and attractiveness of ultra-processed foods and beverages – main contributors to high fat, sugar and salt intake in the US and globally (Monteiro et al. 2011; Martínez Steele et al. 2016). These policies have included taxes and proposed portion size limits on sugar-sweetened beverages, restricting the use of partially hydrogenated oils, and restricting where certain types of restaurants or products can be placed or sold (Brambila-Macias et al. 2011b; Sturm & Cohen 2009; Restrepo & Rieger 2016; U.S. Food and Drug Administration 2016a; U.S. Food and Drug Administration 2015).

Implicit to the success of market environment policies is a population-wide decrease in consumption of ultra-processed foods and beverages, primarily achieved through a decrease in their sales. As such, the organisations within the food industry that manufacture and sell these products are understandably concerned about the potential negative impact of these policies on their business. They have strongly opposed their

incorporation into policy using a number of corporate political strategies, such as lobbying, influencing the scientific evidence base, providing funding and establishing partnerships (Mialon et al. 2016; Brownell & Warner 2009; Bailin et al. 2014; Scott et al. 2017).

Food and beverage product reformulation – the reduction or removal of key nutrients of concern from processed and packaged foods and beverages – is one proposed market-level solution to some of the nutrition problems in the US which has recently come into prominence (e.g. U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015b). However, product reformulation differs from other market-level policies as it aims to change the nutrient profile within a product rather than decrease its overall consumption, and is largely supported by the food and beverage industry (Vlassopoulos et al. 2015) indeed it is frequently undertaken in voluntary industry partnerships with health and government groups (Partnership for a Healthier America n.d.; Alliance for a Healthier Generation n.d.). Voluntary reformulation has also been criticized as being driven by industry interests (Scrinis 2016), in that the resulting product changes are typically small from a health perspective but can be used beneficially in industry marketing (e.g. a product which says ‘now with less sugar’). However there is limited research on the circumstances and conditions that lead to product reformulation becoming a public health policy in the US.

In order to better understand when and why reformulation emerged as the so-called win-win public health nutrition policy approach (Winkler 2013), whereby both business and public health can benefit, we analysed US newspaper articles to explore how reformulation was framed from 1980 to 2015. Media coverage of an issue influences the opinions and views of decision makers and public policy agenda setting (Scheufele & Tewksbury 2007; McCombs & Shaw 1972). In particular, how an issue is framed within the media helps shape perceptions and beliefs about what the problem is and how it should be solved (Entman 1993). Frames emphasize specific aspects of a policy issue in order to guide how and when that issue comes onto the public policy agenda, and what policy solutions are appropriate for that particular view of the problem (Mah et al. 2014; Dorfman et al. 2005; Entman 1993). Frames were used in this research as a tool of analysis. As this paper will demonstrate, food and beverage companies’ reformulation efforts have generated substantial media coverage. This is to be expected given the high percentage of news stories that are generated by industry press releases (Ahern & Sosyra 2014; Lewis et al. 2008). However analysing this coverage also provides information as to the framing of food and beverage product reformulation and therefore insights into why and how

reformulation became a prominent feature on the nutrition and obesity policy agenda in the US. This study is one part of a larger research project looking at the political aspects of food and beverage reformulation, in order to inform understanding of nutrition policymaking dynamics in the US.

METHODS

This analysis aimed to identify how arguments about reformulation were framed in US newspaper articles from 1980 to 2015. Although online sources increasingly provide news and media for consumers in the US, newspapers remain an influential source of news, with the majority of Americans accessing newspaper content every day, either online or in print (Newspaper Association of America 2013). The newspaper articles were assessed to identify in what context arguments about reformulation appear, who is quoted in the articles and how the arguments they make about reformulation are framed, as well as the overall framing of reformulation within the article.

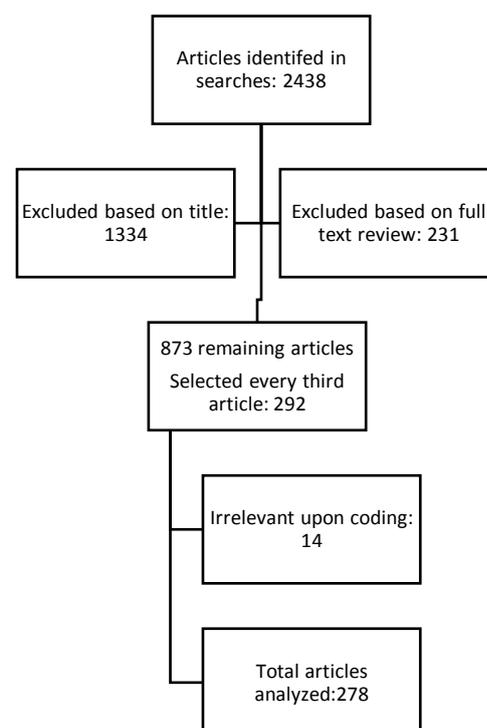
We searched for articles mentioning food and beverage reformulation in the top 10 newspapers in the US, as determined by their daily average circulation (paper and digital) in March 2013, the last freely available data point from the Alliance for Audited Media (Alliance for Audited Media 2013). The searches were conducted in the Nexis database for the time period of 1 January 1980 to 8 January 2016, though not all newspapers had full text available for all years in the database (Table 1). In addition, full-text Wall Street Journal (WSJ) articles were not available in the Nexis database, and so a separate search was conducted using the search function on the WSJ website (Anon n.d.). The search capabilities within the WSJ database were limited to simple searches, and required multiple smaller searches (Table 9.1).

Table 9.1: Newspapers and years searched by search string		
Newspaper	Year Full Text First Available from in Database	Search String
Chicago Sun Times	1992	(BODY((reformulat! AND (food OR product OR beverage OR drink OR soda OR menu OR serving OR obesity OR heart disease OR diabetes OR hypertension))) AND NOT (SUBJECT(Cosmetics OR PHARMACEUTICALS INDUSTRY OR POISONINGS OR PHARMACEUTICALS PRODUCT DEVELOPMENT)))
Chicago Times	1985	
Daily News	1995	
Denver Post	1993	
Los Angeles Times	1985	
New York Post	1997	
New York Times	1980	
USA Today	1989	
Washington Post	1977	Product and reformulation and food Reformulate and (food or beverage) Reformulation and (food or beverage) Reformulate and obesity
Wall Street Journal	1997	

All results from the searches were exported into Excel and checked for relevance by title or full text, as necessary. Included articles must have mentioned reformulation in the context of nutrition, and had to be about the United States, however the overall article did not have to be about reformulation. For example, in many cases, reformulation was mentioned in the context of other nutrition policy discussions (e.g. nutrition labelling). We excluded letters to the editor and opinion pieces from the public, but included editorial board or recurring editorial columns.

From the included articles (n=873) every third article (by publication date) was selected for a sample to be analysed and coded (Figure 9.1). A smaller sample was necessary in order to enable in-depth qualitative analysis. Random sampling was justified in this case because the population of articles was distributed across the days of the week (RIFFE), and the chosen random sample followed a similar distribution to that of the whole sample. From this smaller sample of articles (n=292), 15 were randomly selected to be read in-depth and qualitatively analysed (open coding) by one researcher (CS) to develop the initial coding

Figure 9.1: Article Selection Process



framework specific to this study. This initial coding frame was also informed by previous studies assessing food and beverage policy frames, which have found that the industry positions themselves as “part of the solution” to obesity and NCDs, and that nutrition is frequently framed as a matter of individual responsibility (Nixon, Mejia, Cheyne, Wilking, et al. 2015; Kersh 2009; Ken 2014; e.g. Jou et al. 2014; Elliott-Green et al. 2016). A second researcher (LN) tested the validity of this initial coding framework by applying it to a further 8 randomly selected articles, and the framework was refined accordingly. The resulting coding framework was then applied to the remaining sample of articles by one researcher (CS), however if new codes emerged through the coding process they were added to the framework iteratively. Upon coding, 14 articles were found to be irrelevant, leaving a total sample of 278 articles.

Three main frames of reformulation were identified through the coding process described above and included in the coding framework: business, health and political. The key constructs and arguments underlying each of the frames are summarized in Table 9.2.

Each sentence or paragraph that contained an argument about reformulation was coded, as well as any necessary context, and if multiple frames were present each was coded. We employed the definition of argument as put forth by Nixon et al. (2014), which “considered arguments to be specific elements that represent and express the underlying frame.” From the three overarching frames (business, health, political) each article was given a primary frame, as well as a secondary frame if present. The primary frame was determined by a number of factors within the articles, including:

- The framing of the headline
- The number of times a specific frame appeared in the article (e.g. political appeared 10 times, and business 2 times)
- The framing of the first and last paragraphs of the article
- The ‘master theme’ of the article: was there an overarching narrative or theme running through the article which aligns with a particular frame?
- Who is most frequently quoted in the article (e.g. politician or company representative)?, and how are their quotes framed? Are these quotes in a position of prominence (e.g. first paragraph)?

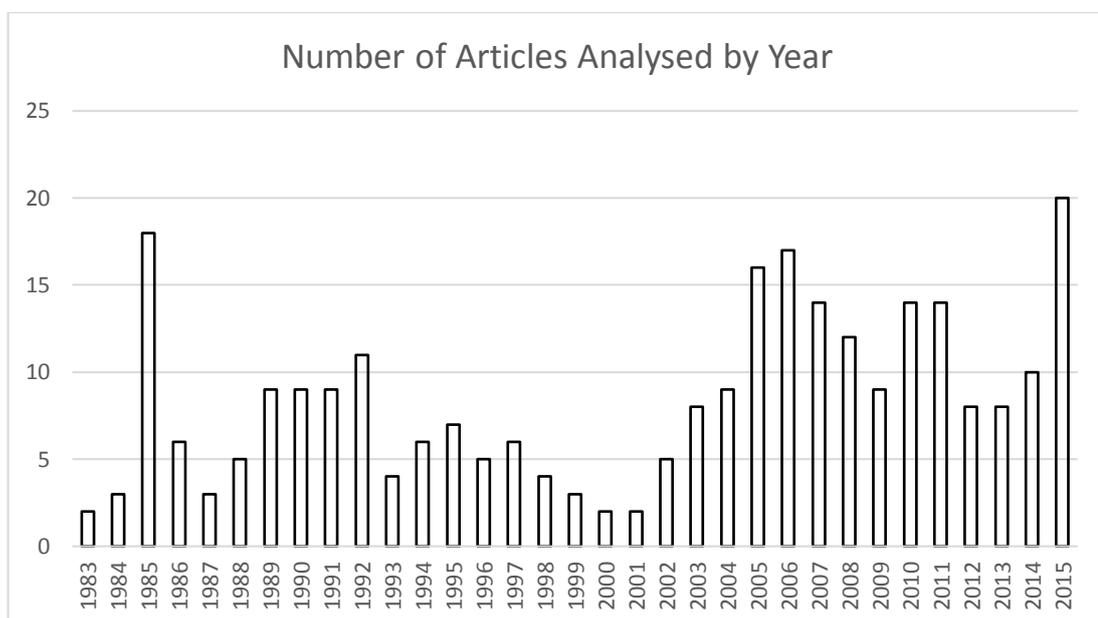
For example, an article that primarily focused on the business aspects of reformulation but with additional discussion of the product’s health impact was given a primary code of business and a secondary code of health. We also indexed the articles for stakeholders quoted, the type of reformulations described within the articles, and key events, dates, programs or individuals identified in the article.

Table 9.2: Frames identified and their underlying constructs/arguments	
Frame	Underlying Constructs/Arguments – Generated from open coding
Business frame of reformulation	<p>Business/market drivers of reformulation</p> <ul style="list-style-type: none"> • Reformulation will increase sales/profits <ul style="list-style-type: none"> ○ Reformulation will improve taste/sensory characteristics • Reformulation will increase marketing/advertising/PR opportunities • Competition • Consumer demand • Consumer and public perception <p>Business case against reformulation</p> <ul style="list-style-type: none"> • Reformulation will hurt business, e.g.: <ul style="list-style-type: none"> ○ Risk to sales from negative consumer perceptions ○ Low demand for healthier foods ○ Reformulation is expensive
Health frame of reformulation	<p>Reformulation will promote health</p> <ul style="list-style-type: none"> • Health/nutrition status of Americans is poor/getting worse • Product is unhealthy/causes negative health impacts • Dietary guidelines for Americans help guide reformulation <p>Public health case against reformulation:</p> <ul style="list-style-type: none"> • Reformulation not effective at improving health, e.g.: <ul style="list-style-type: none"> ○ Number of products expands, unhealthy products not removed ○ Industry can work their way around reformulation ○ Reformulation being done is not enough ○ Reformulation does not mean it's a healthy product
Political frame of reformulation	<p>Reformulation as a response to policy and its political implications</p> <ul style="list-style-type: none"> • Reformulation is done in response to other policies • Reformulation is part of the solution to obesity/NCDs • Need policy for change in food system • Policy loopholes • Evidence use is political <p>Reformulation and its relationship to power dynamics in nutrition policymaking</p> <ul style="list-style-type: none"> • Food industry is under threat • Industry lobbying • Policy change is difficult/a compromise • Tension between what is right for health and what is good for business

RESULTS

Two hundred and seventy-eight articles were analysed from the period of 1 January 1983 to 8 January 2016. Although the search included dates through 1980, we did not find any articles prior to 1983. There was a peak of articles about reformulation in 1985 and again in 2015. Considering only the articles from 1997 onwards, the earliest year with results from all newspapers, the overall number of articles about reformulation appears to have gone up since 1997 (Figure 9.2).

Figure 9.2: Number of Articles Analysed by Year. Note: pre-1997 numbers are not complete due to missing sources.



THREE PRIMARY FRAMES OF REFORMULATION

BUSINESS FRAMES

The business frame of reformulation was the dominant frame in the articles analysed, with 58% of articles (n=162) having business as their primary frame (Table 9.3). This frame was characterized by commercial drivers and inhibitors of reformulation, including impacts on sales, consumer perceptions, competitors and marketing. Most of the articles with this frame (80%) presented reformulation as the solution to a business problem, including poor or weakening sales, increasing pressure from a competitor, changing consumer demands, the need to improve taste/palatability, increased ingredient costs or other problems with the ingredients, among others. For example:

It's not clear how far fast-food companies will go in reformulating recipes. But the nation's biggest chains face growing competition. In the latest quarter, customer visits to traditional fast-food hamburger chains declined 3 percent from a year ago,

according to market researcher NPD Group. Fast-casual chains saw visits rise 8 percent (Choi 2015).

Table 9.3: Frequency of frames identified in the articles

	Articles Containing the Frame (n=278)	Articles with Primary Frame (N=278)	Articles with Secondary Frame (n=278)
Business Frame	234 (84%)	162 (58%)	35 (13%)
Business-Market Drivers of Reformulation	222 (80%)		
Business Case Against Reformulation	93 (33%)		
Health Frame	144 (52%)	62 (22%)	51 (18%)
Health Drivers of reformulation	124 (45%)		
Public health case against reformulation	71 (26%)		
Political frame of reformulation	116 (42%)	54 (20%)	28 (10%)
Politics/Policy	108 (39%)		
Power	47 (17%)		

In this frame, reformulation frequently represented a sales or business opportunity. This included invoking a sense of gold rush fervour and presenting reformulation as a means of overtaking a competitor. For example:

Food companies are racing to produce new and improved fat-reduced and fat-free products (Webb 1990).

As the above quote demonstrates, the business frame of reformulation did not exclude discussions of nutrition or health, however in this frame the primary purpose of reformulation was to present a solution to a business problem or a new business opportunity. Nutrients may have been referenced in relation to the reformulation, but the ultimate goal of the reformulation was business related. For example:

Sometimes food companies even eke out marketing advantages by responding to health concerns, as ConAgra Foods did with its Healthy Choice line during the fitness-crazed 1990s (Greising 2003).

Mayonnaise is a \$650 million business that has been slowly declining, partly because of cholesterol fears...the new product may put the mayonnaise back in a lot of sandwiches (Kleinfield 1989).

Business arguments against reformulation were less frequent (33% of articles), and included that it was a risk to sales and that there were significant costs, in time and effort, involved in successful reformulations, as demonstrated by these quotes:

...research and development costs have risen 35 percent in the last five years as the company concentrated on developing new cereals for nutrition-conscious adults (Key 1989).

In 1990, 14% of food product launches were low sodium, according to Marketing Intelligence Services, a research firm that tracks product launches. But the products rarely sold well as food companies struggled to find workable salt substitutes (Ellison 2005a).

HEALTH FRAME

The health frame of reformulation primarily positioned reformulation as a solution to a health-related problem, including obesity or excessive intake of particular nutrients of concern, and was the primary framing in 22% (n=62) of articles. A typical health-framed view on reformulation is demonstrated by this quote:

A medium-size popcorn and medium soft drink at the nation's largest movie chains pack the nutritional equivalent of three Quarter Pounders topped with 12 pats of butter, according to a review released Wednesday by the consumer advocacy group Center for Science in the Public Interest. The group's second look at movie theater concessions...found little has changed in the last decade-and-a-half, despite some moves by movie theaters to reformulate (MacVean 2009).

This frame is often presented within a narrative about the poor or declining health of Americans, or as a solution to the problem of unhealthy food and beverage products. For example:

The issue is especially important because, as participants made clear, Americans are still eating far too much fat (Webb 1990).

In the health frame, the primary purpose of reformulation is to solve or respond to a health problem, though business and political arguments were often used alongside. For example:

The latest U.S Dietary Guidelines released in January advise eating three 1-ounce servings of whole grains each day...Cereal companies responded aggressively (Deardorff 2005).

Health arguments made against reformulation included that it can result in misleading marketing about the healthfulness of a product, and that reformulation does not necessarily mean a product is healthy. For example:

Cracklin' Oat Bran seems to have been the single product that most outraged Sokolof. 'The consumer is buying oat bran to lower his cholesterol and he's ingesting coconut oil, which is raising his cholesterol,' he says. 'It's a deception' (Streitfeld 1989).

Whole grain products aren't automatically higher in fiber. Often, the higher the sugar, the lower the fiber...(Deardorff 2005)

Another health-framed argument against reformulation was that reformulation targets the nutrient that is of concern today, rather than focusing on the overall health profile of the products. As the quotes below illustrate, health arguments against reformulation also implied a tension between the importance of specific nutrients at different points in time. For example:

Companies have been working to reformulate products...[But] many processed foods are still high in saturated fat, sodium and added sugars...(The Washington Post 2008)

Still, some nutritionists now worry that the focus on trans fats will lead people to lose sight of saturated fats (Abboud 2003).

POLITICAL FRAME

The third frame of reformulation was the political frame, in which reformulation is part of a policy discussion, and seen as a solution to the problem of needing to implement policies for obesity and NCDs. One-fifth of articles (n=54) had this as their primary frame.

This included positioning reformulation as a response to policy decisions such as nutrition labelling changes, or as a means for the industry to avoid negative outcomes from policy decisions. For example, this article described reformulation as a response to mandatory trans fat labelling laws:

In 2006, The F.D.A. required companies to list trans fat on nutrition labels, a shift that prompted many producers to eliminate them. That year, New York City banned trans fats in food sold by restaurants and bakeries; other places, including California, Cleveland and Philadelphia, followed suit. Many major chains, including McDonald's, found substitutes that sharply reduced or eliminated trans fats, as did Crisco (Tavernise 2015).

Other articles positioned reformulation as a response to the industry being criticized by policymakers and nutrition advocates for the nutrition profile of their products. For example:

Several sectors of the food industry, including packaged-food makers and fast-food restaurants, have come under fire over the years regarding calorie counts and nutrition. A number of companies in recent years have moved to improve the

nutrition content of their products, including reductions in sugar and salt content (Kell 2010).

The political frame also encompassed reformulations that arose in order to comply with, or change in advance of, federal regulations on health claims and labelling on food and beverage packages. For example:

With a new food-labeling law set to take effect Jan.1...Some big food makers like Campbell Soup Co. are going so far as to revamp their recipes to take out allergens before they are required to list them (Zhang 2005).

Reformulation was frequently framed politically in articles about the government's attempts to set voluntary standards for products that can be marketed to children. Following the release of proposed voluntary standards – which ultimately were never finalized – the food and beverage industry responded by creating their own voluntary standards for marketing to children, and reformulating products to meet their own standards ahead of the government standards. For example:

...The Obama administration in April proposed voluntary nutritional standards for foods marketed at kids and teens...CFBAI members responded with their own uniform food-specific guidelines for food marketing...though the New York Times noted that only one-third of the companies' advertised products would have to be reformulated to meet the standards (Hobson 2011).

Furthermore, the political frame was associated with claims of responsibility, particularly directed at the industry.

With two-thirds of Americans considered overweight or obese, reformulation is part of the industry's response to lawmakers, nutritionists and lawyers who say food companies deserve a super-size portion of the blame (Zitner 2004).

This frame of reformulation also brought in overtly political discussions about politicians and policies, about policy compromises and power struggles, and the position of the industry in the policy process. For example:

Thursday's guidelines are the latest in a series of federal efforts to prod food makers to offer healthier products. Advocates have centered their efforts on voluntary guidelines, viewing outright bans on marketing of unhealthy foods as unlikely to win federal approval (Adamy 2011).

