“It’s just the luck of the draw”: Luck, Good Farming and the

Management of Animal Disease in Aotearoa New Zealand

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**1. Introduction**

Faced with the unexplainable and unpalatable, luck, chance and fate provide reassuring clarity. Accounts of good or bad luck – broadly defined as a combination of ‘chanciness’, absence of control, and significance (i.e. how good or bad the outcome was) ([Levy, 2009](#_ENREF_45)) - are frequently invoked to account for the effects of environmental disasters, illness and personal failure. In doing so, luck ends the destabilizing doubt of uncertainty, providing logic where no other rational explanation can suffice. Whether it is flooding (Armaş and Avram, 2009; [Mishra et al., 2012](#_ENREF_51)), earthquakes ([Becker et al., 2013](#_ENREF_6)), tsunami ([Teigen and Glad, 2011](#_ENREF_73)), volcanic eruptions ([Teigen and Jensen, 2010](#_ENREF_74)), or wildfire ([Eriksen and Wilkinson, 2017](#_ENREF_25)), luck explains why some people die, others escape unharmed, and others hope for the best but prepare for the worst. This paper extends these analyses of luck to animal disease to explore how perceptions of luck help farmers make sense of its geographical spread and pathogenic mobilities. In doing so, the paper aims to show how a focus on luck helps to understand the complex reality of how farmers navigate unpredictability and risk-taking in an environment that may seem to be full of threats.

The geography of animal disease is set within a disease ecology in which a relational mix of the socio-political (farmers, governments), material (farmyard infrastructure) and natural (pathogens, wildlife) agents configure disease absences and presences ([Hinchliffe et al., 2016](#_ENREF_37)). Whilst these ecologies may be similar to other environmental threats, their constitutive elements can be highly mobile, geographically diverse, and controllable to lesser or greater degrees. Disease transmission may occur locally within and between farms, carried by wildlife or the wind, or from contact between cattle on different farms. Disease pathogens can be translocated across vast distance as animals are bought and sold, and transported to farms that may be distant physically, environmentally and culturally. It is this degree of mobility that means animal diseases present a different geographical challenge to other environmental threats that occur with little or no warning. Indeed, the mobility of livestock has become a defining feature of modern systems of pasture-based agriculture, but which significantly contribute to the spread of animal disease ([Carrique-Mas et al., 2008](#_ENREF_11)) and are enabled by the socio-political organisation of agricultural and disease control governance ([Law, 2006](#_ENREF_42); [Stoddard and Cantor, 2017](#_ENREF_70)).

Given the costs associated with the geographical spread of disease, governments have sought to constrain its mobility by using practices of spatial confinement and containment ([Hidano et al., 2016](#_ENREF_33)), whilst simultaneously encouraging farmers to act ‘responsibly’ and control disease themselves. This has included attempts to encourage farmers to voluntarily adopt new cattle purchasing practices to minimise the risks of livestock movements using epidemiologically defined risk assessments and categorisations of disease risk ([Adkin et al., 2016](#_ENREF_1)). These practices work by establishing new forms of ‘good farming’ ([Burton, 2004](#_ENREF_8)) or ‘biosecurity subjectivities’ ([Barker, 2010](#_ENREF_5)) which set what counts as appropriate farming conduct. By enabling farmers to police themselves, these practices should guide them towards purchasing low-risk cattle, thus reducing their exposure to good or bad luck. The extent to which they do so, however, is likely to vary spatially, reflecting the local interplay between governmental practices and environmental threats ([Alami et al., 2018](#_ENREF_2)), social identity and memories of disease outbreaks ([Davis and Reed, 2013](#_ENREF_14)).

In this context, this paper examines how luck is woven into farmers’ understandings of disease and the conduct of ‘good farming’ in relation to government attempts to restrict the movement of cattle. Specifically, the paper explores the effects of metrological practices of self-government that help farmers prevent disease by creating new ‘good farming’ subjectivities. To do this, the paper examines attempts to eradicate bovine Tuberculosis in Aotearoa New Zealand. Firstly, we outline theories of luck, and their relationship to the good farming and neoliberal practices of self-government. Secondly, we describe how farmers in different areas of disease risk rely on discourses of luck to make sense of disease transmission, the utility of disease risk categories and the relationship between ‘good farmers’ and good luck. Finally, we conclude by considering how luck relates to the socio-political organisation of disease control and its relevance to understandings of farmer behaviour.

**2. Luck: Explaining and Avoiding Harm**

Although luck occupies a significant role in cultural life its definition is disputed ([Pritchard and Smith, 2004](#_ENREF_61)). [Levy (2009)](#_ENREF_45) defines luck as a combination of ‘chanciness’, absence of control, and significance. [Rescher (1995)](#_ENREF_62) adds that the probability of the event determines the extent to which it can be considered lucky. For others, luck is not defined by outcomes but their avoidance. [Teigen et al. (1999)](#_ENREF_72) argue that the decisive factor in identifying luck is the counterfactual: what would have happened without it. The worse the counterfactual is (e.g. death), or the proximity to misfortune (e.g. near-death experiences), the more luck is said to be involved ([Teigen, 1997](#_ENREF_71)). Counterfactuals may be upwards or downwards, emphasising what could have happened in relation to normal events, or the worst possible outcome. In either case, luck resides in the avoidance of outcomes, rather than the outcome itself. For bad luck, counterfactuals play a different role since it is ‘not only bad in comparison, they also seem bad in a more absolute sense’ ([Teigen et al., 1999](#_ENREF_72)). As a result, outcomes may be considered unlucky because of the trauma experienced, or because they are described in comparison with upward counterfactuals. Others argue, however, that experiences of bad luck themselves generate counterfactual thinking, the content of which is determined by what is considered normal ([Kahneman and Miller, 1986](#_ENREF_39); [Roese and Olson, 1995](#_ENREF_63)).

