

# The Missing Ingredient in New Zealand's climate policy: food

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## Abstract

The food system is a major producer of greenhouse gas emissions. There is a growing consensus that to achieve net zero we need to change production and consumption patterns. Mitigation policies that rely on improving production methods used to farm animals, rather than reducing the number of animals farmed, will likely, for multiple reasons, have only a limited overall impact. Policies that fail to address consumption miss opportunities for reducing emissions, as well as a range of other co-benefits. This article proposes that the representation of agriculture and its impact on climate needs to change. There is a compelling case for the food system to be included in climate policy as a coherent whole.

**Keywords** agriculture, food, climate policy, production, consumption, meat, dairy

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**W**e are experiencing a global crisis. The world's food system has been a major contributor to the planet's greatest challenges: climate change, biodiversity loss, poor human health and animal suffering (Ruggeri et al., 2024).

The scale and urgency of the climate crisis is such that no potential policy levers should be excluded from climate mitigation strategies. We need to transition away from emissions-intensive production and consumption across all sectors, including the

food system. We need to move towards nature-positive food production, healthier and more sustainable diets, and radically reduced food loss and waste.

Actions to mitigate emissions in the food sector have so far been siloed. It is increasingly recognised that a 'food system' approach is necessary. Such an approach encompasses the entirety of the production, transport, retailing, consumption and waste of food, and includes impacts on nutrition, human health and the environment (Chatham House, 2021, p.11). Climate policies have been almost silent on the questions of what food we produce and what food we consume: in other words, our diets. This applies as much to New Zealand as to anywhere else.

The premise of this article is that if New Zealand is committed to achieving significant reductions in emissions by 2030, and net zero (including biogenic methane reductions of 24–47%) by 2050, the government will need to reframe the problem of climate change and take greater account of emissions from the food system. This has the potential to enable New Zealand not only to achieve its emissions targets, but also to address multiple other issues, including social, economic and health challenges (Aotearoa Circle, 2022).

Two policy levers could achieve this goal. First, Nationally Determined Contributions (NDCs, the country-specific

climate commitments central to the Paris Agreement) provide a strategic opportunity for governments to integrate a food system approach across their climate mitigation policies. Second, the development of a national food strategy has the potential to deliver multiple co-benefits for human health, the environment and climate.

This article outlines the growing scientific evidence to support integrating the food system into a nation's climate and public policies. It explores the (limited) extent to which this has happened, globally and in New Zealand. Finally, it considers the necessary conditions for change and what policy options support this goal.

#### What is the problem?

The global food system is among the principal drivers of our current planetary crisis, responsible for up to 34% of all global anthropogenic greenhouse gas emissions (Crippa et al., 2021), as well as driving soil degradation, deforestation, biodiversity loss, nitrogen and phosphorous cycle disruption, diet-related public health issues and animal suffering (Willett et al., 2019). The need for food system change is urgent. The term 'global syndemic' has recently been coined to describe how the global food system is driving climate change, obesity and undernutrition (Swinburn et al., 2019). Studies now estimate that even if we stopped using fossil fuels entirely, current emissions from the global food system would make it 'impossible to limit warming to 1.5°C and difficult even to realise the 2°C target' (Clark et al., 2020).

The evidence for the food system's role in addressing these challenges and helping to live within planetary boundaries is now firmly established and has been growing over the last 15 years. It features in many sources, including those from international institutions (IPCC, 2018; UNEP, 2019; FAO, 2020; FAO, UNDP and UNEP, 2021; Ghebreyesus, 2023), national institutions (Committee on Climate Change, 2020; Willett et al., 2019; Chatham House, 2015, 2021), academics (Rockström et al., 2009; Lang, 2020) and civil society (WWF, 2022).

To the extent that climate policy has engaged with agriculture or food, it has largely been about changing the methods used to produce what we eat – production – rather than what we eat – consumption.