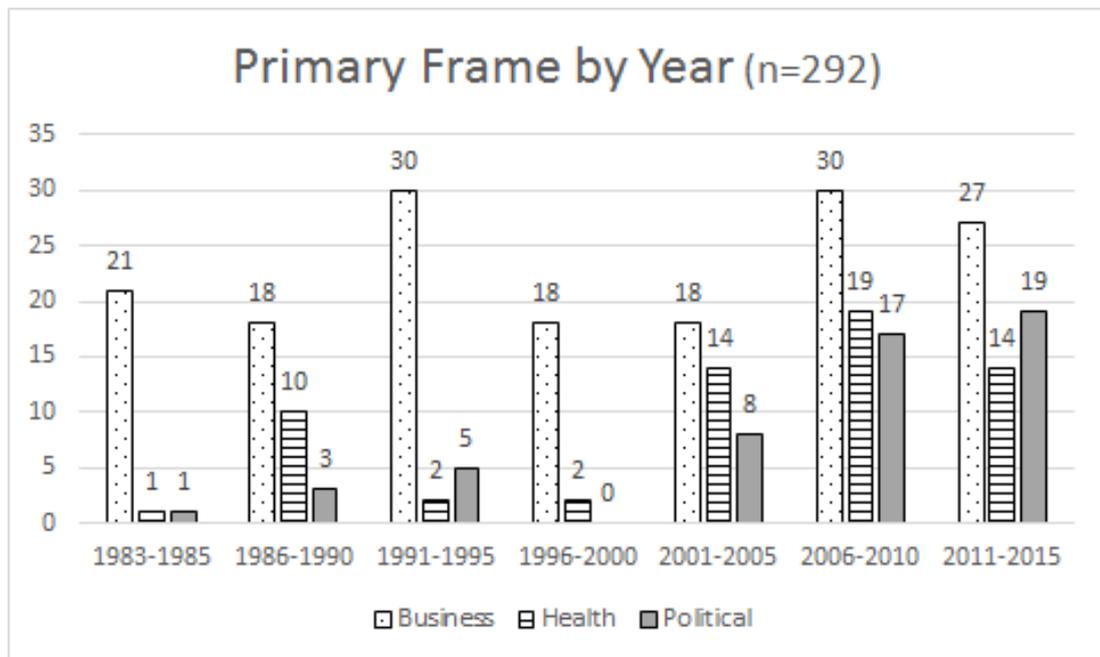
In particular, the Obama administration and Michelle Obama specifically, featured prominently in politically framed articles, with her Let's Move! program being cited as an impetus for reformulation. For example:

Wal-mart, the nation’s largest retailer, will announce a five-year plan on Thursday to make thousands of its packaged foods lower in unhealthy salts, fats and sugars...The initiative came out of discussions the company has been having with Michelle Obama, the first lady, who will attend the announcement in Washington...(Stolberg 2011)

PERIODIC TRENDS

From 1983 to 2000, the articles were primarily framed in terms of business arguments (n=88), with a smaller number of articles having a primary health frame (n=15). Only nine of 112 (13%) articles in this period had a primary political frame (Figure 9.3). In the period from 2001 to 2015, the political frame of reformulation became more frequent, with 44 of 166 articles (26.5%) being primarily framed in this way; health frames also increased (n=47) but a business frame remained predominant (n=77).

Figure 9.3: Primary Frame by Year (Percent). Note: pre-1997 numbers are not complete due to missing sources.



Coinciding with an increase in the political frame of reformulation, the period from 2001 to 2015 was characterised by a repeated pattern of policy change and/or litigation efforts against the food industry, followed by an announcement of voluntary reformulation efforts on the part of the industry. As such, politically framed articles appeared clustered around political events. Of the 82 articles coded with a primary or secondary political frame, 63 described the reformulation as following a specific policy or legal action (77%). Of those, 37 were prompted by a federal policy debate or change, 14 by a state or local government policy debate or change, seven by the introduction of a lawsuit against the company, and

five by Michelle Obama's Let's Move! campaign. In particular, the years with peak political framing as the primary frame in the article – 2005 and 2011 – coincided with major nutrition policy actions by the federal government: in 2005 the FDA announced plans to adopt mandatory trans fat labelling; in 2011 the government discussed standards for marketing food and beverage products to children, and Michelle Obama's Let's Move! Campaign announced joint efforts with Walmart and the National Restaurants Association.

The rise of the political frame of reformulation in this period was also associated with a change in food and beverage industry strategy, moving from denying their potential role in the obesity epidemic to acknowledging their desire to be part of the solution to obesity. For example, in 2003 McDonalds denied "that [the] current concern of fast rising rates of obesity" was behind their decision to reformulate their Chicken McNugget (Alexander 2003). However, the article goes on to say "the launch is well-timed for McDonald's, which recently has come under especially harsh criticism on the healthiness of its food," and describes how the reformulation follows a lawsuit against the company:

The company this year secured the dismissal of a high-profile lawsuit in New York that accused McDonald's food of causing obesity in two children, but not before the judge opined that McNuggets were a "McFrankenstein creation of various elements not utilized by the home cook" (Alexander 2003).

Whereas in contrast, later articles featured discussions of being part of the solution. For example, a Los Angeles Times opinion piece later in the same year (2003) opened by saying:

For the last year, the packaged food industry has been getting a good old-fashioned cuffing...Politicians in Sacramento and elsewhere have been legislating furiously to ban snack foods in schools...Yet until recently, the response of Big Food has been largely defensive...That changed this month when Kraft Foods Inc.,...announced a wide-ranging series of anti-obesity initiatives: smaller individual portion sizes, an end to marketing in public schools, even reformulation of some of its more egregious artery-cloggers.... (Crister 2003)

Another article discussed how not taking action became a bigger political risk to the industry, and compared the situation to the tobacco industry:

Kraft felt inaction might invite a greater threat. The government could impose restrictions on children's marketing, not to mention the risk of bad publicity or potential lawsuits. "If the tobacco industry could go back 20 or 30 years, reform their marketing, disarm their critics, and sacrifice a couple of hundred million in profits, knowing what they know today, don't you think they'd take that deal in a heartbeat?" asked Michael Mudd, an architect of Kraft's obesity strategy and a former executive vice president...(Ellison 2005b)

However, there was a tension in the articles between the industry being part of the solution and using reformulation as an argument against other nutrition policies. For example, in an article on the proposed standards on marketing to children, an industry group said they had already reformulated, implying that the new standards are not necessary:

Food makers already cut back on marketing some of their least healthful products to kids amid pressure from regulators and the threat of lawsuits. The Grocery Manufacturers Association says that in recent years food and beverage manufacturers have changed the recipes of more than 20,000 products to reduce calories, sodium, sugar and fat. The association recently agreed to place nutrition information on the front of package (Kilman 2011).

This same argument was also present a few years earlier against proposed regulations from the FDA on nutritional claims on packages (Zhang 2009), and in the context of Michelle Obama's Let's Move! campaign:

Food makers, which have fended off other government attempts for new nutrition regulations, say they have already made changes to combat childhood obesity by curbing marketing to children and offering healthier options. The Grocery Manufacturers Association...said its members have reformulated 10,000 products in recent years to reduce levels of calories, fat and sodium (Adamy 2010).

Likewise, there was a tension between reformulation being part of the solution (political frame) and it being a response to consumer demand (business frame). In an article about the FDA setting a deadline for the industry to remove trans fats from products, the industry's rationale in reformulating was described as being "cognizant of consumer demand" and responding to "research about the harm caused by trans fat" (Tavernise 2015). Or, for example, this article which described the reformulations as being motivated by both consumer demand and policy change:

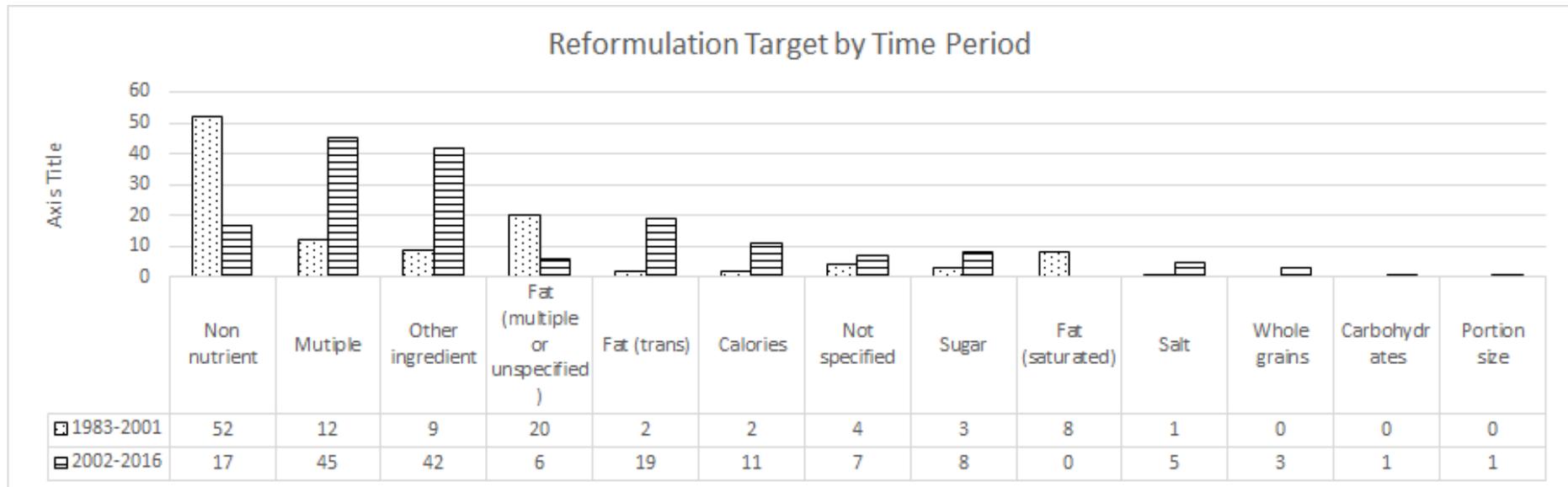
As consumers increasingly ask for healthier fare, the company that operates Olive Garden and Red Lobster restaurants said Thursday that it will cut salt and calories across its menus by 10 percent over the next five years and 20 percent over the next decade...The move comes as the federal government and some states have stepped up pressure on the nation's restaurants to post calorie information...(Bryson York 2011)

In the post 2001 period, health arguments against reformulation centred on it being a minor change to products that are otherwise "just not redeemable" (Zitner 2004, Chicago Tribune, 22 January). These arguments typically appeared towards the end of the articles, after the industry reformulation announcement or effort had been discussed, indicating

their relatively weaker position within the articles. Articles with a primary political framing also frequently discussed the business implications of a policy or legal challenge facing the industry. However, the business arguments were stated in response to the policy or reformulation effort.

The analysis also found a periodic trend in the target or focus of the reformulations, becoming more nutrient focused as time went on, which aligns with the framing trends (Figure 9.4). In the period from 1983 to 2001, which was primarily business framed, the majority of reformulations were undertaken to improve non-nutrient qualities of the products (e.g. taste, texture, etc.). Reformulations to reduce saturated fat and cholesterol were also prevalent in this period, but to a lesser extent. In contrast, the period from 2001 to 2015, which was associated with a rise in political and health frames, the reformulations were increasingly targeting specific nutrients or multiple nutrients (e.g. salt, sugar, and fat), as well as other ingredients that had gained a negative public perception (e.g. additives, GMOs, artificial sweeteners and gluten).

Figure 9.4: Reformulation target by period



STAKEHOLDERS QUOTED AND THEIR FRAMING

Industry actors were the most frequently quoted stakeholder group, appearing in over half of the articles analysed (n=148), followed by those from public health groups (n=64). Actors from other sectors were less prominent in the articles analysed (Academia=27, Government=28, Other=25, General public=9). Across all three primary frames, an average of 51% of frames identified came from general text of the author, rather than quotes attributed to specific actors. Articles with a primary frame of business featured four times as many quotes from industry actors as from government, public health and academia combined (n=201 v. n=49).

DISCUSSION

From 1980 to 2015 food and beverage product reformulation was framed in US newspaper articles as a solution to three types of problems: business, health and political. The business and health frames of reformulation appeared throughout the sample analysed, while the political frame appeared only sporadically as a secondary frame until 2001, when it became a recurrent primary frame. The three frames, however, were not mutually exclusive, with health and business arguments featuring alongside the political frame and vice versa.

In the 1980s and 1990s, the articles primarily described reformulation as a business initiative, even when prompted by health fads or trends, with reformulations frequently targeting the sensory characteristics of the product and with the goals of sales growth and outperforming competition. Starting in the 2000s and continuing in to the 2010s, when litigators and the government began to focus on the causes of obesity and diet-related diseases, there was a marked shift in the tone of the articles and reformulation became framed as a policy-related initiative with specific health goals. This analysis suggests that reformulation has evolved over time from an internally driven process responding to a business opportunity, to being a response to an externally driven political or public relations threat. These two conditions, however, are not mutually exclusive, and the political threat has not replaced traditional business threats but rather added to them.

From 2001 to 2015, the industry frequently framed reformulation initiatives as being voluntary and in response to consumer demand, while the articles repeatedly included background text about recent lawsuits or government policy changes facing the industry. Multiple articles referred to the industry as being “under fire” and threatened by policy and legal action. However, by acting voluntarily ahead of proposed regulatory changes, the food and beverage company’s actions were positively received in the articles and generated positive PR for the company, as well as directly heading off specific litigation

attempts against the industry on multiple occasions. The business roots of reformulation, however, were still prevalent even in the most recent articles, and the predominance of a business frame shaped the portrayal of reformulation as a business initiative that has public health benefit (rather than as a public health initiative itself). Collectively, the articles described reformulation as a business response to a threat, whether that threat be their competitor, weakening sales, or in the later years the government. The focus on a business frame also emphasizes the cost and effort to business in reformulating, and the prominence given to consumer demand within the articles suggests that whether or not consumer demand can be generated for a product is an important deciding factor for the industry in whether or not to undertake reformulation.

In the public health field, there are on-going debates about the merit of voluntary and self-regulated food and beverage industry initiatives, and this finding – that voluntary reformulation followed increased political pressure on the industry – provides important context for that debate. Proponents argue that voluntary agreements are more expedient and effective than pursuing a difficult regulatory course of action (Haufler 2001; Institute of Medicine 2012). However, given the emphasis the industry places on the difficulties and length of time needed to undertake reformulation – in this analysis and others (Webster et al. 2011; National Heart Foundation of Australia 2012) – it is unlikely that they would have taken such voluntary reformulation actions if the threat of policy change were not already present in the early 2000s. Furthermore, these findings align with previous research showing that the food and beverage industry has shifted their framing of obesity over time to encompass being part of the solution (Nixon, Mejia, Cheyne, Wilking, et al. 2015). Moreover, although we recognise it is not possible to directly compare the tobacco and food industries, previous research on the tobacco industry mirrors and supports the results of this analysis (Gilmore et al. 2011; Moodie et al. 2013; Stuckler & Nestle 2012). In the case of tobacco, the industry created and promoted filtered and low-tar/low-nicotine cigarettes following increasing pressure from the public and policy makers in the 1940's, 50s and 60s (Hurt & Robertson 1998; Warner 1985).

This analysis begins to provide insights into how and why reformulation has become a prominent public health policy. It is a topic that, over time, has combined the business and profit interests of food and beverage companies, with the health interests of public health actors, and the policy interests of government. It is a “chameleonic idea”: one that can appeal to multiple actors from multiple viewpoints (Smith 2013). It is seen as a win-win for appearing to address the problems of obesity and NCDs without heavily infringing on

the business practices of the food and beverage industry, particularly by public health actors with industry-friendly perspectives (See for example Winkler 2013). However, the competing frames identified in this analysis demonstrate the tensions that come with integrating business, health and political interests into a single idea. Arguments made in the health frame of reformulation describe the health status of Americans as poor or failing –a “story of decline” (Stone 2012) – and actors making these arguments suggest that more significant changes to products and the food environment are required. Whereas arguments made in the business frame describe small-scale changes to existing products, so as not to threaten profitability, but which generate positive PR and improve brand image. As the purpose of reformulation has shifted from a purely business initiative to one with a political intention, in line with the increasingly complex corporate political strategy of the industry to block public health regulations (Mialon et al. 2015; Mialon et al. 2016; Scott et al. 2017), the political frame of reformulation has become and will remain important. Reconciling and negotiating these frames and aims of reformulation will be a necessary step in ensuring its success from the public health point of view.

LIMITATIONS

This is only one illustration and does not claim to explain causation between the sequence of events described in the articles and the frames of reformulation. It is limited by its singular focus on newspaper articles in the United States, and that the newspapers analysed had varying years available in the databases used. In particular, analysing one-third of the article population may have introduced bias. That articles covering reformulation appear to have risen over time may be due to the limited availability of older articles in the database or the sampling method of selecting every third article, which may have inadvertently made the prevalence of articles appear higher in certain years over others. Furthermore, only a small portion of the analysed articles were double coded, and each of the three frames found in the articles analysed could reflect reporting styles of the various newspapers, of the section the article was found in, or the specific journalist. However, taken together, and in the context of the temporal trends identified, the sample analysed suggests that the framing of product reformulation has shifted.

SIGNIFICANCE OF PAPER 4

At its core this paper highlights the importance of framing the nutrition policy debate, in which actors seek to define which policy solutions are best, and to position product reformulation within that broader debate so that it emphasizes certain belief and value systems. These debates are deeply political, and ultimately about assigning or deflecting responsibility for the problems of poor nutrition, obesity and NCDs.

The shifting frames of reformulation are significant because of the values they invoke. Lakoff (2006) describes how invoking values in political contests can persuade voters more than specific policy positions, as values resonate deeply with individuals (Lakoff & Rockridge Institute 2006, p.7). This research suggests that reformulation is an issue that can represent multiple value systems depending on how it is framed, therefore making it resonate with a number of issues and policy actors. The framing of reformulation also connects it to overarching deep frames in the public discourse – those that “constitute a moral world view or a political philosophy” (Lakoff & Rockridge Institute 2006, p.29) – particularly those about individual versus corporate responsibility, and questions about what the role of government should be in issues that are seen as personal. Specifically, if reformulation is framed primarily as a business initiative, the values of free markets and economics are invoked. A business frame also helps legitimise the food and beverage industry as a participant in health policy processes (Smith 2013, p.77). If framed in terms of health, reformulation can either take on progressive values of enabling conditions that promote equal health opportunities for all, or the conservative value of individual responsibility for health, depending on how it used (Lakoff & Rockridge Institute 2006). And if framed politically, reformulation can either position the corporation as a good corporate citizen and reinforce the conservative value of minimal government regulation (e.g. by discussing the need for voluntary mechanisms), or serve to challenge “government by corporation” and reinforce the progressive values of community care and collective responsibility (e.g. the government-led belief discussed in Chapter 7) (Lakoff & Rockridge Institute 2006, p.93).

The ability to fluctuate between these frames of reformulation, and the values that they invoke, means that the issue of reformulation can assume different interpretations in political forums depending on the stakeholder and the frame of reformulation that they are using. As discussed above, findings from this research suggest that the food and beverage industry does just that, framing reformulation differently over time and for different

audiences, thereby invoking deeply different values, and with politically based reasons for doing so, especially after the year 2000. The three frames of reformulation therefore help to further reinforce the claim made in Chapter 6 that reformulation can be seen as one element of the food and beverage industry's corporate political strategy.

Likewise, that the framing of reformulation has shifted towards the political, and that voluntary reformulations followed increasing political instability for the industry, also reinforces the relationship between reformulation and the industry's successful corporate political strategy (Chapter 6). An action taken in response to a political threat is at the centre of the definition of corporate political strategy. Applying the corporate political strategy decisions defined by Hillman and Hitt (1999), the media analysis suggests that in the early 2000s, product reformulation may have been a transactional or reactive corporate political strategy taken by individual companies. However, in the later 2000s and 2010s, when the food and beverage industry began to form reformulation focused partnerships, reformulation can be seen as shifting into a relational, collective political strategy aimed at constituency building (Hillman & Hitt 1999).

ADDITIONAL FINDINGS RELATED TO PAPER 4

FRAMES IN INTERVIEWS

The media analysis identified three primary frames of reformulation – business, health and political – and that its framing has shifted over time to encompass a public health policy interpretation of the concept. This finding is supported by the interviews, in which participants discussed the evolution of reformulation as moving from a within-industry process to one that has taken on health and political aims in recent years. For example, this participant from academia described the evolution of reformulation as going from “selective” to “systematic” in an effort to appease policy makers and the public.

...in the old days of reformulation, back in the 80s and 90s, companies were very selectively reducing components on particular products...And now what we have is more systematic reformulation going on...And that's directed not so much at the consumer but at the policy maker and the interested public to know, and it's all about their CSR responsibilities, they're saying we're good corporate citizens. – 6017 (Academia)

Likewise, this public health participant who believed in working with industry, described how both consumer demand and “pressure” from outside groups are driving reformulation:

Well the industry would say, what I've heard them say is that they are meeting consumer demand, and that they are creating products that consumers are going to buy. And so I think that is part of it, consumer demand. I think there's also another strategy of putting pressure on industry groups working through government, working directly with the industry through non-profit and consumer groups, to encourage them, to help them understand why it's important, and potentially holding a threat of regulation of them as the reason why they would want to make changes voluntarily. – 8284 (Public Health/NGO)

As in the media analysis, all three frames were present in the interviews; participants saw reformulation as being motivated by business, health and political reasons. Health framed arguments were frequently used by participants when answering questions about the rationale for reformulation. For example, an academic participant answered this question by saying:

...I'm interested in product reformulation from the health perspective. And from that perspective in order to comment on the importance of food reformulation for sugar, you need to see what is the evidence for the effects of added sugar, or sugar content of different food products and the relationship with health. – 4549 (Academia)

Interview participants from the food and beverage industry also largely focused on health as the motive for their reformulations and emphasized a health frame. For example, this participant from industry said:

I would say that the public health driver is what's driving the company [to reformulate], but there are other reasons to do it as well. – 4282 (Industry)

Likewise, another said:

We are the only multinational food company that is exclusively focused in the area of healthy and better-for-you-foods...[with] a mission to bring healthier food to as many people as possible. – 1389 (Industry)

However, in contrast to the media where business arguments were prominent, interview participants typically only used the business frame alongside the health and political frames, unless I specifically asked about it separately (e.g. what would be the business case for undertaking reformulation?). In particular, participants highlighted how reformulation for health reasons might pose a risk to the food industry's business. For example, this industry participant discussed the tension between the health and business goals of reformulation:

I think added sugar is something that from a nutrition point of view should be reduced. But notice how I qualified that. From a nutrition point of view. If the

palate of the consumer is such that it demands more than just naturally occurring sugar, and one takes that posture and the rest of the category doesn't, you know the one that adopts that posture they get a lot of accolades. But they may not get a lot of business. So at the end of the day, when it comes to food, it's got to taste good. – 1389 (Industry)

Similarly, this participant from academia described the business aims of reformulation, but said it would “perhaps” address health as well.