Control is a key element of good and bad luck counterfactuals. On the one hand, luck can help explain events, providing a sense of control. On the other hand, a lack of control can be central to accounts in which luck provides the explanation. Rotter’s ([1966](#_ENREF_66)) concept of ‘locus of control’ suggests that people with low sense of control (i.e. external locus of control) attribute events to luck, chance and fate. For [Heider (1958)](#_ENREF_31) luck is more likely to be invoked when the external environment is perceived to be the primary cause and beyond the control of individuals. Such accounts are common in studies of health and illness. In human health, [Davison et al. (1991)](#_ENREF_15) describes how the public use a system of ‘candidacy’ to explain deaths from coronary heart disease. Luck is a central component to this explanatory framework, providing a way to make sense of exceptional deaths that do not conform to standardised risk profiles. Similarly, studies of animal disease reveal high levels of fatalism amongst farmers ([Broughan et al., 2016](#_ENREF_7)). These beliefs in luck and chance help farmers make sense of why some herds are diseased and others not, but their resulting fatalism and perceived lack of control is associated with a failure to implement preventive biosecurity measures ([Enticott, 2008](#_ENREF_21)) or even taking more risks rather than less ([Enticott et al., 2020](#_ENREF_23)).

As an explanatory framework, luck may also help to guide future behaviour. Perceptions of luck may be associated with positive behaviours such as planning towards specific goals ([Day and Maltby, 2005](#_ENREF_16)). Downward counterfactuals – bad luck stories that conclude ‘it could have been worse’ – may also have a mood enhancing effect ([Teigen and Glad, 2011](#_ENREF_73)). For policy makers seeking to change behaviour to limit the impacts of environmental threats, the relationship between hope, adaptive agency and good luck may therefore help to overcome perceptions of bad luck. [Eriksen and Wilkinson (2017)](#_ENREF_25) show how beliefs in good luck are connected to preventive bushfire actions and suggest using discourses of hope and good luck within risk communication to influence preparedness behaviour.

Attempts to change behaviour like this seek to redefine subjectivity through discourses of individual responsibility ([Rose, 1999](#_ENREF_64)). Broadly, approaches to individual ‘responsibilisation’ deploy strategies of persuasion that seek to control behaviour through self-governance. They are reflective of the various ‘mundane neoliberal practices’ that have reconfigured ‘spaces, states and subjects’ in various forms ([Larner, 2003](#_ENREF_41)) and which are common to the evolving governance of animal health and biosecurity ([Dibden et al., 2011](#_ENREF_17); [Higgins et al., 2012](#_ENREF_36)). These strategies may rely on discursive forms of affectual persuasion to define appropriate conduct and encourage a permanent psychological state of anticipation, prevention and preparedness ([Anderson, 2010](#_ENREF_3)). They may also rely on metrics, rankings and ratings through which citizens calculate and compare themselves to others, adjusting their behaviour to fit norms of appropriate conduct ([Miller and Rose, 1990](#_ENREF_49); [Murdoch and Ward, 1997](#_ENREF_55)). Metrological regimes such as certification and market instruments may be invoked to govern economic behaviour ([Lockie and Higgins, 2007](#_ENREF_47)), but their success rests on the extent to which they align with cultural understandings of appropriate conduct. Indeed, conforming to social identities and what is understood as ‘good farming’ ([Burton, 2004](#_ENREF_8)) is a key factor in ensuring that new farming or disease control practices are culturally compelling ([Panter-Brick et al., 2006](#_ENREF_59)). Here, ‘good farming’ refers to institutional and economic forms of capital, but specifically symbolic cultural capital: the visible demonstration of practical knowledge such as good stockmanship, symbols of appropriate farm maintenance such as clean farmyards and tidy hedgerows, and attributes such as hard work. Thus, where specific farming subjectivities encoded within neoliberal practices fail to recognise the cultural capital of good farming, instead reducing farmer behaviour to simplistic logics, they are more likely to fail ([Burton et al., 2008](#_ENREF_9)).

When it comes to agricultural governance, Aotearoa New Zealand represents a proto-neoliberalising space in which self-governance has been enacted through a variety of neoliberal practices ([for a detailed description of the New Zealand neoliberal 'experiment', see: Le Heron and Pawson, 1996](#_ENREF_44)). For example, [Campbell et al. (2012)](#_ENREF_10) suggests that ‘metric-centric’ practices of audit and self-calculation have dominated reforms to agricultural governance (see also: [Henry, 2017](#_ENREF_32); [Rosin et al., 2017](#_ENREF_65)). For disease control, [Barker (2010)](#_ENREF_5) describes how various contractual and non-contractual government attempts seek to inspire ‘biosecurity citizenship’, in which material and discursive practices have come to enact ‘obligations for daily life’. Intruding within both public and private spaces, these practices patrol for unwanted biological presences, contributing to a shared sense of national identity, and providing a guide to ‘doing the right thing’. Alongside these discursive practices, the metric-centric tendencies of agri-food reforms is also present in the management of the animal disease bovine Tuberculosis (bTB). The reliance on pasture-based cattle feeding systems means that livestock movements are an integral part of farming systems and a key risk factor in the spread of bTB. In an attempt to reduce the risks of cattle movements, a voluntary system of risk-based classifies every farm’s level of bTB exposure or risk. Known as ‘C-status’, every herd is classified according to the number of years they have been clear of bTB (e.g. C1, C2 through to C10) or infected (e.g. I1, I2 etc.). Farmers purchasing cattle from herds with inferior bTB status are penalized: if a C10 farm buys cattle from a C5 herd, it would adopt the lower status classification. Where C-status reflects the cultural capital of good farming, it may therefore encourage farmers to change practices and behaviours.

C-status constructs good farmers in a number of ways. As an official form of certification, C-status explicitly provides farmers with institutional capital. Although there are no explicit standards or benchmarks within C-status[[1]](#footnote-2), implicitly it defines good farming conduct as disease-free, and the longer the better. Cultural capital is therefore provided by associating disease freedom with the practical skills of good stockmanship and the public display of healthy good-looking cattle. Moreover, the financial reward of selling high-status cattle may allow farmers to demonstrate other aspects of farming cultural capital such as hard work, practical skills of rearing, productivity and financial success. Social status is therefore literally conferred on disease-free herds, defining them as ‘good farmers’ through their ability to avoid disease. In connecting disease freedom with good farming, C-status therefore provides a hopeful pathway, offering a means of aspirational self-government for farmers with bTB to guide their behaviour rather than basing it on feelings of good or bad luck.