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#### State of the science – it's the cow not the how

A phrase used to describe the flaw in this approach is 'it's the cow not the how'. Recent scientific studies have assessed the greenhouse gas emissions of individual food products, and, broadly, show that the production of meat and dairy emits substantially higher emissions than plant-based proteins (Clune, Crossin and Verghese, 2017; Poore and Nemecek, 2018; Springmann et al., 2018; Hayek et al., 2020; Santo et al., 2020). There are biophysical reasons for this discrepancy, which cannot be significantly addressed by technology. These include: (1) feed to edible protein conversion ratios are greater for animals; (2) deforestation for agriculture is dominated (67%) by feed for animals (soy, maize and, in New Zealand, palm kernel expeller for dairy feed), resulting in release of carbon; (3) enteric fermentation is the digestive process from ruminant animals that releases methane, and chicken and pigs create emissions from manure that generates nitrous oxide, another potent greenhouse gas; (4) emissions from processing (especially

slaughterhouse effluent) are greater than processing emissions from most other products; and (5) wastage is high for fresh animal products, which are prone to spoilage (Poore and Nemecek, 2018; Hayek et al., 2020).

Thus, mitigation policies that rely on trying to improve the production methods used to farm animals will necessarily have limited impact. Instead, multiple changes are needed: reducing the number of animals farmed, changing what food is produced and shifting consumption patterns.

#### It's only going to get worse – but there's a win-win solution

Globally, meat consumption is projected to grow due to population increase, greater economic prosperity and dietary shifts within some middle-income countries (FAO, 2020). As well as being emissions-intensive, the consumption of red and processed meat is also associated with increased risk of non-communicable diseases, including cardiovascular disease, type 2 diabetes and certain cancers (Godfray et al., 2018).

Because meat-free foods such as vegetables, fruits, legumes and wholegrains produce lower relative emissions (Willett et al., 2019), one way to reduce greenhouse gas emissions is to reduce demand for greenhouse gas-intensive foods by encouraging shifts to more sustainable diets (Harwatt et al., 2024). A global transition to healthy and nutritionally adequate dietary patterns that focus on sustainable food choices could reduce premature mortality by as much as 22% and cut diet-related emissions by between 54% and 87% (Springmann et al., 2018). In 2020, over 50 scientists called for a transformation of agriculture (Harwatt et al., 2020) and to reach 'peak meat' by 2030 to tackle the climate crisis.

#### Why has this solution not been grasped?

This win-win solution relies on an understanding that climate mitigation strategies should recognise the relationship between production and consumption: in other words, between supply and demand (UNEP, 2019). But more often food systems continue to be analysed in their siloed, component parts, than viewed as

a coherent whole (Chatham House, 2021, p.33). The United Nations Environment Programme contends that we need to 'acknowledge that consumption drives the shape and the design of production systems' (2019, p.13). Likewise, Chatham House argues that we should recognise that 'to change supply-side practices, we need to change demand-side markets and vice versa' (Chatham House, 2021, p.34). It follows, therefore, that reducing meat and dairy production and consumption in favour of plant-based foods should feature prominently in climate policy (Ruggeri et al., 2024). Given this potential to yield substantial greenhouse gas reductions, not to mention the co-benefits across these other domains, current policy incoherence represents a vast missed opportunity.

#### *Significance for New Zealand*

Arguably, New Zealand has developed a narrative of 'exceptionalism'. This holds that New Zealand, with its relatively small population and domestic demand, but with a prominent primary industry export sector, is an efficient and sustainable producer of quality food for various markets around the world. But does this narrative stand up to scrutiny? New Zealand's food sector is dominated by meat and dairy production – largely for export: 95% of total dairy production is exported (Agriculture and Horticulture Development Board, 2022). Although New Zealand's contribution to global greenhouse gas emissions is relatively low, 48% of our emissions come from agriculture, which is a much higher proportion than for other countries, even those with similar agricultural sectors, including Ireland at 37.8% (Environmental Protection Agency, 2023), Denmark at 28% (Nielsen et al., 2023) and the Netherlands at 16.7% (Statistics Netherlands, 2023).