I see reformulation as a process which is initiated with the industry, aiming to add or remove different nutrients or [change then] nutrient composition of different products either to improve their sales or to add variation in the product, or perhaps to add to the quality of the food. – 4549 (Academia)

Participants also invoked the business frame of reformulation by making the argument that government interventions need to be business-friendly in order to be successful. In particular, interviewees emphasized that product reformulation is politically appealing because it can be framed as a win-win policy for business and public health. For example, this former-industry participant highlighted how reformulation was a “business opportunity”:

So my role is to try to show my former colleagues, that, you know, don't be dumb. This is a business opportunity for you. And I do care about reducing obesity and getting people to eat healthier. – 9507 (Public Health/Formal Industry)

Likewise, an academic participant described how even if the government were regulating reformulation, it would need to be done in a way that was “manageable” for the industry.

So I believe the government has to begin in many cases, will have to be in the position of requiring the companies to reformulate in ways that are manageable for the companies, probably leading to slow changes in consumer preferences. – 1151 (Academia)

The political frame of reformulation was frequently invoked in the interviews, though this is not unexpected given that the majority of questions pertained to how and why reformulation became a political issue, and the role various political actors have played in that. In particular, reformulation was seen as arising in part out of a need for the food and beverage industry to respond to increasing political pressure. However, the political frame was also interwoven with that of a business frame. For example, this participant from the government who described reformulation as motivated by both political and business reasons:

It's [reformulation] usually because there is a regulatory requirement and the company is either trying to avoid it, so reformulation so I don't have to declare that I have trans fats in this product, as an example. Or they want to create a market for their products because of consumer demand. – 4465 (Government)

Likewise, this NGO participant, who was identified as part of the 'work with industry' coalition (Chapter 7), used both business and political frames to explain why the industry was willing to participate in nutrition policy initiatives.

I think consumers are driving that [reformulation]. I think there's a demand for healthier products and if there's a demand then industry should respond. So I think that's why they're coming to the table more readily to have these discussions. – 8620 (Public Health / NGO)

FRAMING AND COALITIONS

The three frames of reformulation identified in the media analysis also help to provide further context and explanation for the belief systems and advocacy coalitions identified in the interviews (Chapter 7). In particular, the 'work with industry' coalition may have been able to cross sector boundaries because though the actors had potentially very different aims for undertaking reformulation, they were able to use a common language and invoke common values by employing the health frame of reformulation. As one example, the following two quotes come from participants in different sectors but who both believe in working together with industry. They're both health framed, and talking about added versus natural sugars, but to very different ends. In the first, the NGO participant is arguing in favour of reducing added sugars because of the types of products it's typically in. In the second the industry participant is using added sugar reduction as a defence of their product, which contains natural sugars.

We differentiate between sugar that is added during packaging or processing which provides additional calories without many nutrients and that's more directly linked to overweight and obesity versus naturally occurring sugars in foods like fruits and dairy products...So we're focused on reducing consumption of added sugar. – 8284 (Public Health/NGO)

What bothers me is products that have whole nuts in them will get dinged on sugar, but they're natural. It's not an added sugar. So I'm all for lowering sugar and I think that you know the goal of every food manufacturer would be to deliver a range of healthy products...[But] I'm talking about the overall profile, for nuts specifically. Nuts have a sugar content, and a protein content actually... – 1775 (Industry)

In contrast, the interviewees who believed in 'government-led' policy frequently talked about reformulation politically – such as the weak or negative impact of voluntary

reformulation governance mechanisms and how reformulation posed political issues of conflicts of interest, responsibility and accountability, particularly in reference to the food and beverage industry. As discussed above, that the interviews included a political frame is to be expected, as it is how the questions themselves were framed. However, those within the ‘government-led’ group pursued the political frame in their answers, whereas those in the ‘work with industry’ group often pivoted away from it (particularly interviewees from the food and beverage industry). For example, when I asked the first question about “What does product reformulation mean to you, how would you define it?”, one participant from the ‘government-led’ group answered immediately in a political frame:

This may sound a little jaundice, but from the kind of work that I do, product reformulation to me is a somewhat cynical move on the part of the industry to just sneak right under the standards so that they can market their junk food to kids in schools and sell the junk food to kids in schools. So you know just tweak enough. – 5397 (Public Health/NGO)

Similarly, another participant from the ‘government-led’ belief group described reformulation in a political frame by saying it is “in the industry’s best interest”:

It’s [reformulation] a term that’s used by industry sympathetic public health and nutrition people. And an excuse to avoid making serious dietary recommendations that might actually improve health. It’s something in the industry’s best interest. – 7982 (Academia)

The above examples highlight that in the political frame, reformulation is only one of many policy options that could be taken to address obesity and NCDs, and by using the political frame, the actors in the ‘government-led’ group frequently raised more issues than problems they solved. However, there was no common view on reformulation among the ‘government-led’ group, and among those who argued against reformulation there was no common view on what policy would be preferred. It is therefore possible that a focus on the political frame of reformulation may be another reason that this group has not aligned into a coalition.

FRAMES IN CONSULTATION ANALYSIS

In the media analysis, the business frame of reformulation was consistently used across the entire time period assessed, and it was identified that business-related actors used it predominantly. However, in the consultation analysis (Chapter 6), which was largely populated by industry representatives, the health frame of reformulation was more prominent. While business arguments were raised as explanations for why reformulation is a difficult process, and many submissions touched on the political frame, by and large

reformulation was framed as a solution to a health problem in the industry's consultation responses. For example:

Food manufacturers are working across multiple product platforms to further develop functional foods that can provide a range of health benefits from helping to reduce the risk of chronic disease, to enhancing the ability to manage health conditions, to promoting growth and development, to helping to improve performance, and to ultimately improving the quality of life. This area of innovation further demonstrates the commitment of the food industry to providing consumers with the products, tools, and information they need to build healthier lifestyles. – CID 358

In another example, the following quote from a food manufacturer demonstrates how the three frames were intertwined in the consultation responses, but that reformulation was primarily positioned as a solution to a health problem. In this case, the submission cites taste as a limitation of reformulation, which invokes the business frame, and references the 'crucial role' of industry invoking the political frame, but health is emphasized as the impetus for undertaking the reformulations.

[Company] recognizes the crucial role industry plays in helping our consumers lead healthier lives. We believe a balanced diet and a wholesome, active lifestyle are the keys to healthy living, and we are committed to improving the health profile of our products while meeting consumer requirements for taste. – CID 370

In contrast, this same industry actor (CID 370 in consultation analysis) was cited in a news article, discussing the same reformulations as above, at about the same time period; however, in the media article the emphasis is on consumer acceptance and taste, and therefore a business frame.

For health improvements to be successful, we have to make them in a way that consumers accept the change, which means no compromise on taste," said [name], the company's chief health and wellness officer. "We opted for a stealth health approach of making small incremental changes over time" (Jargon 2014).

This contrast between the public framing of reformulation in newspaper articles, and the framing of reformulation presented in direct dialogue with governments is highly indicative of the malleability of reformulation as an idea, what Smith (2013) terms chameleonic (as will be presented in Chapter 10). Not only has the term reformulation shifted in framing over time, different frames of reformulation can be used with different audiences for widely different purposes. The industry's submissions to the DGAC consultation demonstrated large elements of their corporate political strategy, in which a key element is emphasizing the industry as a partner in health-related initiatives; it is therefore

unsurprising that a health frame of reformulation prevailed in the consultation analysis. In the media, however, the industry must appeal to multiple audiences, chief among them their shareholders and investors, who wish to know how reformulation can serve the business-interests of the company. This may explain why, even when a news article as a whole framed reformulation politically (e.g. as a response to a government policy change), business actors quoted within emphasized business-related elements by citing reformulation as a response to increased consumer demand for healthier products (data for this finding can be found in Paper 4 above). However, it is important to note that the industry also seeks to create consumer demand through product promotions and marketing, and therefore the 'consumer demand' argument of the industry is not as straightforward as it was presented in the news articles.

10 HOW REFORMULATION BECAME A PROMINENT PUBLIC HEALTH APPROACH

This chapter provides an analysis of the findings from this research through the Political Priority Framework (PPF). Central to the PPF is the concept of power – of actors, ideas, contexts and characteristics of the issue (Shiffman & Smith 2007). Reformulation has each of these factors: powerful actors supporting it, powerful ideas that appeal to multiple sectors of stakeholders, and favourable contexts and characteristics. These factors together provide insights into how and why reformulation has become a priority public health approach in recent years.

This chapter synthesizes the data from all three methods and is intended to provide an overview of the findings of this research by crosscutting the data according to the four categories of the PPF. It builds on and incorporates the findings of the previous four results chapters.

ACTOR POWER

Within the PPF, actor power refers to: “the strength of those who participate in [an initiative], in the quality of linkages between these actors, and in their collective capacity to confront opponents” (Shiffman & Smith 2007, p.1371). Defined in this way, actor power is closely related to the concept of advocacy coalitions from the Advocacy Coalition Framework (Chapter 3), which focuses on how coalitions of actors form around their core beliefs and work together to influence the policy system, and therefore this section pulls heavily from the data assessing belief systems and coalitions within the interview participants (Chapter 7).

In assessing the actor power behind reformulation, it is important to note that it has the support of actors from two powerful groups within the policy subsystem: the food and beverage industry and the government. It has also garnered cross-sector support among NGOs and academia and has potentially fostered the formation of coalitions. These factors supporting the rise of product reformulation into prominence were explored in-depth in the industry strategy (Chapter 6) and coalition (Chapter 7) chapters respectively, but are briefly presented here in the context of the Political Priority Framework.

POLICY COMMUNITY COHESION

Reformulation has broad support from a wide variety of actors within the nutrition policy subsystem, and this research indicates that the individuals and groups who support

reformulation may have coalesced into a policy coalition based on a common belief system, as theorized by the ACF and described in Chapter 7. A group of individuals interviewed in this research aligned on a common belief of working collaboratively with the food and beverage industry on nutrition issues, and supported reformulation as a way to improve the nutrition of Americans; these actors are referred to in this thesis as belonging to the ‘work with industry’ coalition. According to the ACF, an advocacy coalition is able to overcome traditional sector boundaries because they hold a shared common belief and agree on a preferred policy option (Sabatier & Weible 2007). The participants who expressed the ‘work with industry’ belief spanned individuals and organizations from the food and beverage industry to health-oriented non-profit organizations. These individuals and groups were also active members of existing cross-sector partnerships and collaborative reformulation initiatives (e.g. Healthy Weight Commitment Foundation 2016; Partnership for a Healthier America n.d.), giving further support to the notion that a coalition has formed around the ‘work with industry’ core belief.

The coherence of the ‘work with industry’ coalition is one important factor explaining how reformulation became a prominent public health policy. As Shiffman (2007) describes, cohesive groups:

...agree on basic issues such as how the problem should be solved [and] are more likely to acquire political support than are those that are divided by such issues, since politicians will be more likely to listen to those in agreement as authoritative sources of knowledge (Shiffman and Smith, 2007, p.1371).

Therefore, it is not only that this group held common beliefs and supported reformulation, but also that there are powerful actors within this group, and that they have worked together to see reformulation – one of their preferred policies – become a political priority.

However, it is beyond the scope of this research to assess if the coalitions formed because of an existing belief system – ‘work with industry’ – or if the existence of the formalized partnerships and coalitions fostered the belief system. However, by adding the view of the Multiple Streams Framework (MSF), which theorizes about the conditions and circumstances leading to certain policies emerging at certain times, voluntary reformulation partnerships can be seen as a factor that “greased the wheels” and laid the groundwork for broader support of voluntary reformulation and a ‘work with industry’ approach. Therefore, this research suggests that the partnerships helped further the belief system.

Formalized reformulation partnerships have also fostered the ‘work with industry’ coalition in that they have enabled significant interaction and coordination among those in favour of reformulation across many sectors. In particular, these partnerships have included or were started by powerful multinational food and beverage corporations. When these corporations join partnerships, including those addressing reformulation, they bring with them a variety of types and resources of power, prime among them their finances and the strength of capacity that brings (Haufler 2001). The power of the food and beverage industry within these partnerships, and that reformulation aligns with the industry’s corporate political strategy (Chapter 6), is an important factor in explaining how reformulation became a prominent policy. Furthermore, the partnerships have provided legitimacy to the industry’s claim that they are part of the solution, in line with their corporate political strategy to avoid or pre-empt public health regulations (Chapter 6). For example, evaluations of the Healthy Weight Commitment Foundation – an industry partnership – and the reformulations undertaken by Walmart have shown reductions in calories and specific nutrients in the food supply (Taillie et al. 2015; Ng et al. 2014). Though these reductions have been criticized – as being at levels unlikely to improve health, and reflective of broader shifts in the purchasing habits of consumers rather than concerted industry efforts (Mozaffarian 2016b) – the findings of these evaluations have nonetheless been used by the food and beverage industry as examples of the success of voluntary reformulation and as a means to garner further support for voluntary approaches (Chapter 6). For example, on its website Walmart emphasizes that its reformulations were a success “before federal mandates”:

...we’re constantly looking for ways we can help people live better – oftentimes, before federal mandates like these [for trans fats] are handed down. In fact, by the end of this month, we anticipate having successfully removed all partially hydrogenated oils from Walmart private brand food – such as Great Value – sold in our U.S. stores, a goal we’ve been working toward since 2011 (Meckowski 2016).

Likewise, the Healthy Weight Commitment Foundation describes their reformulations as a “significant accomplishment” that have been praised by public health groups:

The Foundation’s food and beverage company members have removed 6.4 trillion calories from the food supply by changing the recipes of existing products, introducing new lower-calorie products, and providing single-serve options. This significant accomplishment was evaluated and independently verified by the Robert Wood Johnson Foundation and received an award from the Partnership for a Healthier America, chaired by First Lady Michelle Obama (Healthy Weight Commitment Foundation 2016).

In addition, the food and beverage industry has formed reformulation partnerships and joint-initiatives among themselves, for example the Healthy Weight Commitment Foundation, a non-profit group formed largely of food and beverage industry actors, undertook a calorie reduction pledge (Healthy Weight Commitment Foundation 2016). In these initiatives, companies that would normally be in direct competition with one another are jointly supporting and undertaking reformulation. Previous research into the tobacco and alcohol industry has found that companies may be deeply divergent and competitive as individual companies, but that coalitions can form when they see a common policy threat (Ong & Glantz 2000; Hawkins & Holden 2013). As Chapter 6 outlines, reformulation likely forms part of the food and beverage industry's broader corporate political strategy to prevent restrictive or mandatory public health policy, which would also help to explain *why* reformulation partnerships have been formed and a 'work with industry' belief system promoted.

LEADERSHIP AND GUIDING INSTITUTIONS

Within formalized reformulation partnerships and in the 'work with industry' coalition there are a number of strong leaders and institutions supporting reformulation, including current and former members of the U.S. government. These include among them the Alliance for a Healthier Generation, co-founded by the foundation of past President Bill Clinton, and First Lady Michelle Obama, a vocal champion of voluntary reformulation who made childhood obesity a household concern with her widely publicized Let's Move! campaign (Alliance for a Healthier Generation 2016; Let's Move! n.d.). These organizations, partnerships and individuals featured prominently in the media analysis (Chapter 9), and were frequently cited in the interviews as a factor contributing to the prominence of reformulation (Chapter 7).

The reformulation partnerships discussed above, particularly the Healthy Weight Commitment Foundation, also serve as powerful coordinating and guiding institutions in support of reformulation. As the food and beverage industry has been a strong opponent to many nutrition policies that have been on the agenda in the U.S. (Nestle & Wilson 2012), their support for voluntary reformulation is a notable departure and serves to focus attention on the issue. The industry's trade associations are also prominent supporters of voluntary reformulation and actively promote the reformulations undertaken by their members, which was particularly visible in the consultation analysis (Chapter 6).

CIVIL SOCIETY MOBILIZATION

The interviews undertaken for this research found that another group of individuals and organizations aligned on the belief that nutrition policy should be government-led (Chapter 7). This approach would preclude the reformulation initiatives in the US, as they're currently voluntary and typically not federal government-led (the FDA's ruling removing the 'generally recognized as safe' status of partially hydrogenated oils is a notable exception. Likewise, if enacted, the voluntary salt reduction initiative proposed by the FDA in June 2016 would also be an exception to this (U.S. Food and Drug Administration 2016b)). However, while this group shared the common belief of government-led public health policy, they held widely varying views about the value and utility of reformulation as a public health approach, and did not have a clear alternative policy that they were collectively in favour of.

The consequence of these fractions and divisions within and between public health actors (Chapter 7) is that those who are unsupportive of reformulation are not as cohesive as those in support of it. These fractions are in particular contrast to the food and beverage industry, which employs a highly similar policy narrative and framing when discussing reformulation (Chapter 6), and interview participants belonging to the 'work with industry' coalition echoed this narrative (Chapter 7). As the 'government-led' group were divided in their views on reformulation it was not possible to identify a consistent or cohesive counter-narrative or counter-framing (Chapter 7), and thereby arguments in support of reformulation are relatively uncontested in the public and policy debate. The uncontested nature of the pro-reformulation narrative was also visible in the DGAC consultation responses analysed (Chapter 6), where the contributions from actors in support of reformulation were significantly more numerous and cohesive than those not in support of reformulation as a public health approach.

Also, though the public health actors in the US have had a high level of interaction and coordination in efforts to enact sugary drinks policies (Healthy Food America n.d.; Public Health Advocates 2016), a similar level of collaboration has not crystalized around reformulation, therefore giving further support to the notion that the 'government-led' group has not formalized into a coalition around reformulation. This may be largely explained by the diversity of views on reformulation within the 'government-led' group – and because common sense would suggest it is easier to coalesce on policies you agree with, rather than what you would argue against. Or it may be that the public health community sees no reason to mobilize against reformulation, particularly as public health

actors may have partial or conditional support for reformulation as a policy (Chapter 7). However, the lack of a counter-coalition against reformulation has implications for the public debate on reformulation, and this was visible in the media analysis, which found newspaper coverage of reformulation to be largely positive and supportive of the approach and with a dominant presence of the food and beverage industry among those who were quoted in the articles (Chapter 9). Taken together, all of this suggests there is little evidence of civil society mobilization against reformulation, which is another factor helping to explain its rise into prominence as a public health policy.

In summary, reformulation has had the support and guidance of powerful actors in formalized partnerships around a common belief system of working collaboratively with industry. Those not aligning to this belief system have fractured views on reformulation as a public health policy and therefore there is limited civil society mobilization against it. Combined, these factors help explain how and why reformulation reached its position of prominence within the public health agenda. Furthermore, as will be explored in the following section, reformulation as an idea has also been powerfully framed, which helps to explain how, as a concept, it has appealed to actors across multiple sectors – and therefore helped to form the coalitions described above – and why it has been accepted within the policy subsystem as a promising policy approach.

IDEAS

The concept of ideas in the PPF refers to how an issue is framed, a central conceptual lens of this research (Chapter 3). Ideas can be framed in multiple ways, which appeal to actors within or outside of the coalition or subsystem (internal or external frame). Strong internal frames “provid[e] a common understanding of the definition of, causes of, and solutions to the problem” (Shiffman & Smith 2007, p.1372). While external frames “move essential individuals and organizations to action, especially the political leaders who control the resources that initiatives need” (Shiffman & Smith 2007, p.1372). This section will outline three ideational factors that have contributed to reformulation’s prominence: it is a chameleonic idea (Smith 2013) with multiple framings that appeal to internal and external stakeholders, and it aligns with two existing framings of nutrition policy in the US: nutrient-based policies and individual responsibility.

CHAMELEONIC FRAMING OF REFORMULATION

As presented in Chapter 9, reformulation has been discussed in US newspapers since the 1980s. However, over time, its framing has shifted from being a solution to a business

problem to also being a solution to public health and political problems. A consequence of these multiple framings of reformulation is that, as a concept, it has the ability to appeal to many groups and stakeholders. When reformulation is framed as a business issue, the emphasis is placed on sales growth and competition gains that can be generated by reformulation. This frame was largely dominant in the media analysis. However, starting in the early 2000s, when the food and beverage industry began to feel under threat from a political focus on the causes of obesity, the framing of reformulation became progressively political, focusing on reformulation as a policy solution to obesity and NCDs. The health framing of reformulation is closely related to both the business and political frames, as appealing to health conscious consumers is an impetus for generating business growth, and health-focused reformulations became a central component of the policy solutions to obesity and NCDs. As can be seen from the intertwined nature of the framings, discussing reformulation in one way over another can appeal to different sets of stakeholders at the same time (Chapters 7, 8 and 9).

An idea that simultaneously appeals to multiple groups and actors can be referred to as chameleonic. Such ideas “deliberately encapsulate multiple meanings” which means that in different contexts they “may look the same, but, once unpacked, the content may appear remarkably different in each context” (Smith 2013, p.192). With three predominant framings, reformulation, as a single concept, is able to address multiple problem/solution pairings. From the perspective of the food and beverage industry, it means that reformulation can: help in reducing the risk of restrictive or mandatory government regulations; promote partnerships and long-term relationships with government representatives and civil society by positioning the industry as part of the solution; result in new products and potential sales opportunities; generate positive brand image; and increase their products’ appeal to health conscious consumers (Chapter 6). From the civil society/NGO perspective, it means that reformulation can address health concerns by making progress on public health nutrition policy goals, without invoking significant counter-lobbying from the food and beverage industry (Chapter 7).