However, the connection between good farming and disease control is not as straightforward as might be expected. [Naylor et al. (2018)](#_ENREF_56) show that whilst farmers associate good farming with following appropriate disease control practices, disease outbreaks may be excused by government failings rather than ‘bad farming’ (see also: [Enticott, 2008](#_ENREF_21); [Little et al., 2017](#_ENREF_46); [Shortall et al., 2018](#_ENREF_68)). Slippage between good farming and that encoded within neoliberal disease control practices may also reflect the uneven geography of neoliberalism as its practices encounter and are remade in relation to local patterns of agricultural development and disease ([cf. Massey, 1995](#_ENREF_48)). For practices like C-status, variations in prior disease incidence and farmers’ relationships with government may therefore mediate the meaning of good farming encoded within it. In fact, C-status encodes a single ‘epidemiologic lens’ which associates disease-freedom with good farming, emphasising a logic of control whilst eliding other values and approaches to disease control ([Shortall and Brown, 2020](#_ENREF_67)). Good farming may instead be defined by a logic of care that embraces uncertainty as a means to find ways of living with disease ([Mol, 2008](#_ENREF_52)). For example, [Singleton and Law (2013)](#_ENREF_69) argue that practices of care in which decisions are slow, adaptable and craftlike are more consistent with farmers’ views of good farming than technological practices of control. Indeed, other studies of disease control suggest they are more consistent with the development of effective disease control practices than those that rely on universal, decontextualized rules, and instead embrace the unpredictability and variability of cattle, pathogens and other nonhumans ([Hinchliffe et al., 2016](#_ENREF_37)).

Whilst it is possible to imagine how calculative forms of self-governance may inspire upward counterfactual thinking to create hope and replace fatalism and beliefs in bad luck, failure to accommodate different ‘epidemiological lenses’, local experiences of disease and good farming mean luck may remain an important resource to make sense of disease outbreaks. In what follows, we therefore explore the extent to which accounts of luck feature in farmers’ descriptions of animal disease management, and the power of metrologies of disease risk to turn bad luck into hope and inspire the adoption of preventive biosecurity practices.

**3. Methodology**

The management of bTB in Aotearoa New Zealand offers a unique opportunity to explore the relationships between practices of disease control, luck and good farming. Although zoonotic, bTB is primarily found in and transmitted between cattle and wildlife (e.g. possums) and is managed by Operational Solutions for Primary Industries (OSPRI), formerly known as the Animal Health Board (AHB). The AHB was made possible by the 1993 Biosecurity Act which signalled a shift from a paternalistic, top-down style of disease governance, to one which was owned and development by the agricultural industry ([Enticott, 2017](#_ENREF_22)). The AHB was formally established in 1998 as a pest management agency: a partnership between the farming industry and the national government in which farmers had the majority stake due to their larger financial contribution to operations such as ground or aerial poisoning of wild possums ([Hutchings et al., 2013](#_ENREF_38)). Subsequently, the national prevalence of bTB in cattle herds has fallen to 0.07% ([OSPRI, 2019](#_ENREF_58)). Alongside these controls, geographical restrictions on the movement of cattle from areas of high bTB prevalence, and in partnership with farmers, the C-status risk-based trading scheme was introduced.

To assess the role of C-status as a neoliberal practice to guide cattle purchases and define ‘good farming’, farmers were interviewed in two areas of Aotearoa New Zealand, one with high and the other with low bTB prevalence. The low risk area was the Manawatu region, in which bTB prevalence was less than 0.03% as of 2015; the high-risk area was the West Coast region which has 48% of all bTB incidents ([OSPRI, 2015](#_ENREF_57))[[2]](#footnote-3). In the low risk area, 21 farmers were interviewed: 16 were rated C10, 10 had previously experienced a bTB incident, and herd sizes ranged from 220-2500. In the high-risk area, 20 interviews with farmers were conducted with farmers, all of whom had experienced a bTB incident. The C-status of bTB-free farms ranged from C1 to C5 and nine were infected at the time of the interviews. Herd sizes ranged from 150 to 370. In each area, farmers were recruited using snowball sampling based on recommendations from farmers and AHB vets working in each area. Interviews covered the history of bTB in each farmer’s herd, their understanding of disease transmission, the role and meaning of C-status, and the governance of bTB.

Interviews followed a biographical approach in which the aim was to explore farmers’ experiences of bTB; their approach to preventing outbreaks and perceptions of different preventive measures such as C-status; and their experience and perceptions of institutions involved in managing bTB. Luck was not an explicit focus of the interviews and no direct questions were asked about it unless it was raised by farmers themselves. All interviews were recorded and transcribed, then coded using NVivo v.12. Interviews were conducted on the basis of strict confidentiality and transcripts subsequently anonymised. Quotes from participants in the low-risk area are identifiable by ‘LR’, and those from the high-risk area by ‘HR’. Initial analysis involved searching the transcripts for key words (including stemmed words), including luck, chance, coincidence, fortune, hope, trust, fate, fault, blame and control. In addition, coding sought to identify good and bad luck stories in which upward or downward counterfactual stories were. This involved searching for idiomatic statements of luck such as ‘it could have been worse’ or commonly used local expressions such as ‘good as gold’ and ‘she’ll be right’. Following initial identification of statements of good and bad luck, incidents were coded thematically and categorized in relation to bTB, C-status and good farming.