Viewed through an economic lens, agricultural export revenue contributes \$54.6 billion to the New Zealand economy, of which meat, dairy and wool contribute \$35.6 billion (Ministry for Primary Industries, 2023). But these figures fail to capture the wider harms attributable to New Zealand's animal agriculture, the so-called 'externalities'. Significant costs arise from nitrate contamination of drinking water, nutrient pollution of lakes, soil compaction

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and erosion, and, of course, greenhouse gas emissions (Ministry for the Environment, 2023). Added to this, the food sector itself is vulnerable to climate shocks, as demonstrated by the extreme weather events of recent years.

This all presents risks to the economy. A lack of transparency about New Zealand's food production and its relatively low level of regulation in the face of the 'clean and green' narrative poses a degree of reputational risk on the international stage. New Zealand's Climate Change Commission warns that some overseas markets in future might restrict access unless steps are taken to reduce emissions (Climate Change Commission, 2024a, p.114).

#### *The holy grail of 'clean and green'*

In developing policy, what matters is how problems are represented, defined

or framed. It is important to explore what is included and what is left out of that representation (Bacchi, 2009, p.3). Policy around climate, agriculture and food is an example where some issues are very obviously left out. New Zealand's narrative of a 'clean and green' exporter of food to the rest of the world is deeply entrenched, a part of the nation's cultural identity (Sharp, Rayne and Lewis, 2024). New Zealand's farming industry bodies consistently describe production methods as sustainable and more efficient at growing food for export and domestic consumption than other countries' (Trebilcock, 2024). Global comparisons of the impact of animal agriculture are often met with the framing of: 'we are different' (Ministry for Primary Industries, 2022). And, the argument goes, changing consumption patterns domestically would not yield significant emissions reductions, given the volume of New Zealand's produce that is exported. But are we different? Two recent studies would challenge this representation.

A study from Otago University looking to explore this 'exceptionalism' demonstrates that, even allowing for contextual differences specific to New Zealand's food system (grazing, use of renewable energy, transport-related emissions from food imports), it is still the case that changes in consumption patterns would deliver positive impacts for emissions and public health (Drew et al., 2020). In the Otago study, a New Zealand-specific life cycle assessment database was developed by 'modifying cradle to point-of-sale reference emissions estimates according to the New Zealand context' (ibid., p.5). It found that, as elsewhere, New Zealand vegetables, fruits, legumes and wholegrains produced substantially less greenhouse gas emissions than animal-based foods (particularly red and processed meats). Diet change and reduction in food waste could confer national diet-related emissions savings of between 4% and 42%, the range reflecting the extent to which diets conform to the New Zealand dietary guidelines (p.1). Health gains and healthcare system cost savings could also be identified.

A 2023 Auckland University study supports these findings. It found that

household purchases of red and processed meat and dairy were responsible for 54% of dietary greenhouse gas emissions, concluding that ‘encouraging New Zealanders to purchase foods with lower carbon footprints could feasibly help the country reach its emission reduction goals’ (Kliejunas et al., 2023, pp.1, 7).

While there are important differences that apply to New Zealand, these do not appear to cause notable deviation from global trends. We are not so exceptional after all. Shifting demand away from emissions-intensive food would support greenhouse gas emissions reduction, as well as other environmental and health benefits. Again, it is a win-win.

Meat and dairy are significant contributors to several of our long-term challenges. Their negative externalities are not currently priced in. But these inconvenient truths are missing from the way the policy problem has been represented. Our reliance on animal agriculture has New Zealand frozen in what some have called a ‘policy lock-in’, whereby economic and social forces reinforce a ‘no change’ approach by hiding the very nature of the problem (Lang, 2020, p.197).

#### *What about export demand?*

But even if the New Zealand public changes its diet, what about export demand for New Zealand meat and dairy? Consumer and policy trends abroad would suggest that agricultural disruption lies ahead. As the Climate Change Commission points out, ‘[c]hanges in consumer preference could significantly affect the value of these exports’ (Climate Change Commission, 2024a, p.114). This is happening and we need to be prepared.