Framing reformulation as part of the solution to obesity and NCDs also appeals to policy makers, who are under increasing pressure to take action but face significant political constraints. Importantly for policy makers, chameleonic ideas are more likely to be adopted into policy (Smith 2013), as their broad appeal among stakeholders should help prevent substantial lobbying against the policy. When reformulation is framed politically, actors

who are working to establish public health nutrition policies respond positively, as do actors from the business community, who see reformulation as a way to ease the political pressure they're facing and can potentially achieve a growth in sales from the reformulated products. Even those interviewees from the public health community who expressed reservations of the potential health impacts of reformulation (health frame), were able to agree that it is one of many solutions that is able to be carried forward politically (political frame) (Chapter 7).

Furthermore, framed in this way, as a solution to obesity and NCDs, reformulation also appeals to the general public, who want to improve their health but may be increasingly confused about nutrition advice (related to the "swinging pendulum" of nutrients described in Paper 3, Chapter 8) and may not wish to discontinue eating their favourite products in the name of health (discussed further in the section on effectiveness).

The chameleonic nature of reformulation as an idea is embodied by the work with industry coalition. Though actors within this group tend to frame and understand reformulation differently, through its chameleonic properties they are able to agree on reformulation as a solution to the various problems defined by their particular framing of the issue. This agreement allows for a coherent internal framing within the coalition: that though reformulation may achieve different aims for different stakeholder groups, it is a solution that they can work on together. To give an example, the changes that result from product reformulation can be on a spectrum from small reductions in one nutrient to major reductions in multiple nutrients of concern. This variation allows individuals or groups to have disparate interpretations of what a pledge to reformulate products would entail. The food and beverage industry's consultation submissions described reformulation as a difficult process that is best implemented slowly, and that small changes in products are the most feasible (Chapter 6). And while some public health actors in the interviews supported reformulation and working with the industry as an approach, they also argued that not enough progress had been made and that small reformulations, or indeed reformulation itself, will not be enough on its own to reverse the trend of rising obesity and NCDs in the United States (Chapters 7 & 8). However, because of the chameleonic properties of reformulation, including ambiguity in how much of a reduction is necessary for reformulation to be a success – and an apparent desire on the public health side to encourage further progress – these groups with differing views on reformulation are able to formally work together in reformulation partnerships.

Thus, by being chameleonic and encompassing multiple framings, reformulation is able to garner both internal – within the ‘work with industry’ coalition – and external support, both of which help to explain why it has come into prominence as a public health nutrition policy. However, being chameleonic is not the only ideational strength of reformulation, and the two next sections will outline how reformulation benefits as an idea from aligning with two overarching frames/paradigms of nutrition policy in the US: individual responsibility and a nutrient-based definition of nutrition.

THE INDIVIDUAL RESPONSIBILITY FRAME AND THE FOODS/NUTRIENTS PARADIGM

The dominant framing of nutrition in the US is one of individual responsibility (Kersh 2009), and this section will use findings from this research to demonstrate how aligning with this frame further explains how and why reformulation became a public health nutrition policy. In the individualism frame, the problem of poor nutrition arises due to an individual’s eating and physical activity habits, education level and willpower – or, as is often implied, lack thereof (Dorfman & Wallack 2007). Following this frame, nutrition policies would target an individual’s level of nutrition education or focus on enabling individual behaviour change. The individualism frame is a prominent feature in many policy debates, as it is dominant in American culture more broadly, but it is also prevalent in nutrition policy debates because the food and beverage industry has been shown to promote it (Lakoff & Rockridge Institute 2006; Kersh 2009). In framing nutrition as an individual’s responsibility, the industry is able to deflect attention and responsibility for the problem of poor nutrition from being attributed to them; assigning or avoiding responsibility attribution is an inherent aim of framing and reframing (Stone 2012). In the US setting, assigning responsibility is broadly equated with assigning control (Stone 2012), and therefore, if the industry is attributed with responsibility for obesity and diet-related NCDs, then they are also the party who has the control to change the situation. However, achieving this attribution, and the implied control that comes with it, is the aim of those stakeholders promoting an environmental and corporate responsibility frame, the counter frame to the individualism frame. In this frame, the problems of poor nutrition and obesity are defined as a result of an unhealthy food environment, in which the food and beverage industry plays a determining role.

On the surface, food and beverage product reformulation appears to fall somewhere between the two frames of personal responsibility and environments (Kersh 2009). It is commonly described as a strategy to help consumers make the healthy choice more easily (Winkler 2013; van Raaij et al. 2009), which invokes the personal responsibility frame of

choice. Therefore, in reformulating, the industry is able to appease their critics and relieve the political pressure to act. However, they do so in a way which does not implicate themselves as responsible for the problem, even though they are taking actions which they self-describe as being part of the solution (Chapters 6, 7 and 9). Yet, reformulation also satisfies proponents of the environmental frame of nutrition – as it is an action under the responsibility of the industry it can also be seen as a market-level approach (Brambila-Macias et al. 2011b) (Chapter 7). Therefore, reformulation appears to fit within both of the competing overarching frames of nutrition policy, another of its chameleonic properties.

However, the public framing of reformulation, as discernible from the media analysis (Chapter 9), aligns much more closely with that of individual responsibility. In the newspaper articles analysed, the industry frequently presented reformulation as a solution to help consumers make healthier choices, and emphasizing consumer choice is a key strategy for implying an individual responsibility frame. Thereby, focusing on consumer choice implies that though the food industry is providing alternative choices, it is not the responsibility of the industry if the consumer continues to make poor choices. For example, one news article quotes a business actor as saying:

I don't think it's up to a retailer to make a decision for a patron, but we are giving them an option (Horn & Crabtree 2007).

Likewise, this newspaper quote describes how companies are “trying” but that it is “up to consumers...to change...”

Offering products with reduced sugar content or fortified with vitamins is ‘a good PR move,’ said Laure Klein, vice president of Just Kid Inc., a Connecticut market research company that develops new product concepts and advises many food companies on their product lines. The new offerings can show a company is trying ‘to address the issues of making healthier offerings,’ Klein said. ‘It’s up to consumers to decide whether to accept and change their lifestyle and habits’ (Mayer 2005).

An individual framing of nutrition was echoed in the consultation analysis (Chapter 6), which found that though the industry was promoting their voluntary reformulation initiatives as part of the solution, they sought to minimize the potential blame attributable to their products and used their consultation responses to emphasize consumer choice and nutrition education, thereby maintaining an individualism frame of nutrition. Furthermore, the health and political framings of reformulation identified in the media analysis (Chapter 9) are predicated on the belief that reducing specific nutrients within ultra-processed foods

will improve their nutrition profile and health impact – a nutrient-focused view of nutrition policy that was explored in Paper 3 (Chapter 8). In and of itself, the nutrient-focused approach to nutrition and nutrition policy in the US inherently supports a nutrient-focused approach like reformulation. Furthermore, the consequence of the nutrient-focused view of reformulation and nutrition policy is that all processed foods can theoretically be improved to fit into a healthy diet. This sentiment is encapsulated in the view that ‘there are no bad foods, only bad diets’ – a position supported by the American Academy of Nutrition and Dietetics (“...all foods can fit into a healthful eating style...” (Freeland-Graves & Nitzke 2002)) and the food industry (Scrinis 2013). It could be argued that this view of nutrition places the blame for unhealthy diets with the consumer – if an individual’s diet is unhealthy it is because they chose the wrong foods with which to compose their diet – and is therefore individually focused. However, this ‘all foods fit’ view is in conflict with increasing evidence showing that there are some foods that would be better excluded from the diet entirely, or eaten with such infrequency as to be a very minor part of the overall daily diet (Monteiro et al. 2011). This issue was also discussed in the interviews, for example one interview participant from government said:

...I applaud those manufacturers who are really taking reformulation seriously...However, on the other hand, I’ll throw this out there because this always comes up in these discussions, the whole ‘all foods fit’ mantra. There are some extremely processed foods that I don’t think should fit anywhere...and so I think there’s a threshold there. – 5078 (Government)

There is also a growing view that it is not logical to expect consumers to be responsible for their ‘choice’ when that choice is a widely available and heavily promoted food which has been designed to appeal to their innate desires (Moss 2013; Brownell & Gold 2012). In particular, it has been argued that ultra-processed products are designed by the industry to promote frequent consumption by creation of the “bliss point” (Moss 2013). This view was reflected in the interviews as well, with one participant from academia saying:

...the companies are extremely good about manipulating food ingredients to maximize consumption. Now whether they do this intentionally, to create an addictive process, I don’t know. But it certainly, that could be one of the outcomes [of reformulation], intended or not. – 1151 (Academia)

Thus, though reformulation may appeal to the sentiments of an environmental frame, with deeper assessment of findings from this research it can be seen as aligning more readily with the individualism frame. In comparison to other nutrition policies that aim to reduce consumption of ultra-processed products, reformulation aligns with and perpetuates the

'no bad foods' view of nutrition, thereby emphasizing an individual framing of nutrition policy and legitimizing the place of ultra-processed products in the diet.

However, though it is argued here that reformulation – as it is currently framed and used in the public domain – aligns with an individualism framing of nutrition, this argument does not dispute that it also *appeals* to those claiming environmental/industry causation of obesity and NCDs. Appealing to both the individual and environmental frames is another of the chameleonic properties of reformulation, enabling reformulation as a policy to garner broad support from disparate groups. This chameleonic framing, therefore, further helps to explain how a 'work with industry' coalition was able to coalesce around the issue of reformulation, and why reformulation has become a prominent public health policy. Furthermore, the individual/environmental framing debate is not the only overarching debate in nutrition policy in the US, and reformulation also benefits from aligning with the largely nutrient-based framing of public health nutrition as was explored in Paper 3 (Chapter 8).

POLITICAL CONTEXT

The previous sections outlined how reformulation has risen to prominence because it has gained broad support from powerful actors, and it has benefited from being a chameleonic idea that aligns with the dominant framings of nutrition policy in the US. This section will seek to explain why reformulation became prominent when it did by assessing the political context through the Multiple Streams Framework (MSF).

According to the MSF, the choice of a policy within the policy system at a particular point in time is "the collective output formulated by the push and pull of several factors" (Zahariadis 2007, p.66). In the MSF, "several factors" refers to three streams of problem, policy, and politics, and when they come together a political window opens allowing policy entrepreneurs the opportunity to enact their preferred policy. Shiffman describes these policy windows as "when conditions align favorably for an issue" (Shiffman and Smith, 2007, p.1372). The defining features of a policy window are summarized in Chapter 3.

The MSF, and the policy windows described within, as defined by Kingdon (1984), encompasses a number of factors that Shiffman alternatively places in different categories of the Political Priority Framework. In particular, some of what Kingdon refers to as the problem stream fits in with Shiffman's section on ideas and the problem defining function of framing, and some of what Kingdon places in the policy stream – notably "technical feasibility" – belongs in the characteristics section of the Political Priority Framework.

Therefore, some of the factors that would classically belong in a discussion of a policy window – according to Kingdon – are discussed in other sections of this chapter. However, though this section is primarily based on Shiffman’s conceptualization of the policy context, Shiffman refers specifically to ‘policy windows’ in the PPF and the Multiple Streams Framework is an overarching framework for this research. Therefore, this section is also informed by the notion of policy windows as defined by Kingdon.

This section will provide an overview of the policy window that aligned for reformulation in the early 2000s. It calls on data from the consultation analysis (Chapter 6), the interviews (Chapters 7 and 8) and the media analysis (Chapter 9).

REFORMULATION’S POLICY WINDOW

PROBLEM AND POLICY STREAMS

Beginning in 2001, there was a growing consensus and urgency to address obesity and diet-related NCDs on a national level, and obesity became prominent on the public health policy agenda in the US (Office of the Surgeon General (US) et al. 2001). This focus on obesity and NCDs has continued to increase, and has generated vast amounts of research into their causes, including around the growing interest area of environmental causes of disease (Morland & Evenson 2009). This environmental lens has subsequently led to an increased focus on the actions and products of the food industry (The PLoS Medicine Editors 2012), which has been bolstered by recognition of the limits of policies focusing on individual education and behaviour (Walls et al. 2009). It was in this period that reformulation came into prominence as a public health policy.

Furthermore, reformulation came about following a period of largely nutrient-based nutrition policies, including food labelling and nutrient-focused dietary guidelines, and so reformulation aligned with the prevailing view of nutrition at the time. For example, one interview participant from the government linked the rise in reformulation to the Nutrition Labeling and Education Act in 1990:

...although this would take you back 20 years, maybe it was the passage of the NLEA...maybe it just sort of slowly started the ball rolling. – 5898 (Government)

Likewise, a participant from academia connected the rise in reformulation to the past success of nutrient-specific approaches such as fortification to addressing undernutrition:

So, I think there are a couple of reasons. One of them is basically because nutrition is on the agenda. So given that nutrition gets basically attention over the past decades, specifically undernutrition, and I think that reformulation basically got

attention as an effective intervention for undernutrition originally. – 1151
(Academia)

As political attention on the industry continued to grow in the 2000s, one of their responses was to proactively reformulate their products to reduce certain nutrients of concern (Chapter 8). However, the industry had been reformulating their products for business purposes (e.g. improve flavour, gain a competitive advantage) since at least the 1980s (Chapter 9). That the industry was already reformulating – albeit for very a different purpose – meant that the industry could emphasize their reformulations when political pressure opposing them began to grow along with the obesity epidemic. In this way, the evolution of reformulation into a political process could be considered a “convergent” idea in the nutrition policy field: one that is a “rapid gestation of [an] old idea” (Zahariadis 2007, p.77).

For example, one interview participant from a public health NGO described how the industry would describe reformulation as being in response to “consumer demand,” but that it came about because of the “threat of legislation”:

Well, the industry would say, what I've heard them say is that they are meeting consumer demand, and that they are creating products that consumers are going to buy. And so I think that part of it is consumer demand. I think there's also another strategy of putting pressure on industry groups working through government, working directly with the industry through non-profit and consumer groups, to encourage them, to help them understand why it's important and holding a threat of regulation, whatever that might look like, over them as a reason why they would want to make changes voluntarily. – 8284 (Public Health/NGO)

This view was supported by the media analysis (Chapter 9), which found that the majority of the industry’s voluntary reformulation initiatives in the early 2000s were preceded by policy change and litigation against the industry.

POLITICS STREAM

Reformulation rose to prominence as a public health policy with the industry’s voluntary efforts in the early 2000s, and political support grew with the creation of reformulation focused public-private partnerships in the mid-2000s. In 2006, the Alliance for a Healthier Generation, a partnership between The Clinton Foundation and the American Heart Association, launched a voluntary initiative with major food producers to reformulate foods and beverages sold in schools (Alliance for a Healthier Generation 2006). In 2010, reformulation had a further rise in prominence due to the Let’s Move! campaign launched

by Michelle Obama, which had an explicit focus on reformulation (among other efforts) (Let's Move! n.d.). In conjunction with Let's Move!, the reformulation focused Partnership for a Healthier America was also founded in 2010, in which Mrs Obama is the Honorary Chair (Partnership for a Healthier America n.d.). All three of these initiatives and partnerships fostered collaborative relationships between the industry, public health professionals and the government, and helped reformulation to become a favoured policy option (Chapter 7). Furthermore, with the food and beverage industry supporting reformulation, it was reasonable to assume that it would face far less opposition in the policy process than other nutrition policies (Chapter 7).

However, typically, policy windows “are opened by compelling problems or by events in the political stream” such as a “new administration” (Zahariadis 2007, p.74). In the case of reformulation, this research suggests that the policy window for reformulation didn't fully open until Michelle Obama and the Obama administration put the full weight of the White House behind the policy, and publically discussed joint reformulation initiatives with Walmart and the National Restaurants Association (Stolberg 2011; Adamy 2010). Multiple interview participants described the highly influential role of the Obama administration in reformulation, as exemplified by the following quote from an academic:

And I do feel that part of [reformulation] is consumer awareness, part of it is that there's been a huge, huge, cheerleader on the side of all of this in the past 7 years, Michelle Obama. She has really made it much more visible, and you know I don't think we would have come this far without her. – 6388 (Academia)

Another participant noted that the Obama administration was able to focus attention on nutrition policies despite facing significant political challenges in the legislature:

Because the current sitting president has made food and health such a big objective, and that has cost him some political capital, and so I would just encourage you to at least mention the politics, mention the stymied congress, that the 113th was the least productive in modern history. – 8260 (Public Health/NGO)

Therefore, it was the opportunity of a changing administration, and the power, ideology and priorities they came in with, that allowed increased attention and political action on nutrition, including reformulation – or as Zahariadis described it: “opportunities ration attention” (Zahariadis 2007, p.75). Furthermore, though gaining political attention for nutrition was not without its challenges, reformulation had a number of factors in its favour. With the change of administration in the politics stream, attention was able to focus on reformulation as a policy because the problem of poor nutrition had been defined

as one of nutrients, there was broad consensus that poor nutrition and resulting obesity/NCDs were severe public health problems, and the industry was already voluntarily reformulating and promoting reformulation as their preferred policy option to address obesity and NCDs (Chapter 6). This is not to say that reformulation was the only policy receiving attention in this time period – indeed taxes on sugar-sweetened beverages were tremendously prominent on the agenda, among others (American Public Health Association 2012) – but to explain how reformulation came to be one of the prominent approaches on the national nutrition policy agenda.

In assessing reformulation’s policy window, it is important that high-level politicians and the food and beverage industry championed reformulation. According to the Multiple Streams Framework, “selection [of a particular policy] is biased by the manipulating strategies and skills of policy entrepreneurs, who couple problems, policies and politics into a single package” (Zahariadis 2007, p.77). As presented in Chapter 6, the food and beverage industry, in particular, has been adept at framing reformulation in a way that suits their preferences and in inserting that narrative and framing into the policy process. It is the industry’s framing of reformulation – that voluntary is more expedient and effective – that has been incorporated into the initiatives spearheaded by Michelle Obama. As a policy entrepreneur the food and beverage industry has been particularly successful, likely because they have a comprehensive corporate political strategy (Chapter 6) as well as the “resources and access” necessary to give ample time and attention to decision makers, who they can readily access. (Zahariadis 2007, p.78). The policy window that opened with the Obama administration remains open today, and reformulation continues to gain support. Most notably, in June 2016, the FDA announced a first of its kind industry-wide voluntary sodium reduction effort spearheaded by the government.

Figure 10.1 below combines data from the media analysis, punctuated with key reformulation related events, to demonstrate the shifting framing of reformulation over time and visually represent the policy window for reformulation as a public health policy that opened in the late 2000s.

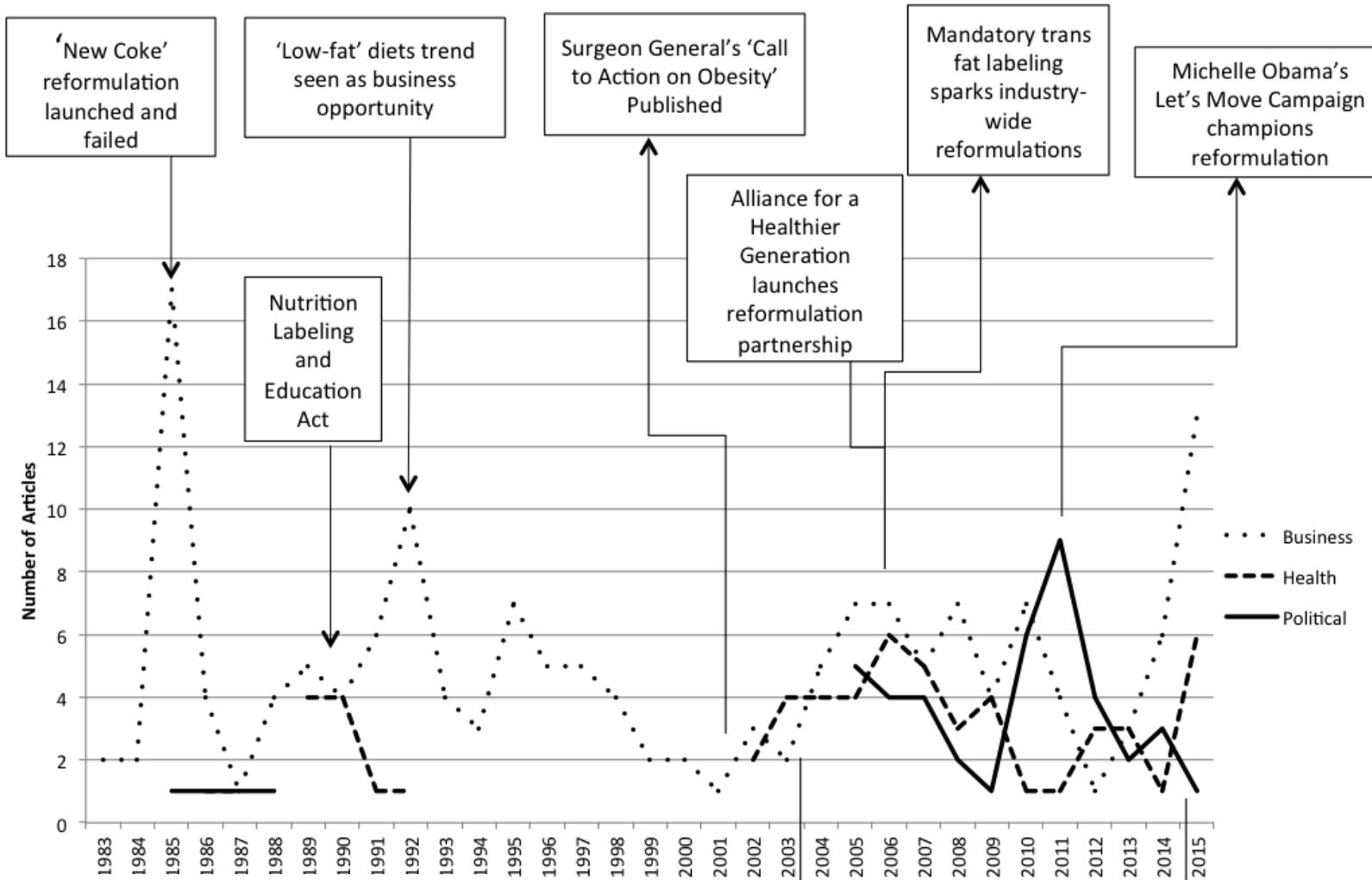


Figure 10.1: Framings from the media analysis, plotted by year and with key reformulation events indicated

ISSUE CHARACTERISTICS

As the above sections have demonstrated, circumstances aligned to open a policy window for reformulation in the early 2000s, in part because of powerful groups supporting reformulation and promoting a framing of reformulation that aligned with dominant ideas in nutrition policy. However, as this section will present, reformulation as an approach also benefits from certain characteristics that make it an *attractive* policy option. According to the Political Priority Framework, the issue characteristics that promote political prominence are credible indicators that are easily measured, that the policy addresses a problem of growing severity, and is an easy-to-implement, effective intervention. Collectively these factors mean that “some issues are intrinsically easier to promote” (Shiffman and Smith, 2007, 1372). As will be presented in this section, reformulation has two of these characteristics: credible and measurable indicators, and it addresses a severe health issue. The third characteristic, effectiveness, depends on the governance mechanism of the reformulation initiative – with voluntary reformulation having limited effect. Yet, as this thesis has shown, whether or not a stakeholder believes reformulation to be an effective policy depends on their broader view about nutrition policy (e.g. ‘work with industry’ in Paper 2 and the foods/nutrients paradigm in Paper 3).