**4. Defining Good Farming in Aotearoa New Zealand**

For C-status to be a compelling disease control metric, its encoding of ‘good farming’ must reflect existing versions held by farmers. Encouragingly for the prospects of C-status, these characteristics were identified throughout interviews in both high- and low-risk areas. Farmers specifically distinguished between ‘good operators’ and those who they described as ‘rogue’, ‘rough’, or ‘dodgy’ farmers, ‘cowboys’ and ‘dumbarses’. A ‘good operator’ demonstrated their good farmer credentials in five inter-related ways. Firstly, ‘good operators’ made a positive contribution to the farming community at national and local scales. A primary concern for farmers was ‘doing what’s right for everyone’. This could involve being a good neighbour by maintaining fences and field boundaries, and informing neighbours of disease outbreaks ([cf. Shortall et al., 2018](#_ENREF_68)). In terms of managing bTB, ‘good operators’ did not oppose methods to control disease in the wildlife population. By contrast, farmers’ actions that caused ‘distress’ were criticized: these included those that established new practices that produced local environmental hazards or farmers that did not look after their land:

“[He was a] funny old bugger, yeah he was, he wouldn’t let anyone in there, and he’d got all these massive old trees that needed cutting out and he wouldn’t let anyone going in cut wood or anything, he just hated the idea of someone making money off the land. (LR16).

Conforming to these local expectations and national regulations was essential to being a ‘good operator’. There was little sympathy for those farmers that flouted regulations designed to ensure the profitability and safety of farming throughout Aotearoa New Zealand. For example:

“Some people just fall through the gaps don’t they and they’re the ones that, y’know, we do everything properly, we bring every two-year-old animal home and they all get tested and when we move them off farm it’s all written down and can be traced so, but I guess there’s people who don’t do that” (LR13).

Other farmers described how stopping certain practices that were legal but which posed a disease threat gave them ‘peace of mind’ both in terms of limiting the spread of disease, but also maintaining their place in the farming community. Unlike other studies ([Escobar and Demeritt, 2016](#_ENREF_26)), keeping good formal records was also associated with being a good farmer. However, whilst farmers in the high-risk area recounted tales of suspicious cattle movements under the cover of darkness, and linked them with the spread of disease, the effect of bTB on farm profitability and farmer welfare meant they could sympathise with some who had broken the law:

“One of our sharemilkers down the road is being prosecuted because he decided to sell his herd and get out of dairy farming but as a sharemilker that is where your whole equity is so he was basically charged with reading his own animals, and 5 of them were put down the back (killed) so the herd had a clear test because at the end of the day if you have a reactor, that’s his asset devalued, [by] about half. And if he is prosecuted he could end up in jail, so these are the sorts of things that people do. And in a way you feel sorry for him because that’s where his equity is” (HR 05)

Sympathy was not extended to large corporate farmers particularly in the low-risk area where they were less common or owned by non-local farmers. Their size and ownership meant that their mistakes were their problem. Rather, a ‘fair go’ was reserved for traditional family farmers that were symbolic of Aotearoa New Zealand rural culture (cf. [Dominy, 2001](#_ENREF_18); [Hatch, 1992](#_ENREF_30)). However, whilst farmers complained about the actions of ‘cowboys’ who contributed to the spread of animal disease, many were reluctant to criticize farmers whose practices similarly contributed to disease spread but which were perfectly legal. Traders who bought and sold on cattle, and graziers who looked after young stock from multiple herds were singled out as risky farming practices. Despite these risks, these farmers – so long as they stayed within the law – were described as part of the farming system and not viewed as poor farmers:

“Traders here are just part of a cog, y’know, like this this joker here he lambs a lot…but y’know when it comes dry, especially up the East Coast they’ve got to move those lambs on, y’know, coz they’re not up to killing weight so they’ve got to move them and that’s where the traders come in, y’know for lambs and same for cattle really…and they could end up anywhere from Invercargill to Kaitaia man…no one sees them as a risk as long as the paperwork’s there… Coz without that, without your trail of the history of that animal you would be fighting a losing battle” (LR 19)

Secondly, ‘good operators’ were defined as financially successful who paid off their debt and had a good living. The removal of farm subsidies during the 1980s meant that ‘the bottom line’s got to add up’ (LR14): knowing one’s cost of production per hectare and a desire to make money were key to being recognized as a serious farmer. Farmers in the low risk area were keener to adopt progressive farming practices, run more than one farm or participate in off-farm business activities. Those that did not were criticised as ‘cruisey’: farmers happy with their lot, but not working hard to maximise their economic potential. This reflected a key difference in good farming between low- and high-risk areas. Farmers in the high-risk took a more relaxed view of life and emphasised long-term community membership and responsibility in their versions of good farming. Expansion and operating more farms outside of their local area was not highly valued. However, demonstrations of productivity within the local area were important. For example, the practices of ‘humping and hollowing’ or ‘flipping’ to improve soil quality and drainage have a clear visual effect on the appearance of the landscape, distinguishing hard working farmers trying to be productive.

Thirdly, ‘good operators’ needed to demonstrate practical skills and care for their animals. Having good-looking productive animals on display in well-kept fields was a sign of good farming, but it was important that cattle were not ‘pushed too hard’ such that their welfare was compromised ([cf. Haggerty et al., 2009](#_ENREF_28)). Maintaining a balance between making money and caring for animals was therefore a subtle distinction between ‘good operators’ and those out to make a ‘quick buck’. For example:

‘Farming’s different to just about any other industry in that you’re there to look after animals, you make money from looking after animals basically, so a good farmer to me is someone who does that well. And it’s always the balance between welfare and profit basically, and there’s, there’s a happy medium but there’s often conflict between the two and so a good farmer’s someone who gets that balance right. We do have farmers in New Zealand who don’t. There are certainly farmers who are more developers who use the cows to pay the interest and often that’s at the expense of the cows. So, I consider them to be very wealthy but bad farmers’ (LR12)

Fourthly, ‘good operators’ publicly displayed cultural capital by maintaining clean farmyards and healthy stock. The practice of ‘hedgerow farming’ ([Egoz et al., 2001](#_ENREF_19)) in which farm quality was assessed from the car was described in relation to the appearance of livestock and pasture quality/management. Maintaining the appearance of fields and boundaries was also important in terms of pest control. Farms that had been left to go ‘backwards’ could attract feral animals increasing disease risks. Maintaining a clean and tidy farm showed a commitment to a collective effort to minimise animal disease risks.