A Bloomberg Intelligence report estimates that 7.7% of the global protein market will be plant-based food, with a potential value of over US\$162 billion, by 2030 (Bloomberg, 2021). Bloomberg projections for alternative dairy products in the Asia-Pacific region are striking, predicting an estimated 57% majority share of the market by 2030. The story in Europe is similar. Retail sales data from Nielsen IQ covering 13 European countries analysed by Good Food Institute Europe shows that ‘sales of plant-based foods grew by 6% in 2022 – and 21% from 2020 to

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2022 – to reach €8.8 billion’ (Good Food Institute, 2023).

Policy shifts are evident as well. A 2024 European Commission report, ‘Strategic dialogue on the future of EU agriculture’, found that Europeans consume more meat and dairy than scientists recommend, and have signalled that more needs to be done to promote plant-based foods. The report recommends the EU to introduce an ‘Action Plan for Plant-Based Foods by 2026’ (European Commission, 2024).

These examples demonstrate a shift in consumer preference and in government policy direction abroad. New Zealand should take heed. The European Commission strategic focus on diet change is particularly significant, considering the political context of farmers’ protests and industry lobbying resisting environmental legislation. And yet the report still made recommendations targeting diet change towards plant-based foods.

#### **Food system thinking**

To what extent have climate policies, around the world and specifically in New Zealand, integrated food system thinking? Despite evidence supporting the inclusion of food system thinking in climate policies, two recent reports (WWF, 2022; Global Alliance for the Future of Food, 2022), as well as this author’s own research (Feehan, 2021), demonstrate the failure of most countries to include food in their Nationally Determined Contributions.

The WWF report assessed 132 countries’ NDCs. It showed that NDCs were not taking a holistic approach to food system transformation. The majority addressed emissions from agriculture by recommending improved farming methods and technological changes, not changing what was produced. Only two NDCs included policy measures and targets for a shift to sustainable and healthy diets and addressing food loss and waste (Botswana and Costa Rica). The Global Alliance for the Future of Food report assessed 14 NDCs. It found that they rarely included policies to reduce emissions through demand-side measures, and instead focused largely on changing food production methods.

This author’s own findings were consistent with these analyses. I examined nine NDCs<sup>1</sup> to gain a deeper understanding of why countries were not including food in climate policy, using qualitative methods including interviews with policymakers and civil society actors, as well as analysis of the NDCs themselves. Of the nine, six NDCs made no reference to food, diet, consumption, meat or dairy as part of their climate mitigation strategies. None identified decreasing animal agriculture or increasing plant-based agriculture. Five mentioned health in the context of wellbeing and/or negative health impacts due to climate change, not in relation to the positive impact of dietary change. None mentioned funding for dietary change. Press releases accompanying the NDCs most frequently mentioned emissions reduction through technology, changes to agricultural production methods and economic growth.

These analyses of NDCs indicate that the role of agriculture in assisting climate policy is represented as technological innovations

and on-farm improvements. In other words, they see climate change being addressed through relatively modest adaptations to the current system, rather than a more fundamental rethinking of what we choose to produce and consume. It's a framing that says, somewhat nonsensically: animal agriculture itself is not the problem, but how we do it is a solution.

#### What about New Zealand?

New Zealand's first NDC was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in April 2020. In 2021, the newly established Climate Change Commission produced a report to advise the government on the next NDC, titled *Ināia Tonu Nei: a low emissions future for Aotearoa* (Climate Change Commission, 2021). The next NDC was then submitted to the UNFCCC in November 2021, covering the period 2021–30.

*Ināia Tonu Nei*, produced by the new statutory body designed to provide independent advice to government, was the key piece of research informing the 2021 NDC. The report does not adopt a food system approach. It does offer a section on 'options for alternative farming systems and practices', including diversifying land use from animal to arable. But, significantly, it then goes on to outline the multiple challenges facing diversification of land use, such as a 'lack of existing markets, supply chains, access to resources such as water, and a lack of experience, skills, labour, support, and infrastructure' (ibid., p.311). In its final recommendation on reducing 'emissions from agriculture', the focus is on technological approaches and improved farming methods (p.312). There is one recommendation on exploring low-emissions food production, but this is linked to international market opportunities, again seeing agriculture through the lens of trade and economy, not food or diet. There is no mention of changing consumption patterns when outlining the widespread changes that are required (p.17).