CREDIBLE INDICATORS

Reformulation lends itself well to having credible and measurable indicators of progress, as pledges and policies can set quantitative targets for nutrient or calorie reduction to be achieved within a certain timeframe. Not all reformulation initiatives in the US have set quantified targets, but many have, including the Healthy Weight Commitment Foundation, commitments by individual companies, the National Sodium Reduction Initiative and the June 2016 proposed FDA voluntary sodium reduction targets (Slining et al. 2013; Meckowski 2016; U.S. Food and Drug Administration 2016b; The NYC Health Department n.d.). A typical quantified reformulation pledge is demonstrated in the following quote from an industry-sector interview participant:

[Company] has a commitment to reduce, in our beverages, sugar by 25 percent per serve by 2020. Which is a huge task. Huge. – 4284 (Industry)

The measurable nature of reformulation raises both benefits and challenges for public health goals. As the following quote illustrates, the quantified reporting on reformulation pledges can facilitate progress tracking and enable the public health community to encourage the industry to continue making further reductions in their products.

I say, great and then next year you're going to take out another 10% and then next year you're going take out another 10% and we're going to be able to applaud you every year for the next 10, right. – 6343 (Public Health/NGO)

Likewise, the following participant from government described how nutrient based targets are easier to do a “compliance check on.”

But I think the type of regulation that we have is easier to regulate. It's easier to put in place, and it's easier to do a compliance check on, right? It's much more straightforward, so I think that that's what policy makers think about, it's like oh it's easy to do x, y, and z and we can check x, y, and z. – 7126 (Government)

However, the quantifiable and measurable nature of reformulation also poses challenges for public health goals, as the nutrient specific targets can also represent only small changes within an otherwise unhealthy product. Or as this participant described: “teeny weeny little microscopic changes.”

...unless we are talking about, and I think this is sort of controversial too, unless we are talking about stopping making and selling and advertising these products, and selling whole foods, then, then I just think we're talking about teeny-weeny little microscopic changes that really just perpetuate the system. Because if all we have to do is change the size of the box or take you know the fat down and put the sugar up (or vice versa). – 1088 (Academia)

Likewise, a government participant argued for the need to “get away from the notion that they would be ok just with a small reformulation” (3331 – Government), indicating that reformulations to date haven’t been sufficient.

However, despite these voices of dissension, analysis of the media (Chapter 9) has shown that by and large, arguments in the public domain are largely supportive of reformulation. It is seen as a logical and credible solution to the problems of obesity and NCDs, and is a logical policy under the nutrient-based framing of public health nutrition (as described in Paper 3, Chapter 8).

SEVERITY

Likewise, reformulation has become a prominent public health approach as the obesity and NCD epidemics have become severe public health issues in the US. Along with a growing sense of urgency to enact public health measures against obesity, political attention has begun to focus on the role that food and beverage companies and their ultra-processed foods play in promoting obesity and NCDs. The U.S. Surgeon General’s report on obesity in 2001 highlighted the role of industry by saying:

Industry has a vital role in the prevention of overweight and obesity. Through the production and distribution of food and other consumer products, industry exerts a tremendous impact on the nutritional quality of the food we eat and the extent of physical activity in which we engage. Industry can use that leverage to create and sustain an environment that encourages individuals to achieve and maintain a healthy or healthier body weight (Office of the Surgeon General (US) et al. 2001, p.28).

It is notable that this statement from the Surgeon General is broadly in line with a ‘work with industry’ belief system (Chapter 7), and that it is individually framed (“encourages individuals”); it thereby further supports the arguments made in the Ideas section above.

In the later 2000s, academic research and popular lay books began to focus on the hypothesis that ultra-processed foods are engineered to be palatable and encourage consumption, and that high consumption of ultra-processed foods is associated with obesity and NCDs (Monteiro et al. 2011; Moss 2013; Kessler 2009). However, the attention on ultra-processed foods grew when many food and beverage companies were already reformulating, so this was likely a factor in encouraging further reformulations, rather than its initial impetus.

The severity of the obesity and NCD problems facing the US, however, also prompted some participants to question whether reformulation was a strong enough public health response (Chapter 7). For example, one NGO participant said:

...Going up to 60, 70, 80% of the population being overweight or obesity...I mean if you look at the indicators, you can talk as much as you want about self-reformulating and so on, but the indicators aren’t showing any real progress yet. And that’s a problem. – 6045 (Public Health/NGO)

EFFECTIVE INTERVENTIONS

Previous evaluations of the health impacts of voluntary reformulations have shown limited effectiveness (Curtis et al. 2016; Knai et al. 2015; Elliott et al. 2014; Savio et al. 2013; Mozaffarian 2016b; Taillie et al. 2015). Participants in this research discussed the effectiveness of reformulation from the view of two separate but intertwined issues: the effectiveness of reformulation itself, as an approach, and the effectiveness of the various governance and implementation mechanisms used in reformulation initiatives. Indeed, the data from interviews conducted in this research suggests that whether public health actors support reformulation as an effective approach varied depending on its governance structure, and in particular if it were undertaken in collaboration with industry actors (Chapter 7). Many interview participants also argued that reformulation on its own would

not be enough to induce significant dietary improvements in the US, and that they would only support reformulation if it were one part of broader efforts to improve diets in the US (Paper 2, Chapter 7), such as was the case with the comprehensive – and successful—salt reduction initiative in Finland and trans fatty acid reductions in Denmark (Bech-Larsen & Aschemann-Witzel 2012; Restrepo & Rieger 2016; Laatikainen et al. 2006). Others, however, did not support reformulation for they felt that reducing nutrients within food and beverage products would be less effective than enacting policies which would help to limit overall consumption of the type of products targeted by reformulation (Paper 3, Chapter 8).

That being said, the public perception of reformulation, as evident in the media analysis, was positive, with arguments in favour of reformulation more common than arguments against it in the newspaper articles analysed (Chapter 9). Furthermore, reformulation has many strong appeals in its favour beyond direct evidence of its effectiveness. As argued by Smith (2013), ideas can be more powerful than evidence in policy situations, and the reformulation approach, as an idea, has many common sense and ideational appeals (also discussed above in the ideas section). The basic approach of improving existing products has been effective for treating nutrient deficiencies and as a solution to undernutrition – as illustrated with the quote by participant 1151 in the policy window section above. Furthermore, common sense and the nutrient-framing of nutrition suggest that reformulation should work, and that it would be a much easier solution than trying to regulate change in the broader food environment. In particular, voluntary industry-driven reformulation, unlike many other public health interventions does not require government funding and implementation, so it is cost-effective from the government budget perspective. As the interview participant below described, it is therefore “politically feasible”:

I think that with respect to some policy areas there are, there are sometimes benefits of [reformulation] being voluntary, and sometimes has benefits of being mandatory. I'm trying to think about what a mandatory policy might look like, with respect to added sugar reformulation. I can't think of one that would be legal and two that would be politically feasible in this type of political environment, so I really think that working voluntarily with food and beverage industry and through government to provide incentives and encouragement, for the types of changes that we want to see, is the best strategy in this area. – 8284 (Public Health/NGO)

However, another public health participant highlighted that working with industry on initiatives like voluntary reformulation has become an “ideology” out of necessity:

Well I would say in the first place, a focus, too much focus on reformulation takes the wind away from other alternatives. And in terms of feasibility, I mean that is the problem. It's because of this whole ideology that's really sweeping around, this is seen as the palatable alternative because it's working with industry, because without that you can't make anything happen. – 6045 (Public Health/NGO)

From the lay perspective, and to many public health professionals, reformulation appears relatively simple for the food industry to implement (though the industry has many justifiable reasons for why this is not the case – as discussed in Chapter 6). Lastly, from the consumer perspective, reformulation gives the impression that they can continue to consume their favourite products and be healthier while doing so (as is presented from the perspective of the public health community in Chapter 7). This view was discussed in the interviews, as summed up below by a participant from academia:

...so potentially for example 5 percent a year or every six months, is feasible in terms of a, reducing the levels in the food without affecting consumer choice, because that's something that public health groups often forget about, is that consumers want things that taste good so they don't really care if its 10 percent lower in sodium in the product. – 7560 (Academia)

In summary, reformulation is a response to a public health problem with growing severity and political attention, and it has credible and measurable indicators. Furthermore, though empirical evidence shows limited effectiveness, common sense and past experience with undernutrition and fortification lend appeal to reformulation and the public perception of reformulation is overall positive. These characteristics of reformulation further help to explain why it has become a prominent public health nutrition policy in the US.

CHAPTER CONCLUSIONS

Assessing reformulation through the Political Priority Framework provides multiple indicators for how and why reformulation has become a prominent public health nutrition policy in the US. Firstly, a number of powerful actors support the approach, and the issue has garnered broad support from a coalition formed around the core belief of working together with the industry. Secondly, reformulation is a chameleonic idea which benefits from multiple framings, and which aligns with the dominant nutrition policy framings of individualism and nutrients. Thirdly, the political context in the early 2000s created an opportunity for a policy window to form, which fully opened with the incoming of the Obama administration and Michelle Obama championing a nationwide initiative against childhood obesity. Finally, reformulation has credible and measurable indicators, and

common sense would suggest it should be effective, even if empirical evidence thus far suggests its effectiveness is limited.

11 DISCUSSION

Effectiveness of voluntary reformulation – as a standalone policy – is limited at best.

Voluntary initiatives to date in the UK, Australia and the US have only resulted in minimal reductions in nutrients/calories and have been criticized as unlikely to result in improvements to health (Savio et al. 2013; Elliott et al. 2014; Knai et al. 2015; Mozaffarian 2016b; Taillie et al. 2015). In the US, the National Salt Reduction Program by the NYC Health Department led to small reductions in sodium content but not to levels likely to improve health (Curtis et al. 2016). Likewise, the Healthy Weight Commitment Foundation – a food and beverage industry funded partnership – resulted in calorie reductions (Ng et al. 2014), but those calorie reductions have been criticised as non-significant and resulting from declining consumer purchasing rather than the industry’s reformulations (Mozaffarian 2016b; Nestle 2014b). For example, Mozaffarian (2016) criticised the HWCF reformulation program as:

...a stroke of marketing genius, turning [the industry’s] steadily declining calorie sales into a novel opportunity for self-promotion, an easily publicized by deceptive sham pledge that merely reflected on-going trends (Mozaffarian 2016b, p.e10).

Yet reformulation has nonetheless become a prominent feature in nutrition policy in the US (and globally). The findings of this research suggest that reformulation was able to achieve such prominence for two main reasons: one, that voluntary reformulation forms part of the food and beverage industry’s strategy, and two that it is a “chameleonic idea” (Smith 2013) that aligns with multiple nutrition policy beliefs, frames and paradigms.

Ideas are powerful forces in policy processes as they are tied to the underlying values and assumptions of policy stakeholders (Smith 2013). They provoke both emotional and cognitive responses, can be incorporated into persuasive story-like discourse, and used by corporations and other policy stakeholders to shape policy processes (Smith 2013). In this research, reformulation as an idea – and the role of the food and beverage industry in propagating that idea – was found to be more powerful in influencing the policy process than evidence of reformulation’s effectiveness. This first part of the Discussion will summarize the industry’s role in promoting a reformulation approach, and what the story of voluntary reformulation in the US tells us about stakeholder dynamics in US nutrition policymaking. It will then turn to the power of reformulation as an idea, and reflect on what the findings of this research mean for the governance of future reformulation

initiatives. These conclusions are reached by synthesising the findings from all three data sources and the papers presented in this thesis.

INDUSTRY STRATEGY AND STAKEHOLDER DYNAMICS

The idea of reformulation as a public health policy – and its policy window – emerged following industry initiated reformulations in the early 2000s, as illustrated by the media analysis and the interviews (Chapter 10). During this time, the industry was *responding to* increasingly negative attention and pressure from the government and public health communities about the role of their products in obesity and NCDs. Numerous policy proposals and lawsuits were launched against the industry, which the industry sought to avoid or pre-empt with reformulation. Avoiding or pre-empting mandatory and/or restrictive policies is the aim of the industry’s corporate political strategy and, as the document analysis presented in Chapter 6 demonstrated, voluntary reformulation functions as one component of the industry’s strategy. In particular, product reformulation and the partnerships it is undertaken within are illustrative of the industry’s strategy to build collaborative relationships in the policy process where they are “part of the solution” – a finding also echoed by others (Miller & Harkins 2010; Mozaffarian 2016b; Ken 2014). This finding is further evidenced by leaked emails from Coca-Cola released in 2016 that revealed a close working relationship between the organisation and political actors, as well as demonstrating all categories of the corporate political strategy taxonomy presented in Chapter 6. The emails also make particular reference to reformulation as a strategy for the company to argue against proposals for taxes on sugar sweetened beverages (Pfister 2016).

However, though all three sources of data found the food and beverage industry to be heavily influential in promoting a voluntary reformulation approach, other stakeholders also played a role in crystallising political priority on the issue. In particular, the interviews revealed a cross-sector coalition including NGOs, government representatives and academics who were aligned in the belief on working together with the industry on nutrition policy. The interview participants in this coalition were supportive of and participated in reformulation initiatives – 11 of 34 interview participants held the work with industry belief, and none of them argued against the reformulation approach (Chapter 7). Furthermore, data synthesis through the Political Priority Framework (Chapter 10) and theoretical work using the MSF to establish the *policy window* for reformulation highlighted how the Clinton Foundation formed early reformulation focused partnerships with the industry (Alliance for a Healthier Generation 2006), helping to focus attention on the issue. Likewise, the Obama administration was a highly visible champion of voluntary

reformulation in the later 2000s (Let's Move! n.d.). These initiatives also built upon a history of nutrient-based nutrition policies and dietary guidelines in the US, which were set in place by the government and public health advocates and functioned as one of the underlying conditions that encouraged reformulation (Mancino et al. 2008; Mozaffarian & Ludwig 2010; U.S. Department of Health and Human Services and U.S. Department of Agriculture 2015b; Oppenheimer & Benrubi 2014; Kennedy 2008). However, the industry has also lobbied the US government to shift nutrition policies towards a focus on nutrients, particularly in the Dietary Guidelines (Oppenheimer & Benrubi 2014; Nestle 2002), illustrating a push-pull dynamic between policy actors and their priorities. The government influences the industry through its policies (e.g. nutrient-focused Dietary Guidelines fosters reformulation), but the industry also influences the government to insure that those policies are supportive of their businesses aims (e.g. industry lobbying led to nutrient focused DGAs). Or, in the words of one interview participant from the government: *"We provide these guidelines that are exactly what they [the industry] want them to be"* (3331-Government). From this perspective, it could be argued that other policy actors are playing a role in the script of the industry's political strategy – rather than writing the script themselves.

However, this push-pull dynamic between the food and beverage industry and other policy actors also has important implications for the assumed power of groups in political opposition to the food and beverage industry. In particular, the public health community has criticized the food and beverage industry for not 'going far enough' (Lewin et al. 2006; Ludwig & Nestle 2008; Monteiro & Cannon 2012; Mozaffarian 2016b). Yet, this point of view obscures the need for an inward-looking critique of the role and agency of the public health nutrition community within the nutrition policy process. The media analysis and data synthesis through the Political Priority Framework found that the industry began voluntarily reformulating in the early 2000s following increasing pressure from the government and public health communities (Chapters 9 and 10). Thus if public health actors argue that the industry needs to make further improvements, this criticism must not disregard the potential power of the public health community to influence that change by applying public and policy pressure. This is particularly important given the finding from the interviews that a number of non-industry participants were against or sceptical of reformulation but there was no evidence that they had come together in a coalition to argue against it or for its improvement (Chapter 7). While more than half of the interview participants were aligned in the belief that nutrition policy should be 'government led',

they were divided in their support of reformulation and did not demonstrate a coordinated alternative policy agenda. In contrast, such coalitions of actors have formed in the US around sugary drink policies, and they've been increasingly successful with soda taxes passed in major US cities in recent years (Nestle 2015). However, there has not been a specific coalition focusing on reformulation, which is a notable absence given the finding of this research that voluntary reformulation forms part of the industry's political strategy.

REFORMULATION AS A CHAMELEONIC IDEA AND NUTRITIONISM

The previous section outlined how policy stakeholders, and particularly the food and beverage industry, have been instrumental in advancing reformulation into a position of prominence in the US. However, the *idea* of reformulation itself has also been a powerful factor in its success. An ideational view on policymaking focuses on how ideas are exchanged and translated to influence policy (Smith 2013). Reformulation is a powerful policy idea because it is chameleonic in all three types of ideational influences as set out by Smith (2013): it aligns with multiple overarching paradigms (the 'work with industry' belief system and the foods v. nutrients paradigm), policy frames (the business, health and political frames of reformulation), and specific policy proposals (reformulation has the ability to assume both voluntary and mandatory governance mechanisms). Voluntary reformulation also follows the success of reformulation for trans fatty acids following mandatory changes to food labels in the US (Otite et al. 2013), and success from other government-led reformulation initiatives globally (e.g. the initially government-led salt reduction program in the UK which had progressive salt targets (He et al. 2014)). Though these successful initiatives employ vastly different governance mechanisms from the voluntary initiatives described above, they have nonetheless contributed to the success of reformulation as an *idea*.

The results of the media analysis highlight the chameleonic nature of reformulation as an idea, as it is able to embody multiple frames and therefore understandings and belief systems. For example, the business frame of reformulation emphasises commercial drivers and inhibitors of reformulation, while the health frame focuses on the potential health benefits of reformulation, and the political frame positions reformulation as a policy solution to the problem of obesity and NCDs. Reformulation can also be framed as targeting individuals – and therefore aligning with a deeply rooted emphasis on individual responsibility in US political debates (Stone 2012; Dorfman & Wallack 2007) – as well as being framed as an environmental-level solution to poor nutrition. These chameleonic properties of reformulation, and the multiple viewpoints they encompass, imbue

reformulation with political dexterity and help to explain how the cross-sector ‘work with industry’ coalition identified through the interviews could be unified in their support of reformulation despite holding different views on the purpose and value of reformulation as a public health approach (Chapter 7).

However, these chameleonic properties of reformulation also served to create tensions in non-industry stakeholder support for reformulation. The interviews demonstrated that stakeholder support for reformulation as a policy was influenced by their views and beliefs about the *idea* of reformulation and how it should be governed, rather than evidence of its effectiveness. Numerous arguments were made for and against a reformulation approach, including whether or not voluntary governance mechanisms were sufficient, concerns about conflicts of interest arising from working together with the industry, and qualms about the resulting overall health profile of reformulated products. The following participant from a Public Health NGO vividly demonstrated these arguments:

Um, this may sound a little jaundice, but from the kind of work that I do product reformulation to me is a somewhat cynical move on the part of industry to just sneak right under the standards so that they can market their junk food to kids in schools and sell the junk food to kids in schools. So you know tweak just enough. (5397 – Public Health / NGO)

These concerns echo those raised in previous research about the limitations of voluntary or partnership-based reformulation initiatives (Freedhoff & Hébert 2011; Panjwani & Caraher 2014; Knai et al. 2015). What this research adds is the finding that these arguments are predicated on underlying beliefs about how nutrition policy should be formulated (e.g. foods versus nutrients), how it is governed (e.g. the ‘work with industry’ belief system), or related to deeper personal values and worldviews (e.g. the role of the individual versus corporations). Among interview participants in this research, the distinction between voluntary and mandatory governance mechanisms for reformulation – a subject of much debate in public health (Bryden et al. 2013; Daube 1993; Magnusson & Reeve 2015; Savell et al. 2016; V I Kraak et al. 2014; Savell et al. 2014; Saloojee & Dagli 2000) – was conflated with the idea or principle of working together with the food and beverage industry on public health initiatives (Chapter 7). This was acutely illustrated in an interview with an academic, who said:

“its [reformulation] a term that's used by industry sympathetic public health and nutrition people. And an excuse to avoid making serious dietary recommendations that might actually improve health. Its, this is something in industry's best interest. They have a real problem. They're making junk foods and that's what people are supposed to eat less of and that message is getting out” (7982 – Academia)

Furthermore, the interviews found that stakeholders' support for the idea of reformulation, regardless of its governance mechanism, was influenced by their views on whether nutrient-focused approaches like reformulation adequately capture public health interpretations of what is meant by 'healthy' foods and beverages (Chapter 8). These tensions in beliefs have important implications for the nutrition policy agenda in the US, as will be discussed later in this chapter.