Finally, ‘good operators’ were distinguished by their practical skills and knowledge of farming. Good livestock not only looked good, but behaved well, was not ‘easily spooked’ or wound up, or displayed signs of being abused through poor handling. The practical skills of a good stockman could also be recognized in conversation and the ability to ‘talk farming’:

‘If it looks terrible, they’re under-performing, light cows, you can see cows from the road most days, you can see the state of their herd…You can drive up a drive way often or talk to a farmer for 10 minutes and you’ll soon work it out how good they are. Yeah, knowledge and just they, you know what they are sort of saying, looking around at the environment, you only need to look at say the, if you could ask them their production per cow, the cow condition and look at the state of their farm, you generally tell what sort of farmer they are’ (LR09)

Farmers who had ‘no idea’, lacking knowledge of even the most common aspects of farming, such as form filling, disease testing and looking after animals were associated with small-scale lifestyle farmers who were ‘in need of educating’ ([cf. Naylor et al., 2018](#_ENREF_56)). For ‘real’ farmers, these activities were second nature and performed subconsciously.

**5. Connecting Good Farming, Disease Control and Luck**

C-status should assist farmers identify the most reliable cattle to buy, rather than relying on luck to avoid bTB. In fact, farmers in both high- and low-risk areas reported that a high C-status was personally important, reflecting the productive and economically successful ‘good operator’. Being C10 ensured the best possible price for their cattle; those that were C2-4 suggested that selling cattle was harder as buyers sought to negotiate the price downwards because of their status. Thus, high C-status farmers described it as an ‘affective state’ (Anderson, 2010) – a ‘warm fuzzy’ feeling (LR21), and something to be pleased about, proud of and jealously guard (HR08). However, the extent to which these affectual states contributed to heightened anticipation varied. For example, when farmers reported a preference for buying C10 cattle, it was because C-status inspired confidence, such that they ‘wouldn’t even ask the question about TB, I’d just buy it. I wouldn’t care when it was last tested or anything because it’s a C10 you’ve got that confidence’ (LR09). Buying cows with a high C-status in the low-risk area simultaneously provided ‘peace of mind’ alongside a sense of ‘hope [that] they are clean’ (LR13). In the high-risk area, however, whilst C10 cattle were seen as ‘good cattle’, they offered little hope of staying clear from bTB. Farmers felt that a high C-status was something they had ‘[got] away with’ (HR17). Reflecting on the hope of being C10 was itself seen as bad luck:

‘Definitely it would be good, definitely, there’s no two ways about it, but I’m just not holding my hopes on [being C10]. I know its negative but I just don’t want to be yeah and then boom. Just go with what’s happening there’s no point getting up and down about it, it’ll give you a guts-full of cancer otherwise stressing out about it’ (HR09)

The relationship between C-status and good farming was also problematised by the meaning of diagnostic tests. A common refrain amongst farmers was ‘clear is clear’: that is, by passing a bTB test, the risk of infection is the same from any herd whatever its C-status. As one farmer joked, ‘you can’t be half pregnant, can you?!’ (LR13). Farmers that had just been declared bTB-free after years of infection claimed they were more likely to be free from bTB than a C10 herd tested once every three years. At the same time, luck provided a fall-back position: the uncertainties of the bTB test were cited to show how dependent farmers were on luck to stay bTB-free (see Enticott, 2017). In this sense, even farmers that committed some of the most basic mistakes, such as buying low status cattle were able to escape blame, so long as they were following the rules, be prepared to learn from their errors, and explain to others the risks involved:

‘An example was our national dairy council last year, a farmer bought an infected bull in for his breeding regime and it was riddled with TB and he didn’t know, he just bought it off the block, I don’t think the block even knew, I don’t think they really…he was a fairly onto it farmer, I don’t think he had been treating it too lightly [he] just was unaware, [but] he was willing to educate us to say look you’ve got to be careful because I didn’t think this would happen…He was willing to tell everyone about it, very soul destroying for that farmer, and we were all very concerned and it was an education thing really’ (LR09)

As this quote shows, for farmers in the low risk area, C-status allowed them to push bTB to the back of their minds and focus on other farming challenges. The confidence C-status provided, however, could precipitate complacency: farmers became ignorant of their neighbours’ C-status and purchased C10 cattle as a matter of routine rather than from a state of anticipation. Rather than using C-status to think more deeply about the risks of bTB, the area cattle were from and other ‘good operator’ characteristics appeared more important than a number. Thus, whilst farmers were unlikely to ‘go down to any Joe Bloggs and buy a bull to run with your cows’ (LR13), assessments of disease risk were mediated by where a farmer was from or known to be a trusted colleague:

‘If someone rang me up from Masterton saying they’re sending me a bull up, straight away, I’d say are you in a movement control area? We instantly know which areas of New Zealand are likely to be near them. Eketahuna, or what have you, whereas, if [a friend known to be a good farmer locally] rang me up from up the road and said I’ve got a couple of bulls, you can have a couple if you want, its good as gold, coz you know the area’ (LR10).

In doing so, farmers transferred the consequences of their purchasing decisions to the AHB, deriving a sense of ontological security from its veterinary experts to resolve any problems ([Harries, 2008](#_ENREF_29)). Thus, beliefs in luck were doubled-edged. On the one hand, going down with bTB following a C10 purchase was bad luck and just ‘one of those things’ – an accident, a failure of the test, or the fault of ‘dodgy’ farmers. On the other hand, however, veterinary experts in the AHB offered farmers hope that an outbreak would be resolved quickly:

‘My job is to produce a good product and send good milk out the gate. The next guy down the road, the next guy at the factory, he’s the expert that’s gotta deal with it from there and I can’t worry too much, y’know what I mean. And I guess the TB thing’s a bit the same that, I’ll do my best to do my bit here and I hope everybody else is but every so often there’s going to be a fall down somewhere and you’ve got to leave it to the experts to sort it and trust that they do so, [and] we’ll face it when it happens’ (LR14)

Whilst being C10 was welcomed by all farmers, its relationship with good farming and ability to displace discourses of bad luck was not simplistic, but reflected the complex balances and situated work that farming involved. On its own, C-status valorises disease-freedom above all other dimensions of good farming: purchasing cattle should be a simple matter of seeking out the highest rated cattle of all. Yet, as farmers described, being a good operator as opposed to being C10 requires different practical skills. Whereas, C-status imagines the good operator as a rational actor who chooses to buy C10 cattle, it provides no guidance on the practical skills to manage a farm beyond its disease status. By contrast, the good operator uses situated and intuitive skills to carefully balance or ‘engineer’ ([Higgins et al., 2018](#_ENREF_35)) the relations that configure their farm to ensure its socio-economic continuity. This craftlike process matches potential cattle purchases to different farmyard cultures and disease ecologies to ensure these relations hold together ([Hidano et al., 2019](#_ENREF_34)). These practical skills ensure that cattle purchasing decisions are not reducible to a single epidemiological lens, but involve carefully balancing a range of different considerations.