The resulting NDC submitted in November 2021 includes no ambition for reducing the number of animals farmed to meet emissions targets or changing consumption patterns. New Zealand's next

[Regarding the Climate Change Commission's draft advice on the fourth emission's budget] 'food' is used seven times ... referring specifically to food waste, processing, cost and services. The word 'diet' does not feature.

NDC is due to be submitted by February 2025. The Climate Change Commission will base its advice to government on the modelling work used in the 2024 'Draft advice on the fourth emissions budget' (EB4), and in the 2024 *Review of the 2050 Emissions Target* discussion document (Climate Change Commission, 2024a, 2024b).<sup>2</sup>

#### Are we closer to a more holistic view?

Encouragingly, both documents indicate that the Climate Change Commission will 'take a "systems view"' and consider 'how government policies, economy, industry, society and the environment are all connected' (Climate Change Commission, 2024a, p.16, 2024b, p.15). However, a closer reading reveals signs of familiar siloed thinking, failing to connect emissions reductions with both production and consumption, or supply with demand.

The EB4 document outlines opportunities for reducing and removing emissions in each sector. The Climate Change Commission has structured emissions budgets representing the total allowable net volume of greenhouse gas emissions across a five-year period (Climate Change Commission, 2024a, p.33). On agriculture, it advises that this can be met through a combination of actions improving agricultural productivity.

However, these are production-focused mitigation strategies, essentially producing the same type and volume of food.

Agriculture is framed as an issue of growth and trade, not diet, food, consumption or health. Food consumption is not mentioned as a strategy to mitigate emissions. The word 'food' is used seven times in the document, referring specifically to food waste, processing, cost and services. The word 'diet' does not feature. By contrast, co-benefits and behaviour change do feature – just not related to food. The document takes a far more systemic view of the transport and energy sectors, going further in encouraging behaviour change and seeing possible co-benefits. It's not clear why the same systems thinking is not applied to food or agriculture.

A similar framing of agriculture is found in the *Review of the 2050 Emissions Target* document: a focus on changing production methods only. Behaviour change is mentioned once. Food is mentioned twice, in relation to basic needs and New Zealand as a food exporter. Diet is not mentioned, and health benefits are discussed in the context of changes in climate patterns, not food.

#### Discussion: problem representation

As discussed, there appear to be two 'problem representations' about reducing emissions from animal agriculture. The first is as a 'production' problem, which largely sees the current model of New Zealand agriculture as fundamentally sound or unchangeable, and which offers only minor or modest adaptations to existing practices, that can only ever have a limited role in reducing emissions or other harms. The second represents the problem as one of production and consumption, and sees the opportunities of more radical change in helping New Zealand achieve significant emissions reductions, as well as delivering benefits across a wide range of other domains.

Like the other countries explored in the analyses above, New Zealand's climate policy, as evidenced in its early NDCs and supporting advice from the Climate Change Commission, sits very much in the first category. It sees emissions from the food system as a 'production problem'. It envisages supply-side interventions to reduce emissions, including technological solutions

or on-farm improvements, but has so far fallen short of capturing consumption, or individuals' food choices. It assumes that New Zealand's food system will stay the same, but just done slightly differently.

This is indicative of a siloed view of the food system. My own research revealed that the EAT-*Lancet* report (Willett et al., 2019), which provided scientific targets for healthy diets and sustainable food systems, was included as evidence to inform New Zealand climate policy, but with apparently little influence over its broad direction or formal policy documents.

#### ***What's the alternative?***

The alternative would be to recognise the need for supply-side and demand-side changes within the food system. This representation acknowledges that there are limits to mitigation strategies that only cover production methods, due to the biophysical constraints inherent in current meat and dairy farming (Bordisky et al., 2018; Garnet, 2013; Springmann et al., 2018). By contrast, it sees demand-side interventions as necessary, and that 'dietary change can deliver environmental benefits on a scale not achievable by producers' (Poore and Nemecek, 2018, p.991). A focus on food production alone does not allow for, or represent, food system thinking. The current state should be replaced with a food system approach, 'recognising that all the elements of the food system interconnect' (Hawkes and Parsons, 2019, p.6).