The interviews also highlighted that, as an idea, nutrient-based policies like reformulation are perceived to be more politically feasible than food-based policies, particularly as they are well suited to creating specific and measurable targets (Chapters 8 and 10). Therefore reformulation's nutrient-focus provides further strength to the ideational power of reformulation by imbuing it with a sense of political pragmatism. In contrast, food-based policies are typically multi-component and wide-reaching (for example, see the excellent Brazilian Dietary Guidelines (Brasília Ministério da Saúde 2014)), which is why though potentially more effective (Sievenpiper & Dworatzek 2013; Mozaffarian & Ludwig 2010), they are also difficult to encapsulate into one *idea*, let alone an idea as chameleonic as reformulation.

The nutrient focus of reformulation, however, is a political double-edged sword as it is also beneficial to the food and beverage industry's corporate political strategy (Nestle 2002; Scrinis 2016). As discussed in Chapter 8, the interviews highlight how it functions as a frame that focuses the policy debate on the inanimate object of 'nutrient' rather than the food and beverage industry and their products. It also enables the industry to maintain control over which nutrients to target with reformulation, while positioning itself as "part of the solution" – as demonstrated in all three sources of data. The consultation analysis also found that the nutrient focus of reformulation allows the industry to emphasise the positive nutrients in their products in communications with policy makers and the public (Chapter 6). All of these nutrient-related challenges of reformulation are emblematic of the broader limitations of a reductive nutrient-based approach to nutrition (Scrinis 2013; Scrinis 2016). Furthermore, synthesis of the data through the Political Priority Framework (Chapter 10), highlighted how the nutrient-focus of nutrition also allows for the view that all foods – including the industry's ultra-processed food and beverage products – can be part of a healthy diet, as all foods can theoretically be improved to fit into a healthy diet. Thus just as a focus on physical activity serves to deflect attention away from the industry's products (Gomez et al. 2011; Freedhoff & Hébert 2011), so too does a focus on nutrients, and the associated 'all foods fits' view (Chapters 8 and 10). Yet, while the 'all foods fit' view

is particularly useful for the industry's corporate political strategy, increasing evidence shows that excluding or severely limiting ultra-processed foods in the diet would improve health (Monteiro et al. 2011; Moubarac et al. 2013). Moreover, as discussed in relation to the interview findings in Chapter 8, the industry's support and promotion of reformulation and nutrient approaches could pose strong opposition in moving towards a more tactical approach between food and nutrient-based nutrition policies.

GOVERNANCE OF REFORMULATION IN THE CONTEXT OF CORPORATE STRATEGY

Taking into consideration that voluntary reformulation is part of the industry's political strategy (Chapter 6), this thesis echoes existing literature raising significant concerns about the efficacy of voluntary reformulation as a public health approach (Panjwani & Caraher 2014; Knai et al. 2015; Freedhoff & Hébert 2011; Gilmore et al. 2011). While some have argued that voluntary industry-led reformulation is simply a beneficial alignment of interests between the business and public health communities (Winkler 2013; van Raaij et al. 2009; Yach et al. 2010; Yach et al. 2007), food and beverage industry voluntary initiatives do not exist in a vacuum. In addition to their limited effectiveness, as discussed above, they influence the framing of policy debates by promoting a particular policy narrative – as identified in the consultation analysis – one that seeks to minimize the blame placed on the industry, to undermine and pre-empt the need for mandatory government regulations around nutrition, and to influence the regulations that do come into place (Chapter 6). Thus the results of this research suggest that, as a political process, voluntary reformulation creates additional challenges for advancing the public health nutrition policy agenda, particularly given that it forms one component of the food and beverage industry's corporate political strategy to avoid public health policies restrictive to their business (Scott et al. 2017). Those policies, the ones the food and beverage industry strategize against, are the policies most recommended by public health professionals as the best options for reducing NCDs and obesity (Walls et al. 2011; Gortmaker et al. 2011; Brambila-Macias et al. 2011a).

These findings do not necessarily invalidate reformulation as a public health approach, but present the case that a voluntary and self-regulated approach plays more into the hand of the industry than it advances public health. Therefore, primary to the public health agenda will be the need to ensure that reformulation achieves its health aims, and that the manner in which the reformulations are undertaken do not threaten health (e.g. with undesirable substitution effects). Achieving both of these factors requires oversight from a non-vested

interest and a means of holding the industry accountable when reformulations do not achieve the desired health aims (e.g. Sugarman & Sandman 2007), both of which imply the need for reformulation to be government-led and mandatory. This could take the form of performance-based regulations (Magnusson & Reeve 2015), however meaningful sanctions would need to be in place for non-compliance (Bryden et al. 2013; Sharma et al. 2010). This approach has been proven as viable in the successful UK salt reformulations, which were initially formulated with progressive targets (He et al. 2014). Further evidence for this argument can be found in the parallel field of food and beverage industry marketing to children, where similar considerations and conclusions have been made of the industry's self-regulated schemes because they contain numerous loopholes and have had minimal impact on reducing a child's exposure to unhealthy food advertising (Reeve 2016; Théodore et al. 2016; Ronit & Jensen 2014). These conclusions have also been informed by the widely successful tobacco control efforts in the US, which have employed mandatory regulations on the affordability, availability and attractiveness of tobacco products (Chapman 2007).

However, government-led initiatives specifically on reformulation are not the only policy option for reducing key nutrients within food and beverage products, as demonstrated by the success of trans fat reformulation in the US, Denmark and other countries (Restrepo & Rieger 2016; Otite et al. 2013; WHO Regional Office for Europe 2015; Schleifer 2013). In the case of the US, trans fat reformulations followed legislation requiring companies to disclose the amount of TFA on their packages. The industry responded with reformulation which dramatically reduced the amount of TFA in American food products (Hooker & Downs 2014; Otite et al. 2013). Since that time the US government has also ruled that partially hydrogenated oils (the source of added trans fats in food products) are no longer *generally recognised as safe* (U.S. Food and Drug Administration 2015). Thus the use of industrially created TFA in food products in the US is effectively banned. Therefore, in the policy process that led to successfully reducing TFA in the US, the food industry was required to respond to government policy change rather than self-initiating and regulating, which is an entirely different dynamic to that of existing voluntary and industry-led reformulations in the US. The TFA example also demonstrates that reformulation can be achieved without specific legislation on reformulation if relevant and mandatory policies are enacted on other nutrition issues such as labelling (Hendry et al. 2015). This has also been true in the UK, where the coming introduction of a sugary drink levy – with two-tiers based on sugar content – has incited the industry to pre-emptively reduce the sugar content in their beverages so they can fall in the lower tax bracket (HM Government 2017).

THEORETICAL REFLECTIONS AND CONSIDERATIONS

This research was particularly interested in the influence of stakeholders on the policy process in the US, and therefore the theories of Advocacy Coalition Framework and Multiple Streams Framework were chosen for their focus on these elements (Weible et al. 2012; Sabatier & Weible 2007; Zahariadis 2007). Both frameworks provided a slightly different perspective, yet taken together they formed a deep and comprehensive picture of the situation and contexts involved in the increasing political focus on reformulation. However, in undertaking this research a number of considerations and critiques about the theory emerged.

This research applied the Advocacy Coalition Framework in order to shed light on how policy actors seek to influence the policy process. When looked at through the ACF, the results from the interviews suggest that the nutrition policy subsystem has divided in line with core beliefs, and that a coalition has formed among those actors who support 'working with industry' and reformulation as a public health approach (Chapter 7). This coalition was able to form across sectors, despite the varying perspectives of the actors within, because of a common belief system in the need to 'work together' with industry, and because reformulation is able to encompass multiple frames and meanings, as identified in the media analysis, spanning from business to health and political interests (Chapter 9). The formation and support of this coalition provides evidence as to *how* product reformulation rose to prominence. Furthermore, the existence of a cross-sector coalition, in and of itself, is further evidence of the close working dynamic between the food and beverage industry and other policy actors.

In this case, the interviews supported the premise of the ACF that underlying beliefs were more important than institutional affiliation in influencing a stakeholder's position on reformulation as a public health policy (Chapter 7). Yet, the ACF did not provide insights into *why* reformulation – nor indeed the coalition in support of working with the industry – became prominent when it did. However, this perspective was contributed by the MSF, which was used in order to understand *why* reformulation came on to the public health policy agenda *when* it did, as presented in Chapter 10. Applying the MSF to the research facilitated the identification of the policy window that opened for product reformulation in the 2000s, when the Obama administration, and First Lady Michelle Obama in particular, began to focus on the issue of childhood obesity. The First Lady's Let's Move! campaign, and the associated Partnership for a Healthier America, partnered with large food and beverage companies to promote reformulation as an important strategy for childhood

obesity. This change of administration, and the priorities they put into place (politics stream), followed increasing focus on the role of ultra-processed foods in obesity and NCDs (problem stream), and voluntary reformulation efforts by the food and beverage industry, which served to highlight reformulation as a viable, and politically favourable, policy (policy stream). Having said that, however, the MSF lacked an emphasis on the role of framing and actors in shaping the debate enabling reformulation to become a prominent policy idea. For this reason using the analytical tools of framing and narratives was particularly helpful in understanding the emergence of reformulation as a policy approach.

Overall, in this study the ACF was more helpful in interpreting the results than the MSF, particularly given that the industry and their associated coalition played a key role in promoting reformulation as a public health policy. Yet, neither the ACF nor the MSF included corporate political strategy elements or an explicit focus on ideas, both of which were found to be highly influential in the policy process around reformulation. In particular, the idea of reformulation as a policy did not arise from a 'soup of ideas' on its own – as would have been predicted by the MSF (Zahariadis 2007)– but through deliberate action and strategic framing by the industry. The 'soup of ideas' proposed by the MSF doesn't acknowledge the role of vested interests in generating and inserting ideas into the policy process (as this research and the work by Katherine Smith has shown (Smith et al. 2015; Smith 2013)). In the MSF the focus on policy entrepreneurs is to explain how they couple the three streams, rather than how particularly powerful stakeholders can craft or guide those streams so that they suit the actor's interests – in this case the food and beverage industry's interests. Likewise, combining the Advocacy Coalition Framework with corporate political strategy and the concept of ideational power, an approach also called for by Smith (2013a) provided important insights. Doing so allowed for a comprehensive understanding not only of the beliefs that bind coalitions but provided insights into how those coalitions seek to advance their beliefs and preferred policies through the enactment of multiple strategies, including through the promotion of chameleonic ideas and strategic framing. For this reason, the theoretical concept of ideational power (Smith 2013) was key in helping to answer the research question and in understanding how the industry promoted the idea of reformulation as a public health policy.

FURTHER RESEARCH

This research has also identified three gaps in the literature where further research would be beneficial for advancing public health nutrition policies. These include research focusing

on nutrition policy through a political lens, on the influence of ideas in the nutrition policy process, and on the framing of nutrition and nutrition policy.

RESEARCH INTO THE POLITICS OF FOOD AND NUTRITION POLICY

This thesis is one of a growing number of studies looking at the politics of food and nutrition policymaking (e.g. Mialon et al. 2016). However, this type of research in the nutrition field is still limited (Chapter 5), and in particular further research into the industry's corporate political strategy will be important. This study has demonstrated the utility of incorporating a political science perspective and theories into nutrition policy research; in doing so, it was able to shed light on the beliefs, frames and paradigms that underlie a stakeholder's particular policy view. The beliefs, frames and paradigms this research identified and analysed are likely to be relevant underlying factors for many other nutrition and public health policies. Therefore, a consequence of using political frameworks in this research is that it can be more easily generalized to similar policies in the US. Furthermore, understanding stakeholder beliefs and working to frame or counter-frame a policy debate are key to facilitating the work of nutrition policy advocates and therefore in advancing the public health nutrition policy agenda. Further research applying political theories in order to explore these beliefs, frames and paradigms would advance these efforts.

FOCUS FUTURE RESEARCH ON IDEAS

The role of ideas in policymaking has been a central component of this research, and this thesis has shown that food and beverage reformulation is a policy with powerful ideational qualities in its favour. However evidence has historically been emphasized over ideas in public health policy research and advocacy (Smith 2013). Chameleonic and strategic framing were key factors in helping to explain how and why reformulation became a prominent policy, and thus, moving forward, the preferred policies of the public health community will benefit from being framed in strategic and chameleonic ways. Therefore, future research into reformulation and other nutrition policy initiatives should focus attention on the ideas that surround and inform the policies as well as the evidence of their effectiveness.

FUTURE RESEARCH INTO THE FRAMING OF NUTRITION POLICY

Problem definition is a core theme in the theories applied to this research and the issue of how to frame issues in nutrition policy emerged from all three sources of data. However, the public health community has not traditionally been explicit in problem definition and attempts at framing (or reframing) nutrition policy. This research is a case in point, as the

lack of a unified counter-frame in the interviews was one of the many reasons why product reformulation, which has fractured support in the public health community, was able to become a prominent public health policy (Chapter 10). Therefore, in reflecting on the findings of this research, a key research recommendation lies in redefining and reframing the problem of poor nutrition, and for the public health community to applying that frame strategically in the policymaking process. However, apart for a few notable exceptions (Niederdeppe et al. 2012; Jou et al. 2014; Niederdeppe, Shapiro, et al. 2011; Dorfman & Yancey 2009; Dorfman et al. 2005; Niederdeppe, Robert, et al. 2011), limited research has been undertaken on developing such frames, how the public and policy makers respond to such frames, or how to strategically use and employ such frames in policy debates. Further research in this vein will be important in moving the public health nutrition policy agenda forward. In particular, as will be discussed in the next section, research is needed into a food-based framing of nutrition policy (Chapter 8).

IMPLICATIONS FOR NUTRITION POLICY IN THE US

The key findings of this research also highlight a number of potential implications or considerations for nutrition policymaking in the future. These include that partnerships with the food and beverage industry form part of their strategy, that the concept of a win-win policy may need to be reconsidered, and that nutrition policies are needed that address both the food and nutrient-based perspective.

COLLABORATIVE APPROACHES ARE PART OF THE FOOD AND BEVERAGE INDUSTRY'S CORPORATE POLITICAL STRATEGY

This research has found that reformulation contributes to the food and beverage industry's strategy to form collaborative relationships with policy actors in order to influence the policy process. This finding is likely applicable to other nutrition policies and initiatives in which the food and beverage industry is a partner or acting voluntarily, and this should be considered in undertaking such policies/initiatives. In particular, there are numerous debates about conflict of interest in food and nutrition policy (World Health Organization 2016; Freedhoff & Hébert 2011; Buse & Walt 2000; Ken 2014), and these debates should also take into consideration the dynamic and intertwined role of the food and beverage industry in nutrition policymaking. The act of forming collaborative relationships, as well as the voluntary initiatives they undertake, are both part of the industry's corporate political strategy. And so on the one hand we might be working together on one issue, but on the other hand the industry might be using that collaboration as a strategy to work against another policy or initiative – particularly those aimed at the market environment. It will

therefore be important to assess whether the benefits of partnership outweigh the potential risk to future policymaking.

BROADEN THE CONCEPT OF WIN-WIN POLICIES TO INCORPORATE VALUES AND BELIEF SYSTEMS

A central finding of this research is that a stakeholder's view on reformulation as a nutrition policy is dependent upon their underlying values and beliefs about whether to work together with industry on nutrition initiatives and whether food and nutrition policies should be framed around foods or nutrients. An implication of this finding is that stakeholder support for particular nutrition policies may be a *fait accompli* depending on their existing beliefs and values. Extrapolating this finding to future policy initiatives, it may be necessary to expand the notion of win-win policies – a concept that typically means a win to the financial or political position of the stakeholders involved – to represent those policies that are a win-win from the perspective of underlying belief systems. This is one of the reasons product reformulation has been able to gain prominence – it is chameleonic and can assume different meanings that align with the underlying beliefs of various stakeholders – and achieving this quality may help advance other nutrition policies on the policy agenda. Implementing this recommendation may therefore require strategic framing and positioning of policies in order to encompass multiple underlying beliefs and views.

FORMULATE NUTRITION POLICIES THAT FOCUS ON BOTH FOODS AND NUTRIENTS AND USE FOODS-BASED FRAMING IN POLICY ADVOCACY

The findings of this research suggest the need to shift the balance of nutrition policy so that it encompasses a tactical use of both food and nutrient-based approaches (Chapter 8), and doing so will require strategic framing to promote a foods-based framing of nutrition and nutrition policy. The call for a more foods-based approach to nutrition-policy is also supported by a number of prominent public health scholars (Mozaffarian & Ludwig 2010; Mozaffarian 2016a; Sievenpiper & Dworatzek 2013; Scrinis 2013), for it is seen that they better reflect the complexity of diets and dietary patterns, and that it would be simpler for consumers to implement food-based dietary advice.

However, further conceptual work is needed within the food-based policy paradigm to define effective policy frames. As discussed in regards to advocacy coalitions in the public health community (Chapter 7), 'whole food' policies are typically large and not easy to formulate into SMART policies (specific, measurable, achievable, realistic, and time bound) (World Cancer Research Fund International & NCD Alliance 2016). Pulling away from nutrient-specific policies like reformulation will be facilitated by making concrete

recommendations about which ‘whole foods’ policies the public health community supports, and packaging those ideas within powerful frames that resonate with deeper community beliefs. This will require significant work in conceptualizing the food-based approach into specific, manageable and actionable policies, and conducting research into the effectiveness (and cost-effectiveness) of those policies. Lastly, advocates will also need to assess how a food-based framing of nutrition resonates with consumers and policy makers, and how to best use and promote that framing in practice (e.g. development of food-based messages for policy campaigns).

STRENGTHS AND LIMITATIONS

This research employed the methods of qualitative documentary analysis and interviews, which are well established methods of policy research (Bryman 2016). This research has also demonstrated that media and framing analyses add important context and depth to the information that can be gleaned from documents and interviews. In particular, analysing the media allowed for comparison between the framing of reformulation in a policy context and the framing employed publically, which facilitated identification of the chameleonic qualities of reformulation. In addition, analysing historical media data enabled the establishment of a clear temporal order, without which it would have been much more difficult to identify a policy window for reformulation. This research was also unique in calling on multiple theoretical frameworks and conceptual lenses through which to interpret the political priority of product reformulation in the US. It is the first study to assess reformulation in this way.

Limitations related to each specific method were covered in the relevant papers (Chapters 6 to 9). However, there are a number of crosscutting limitations of this research, which will be discussed here. First, this research defined voluntary reformulation initiatives as part of the public health policy process, a perspective that may have limited the scope of this research. Case in point, there are some reformulation initiatives that sit entirely outside of the official public health policymaking process, and which may function differently than those with more direct connections to policymaking processes. However, as discussed above, all voluntary reformulation initiatives would help to frame the policy debate by promoting a certain narrative about the relative value of voluntary actions versus mandatory regulations. Furthermore, voluntary reformulation initiatives form one component of the food and beverage industry’s corporate political strategy. Therefore, even voluntary reformulation initiatives that sit outside policymaking processes can be

considered an influence on the policymaking process, and it is reasonable to have included them in this policy-focused research.

Similarly, the methods chosen for this research were entirely qualitative, which defined the type and scope of results from the outset. Though this research was undertaken rigorously, with input from a team of researchers and data was triangulated with multiple sources, interpretation of qualitative research is exactly that: interpretation. It is possible that important aspects related to product reformulation as a public health policy were not identified or not interpreted as others might have done.

Likewise, the theoretical/conceptual frameworks chosen may have limited the scope and nature of the results. Alternative theories of policy change could have been applied to this research. For example, path dependency and institutionalism may have been applicable in seeking to understand the influence of past policy decisions and governing structures on the emergence of reformulation as a public health policy (David 1985; Immergut 1998). Equally, rational choice theory, which posits that policy decisions would follow an individual stakeholder's motivations and choices (Hechter & Kanazawa 1997), may have been useful in identifying stakeholder motivations in undertaking reformulation. However, no single theory, of these alternative theories nor any of the theories used in this research, would be able to completely answer the research questions at hand. Therefore, a number of theories were used in order to piece together a comprehensive understanding, and using multiple theories is one way this research sought to overcome this potential limitation.

Lastly, the literature review (Chapter 5) was a scoping review, and not systematic, which means there may have been significant omissions in the literature reviewed. However, the literature review was only peripheral to the core methods of the thesis, and therefore it is unlikely to have affected the results of the primary research presented in this thesis.

PERSONAL REFLECTIONS

This thesis began as a common sense question based on first-hand experience – why is the food and beverage industry supportive of product reformulation when they lobby against every other nutrition policy? – and it evolved into a political science research study. Along the way, some of my assumptions were challenged, and doing the research softened my initially negative view of reformulation, which was primarily negative because of the ways in which I perceived it to be politically beneficial to the industry. However, in undertaking this research, I began to recognize that the public health community has played a significant role in promoting product reformulation as a public health policy, whether that

is by passively accepting it because it is a win-win approach, by setting the stage for nutrient-specific nutrition policies, or by actively promoting it through partnerships. The evidence uncovered in this research allows me to stand by my initial line of questioning, that product reformulation is connected to the food and beverage industry's corporate political strategy, but I now recognize that the public health community is equally, if not more, responsible for product reformulation becoming a public health policy.