For example, the balancing process was complicated by the seasonality of the farming calendar. Most dairy farms in Aotearoa New Zealand operate a spring calving system, but small regional variations in calving dates can make some cattle unsuitable for purchasing as it lengthens the calving window and means the herd is no longer ‘in sync’. Some areas such as the West Coast were considered disease risks, but also that cattle could experience stress during transportation that made them vulnerable to diseases and management problems at their new farm. Similarly, the need for cattle to have resistance to other local disease threats was also considered important. Price was important when buying new cattle. Finding cattle at the right price, though, was itself often a matter of good luck: farmers recalled ‘bargains’ they had come across by chance as a result of marital breakups, holidays, or changes to farming systems. Price could usurp other factors such as disease if ‘they were bloody cheap’ (LR11) and whilst disease status could be a factor in purchasing, others cited age, production, breed and appearance as important influences. Other factors requiring careful consideration included moving cattle between different climates, terrains and/or production systems was recognized to be a problem ([cf. Hidano et al., 2019](#_ENREF_34)) potentially threatening the productive ability of the animal and/or stressing the animal to the extent that they succumbed to bTB or other diseases. For example:

‘Those cows must have got a bloody shock, like, they were in a little 180 cow herd up there, y’know, and then they went down to sort of 1500 cows in a rotary and that, yeah they must have got quite a surprise really… but you often wonder what they cows [are] thinking, y’know, “oh shit, this is not what I’m used to!” [Laughter]’ (LR19)

As well as not recognising the different qualities of cattle, C-status was also incommensurate with other dimensions of good farming that farmers sought to balance when purchasing cattle. Other medical and veterinary practices have been shown to function best when they can adapt to and accommodate different contexts and situations ([Laet and Mol, 2000](#_ENREF_40)). Farmers, however, interpreted C-status as a blunt assessment of cattle quality, rather than possessing a fluid or multiple quality ([cf. Cooper, 2015](#_ENREF_13)). Thus, whilst a rating of C10 was useful in some respects, it effaced other qualities of good farming that were consistent with good cattle and essential to know when seeking to fit cattle to specific farm cultures. For example, describing his own herd, one farmer argued that whilst C-status was useful, disease risk was not reducible to the length of time a herd had been bTB free, but the time that herd had been established, its permanence within the farming landscape and the genetic breeding lines within it which defined good farming:

‘Like our herd, when we bought it, it was a family herd, and it had been on the same farm together for basically – the herd grew from 100 heifers and 60 budget cows and the farm owner grew them and we’ve actually got one left of that original herd, that was a heifer, she’ll be 17 this year if she’s in calf. So, that, I would consider that being a safer herd than someone that’s got a makeup of 4, 3, 5 herds put together as one herd’ (LR15).

This slippage between C-status and good farming also provided space for luck explain how the practical skills of good farmers may fail to maintain the farm’s relational balance, justify mistakes and reinforce the separation of C-status from good farming. Most farmers therefore did not believe that C-status reflected good farming because of farming’s randomness, chance, and bad luck. The consequence was: ‘Whether you are a 10 or a 5 or what, it makes absolutely no difference: you are only one test away from disaster, and it doesn’t matter how long you’ve been clear’ (HR13). Farmers that were C5 were no better off than those that were C10 – they had simply had five years more good luck rather than better management practices (HR08). Farmers in the low risk area rejected associations between good farming and C-status. Rather than being earned, C10 in a low risk area was something that was to be expected: it was more unusual if farmers were not C10. This ‘inheritance’ of C-status was therefore simply a reflection of the area rather than ability, and the luck of farming there rather than on the West Coast:

‘I don’t think it’s farmer’s ability, it’s not your ability as a farmer to control whether you get TB or not…you can do all the things in the world, if you’re in an endemic area and you’re the best farmer in the district you can still get TB. Similarly, you can be the worst farmer in the district in a non-TB area and still not get TB, y’know what I mean. Or the worst farmer in a TB endemic area and still not get TB’ (LR01)

‘They could be a shit farmer and still have a C10, yeah, it doesn’t tell them whether they’re sort of treating their animals to the best of their [ability], or what, but yeah, no, it doesn’t, I’d have to say it doesn’t reflect on their farming ability it just reflects on the fact that they haven’t had TB there for 10 years’ (LR19)

More generally, farmers’ explanations of bTB outbreaks specifically drew on perceptions of bad luck, emphasizing a lack of control over the spread of disease. Farmers said they were unlucky because infected cattle would usually be their best cows with good temperaments and milk production rather than ‘the cruddy old cow that you were going to send to the works anyway’ (HR11). The diagnostic test used to detect bTB was blamed as ineffective, failing to identify cows that were infected, but which could subsequently test positive on another farm after being sold. These bad luck stories were connected to downward counterfactuals, such as wishing farmers had asked more questions about the stock they were buying. Good and bad luck were also seen in non-human terms. Farmers described how cows could be infected with bTB but that it would be ‘walled off’ and lie dormant within their body and immune to being discovered by the test. At times of stress, bTB could ‘break out’ and infect other cattle. Whilst this was perceived to be bad luck, farmers were also clear that it was not something that they could do anything about.

