Australia's agriculture & land sectoral plan for net zero emissions

12 December 2023

This is a joint submission from the Australian Alliance for Animals on behalf of Animals Australia, FOUR PAWS Australia, Humane Society International – Australia and Voiceless, the animal protection institute.

About the Alliance for Animals

The Alliance for Animals is a national charity leading a strategic alliance of Australia's key animal protection organisations to create systemic change for animals. Our vision is for a society where respect for the interests of animals and their wellbeing is enshrined in law, policy and practice. Through our programs we lead sector-wide support for crucial reforms, hold decision-makers to account, and bring our members and allies together to strengthen the representation of animals.

Submitted to:

Climate Policy Branch, Department of Agriculture, Fisheries and Forestry

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Introduction

We welcome the opportunity presented by the Australian Government to provide input into the development of a sectoral plan to reduce emissions from the agriculture and land sector. The sector was responsible for 16.8% of Australia's national greenhouse gas emissions in 2020-2021 and this proportion of national emissions is expected to increase as emissions from the energy sector decline. Our submission is in full support of the commitments Australian governments made in the 2023 *National Statement on Climate Change and Agriculture* to be a climate-smart world leader by:

- Sustainably increasing agricultural productivity and driving future profitability
- Improving adaptation and resilience to a changing climate
- Implementing pathways that will support low-emissions agriculture.

We agree a climate-smart, sustainable sector will help make farming more productive and profitable, better protect our environment, increase access to international markets and strengthen farming communities. However, we submit that the pathway to a low emission, productive and profitable agriculture industry, adaptive to a changed climate, requires transformative action. The evidence is clear: to achieve the emission reductions necessary to achieve the Paris Agreement goals and the 2030 Sustainable Development Goals, a global transformation of our food production systems is urgently needed to reduce livestock production and support the transition to plant-centric diets.

We commend the Australian Government for signing the *COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action* (COP28 2023) and note that the declaration affirms:

> *…that agriculture and food systems must urgently adapt and transform in order to respond to the imperatives of climate change.*

The Australian Government must take a leadership role in this transformation. Building a sustainable food system requires comprehensive policy reform, financial incentives, and widespread collaboration among governments, policy makers, financial institutions, businesses, communities and other stakeholders of the food system.

It is also crucial that policies to reduce emissions from agriculture and land use are developed in an holistic way that considers their potential impact on the welfare of humans, animals and the environment. Just as all sources of emissions should be considered when it comes to seeking solutions to climate change, the development of strategies that reduce emissions from livestock must also consider their effects on other sustainability metrics.

This submission addresses the following three issues raised in the Discussion Paper with a focus on animal welfare and the urgent need for food systems transformation:

- The need for higher ambition
- Opportunities to reduce emissions
- Supporting and enabling change.

The need for higher ambition

1. Connecting animal welfare and climate action

Climate change poses an unprecedented global crisis for humans and biodiversity. Less well recognised is its profound detrimental impact on the welfare of non-human animals. Wild, managed and domesticated animals are directly and indirectly affected by climate change across terrestrial, aquatic and marine environments. Projections for a 2°C rise in atmospheric temperature will result in catastrophic and wide-ranging impacts on the welfare of animals globally.

For Australians, perhaps the starkest example of the animal welfare impacts of climate change is the devastation caused by the 2019-20 Black Summer Bushfires. Over a billion animals were estimated to have suffered and died as a direct result of the fires or through starvation, dehydration, or predation due to the subsequent loss of food, water and shelter (Van Eeden et al. 2020).

But the potential impacts of climate change on animal welfare are greater and more insidious than any one incident or point in time can illustrate. And they are inextricably linked with the welfare of humans and the environment.

The 'One Health' initiative has established the simple yet powerful concept that human, animal, and environmental health are interconnected (One Health Initiative 2012). One Health aims to integrate efforts in medicine, veterinary medicine, public health, agriculture, and environmental health for a common end. Most recently, this approach was listed as an objective in the COP28 UAE Declaration on Climate and Health, endorsed by 23 countries:

> *Facilitating collaboration on human, animal, environment and climate health challenges, such as by implementing a One Health approach; addressing the environmental determinants of health; strengthening research on the linkages between environmental and climatic factors and antimicrobial resistance; and intensifying efforts for the early detection of zoonotic spillovers as an effective means of pandemic prevention, preparedness and response.*

However, the impacts of the climate crisis go far beyond health – they impact the broader welfare of humans, animals and the environment by challenging every aspect of our and their wellbeing. This expanded concept of planetary interconnectedness is termed 'One Welfare' (Figure 1) and can be integrated into fields such as environmental and animal welfare policy, sustainability and conservation to foster interdisciplinary collaboration and improve outcomes for animals, humans and the environment overall (Colonius & Earley 2013; Pinillos et al. 2016).