In addition, this research enabled me to reflect deeply on the importance of framing in policy debates, and to witness such framing in action. One interview, with a participant from the food industry, in particular, encouraged this thought process. In this interview, the participant spontaneously used the term framing, as part of a question posed to me, with the aim of figuring out "where I was coming from."

Researcher: ...And before we begin, do you have any questions about me, about my research?

Interviewee 1389: No, I mean I looked quickly at your background, and so I think I understand very clearly where you're coming from...[but] related to that, just one framing question. What your perspective, what's your belief, about that the role of the dietary guidelines for American's play?

Researcher: Oh, well that's an interesting question...I would say, as a dietician and as a public health person, I think the dietary guidelines are extremely important. As a practical person, I don't think the average person changes their diet very much based on the dietary guidelines.

Interviewee 1389: Yeah I would agree. It just helps me to frame and understand your perspective...

This framing reference was in the first few minutes of the interview, and was shortly followed by a long story in which the participant directed the interview to focus on their company's values and reformulation successes, which again started with "...just to frame what I'm going to share." Therefore, the concept of framing was prominent within this interview, and two types of framing were present: (1) the interviewee was trying to understand the way I frame the issue of reformulation, and tailor their responses to that, and (2) to frame the issue of reformulation positively, as a success story motivated by their desire as a company to improve the public's health (e.g. "...all of those four lines of business fall under a mission to bring healthier food to as many people as possible." – 1389 (Industry))

In reflecting on my responses to this interviewee's framing question, it is evident that I was also trying to carefully frame my answer in a particular way. Knowing that the interviewee

had looked into my background, I was attempting to present myself as a balanced and realistic person who would listen without judgement to the interviewee's perspective. In looking back at this interview, I feel that I should have politely sidestepped the question, however I was taken aback by having such a question asked of me, rather than me asking the questions.

This interaction between the interviewee and myself is broadly reflective of what I witnessed in a closed-door discussion in 2012 about reformulation between stakeholders from the industry and the public health communities. In this meeting, the industry representatives commanded control of the debate, while the public health representatives, myself included, responded; we were clearly on the back foot. The aim of that meeting was for the industry to learn from the public health community about how to improve their reformulation initiatives, however the industry perspectives dominated the discussion. My interview with this industry representative was the opposite; I aimed to learn from their perspective, however the participant's responses were framed in such a way so as to align with their interpretation of my existing views. From these experiences, where value systems and pre-existing beliefs are used to frame discussions between stakeholders from different communities, I have begun to reflect upon and question to what extent true cross-sector collaboration is possible. If each group of actors within a policy debate attempts to ensure their core beliefs and preferred policy options are protected and promoted – as suggested by the ACF and Narrative Policy Strategy, and as was visible in the micro within this interview and in the macro across the research as a whole – it seems unlikely that they would be able to put aside their strategic framing for the sake of collaboration. It is this vein of reflection, on framing, values and core beliefs, which informed the recommendations above on further research and policy.

CONCLUSIONS

This research aimed to assess how and why product reformulation became a prominent public health policy in order to inform understanding of nutrition policymaking dynamics in the US. In particular, it focused on the role and influence of the food and beverage industry in the nutrition policymaking process and in promoting product reformulation as a public health policy. The results suggest that reformulation has benefited from a combination of influence and ideas. Powerful actors within the policy system supported it, including the food and beverage industry, and it aligns with multiple pre-existing value and belief systems within nutrition policy. However, reformulation is also a concrete representation of fractions among nutrition policy actors; dividing lines which at their core are about if or to what extent to work with the food and beverage industry on public health initiatives, and how to define healthy foods for the purposes of policy (e.g. foods or nutrients).

As a study of political dynamics, this research provides insights into the relationship between nutrition policy actors in the US. It demonstrates how the use of multiple political frameworks and conceptual lenses to public health policy research can provide additional understanding into the political course of public health policies. In doing so, it contributes to a growing body of literature in public health which emphasizes the need to look beyond the evidence for public health policy and to focus on the politics of it (Fafard 2015; Smith et al. 2015).

The results further suggest that reformulation forms part of the food and beverage industry's corporate political strategy. In particular, in voluntarily reformulating and establishing reformulation partnerships, the food and beverage industry can be seen to be implementing a collaborative political strategy aimed at building relationships with other policy actors, as a means of shaping public policy (Hillman & Hitt 1999; Weidenbaum 1980). Moreover, this research found that in reformulating the food and beverage industry was also acting in response to increasing pressure from nutrition policy advocates and policymakers. Actors from the public health community and the government sought to influence the actions of the food and beverage industry, and yet at times also partnered with and encouraged their actions. Reformulation therefore demonstrates a push/pull dynamic in nutrition policy in the US, and highlights that the food and beverage industry's influence on the nutrition policy process encompasses an involved, collaborative relationship, rather than purely as an external force on the system.

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APPENDIX 1

Full Coding Framework from the Consultation Analysis
Benefits or Opportunities
Self-perceived benefits
Leader within industry
Evidence
Advocating selective use of evidence
Conduct research to prove healthfulness of product or category
Debunking evidence
Taking advantage of uncertainty in evidence
Employment of well-respected researchers
Highlighting importance of evidence
Industry or privately produced data
Use of government data or research
Use of named author or journal
Excuses
Consumers can make the choice
Foods or product chosen for non-nutrition reasons
No consumer demand
Nutrient plays functional or critical role
Product contributes nutrients
Product made just like at home
Product meets health needs
Product not large contributor - Product not that bad for you
Taking other actions
Change default
Change portion size
Educate instead
Labelling
Marketing
Legitimacy
3rd party evaluation by expert
Complying with govt regulations or advice
Credibility via experts
Economic contributor to society
Exceeding expectations or pledges
Industry effort or data incorporated by others or government
Partnerships to build trust or credibility
Proven track record
Reformulation as means to build trust
Submit data or programs for peer review
Use of expert on submission to construct authority
Using name or known nutrition or health entity
Limiting factors or Risks
Consumer acceptance means eating healthier products
Current regulations or standards limit reformulation
Difficult - OR Technical or Recipe challenges
Expensive
Have already improved a lot
Lack of return on investment
Maintain consumer acceptance
Maintain consumer perceptions
Maintain sales
Consumer desires don't match actions
Maintain taste, appearance or texture

Natural component of food
No adequate substitute available
Retailer reluctance
Safety Concerns
Slow change to increase acceptance
Substitute may be worse than ingredient
Unintended consequences
Will take long time
Motivation
Ability to sell product in schools
Align with dietary or government guidelines
Avoid govt regulation
Business case
Co-benefits for business and society
Desire to be part of solution
Government regulation
Health claims
Health concern
Meet need of consumer or consumer demand
Partnership agreement
Respond to calls to action from government
Seen as leader within industry
To be able to sell in schools
Voluntary pledge
Narratives
Balance energy
Cautiously Optimistic
Companies deserve recognition for progress made
Consumer responsibility and choice
Informed choice
Contributes to health halo effect
Discussion of product or ingredient in DGA
Economic or jobs argument
Educating consumers
Encouraging behaviour change
Government recs too lenient
Have a responsibility to act
Healthy but reformulating anyway
Healthy living a priority
Industry has role to play in policy process
Industry's primary motive is profit
Multifactoral causes of disease
No unhealthy foods only unhealthy diets or part of healthy diet pattern
Not enough progress by industry
Nutrients v. foods OR a whole foods approach
Nutrition is more than just nutrients
Part of the solution and-or committed to addressing the problem
Preference for voluntary approach
Pride in company, product or initiative
Providing info (e.g. labelling) to enable informed choice
Recognition of contribution to the problem
Recognition of problem but not supportive of policy option
Reformulating but it's hard, expensive, technical or takes a long time
Self-regulation is not good enough
Scepticism of industry motivations
Progress Reporting

By individual product, ingredient or nutrient
In bulk or across product line or company
Independent evaluation
Own criteria or guidelines
Reformulation Approach
Change portion size
Expand portfolio or New Product
Procure new ingredients
Publicised approach
Reformulate existing product
Change recipe or cooking process
Decrease ingredient or nutrient
Increase ingredient or nutrient
Stealth approach
Substitute ingredient or product
Reformulation Target
Adding nutrients
Energy or Calories
Fat - All or Unspecified
Fat - Saturated
Fat - Trans
Grain conversion
Portion size
Salt
Sugar

APPENDIX 2

Full Coding Framework from the Interviews
Accountability
External targets or evaluation
Food industry needs to be held accountable
Government
Need accountability to make change
Need an overall goal
Why isn't government taking action
Alternative or whole foods policies
Benefits
Add healthy components
Consumers
Doesn't rely on consumer knowledge
Government
Concerns or consequences
Consumers don't want to change or lose their favourite products
Copycat products in schools
Criticisms of public health - naivety or lack of action etc.
Doesn't address real cause or move us towards real food
Doesn't make a huge difference
Food industry is in charge
Have to make it manageable for companies
Health effect of substitutes or additives
Health equity
Health halo
Impact on public health policy
It's going to cost more
It's political
Line extensions
Marketing or health claims
Not changing best sellers
Onus is on consumer to choose reformulated or new product
Overall product not healthier
Positive - readjust consumer preferences
Some segments of industry not doing enough
Credibility - Legitimacy
External expertise
Using experts or partnerships
Work with industry - Industry has a role to play
Deflecting or hesitant reformulation
Apologizing-excusing-justifying on behalf of industry
'be careful what you wish for'
Difficulty - cost taste technical time
Doesn't reflect the need of average consumer
Have already done a lot
Healthier product not available on the market
Industry isn't 'bad'
Maintain consumer acceptance
Obesity is complicated
Product contributes nutrients
Product is not a big problem
Variety or everything in moderation
Evidence
Contested evidence - doubt

Evidence used to back up statement
Funding
Misuse
Need evidence for government to act
No evidence that reformulation will work
Science is complicated or evolving
Foods v nutrients
Changing food patterns is difficult for consumers
Dietary pattern
Foods message is difficult
Have to do both foods and nutrients
Level of processing is the problem
Natural doesn't mean healthy
Nutrient approach easier politically
'nutrient density'
Nutrient focus allows loopholes
Nutrient focus is negative
Nutrient focus serves needs of industry
Nutrients are used to justify sugar
Nutrients confusing for consumers
'playing with nutrients'
'real food'
real food takes care of nutrient problems
real or whole foods is elitist
Reformulation is nutrient focused
Single nutrient is reductive
'swinging pendulum' or fads
Whole foods or healthy is hard to define
Participant
1088
1151
1389
1775
3331
3565
4284
4497
4549
4665
5078
5397
5883
5898
6017
6045
6112
6343
6388
6517
6808
7126
7560
7730
7842
7982
8038

8284
8291
8329
8516
8620
9507
9593
9872
Reasons to reduce sugar
Biological response to sugar
Dietary Guidelines
Empty calories
High sugar intake or prevalence of sweetness
Obesity or NCDs
Sugar is marker for processed food
Sugar is used to increase consumption
Reformulation approach
Stealth approach
Voluntary or mandatory
Reformulation as it relates other policies
Labelling
Marketing to kids
Nutrient profiling
School meals
Reformulation motivation
Acknowledge sugar is a problem
Competition
Consumer demand or respond to pressure
Desire to be industry leader
Desire to keep on nutrient focused initiatives
Dietary guidelines
Generate goodwill or perception of health
Government policy initiative or head off regulation
Health claims
Motivation shifted
Negative sales or attention or threat to business
Profits or business motives
Regulation is ineffective
Respond to calls to action
Sell or market to specific populations or create new products
Values of company
Responsibility
Choice
Everyone
Government
Individual
Industry
NGOs and others
Scepticism
Industry doesn't actually want to reformulate
Industry mistrust or industry is deceptive
Industry profit motives
Industry pushback against policies
Not much progress
Repeating same mistakes
Starting from a very high level

There are some foods which should not be eaten, even if reformulated
Support for Sugar Reformulation
Have to do something
Is a common ground
No
Quick fix
With caveats
Yes
Timeline of reformulation
Focus on sugary drinks
Government policy
Heightened attention to obesity - NCDs - nutrition
Industry is driving efforts
Mounting evidence
Obama administration
Partnership
Public awareness
Recognition of role of processed foods
Reformulation is continuous
Success with other nutrients
Why sugar reformulation is difficult
More creation of new products than reformulation
Natural sugars too
Need to maintain palatability - acceptance
No one substitute or issues with substitution
Technical function

APPENDIX 3

Full Coding Framework from Media Analysis
Business Framing of Reformulation
Business - Market Drivers of Reformulation
Competition
Big money to be had if can topple market leader
Branded foods under pressure from private label business
Follow suit with competition
Consumer and Public Perception
Consumers have perception of healthier products
Earn respect of consumers
Earn respect of investors
Negative consumer perception driver of reformulation
Consumer Demand
Health conscious consumers driving demand for new products
Industry would change if consumers demanded it
Narrative re ingredient-nutrient not a problem but responding to consumer demand
Reformulation follows trends
Reformulation will increase sales through marketing-advertising-PR
Generate positive PR or brand image
Head off negative PR
If make the change voluntarily, get lauded or can tout about it
Marketing-advertising opportunities for new products
Old products are boring, new products are exciting
Reformulation will increase sales-profits
Can charge more for new or reformulated products
cost reasons sparked reformulation
Create products to target specific segments of the population
Gold Rush
Line extensions and reformulation rather than entirely new product
New ingredient, technology or supplier sparked reformulation
Niche market
Reformulate to improve taste or sensory characteristics
Reformulation helps reverse loss of sales
Sales growth
Business case against reformulation
Reformulation will hurt business
Economic concerns trump health concerns
Functional, taste, texture role
Only want reformulation when can pick or choose who, when, type, etc.
Reformulation creates safety issues
Reformulation is easier in some products or categories over others
Reformulation is expensive
Reformulation takes a long time
Risk to sales from negative consumer perception
Slippery slope
The demand for healthier food is not there
Health Framing of Reformulation
Health drivers of reformulation
Consumer pressure based on health concerns
DGAs spark reformulation
Health motivated reformulation
Health-nutrition status of Americans is bad or getting worse
Ingredient found to be harmful
Pressure from health activists

Product - ingredient is bad for you or causes negative health impact
Reformulate in response to partnership with health group
Reformulation is effective
Public health case against reformulation
Food v nutrients - Nutritionism
A calorie is a calorie
'engineered foods'
Focus is not on foods that are naturally low-free of nutrient in question
Focus is on processed foods
Focus should be on whole foods
Increasing good nutrient is good even if the overall product is unhealthy
Not about decreasing overall consumption of a food
Reformulation targets nutrient du jour
single-nutrient focus
Tug-of-war between nutrient camps
Reformulation not effective at improving health
Companies adding more products - not removing unhealthy option
Encourages consumption
Foods targeted by reformulation remain junk foods
Industry can work their way around reformulation - standards
Reformulated foods are not well received
Reformulation is not enough
Reformulated does not necessarily mean healthier
Reformulation and associated marketing create health halos and-or mislead consumers
Reformulation doesn't change the food environment
Reformulation works in niche but not in mainstream
Political Framing of Reformulation
Politics - policy
Bill Clinton
Bush Administration
Encouraging working with industry
Evidence
Evidence is used to argue against unfavored policy option
Evidence is used to argue for favoured policy option
Evidence is used to inform policy option
Science is politicized
Scientific uncertainty
Uncertainty about best diet even within nutrition community
Industry is 'making strides' on reformulation
Michelle Obama
Need policy for change to happen
Policy loopholes
Political risk
Reformulate in response to labelling or other nutrition policy
Industry 'scrambling' to reformulate ahead of labelling-regulatory requirements
Reformulation is 'part of the solution' to obesity
Reformulation is something but need to push for more
Regulations restrict reformulation
Power
Equating big food with big tobacco
Food industry is powerful actor
Food industry is under threat
Threat of litigation if industry doesn't take meaningful action
Food or food industry is different from tobacco or tobacco industry
Industry strategy - lobbying
Mistrust of industry

Policy change is difficult when it takes on the industry
Policy implementation aims to be business friendly
Policy is a compromise
Reformulation is industry friendly
Tension between doing what is right for business and what is right for health
Responsibility - Accountability
Accountability - Regulation
Have to enforce, track progress, etc.
Partnerships subverted by industry
Self-regulation is preferred
Self-regulation not strong enough
Government Responsibility
Government hasn't made enough progress
Government needs to take action
Government policy is the solution
Individual Responsibility
Consumer choice - awareness
Consumers aren't aware about their diets
Consumers increased their intake - rather than saying industry increased the ingredient etc.
Individuals need to change
Need to educate consumers
Sometimes consumers want junk food
Industry is - is not responsible
Industry is not responsible
Industry isn't culpable (e.g. passive participants, driven by consumers)
Products are not responsible
Industry Responsibility
Industry has some responsibility but not all
Industry is responsible
Industry needs to take more action
Stakeholder - Speaker
Academia
General Public
General text in article
Government
Industry
Other
Public Health

APPENDIX 4

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Definition of reformulation	Definition	<p>Nutrient reductions rather than food-related changes</p> <p>Focus on ‘harmful’ components</p> <p>Changes without affecting taste or ‘consumer appeal’</p>	Paper 3
<p>“What it means to me is primarily um trying to get the so-called harmful nutrients or food components out of heavily processed foods. Um, most people focus on nutrients and some ingredients like sugar and salt, but it’s very much a nutrient focus.” (6017 – Academia)</p> <p>“Um, the simplest answer would be altering the physical components of a product to achieve some new benefits, which may or may not have consumer relevance, maybe driving costs out, um, while maintaining or improving consumer appeal. Because you don't want to have this thing go backwards.” (4282 – Industry)</p> <p>“The immediate thing I think of is reduction in sodium in processed foods. Um, because that is definitely a very hot topic in this agency, in the department, and of course within the beltway. So when I hear product reformulation I immediately think of that.” (5078 – Government)</p> <p>“That's right, because you reformulate with nutrients. Now you could add food. Beverages you probably can't....most reformulation is going to have, is going to be that tricky nutrient only.” (3565 – Public Health/NGO)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Position or stance on reformulation	Support for or against reformulation	Support Support with caveats (e.g. mechanism, governance, substitute used) Does not support	Papers 2 & 3
<p>“Well I'm all for product reformulation but there are really interesting questions about how it can best accomplished. But to the extent that foods can be reformulated to be healthier I think we'll be far better off.” (1151 – Academia)</p> <p>“Oh it's a real important tool. I mean I'm not negative about reformulation, as long as you have the right formula. Ok, so that's the key. It's what is the reformulation?” (3565 – Public Health/NGO)</p> <p>“I don't think that product reformulation in and of itself is going to be the most powerful tool to reduce, or approach, to reduce added sugar in people's diets.” (7842 –Academia)</p> <p>“And I think the way that it can be managed is through a proper government strategy, a comprehensive strategic approach in which product reformulation is in there to achieve specific aims. In other words, those people who are stuck eating those products, who aren't going to change their habits, who aren't going to change their behaviours, for the foreseeable future, that for them it is an appropriate target. But in the meantime, for the next generation, you need to be having, encouraging people not to have those products at all. So if it is fitted into the jigsaw its fine. I think the problem is that it is often not put into that jigsaw.” (9593 – Public Health/NGO)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Position or stance on reformulation	Support for foods versus nutrient approaches	Support nutrient-based approaches like reformulation Support a foods-based approach	Paper 3
<p>“I applaud those manufacturers who are really taking reformulation seriously and recognizing that consumers are demanding change in the food supply here in this country...However, on the other hand, I'll throw this out there because this always comes up in these discussions, the whole 'all foods fit' mantra. Um, there are some extremely processed foods that I really don't think should fit anywhere.” (5078 - Government)</p> <p>“...we like to do both. And knowing that getting 50% less salt in food is not the whole ball game. It's getting people to eat good healthy foods.” (5883 – Public Health/NGO)</p> <p>“If the end result of what we're measuring is better health, um, you know I think there's going to be, you know from a dietitian perspective, I think there's going to be probably some other things to focus on just besides a nutrient.” (8620 – Public Health/NGO)</p> <p>“And does it matter that the oil doesn't have trans fat in it any more if we're still eating a lot of fried food. And that's a bigger question.” (3331- Government)</p> <p>“But the concern is that just focusing on one nutrient at a time may then lead to for example what happened in the 1990s and 1980s. That basically the focus was on saturated fat only and industry started to replace saturated fat with trans fat. Which was the worst substitution” (4549 – Academia)</p> <p>“I support some kinds of product reformulation. I mean the truth is that you know, sure we all preach eat whole foods, eat you know, go to your farmer's market, all that kind of stuff. But the reality is for most of the population, that's not possible. It's not realistic.” (6388 – Academia)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Challenges or implications of voluntary or self-regulated reformulation	Reformulation governance (e.g. voluntary vs. mandatory, stealth versus marketed)	<p>Voluntary reformulation unlikely to succeed</p> <p>Voluntary reformulation effective and preferred</p> <p>Past success in nutrition policy has come through mandatory regulation</p> <p>Voluntary approaches suit the needs of the industry</p>	Paper 2
<p>“I think if it's done voluntarily the chances that it's meaningful is virtually nil. but I think there are going to be some um policy efforts that end up leading to product reformulation that's going to be meaningful.” (6346 – Public Health/NGO)</p> <p>“Why do people choose the foods that they choose? For almost all people the reason we chose the foods we do is because they taste great and we like them...And so we did that [reformulation stealthily] because we didn't want to call out the change because of the concern that mom's and kids would have about it not tasting as good as what they were used to.” (1389 – Industry)</p> <p>“...there have been a number of studies that look at and say well they put in these voluntary standards and then they don't really do as much as what would have been done if it were mandatory.” (3331 – Government)</p> <p>“...the enormous past reformulation is getting rid of partially hydrogenated oil. That in the United States companies have replaced six billion pounds a year of partially hydrogenated oil. And the changes have all been for the better. Because there is nothing worse than trans fat. And so that, that came about because of scientific research, public pressure, and then government regulation.” (5883 – Public Health/NGO)</p> <p>“Well, I think they're incredibly limited. Because they're on the one hand, they're voluntary and companies are doing it, setting their own targets and meeting them in their own timeframe. And some companies are not doing much at all. So there's incredible variation.” (6017 – Academia)</p>			