Luck was also connected to a geography of risk: farmers in the low-risk area perceived a bTB incident to be unlucky if the area where cattle had been grazing prior to a positive test was perceived to be low risk, arguing that they had ‘done the best we could, we followed the rules, we didn’t bend the rules of anything, it just happened, it’s just bad luck’ (LR21). Similarly, farmers in the high-risk area argued that they were unable to prevent contact between infected possums and cows, or control whether farmers’ neighbours had secure field boundaries to prevent cattle-to-cattle transmission. The lack of geographical patterns of bTB incidence meant that an outbreak could only be explained by bad luck:

‘I really don’t know I just think it’s the luck of the draw. We are all within a very short distance of bush that might harbour vectors – I really don’t know – I’m just at a total loss on that one. The thing is some people say it’s strange that it’s only the farms out by the coast but it’s not just the farms out by the coast. Even the farms up the valleys they have all had a TB history as well’ (HR01)

In the low-risk area, farmers also cited their own ‘good luck’ as a reason why they did not worry about bTB: the historical and continuing low rates of bTB in the area were not something that they had any control over. Blame was rarely attached to a bTB incident, as it was as one farmer described, ‘such a hard thing to really get, its more such of a thing that you get it by chance or accident than intentionally type of thing’ (LR15). As a result, farmers’ experiences of bTB were different to those compared to those in high-risk areas: they had higher levels of trust in animal disease control ‘experts’ and officials to swiftly resolve any problems and reduce them to a ‘once in a blue moon type of event’ (LR07).

Comparing their situation to those in the high-risk area, low risk farmers’ sense of luck therefore reflected the principle of ‘minimal mutations of reality’ in which differences are imagined in ‘the closest of all possible worlds’ ([Pritchard and Smith, 2004](#_ENREF_61)). In this sense, the high-risk area represents the closest world in which ‘things could be worse’ and where there is little hope of becoming bTB-free. In the high-risk area, these geographical dimensions of disease risk meant that bTB was often consigned to being ‘one of those things’ in which you had to expect one or two reactors every so often. This did not mean that upward counterfactuals were absent from these expressions of luck: farmers in the high-risk area suggested that you could fence off the bush or check the source of purchased cattle to reduce the risk. However, the coda to these statements was that they were unlikely to work anyway. Farmers cited finding possums in the most unlikely of places or the consequences of the actions of unscrupulous farmers as examples of their inability to control bTB. Even those that had implemented on-farm biosecurity measures confessed to having their ‘fingers crossed that it doesn't happen again – but you just don’t know’ (LR18).

**6. Discussion: Luck, Good Farming and Disease Control**

From these findings, we identify four substantive points that contribute to conceptual understandings of farmer behaviour, luck and the management of animal disease. Firstly, luck should be considered as a central component within the concept of good farming. In short, good farmers are lucky farmers, suffering either from misfortune or benefitting from the ‘luck of the draw’. Traditionally, the concept of good farming suggests that practical skills and subsequent visible displays of cultural capital distinguish good from bad farmers (Burton, 2004). This research, however, suggests that whilst these practical skills remain highly relevant, assessments of good farming are mediated through the lens of luck. When it comes to managing disease, luck may be important in a number of ways: it may help farmers maintain the relational balance of the farm when selecting new livestock to purchase. Luck may determine what cattle are available on the market, or refer to the mutations of cattle and bacteria as they move between different farming disease ecologies ([Shortall and Brown, 2020](#_ENREF_67)).

More broadly, luck provides a resource to understand why good farmers get disease, whilst poor farmers do not and to make sense of unexplainable disease outbreaks. In this sense, visible manifestations of good farming are never enough to confirm who is a good farmer, but are instead dependent on the perceived presence or absence of good luck. Luck contextualises the forms of capital constituting good farming and provides a vital resource to make sense of and confirm who is a good farmer. Good or bad farming is therefore more than the presence or absence of visible capital as these assessments only make sense in context. Whilst these findings are specific to bTB, it is possible that other animal diseases and aspects of farming are also assessed through the lens of luck. Indeed, given the vulnerabilities of farming, it seems likely that the good farming is always likely to be mediated by perceptions of luck, whether that is attributed to inheritance, the weather, family circumstances or other factors. Attempts to assess farmers’ behavioural adaptions to other environmental challenges such as flooding, climate change, the use of antibiotics, or participating in agri-environmental schemes should therefore account for the role of luck in shaping farmers responses to them.

Secondly, farmers’ accounts of disease also suggest that good and bad luck are spatially differentiated. Luck was associated with each farming community’s local geography such as the presence/absence of landscape forms and disease vectors, and its social make-up. Farmers imagined disease risks spatially, identifying spatial patterns of disease and infection, and safe or vulnerable zones. These spatial patterns were nevertheless subject to good and bad luck: spaces presumed to be safe could be unlucky, and in risky areas, bad luck could be mitigated by hoping for the best. Luck was also spatialised at regional and national scales, often associated with the degree of animal disease risk. In fact, these spatialisations of luck were connected to different forms of counterfactual thinking. Upwards counterfactuals (“if only I had fenced off my boundaries”) were connected to bad luck and used by farmers in the high-risk area. Whilst there is some evidence that upward counterfactuals can lead to adaptive behaviour ([Epstude and Roese, 2008](#_ENREF_24)), farmers in our study were more likely to view bad luck as ‘one of those of things’ that could not be changed whatever actions were taken. Thus, whilst some farmers mulled the impact of buying C10 cattle, these ruminations were counterproductive contributing to a sense of false hope ([cf. El Leithy et al., 2006](#_ENREF_20)). Indeed, for some farmers, hope itself could be seen as bad luck, precipitating a bTB incident. By contrast, downwards counterfactuals (“it could have been worse”) tended to be found in the low risk area. These perceptions were largely based on a positive attitude towards and a reliance on the agencies responsible for managing bTB who – in the low risk area – had successfully demonstrated their ability to manage the threat from wildlife vectors. Reliance was not adaptive: farmers blamed incidents of bTB on ‘rogue’ farmers, testing failures, and excusable accidents. Purchasing C10 cattle was preferred, but farmers did not rule out buying other cattle for valid farming reasons. In this way, bTB was just ‘one of those things’ that farmers could not do anything about, but which outside experts would resolve.