#### ***An opportunity***

With the submission of the second NDC due by February 2025, New Zealand has an opportunity to follow through on transformative change to the food system. The current position is short-sighted and incoherent: short-sighted, as it fails to grasp the opportunity for greater and quicker emissions reductions, at a time of urgent planetary crisis, let alone the wider benefits to accrue in respect of human health, improved biodiversity and beyond; and incoherent, in the sense that climate policy seems open to behaviour change and shifts in consumption patterns in its treatment of some sectors (energy and transport), but not others (individuals' food choices).

[T]wo policy levers can achieve this goal: integration of food production and consumption into NDCs, and the development and implementation of a national food strategy.

As my own research has shown, the limited inclusion of measures that facilitate and accelerate dietary changes likely reflects the challenges around encouraging people to change something as personal as what they eat. Changing diets is seen as politically sensitive. Politicians are understandably wary of being seen to dictate choices. Alongside this, New Zealand, like other countries, is moulded by powerful vested interests in the agriculture sector. And, perhaps more than for other comparable countries, what New Zealand grows and eats, and its 'clean and green' image, are incredibly strong components of the nation's history, culture and identity.

But while these challenges are real, they need not be insurmountable, and other countries show what might be possible. France and Germany have strong agricultural lobbies associated with the livestock sector, but their climate policies include measures to promote the consumption of sustainable and healthy foods (Global Alliance for the Future of Food, 2022, p.33). Denmark has developed an 'action plan for plant-based foods' and declared that 'plant-based food is the future' (Ministry of Food, Agriculture and Fisheries, 2024).

Indeed, there are signs of a growing social licence for change in New Zealand. A biennial report on public perceptions of New Zealand's environment (Hughes, Kerr and Cullen, 2019) indicated that greenhouse gas emissions and climate change are the most common global concerns among citizens. Many New Zealanders increasingly recognise that food production has significant deleterious environmental implications locally and globally (Sharp, Rayne and Lewis, 2024).

#### **How to make change happen**

How do policymakers meaningfully integrate food system thinking in New Zealand and beyond? As mentioned at the beginning of this article, two policy levers can achieve this goal: integration of food production and consumption into NDCs, and the development and implementation of a national food strategy.

#### ***Nationally Determined Contributions***

UNFCCC guidelines are a useful start for successfully integrating food into NDCs. Changing what we produce and consume is included under section 3 of the NDC format in the 'planning processes, preparation and implementation section' (see the United Kingdom's 2021 NDC (UK Government, 2020)). Section 3 provides an opportunity for countries to outline any proposed changes in food production and consumption to drive emissions reductions.

There are also tools to integrate a food system approach into NDCs. A report from the Global Alliance for the Future of Food (2022) developed a framework to do this. It assists policymakers to identify opportunities and entry points for food systems at key stages of NDC cycles. The 'Food Forward NDCs' framework created by Climate Focus and WWF (Climate Focus and WWF, 2020) presents policymakers with evidence-based measures, using a food system lens to meet their NDC commitments. Both tools could usefully be adopted by New Zealand policymakers.

#### ***National food strategy***

Another policy lever is a national food strategy. Eat New Zealand (2024), the New Zealand Cancer Society (Peniamia

et al., 2024) and the report from the nutrition research community in the Healthy Food Environment Policy Index (see Mackay et al., 2023) have all called for the development of a community-led, government-facilitated national food strategy. This would set out a plan for independent oversight of our whole food system, ensuring food security and sovereignty and the welfare of citizens (including access to quality, nutritious food for all), the environment and animals, while also delivering on global commitments.