"I think that with respect to some policy areas there are, there are sometimes benefits of it being voluntary, and sometimes has benefits of being mandatory...with respect to reformulation, I can't think of anything that would be legal or politically feasible in this type of political environment, so I really think that working voluntarily with food and beverage industry and through government to provide incentives and encouragement, um, for the types of changes that we want to see, is the best strategy in this area." (8284 – Public Health/NGO)

"I'm a proponent of voluntary regulation as opposed to government regulation. But government regulation should be available if the broader population can't and doesn't on its own. But you know, I'll ask you, just remember prohibition. Government said drinking is bad, people disagreed, and you know what, people drink today. So I think to do it in a voluntary sense, and let government focus on the broader issues of food security and infrastructure and that type of thing." (8329 – Industry)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Challenges or implications of voluntary or self-regulated reformulation	Accountability	<p>Setting reformulation targets is necessary for ensuring industry is held accountable</p> <p>The targets desired by public health are too high for industry to be held accountable for</p> <p>Accountability also needs to come from within the industry</p> <p>Accountability is better ensured by a body outside of the industry</p>	Paper 2
<p>“...when I was at [another company] we had over 3,000 products, 3,500 something like that. If you've done some food science, if I said, ok we are going to launch a new product every single day of the year. A new product that addresses that sodium concern and replace the old product. It would take us over 10 years to get through a portfolio once. Right? Not feasible. Reasonable to hold us accountable for that much sodium.” (4282 – Industry)</p> <p>“...target setting is one thing, but the most important part of that entire process is monitoring of progress against the targets. So there's no point in having a target unless there is transparent, third party independent monitoring. “ (7560 – Academia)</p> <p>“...[one]entity that should be keeping these companies accountable, holding them to this standard, would be their boards of directors...If the CEO knew that his bonus came when you know he figured out a way to get pears instead of whatever reformulated product.” (1088 – Academia)</p> <p>“...any commercial interest that trumps the health of a child cannot be justified. And reformulation is great, but they've got to do it in a way that's meaningful to all the other stakeholders, not to what industry is saying. And if they get to you know sort of load the deck and set what they're going to agree to, then basically they're holding themselves accountable, but there are other groups that have a higher standard for what accountability should be.” (7842 – Academia)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Challenges or implications of voluntary or self-regulated reformulation	Credibility – Legitimacy	The industry gains credibility and legitimacy by working with non-profit partners and in partnerships Third-parties lend credibility to research	Paper 2 & Chapter 10
<p>“Right I mean imagine that a food company puts out an ad on Saturday morning cartoons that says our profits are down...so we went to the lab and scientifically engineered a different sort of product...I mean that absolutely what they're doing, but of course they don't say that. So legitimacy for what they're actually doing comes in the form of these partnership, they're all this corporate social responsibility...they need to create an impression among the public that they're not the bad guys, they're the good guys...And the thing that works in their favour is that sometimes I think when they reformulate their products, maybe the product is actually a little healthier. That's like out of a hundred possibilities, that's at least one possibility, you know. And so when that's the case they can really um you know draw a lot of attention to that.” (1088 – Academia)</p> <p>“I also think they [the industry] see the value in working in tandem with a credible third party to kind of guide them and lead them in the right direction.” (7730 – Public Health/NGO)</p> <p>“So when it comes to regulation, I mean let's look at, let me tie it into some research studies that are done in tandem with potential regulations. So an example might be a study we saw on fast foods. And uh I think RAND corporation did it, they're a very very credible group, and they did a study looking at um I think it was the criteria for what would make a food healthy.” (9507 – Public Health / Former Industry)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Benefits or beneficiaries of reformulation	Benefits and beneficiaries	<p>Consumers and the public benefit from improved products, but only if the reformulations are “meaningful”</p> <p>The government benefits as they are taking action but it is not “too intrusive”</p> <p>The industry would benefit from the ‘level playing field’ of regulation</p> <p>Certain sectors of the industry would benefit from creating substitutes/alternative products</p>	Chapter 10
<p>“I suppose governments can benefit by the fact that they're not being seen as doing anything too intrusive into people's foods. And others who would benefit would be the ingredient processors for the back end of the supply chain who are producing healthier alternatives. So people who might be producing blended oils without trans fats or artificial sweeteners, or those kind of alternatives.” (9593 – Public Health/NGO)</p> <p>“Well when you think about the role the government plays in food regulation, the purpose has always been because there is some societal good, some social good that we're trying to promote. And also that there's a level playing field that is going to be a benefit to the industry and that consumers are also, and the greater public, are going to get a benefit from that.” (4655 – Government/Former Industry)</p> <p>“Well, as far as benefits of reformulation, to the extent that they really do have meaningful health impacts, you know, we're talking about ones like reducing sodium, where you know I think there's clear potential for health improvement. Then yeah, consumers will benefit. They may not benefit from ones that are really as we've said more marketing than health oriented.” (5898 – Government)</p> <p>“Well, as far as benefits of reformulation, to the extent that they really do have meaningful health impacts, you know, we're talking about ones like reducing sodium, where you know I think there's clear potential for health improvement. Then yeah, consumers will benefit. They may not benefit from ones that are really as we've said more marketing than health oriented....And then you know companies I think that there are companies that could stand to, that could, especially people are becoming, as boomers are a large market, they're getting older and therefore more health conscious. There's definitely an emerging market for health products.” (5898 – Government)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Problems or disadvantages with reformulation generally	Concerns, consequences or scepticism	<p>Reformulation may have negative consequences from health effects of substitute ingredient</p> <p>There is limited evidence of reformulation's impact on health</p> <p>The companies are developing new products, or line extensions, rather than reformulating existing products</p> <p>Consumers may assume reformulated foods are healthier and that they can eat more of them</p> <p>Not all key nutrients/ingredients are targeted by reformulation</p>	Papers 2 & 3
<p>"You know there are open questions, for example, I mean you go back to the snack well cookie example. You know that was an example of product reformulation that ultimately did not have positive consequences because the fat was replaced with sugar. So one has to hold the industry accountable to make truly significant changes. And to not make alternative changes simultaneous that would be harmful." (1088 – Academia)</p> <p>"I've never seen a study that's you know shown that kids are eating fewer calories or getting less fat or less sugar because of these reformulated snacks." (5387 – Public Health/NGO)</p> <p>"It's mostly developing new products rather than reformulating old products. But it may be a line extension of lower sugar this or that. Coke and Pepsi and certainly done a lot of that and I expect them to be doing more of new products, probably without fiddling with the original formulas." (5883 – Public Health/NGO)</p>			

“If there are products that have less sugar...people think that these products are healthy and they start to consume more and do some kind of overconsumption which might have unintended consequences as well.” (4549 – Academia)

“[Is it] reduction or shell games about how you label it? I mean you can deal with it many different ways. You can give people the perception of reduction or improvement.” (5898 – Government)

“The omissions I find interesting, that what's not included in this list is things like refined grains, or otherwise referred to as refined carbohydrates. And vegetable oils. So these are some of fundamental building blocks of highly processed foods and there's some evidence that these are harmful components or ingredients in excessive quantities. And yet for some reason they're not included. That really gives the companies a way out in terms of how to reformulate their products.” (6017 – Academia)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Problems or disadvantages with reformulation generally	<p>Why reformulation is difficult</p> <p>Deflecting or hesitating by industry or on behalf of industry (e.g. why companies cannot make changes, focus on positive nutrients)</p>	<p>Reformulation cannot be to such an extent that it is detrimental to the company's business or the product's sensory characteristics</p> <p>Consumers may react negatively to reformulated products and no longer purchase them</p> <p>Reformulation takes significant time and resources</p>	Paper 2 & Chapter 10
<p>"Right, uh, [company] as a company has a commitment to reduce, in our beverages sugar by 25 percent per serve by 2020. Which is a huge task. Huge. Nobody else, [competitor] isn't doing that... But it's tough." (4282 – Industry)</p> <p>"I mean the idea is that you don't want to stifle innovation either, you know, and the companies know best what works. They're the ones with the food scientists and all of that. Well even in the US with the national salt reduction initiative, it was very much designed like targets and the companies themselves figure it out. And I think that's the way the companies prefer it. They can like just figure out what works best for them." (6388 – Academia)</p> <p>"And then we got into talking about well, why do you sell these products at all? And, [company name] rightly pointed out, if they removed a product like that from the market, there would be consumer uproar. They would have people picketing them, they would have people throwing things at them. People would get angry. And so you can't simply just remove unhealthy products from the marketplace." (7560 – Academia)</p> <p>"Well, I'm just thinking of the school lunch program and all the vendors and their frustration with every state having their own thing, and therefore their unhappiness as I understand it, I mean there are so many politics behind that, with the national guidelines. I think there's pushback in terms of whether they had enough time to reformulate." (4497 – Government)</p> <p>"Consumers don't want to buy low sodium products. You know they talk about stealth health with low sodium. They assume that it will taste flat, to them it probably will because they're used to higher sodium foods. So nobody is going to want to take the first move. And so that is probably you know really challenging." (5898 – Government)</p> <p>"In terms of disadvantages, um, that would be at the industry side. The cost to the industry. Potentially then with flow on effect with cost to the consumer if industry decide to you know do some really fancy thing to try and reduce sodium and then push that back to the consumer. The other disadvantage can be of</p>			

course that they take out something like salt or even added sugar and they, you know they add in added fibre or something, but the fibre is fake.” (7560 – Academia)

“I think first of all about food processing companies and the fact that they, the products that they're producing have a certain flavour profile. And that as companies are sourcing the ingredients for their products, they're looking at two things. One is they want to maintain the flavour profile and all the functionality of the food production, so there is a quality aspect in their ingredient sourcing and there's also the second dimension which is the cost factor.” (4665 – Government)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Why reformulation has become a public health approach	Timeline of reformulation	<p>Increasing focus on obesity led to a focus on food and beverage products</p> <p>Increasing regulatory requirements or threat of regulation on the industry</p> <p>The dietary guidelines sparked reformulations</p> <p>Consumer demand has shifted toward healthier products</p> <p>Reformulation has been on-going but receiving more attention now</p>	Chapter 10
<p>“From the company standpoint reformulation is going on constantly. There are discrete points in time that usually from a regulatory perspective, where they're going to have to face into a major reformulation, kinds of things you're talking about with sugar, salt, the discussion we just had about avoiding trans fat labels. But those are really discrete periods of time when many, many, many different companies are trying to reformulate at the same time in order to meet some kind of regulator2 requirement.” (4665- Government/ Former Industry)</p> <p>“When the guidelines first came out and promoted a lower fat diet, you know industry immediately responded with reformulating products and removing the saturated fat and then replacing it with other ingredients. And I think that is a great lesson learned um as far as implications of food and nutrition policy um intended or unintended implications from policy” (5078 – Government)</p> <p>“I'd say that the concern about obesity has been magnified in the past decade or so, and that's bringing attention to food products that contribute disproportionately to the issue.” (1151 – Academia)</p> <p>“And over the years as the American palate has changed and evolved, so to have the profiles of [product], including our own. And fast forward to about 5 years ago, when we began to notice the dialogue about sugar changing and evolving.” (1389 – Industry)</p>			

“You can go back 20 years and [another company] was getting hit for sugar content in their breakfast cereals. At least 20 years ago. You could look back 15 years ago, maybe or 12 years ago, when [another company] was trying to get more whole grains into their products. I would say that reformulation from a health perspective has had different levels of visibility over the past however many years, 30 years. The whole trans fat thing really came to culmination somewhere around 2001, 2002. I will say it's getting more press time now. And I think the internet plays a large role in that. Plays a large role. Everybody's a nutritionist.” (4282 – Industry)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Why reformulation has become a public health approach	Evidence	Reformulation can evolve with the evidence Need further evidence on health effects of reformulation Evidence is necessary for policy change The nutrient-specific or reductive focus of nutrition science fosters nutrient-focused policies like reformulation Industry promotes/creates doubt about the evidence linking their products to poor health	Chapter 7
<p>“Well I supposed you can reformulate a product in many ways. I work in the reformulation arena to make a product healthier. And I always use the term healthier too, not healthy, because I do don't think there's an end to the road. A product is not healthy, I think it's healthier. Because our science changes all the time.” (3565 – Industry)</p>			

“So the science on this has to be robust, and the governments have to be funding research that would help address these questions about how reformulated foods affect people, um, what the companies do in response of reformulation, and what the overall health consequence is?” (1151- Academia)

“Yeah and I would say that if more and more science comes out saying sugar is bad for you, no ifs ands or buts. Then yeah I see a role for government, in the same way they took a role with smoking. You know. Why not? It's going to be harder” (5397 – Public Health/NGO)

“They [the industry] will out of one side of their mouth be talking about how there's no evidence that added sugar is bad, and then out of the other side of their mouth they'll be denying the science on added sugar. It's like they're trying to play both hands.” (6808 – Public Health/NGO)

“...we're stuck having to defend these really flawed initiatives I think and we're stuck I think because the starting point was wrong. And the starting point was nutritionism, I think, and we just need to fix up that, but I think there is real resistance to that because we don't have other developed models. And you need all this science to back up policy initiatives.” (6017 – Academia)

“Nutrition as a science is evolving. You know if you, cholesterol used to be a big no-no, and now dietary guidelines are saying, no don't worry about cholesterol. You know so it's evolving, it changes” (6388 – Academia)

“...one of the goals of the sugar industry was to make sure there was never any consensus. So if the industry says we don't feel like we should act, we have an obligation to our shareholders too and so we're not going to act unless there's consensus, and the sugar industry is working make sure there is no consensus. That's very convenient even if they don't know what the sugar industry is doing.” (8291 – Public Health/NGO)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Why reformulation has become a public health approach	Reformulation and its relationship to other policies	<p>Other policies can result in reformulation (e.g. labelling, marketing standards)</p> <p>Nutrition policy is difficult process, so reformulation is seen as a win</p> <p>Voluntary or partnership-based reformulation is a distraction from other policies</p>	Chapter 10
<p>“But look, um, you know I think the way the public health nutrition and nutrition policy community is, the approach seems to be, um, we have so little power and so little buy in from governments, that any step forward is a good thing. And any kind of initiative or policy initiative is to be celebrated. And I can see that because it is so hard to get anything up in this environment, whether it’s a traffic light label or a tax.” (6017 – Academia)</p> <p>“But I think part of what you do when you get into a public private partnership with one of these groups is you um distract from the need for legislation, or the need for actual policy that has some teeth.” (1088 – Academia)</p> <p>“Well I would say in the first place, a focus, too much focus on reformulation takes the wind away from other alternatives.” (6045 – Public Health/NGO)</p> <p>“You can also look one of my colleagues [name] who looked at trans fat labelling and the product response. Um you know we think of labelling as informing the consumer but it also kind of pushes that push-pull dynamic of supply and demand in ways that hopefully bring along.” (5898 – Government)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Why reformulation has become a public health approach	Motivation for industry to reformulate	<p>Consumer demand</p> <p>Desire to contribute to public health efforts to improve diets</p>	Chapters 9 & 10
<p>“So this is my read of what's going on. It results in a demand for products, substitute products, which are lower sugar. That's not to say that people want the sugar reduced version of the product they like.” (4289 – Industry)</p> <p>“I would say that the public health driver is what’s driving the company but there are other reasons to do it as well I think.” (4289 – Industry)</p> <p>“Because you know the research that we've done on a lot of these products is that there's not really a strong science base. Even [organization] is like, there's not enough research for us to say that you know high fructose corn syrup is bad. So we can't say it, so you know it was, the consumers however are demanding that that's not in their products. And the manufacturers have responded by taking it out.” (7760 – Public Health/NGO)</p> <p>“There's papers by two colleagues of mine [names] that looked at Nielsen sales data. The dietary guidelines spurred production, it spurred innovation and it has, there has been a change in consumption. And that you can go to like 2005.” (5898 – Government)</p>			

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Why reformulation has become a public health approach	Public health role in encouraging reformulation	<p>By focusing on nutrients, the public health and scientific communities have encouraged the reformulation approach (e.g. focusing on the evidence of negative health impacts of one nutrient)</p> <p>Being accepting of an industry role in nutrition policy</p> <p>Failure to consider the market response to nutrition policies/recommendations</p>	Chapter 7
<p>“Its [reformulation] exactly what nutrition scientists and public health nutritionists have been asking for...[because] you know the problem has been identified as these particular components uh and that goes back to I think that goes back to a nutritionally reductive understanding of foods themselves. Um, and because of that and because that's where the science is, the science is around the particular nutrients, and you can't put forward a policy position that's not backed by the science, supposedly, so that's where they've gone.” (6017 – Academia)</p> <p>“I'm interested in the product reformulation from the health perspective. And from that perspective in order to comment on the importance of food reformulation for sugar, for example, you need to see what is the evidence for the effect of added sugar or sugar content of different food products and the relationship between health.” (4549 – Academia)</p> <p>“I hear any number of people in the public health nutrition world really criticize sometimes the food industry for what they're doing, and for various reformulations that have happened, and there's a part of me that wants to say, but we told them to do it. ...They're doing exactly what we told them to do. Because if you read the dietary guidelines...they say replace saturated fat...they'll say reduce sodium, reduce sugar. And by saying that then if, if industry does exactly that, are they not doing exactly what we told them to do?” (3331 – Government)</p> <p>“The food industry's job is to make products that will sell and to generate money for stockholders. That's its job. And to think of it as a public health agency is unreasonable. That's not it's job to do public health. So it would be really nice if it could make healthy products and everybody would buy them and they would make lots of money on healthy products. But that doesn't happen because healthier products are more expensive to make.” (7982 – Academia)</p>			

“And that may have been naivety and the part of nutritionists where they maybe they assumed a static market, or they just didn't really think about the market very much. They thought, ok, will learn that this is high in fat, so instead they'll eat low fat products like fruits and vegetables. Instead of the market saying, well we can give you low-fat candy bars.” (5898 – Government)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
<p>Actors who are responsible for improving the public's nutrition and how reformulation fits within that view</p> <p>Potential role for government in reformulation initiatives</p>	<p>Responsibility</p>	<p>All stakeholders have responsibility</p> <p>Responsibility for improving the public's health lies with the government</p> <p>The government has a responsibility to regulate unhealthy food products</p>	<p>Chapter 7</p>
<p>"It is the government responsibility based on the fact that access to healthy nutrition is one of the human rights. So in that case, it can be part of a voluntary agreement with industry but it seems, the studies have suggested it would be more effective if it were demanded. But the problem with that is whether government has the capacity and infrastructure to impose that law or that regulation or not." (4549 – Academia)</p> <p>"So responsibility is really that there is some moral or legal or social norm imperative to change one's behaviour, to meet a certain goal, right. So I think that there is a collective responsibility of all key stakeholders, um industry but then there's such a diverse you know group of industry players. You really have to separate them out. Ok, what's the restaurant and catering sector doing? What are food and beverage manufacturers doing? What are industry trade associations doing? What's the media doing? Um, so that would be sort of the private sector players. But then what's government doing, particularly at the national level? And then what are academics doing, how are they evaluating efforts? So I think everyone has got a role to play, and everyone is responsible in helping to clarify the roles. That's the responsibility piece. The accountability piece is I think the US government." (7842 – Academia)"</p> <p>"I think that there is increasing um awareness more broadly that all stakeholders have a key role to play, and that the food and beverage industry should be doing something, it's not just all about personal responsibility. Yes, that's important, but also the food and beverage industry should be doing something to help people eat a healthier diet and help to reduce the long term disease risk." (8284 – Public Health/NGO)</p> <p>"Well, a question about responsibility is an interesting one. Because in theory everyone is responsible. Um, the government, the industry, the individuals. Um, but in terms of improving the health of a nation, then it is a governments responsibility" (9593 – Public Health/NGO)</p>			

“I think government just needs to be regulating the food the way they regulate, or the way they should be regulating air pollutants. Right, let's just call these food pollutants.” (6343 – Public Health/NGO)

Interview question	Relevant Coding Framework Categories	Views among Stakeholders	Thesis Chapter/ Paper
Key actors driving reformulation efforts	Key actors	Nutrition policy advocates Food and beverage industry Government	Chapter 10
<p>“Well I think maybe advocates had a lot to do with it when we were pushing for better snacks. Um but I think with beverages it’s the industry trying to keep itself current and keep it’s you know keep the money coming in.” (5387 – Public Health/NGO)</p> <p>“To some degree, to some degree. I mean we’re definitely a player at the table. Um, are we driving the added sugar discussion? No. But you know it’s on our plate, it’s on the radar.” (5078 – Government)</p> <p>“So from a regulatory standpoint, I think definitely a mixed bag. Part of it though is that their arms are tied to a certain extent. So I think there are people for example at FDA who are looking to do, are open to doing other things, but they feel like they cannot. It’s either outside of their jurisdiction or they can’t do it or they don’t have the power or capital to make some things happen.” (6388 – Academia)</p> <p>“So, uh the food and beverage industry of course is extremely influential here. And uh when the report came out they immediately ran to congress. And perpetuated a lot of misinformation, a lot of misinformation. Um, and we have done what we can to educate members of congress to make sure that the industry folks are sharing the correct information” (5078 – Government)</p> <p>“We’ve called on the FDA to limit the sugar content of beverages to about 25% of current levels. And if the FDA did that, it would pretty much solve the sugar problem. But the FDA is not going to do it quickly, the industry is dead set against any kind of a reduction like that.” (5883 – Public Health/NGO)</p>			