Thirdly, understanding the relevance of luck to the concept of good farming is important in designing effective policy tools to help control the spread of animal disease, as well as understanding how agricultural metrologies ‘work’ in general ([Rosin et al., 2017](#_ENREF_65)). Attempts to encourage responsible cattle trading have been a mainstay of past and present attempts to manage animal disease ([Godfray et al., 2018](#_ENREF_27); [More et al., 2015](#_ENREF_54)). However, this research suggests that practices relying on calculative self-government may be undermined in a number of ways. Disease metrics like C-status articulate a distinct epidemiological view of farming behaviour in which good farming is defined by the epidemiological lens of disease control. Yet, farmers may understand good farming in a range of different ways in which the disease-free good farmer and its practices of control is one identity amongst many others ([cf. Law and Mol, 2011](#_ENREF_43)). As [Singleton and Law (2013)](#_ENREF_69) suggest, nuanced practices of care may be equally reflective of good farming but which sit uneasily within blunter practices of control like C-status. Disease metrics like C-status may therefore work best where they are flexible enough to sit alongside and articulate these other influences rather than promote disease control as the defining characteristic of the good farmer. Indeed, if seeking to maintain a workable balance between competing pressures is the hallmark of the practical skills of good farming, it is naïve to expect good farming subjectivities inscribed into disease metrics to supersede all others. C10 cattle may be preferred by farmers, but the complexity of purchasing decisions and attempts to make sense of risk mean that voluntary systems of risk-based trading must be balanced against a range of other factors and understandings of good farming. There is also the danger that such metrics efface the kinds of reflection and deep thinking that managing animal disease risk requires. The inherent uncertainties and variations of disease control (such as diagnostics) also provide scope to question the disease-free good farmer subjectivities.

Finally, this analysis reveals how perceptions of luck are reflective of the interplay between local contexts and the socio-political organisation of disease management. Whilst luck consistently emerged in relation to C-status in the high- and low-risk areas, it did so despite different encounters with local spaces, subjects, versions of good farming and disease histories. In fact, although analyses of neoliberal reforms can stress their geographically uneven effects ([cf. Conradson and Pawson, 1997](#_ENREF_12)), despite their different spatial contexts, farmers universally placed faith in government and veterinary experts to control disease. In one way this encapsulates the positive feelings of hope: that something or someone can prevent disease. These feelings of hope also reveal the tensions between neoliberal practices of individual responsibility and the socio-political organisation of the governance of animal disease. The reliance on external ‘others’ to control disease and discipline farmers that step out of line reinforces a distinct spatial and material ordering of disease control practices ([cf. Wilkinson, 2011](#_ENREF_76)). However, it is precisely because of the application of these specific neoliberal practices of self-government, rather than others like statutory regulation and enforcement, that luck emerges as a key discourse. If the aim of disease control practices is to ensure disease-freedom, statutory systems of regulating cattle movements may represent a more effective method than leaving it to chance. In this way, discourses of luck may reflect how the effects of neoliberalisation are varied and contradictory ([Peck, 2010](#_ENREF_60)).

Moreover, these assertions of luck do not simply reflect the failures of the attempts to manage disease through self-governance, but like other agricultural scripts they perform other political roles ([Vanclay and Enticott, 2011](#_ENREF_75)). For farmers, attributing incidents of animal disease to luck makes disease events become less worrisome if they are explained by luck and factors over which farmers have no control, allowing farmers to concentrate on those aspects of farming that are consistent with good farming. More broadly however, assertions of luck also act as a neutralization device ([Mooney, 2007](#_ENREF_53)) to deflect blame and shift debate away from systemic biosecurity issues that present existential threats to the cattle industry and its position within the global marketplace. Other recent animal disease outbreaks in Aotearoa New Zealand enact a similar ordering in which farmers turn to governmental authority to control animal disease, that is either caused by ‘rogue’ farmers or bad luck and beyond their control, such that there is little that good farmers should do other than comply with regulations ([Williams, 2018](#_ENREF_77)). Assertions of luck work to normalise and preserve cattle movements through a denial of responsibility. In this way, luck legitimises the continued reliance on cattle movements that are integral to modern systems of livestock agriculture and its associated spread of disease, and welfare problems ([Stoddard and Cantor, 2017](#_ENREF_70)).

**7. Conclusion**

This paper has shown how a focus on luck helps to understand the complex reality of how farmers navigate unpredictability and risk-taking in an environment that may seem to be full of threats. By examining farmers’ responses to animal disease across Aotearoa New Zealand, this paper has contributed to a greater understanding of how perceptions of luck justify and legitimize courses of action that appear at odds with government advice and need to be accounted for within the concept of good farming to explain farmers’ behaviour. Good farmers are lucky farmers, suffering misfortune or good luck. Luck emerges through the interplay between socio-cultural and natural factors that vary geographically, and neoliberal practices of self-government that create good farming subjectivities. These practices accentuate the role of luck by emphasising a simplistic logic of control rather than accommodating other forms of good farming and nuanced approaches to managing uncertainty. In doing so, however, discourses of luck also help to reinforce existing farming practices and continued geographical mobility of livestock, despite their role in disease spread. Thus, whilst the employment of metrics of self-governance may appear attractive to policy makers seeking behavioural change amongst farmers, the significance of luck in managing disease means that the outcomes of disease control practices may be unexpected and varied, leaving the geographical spread of animal disease arising from cattle movements to chance.

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1. The 1-10 rating was designed by farmers. Epidemiologists in the AHB had suggested there was little epidemiological value in distinguishing between farms beyond C4. The 1-10 system was retained according to farmers’ wishes, suggesting it should be more compelling. [↑](#footnote-ref-2)
2. In 2018, there were a total of 483,253 cattle movements across Aotearoa New Zealand involving 7,927,355 cattle, 57% were dairy cattle, 1.3% originated from the West Coast, whilst 11% were to the Manawatu (Ministry of Transport, 2018). Of all bTB incidents, 41% are linked to cattle movements and 44% due to wildlife with the remainder due to residual infection in a herd (OSPRI, 2015). [↑](#footnote-ref-3)