#### *The problem needs to be reframed*

But first and foremost, how the problem of animal agriculture and its impact on climate change is represented by policymakers needs to change. It needs to be reframed. Policies so far have looked to tweak the current production system. There has been no serious discussion about the fundamental problem: over-reliance on animal agriculture. By contrast, adopting a systemic approach to the problem of climate change and food offers solutions. Policymakers could explore how New Zealand could diversify the economy towards low-emissions industries that are proven to be environmentally sustainable, produce value-added products (not at the mercy of volatile commodity markets), and that respond to growing consumer trends nationally and globally. Agricultural policy could support farming communities to transition away from intensive meat and dairy to lower-emissions primary commodities. Transitioning from intensified meat and dairy would also encourage a shift from volume-based production towards high value-added commodities. New Zealand did this successfully when we entered the wine industry at the higher end of the value chain over 30 years ago.

#### **Policy implications**

If the Paris Agreement targets are to be met and net zero achieved by 2050, we will need a more coherent recognition of the interdependencies between food production and consumption. Further action is required by government ministries, academics and civil society.

The future of our economy, the livelihoods of farmers and the health and wellbeing of our people and animals should not suffer due to a siloed view of the system.

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- Integrating a food system approach requires government departments to work together to ensure policy coherence across agriculture, trade, environment, foreign policy, health and education. Changes will be needed across the political and economic system; an 'all government' approach should be adopted. The development of a national food strategy could be a first step. Within the strategy, there are a number of policy options to change consumption patterns, including: dietary guidelines that reflect scientific evidence and government targets; reducing demand for meat and dairy through public procurement choices within public services; labelling meat and dairy to reflect environmental impact; and public education campaigns to build understanding about the links between meat and dairy and climate change.
- The Ministry for the Environment should integrate a food system approach within the ambition of the next NDC, including changing what food is produced, reducing the number of animals farmed, behaviour change specifically relating to food consumption, and reduced meat, dairy and food waste metrics.
- The Ministry for Primary Industries should explore alternative export revenue opportunities, how to support

farmers during this transition, and economic opportunities afforded by plant-based industries. Studies have explored alternative land use and production pathways (Sutton et al., 2018), but more are needed to understand the risks and opportunities. The global movement for a 'just rural transition' for farming communities is growing (Just Rural Transition, 2023). More work needs to be done to explore how a rural transition could be fair, inclusive and of benefit to all New Zealand farmers.

- Civil society is largely absent from the debate about food and climate change. Its contribution would help shift the national conversation and drive social licence for change.
- Finally – and perhaps most importantly – the government must have the courage to talk explicitly about what people eat. There is a self-serving alliance of interests preventing an open discussion of the role of food in mitigating climate change. The government seems wary of appearing to infringe on peoples' rights regarding food preferences and of challenging the farming sector. But, without strong messaging from government, individuals feel less accountable for climate change in their own choices and, crucially, they lack access to reliable information about the impacts of them. A lack of information and accountability denies individuals agency and represents an own goal in the fight against planetary destruction. If government reframes the issue and conveys the climate, environmental and public health benefits that can directly result from dietary change, it will drive consensus to support future interventions. Consumers may be initially wary, but with greater awareness of the impact of current consumption, and the benefits of a shift, they are more likely to accept policies that might otherwise be seen as limiting their personal choices. This has been the case for a range of other issues, such as congestion charges, smoking bans and taxes on sugary drinks (Peniamina et al., 2024). Changing diets may be a challenge, but is not an

insurmountable one, and need not be any more difficult than shifting other behaviours in order to address the climate emergency. Government must lead this: as Chatham House argues, the state is the only actor with the ‘financial and human resources to implement policy levers to make the changes required’ (Chatham House, 2015, p.20). In sum, the policy response to climate change needs to take a systemic view and include the food system. The future of our

economy, the livelihoods of farmers and the health and wellbeing of our people and animals should not suffer due to a siloed view of the system. We need a broader national conversation about the relationships between agriculture, food, trade and animals, that includes all aspects of the system: production and consumption. There is no ‘silver bullet’; we need an ‘all of the above’ approach. Our future depends upon it.

- 1 Australia, Brazil, EU, Japan, Mexico, New Zealand, Russia, USA and UK.
- 2 The New Zealand Climate Change Commission report is due on 31 October 2024. At the time of writing it has not been delivered and NDC2 has not been submitted. This article therefore focuses on the EB4 and 2050 target documents, as they represent the best available evidence informing the likely content of the new NDC.

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