Considering the impacts of climate change through a One Welfare lens assists in ensuring that policies and strategies to reduce emissions or mitigate the effects of climate change are considered in terms of their broader impact. This is particularly crucial in the agriculture and land use sector, where policies aimed at reducing GHG emissions, if not thoughtfully designed, can have serious detrimental consequences for animal welfare.



Figure 1. The One Welfare model requires simultaneous consideration of three stakeholder groups: animals, humans, and the environment when designing policy solutions to reduce GHC emissions. (Source: Cristina Wilkins).

As with humans, animals are victims of the climate crisis, but animal production is also a significant cause of the problem. Animal agriculture is one of the most significant contributors to climate change, representing 14.5% to 16.5 % of anthropogenic GHG emissions globally (Gerber et al. 2013; FAO 2017). Livestock farming also accounts for nearly a third of the global annual anthropogenic release of methane, which has over 20 times the global warming potential (GWP) of carbon dioxide (UPEP and Climate and Clean Air Coalition 2021). The agricultural sector is also responsible for 52% of anthropogenic emissions of nitrous oxide, which has nearly 300 times the GWP of carbon dioxide (Tian et al. 2020).

> *In general, the environmental footprint of animal products is significantly higher than that of plant products, driven by direct emissions from enteric fermentation processes of ruminants and manure management, as well as indirect emissions due to high feed consumption* (Kuepper 2023).

> *Global food production is responsible for 35% of all greenhouse gas emissions (GHGE) with the use of animals a source of food, as well as livestock feed, responsible for almost 60% of all food production emissions…without major and urgent transformation in global meat consumption, and even if zero GHGE in all other sectors are achieved, agriculture alone will consume the entire world's carbon budget needed to keep global temperature rise under 2C by 2050* (Higuita et al. 2023).

There is no question that urgent action is needed to reduce GHG emissions from agriculture and land use, but just as we need to consider all sources of emissions when seeking solutions to climate change, the development of strategies to reduce emissions from livestock also consider their effects on other sustainability metrics, including animal welfare (Llonch et al. 2017). We do not yet know all the potential implications of proposed abatement strategies, but where they lead to increased intensification of livestock production, the evidence to date suggests that this will be detrimental to animal welfare. Approaches that provide the most benefit in terms of climate and sustainability without such negative trade-offs for animals need to be prioritised when making policy and funding decisions and researching emissions mitigation strategies (Shields and Orme-Evans 2015). Such strategies

include: improving animal health and nutrition, improving manure and land management and reducing animal numbers through reducing food loss and food waste and also through reducing meat consumption.

2. Why food systems transformation is needed to reach net zero

It has been clear for some time that we cannot solve the climate crisis without transforming food and agriculture. Climate action in the food sector is crucial because food systems emissions alone can jeopardise the 1.5°C target, and climate change contributes to food insecurity and hunger.

As the world's population continues to grow, we need to find better ways to feed the world without compromising on socioeconomic development while reducing ecosystem degradation and GHG emissions. Currently globally per capita meat consumption continues to rise, adding to growing land demands and GHG emissions from agriculture and increasing pressures on the world's remaining natural ecosystems.

Across the world, ruminant livestock use more than two-thirds of agricultural land and account for about half of agricultural GHG emissions, even when excluding emissions from feed production. Eliminating deforestation and ecosystem degradation and restoring ecosystems to limit global warming to 1.5°C will become increasingly difficult if meat consumption continues to increase.

> *Even the least sustainable vegetables and cereals cause less environmental harm than the lowest impact meat and dairy products* (Gibbs and Cappuccio 2022).

Food systems transformation means fundamentally changing how our food systems operate to deliver significant, measurable progress for the climate, and for the welfare of people, animals, and the environment (UNFCCC 2023). It requires ambitious political leadership to shift economic and social incentive structures combined with fundamental behaviour change across consumers, investors, agri-businesses, and researchers (Woodhill 2023). Key to these changes are targets to:

- reduce the GHG emissions intensity of agricultural production
- reduce ruminant meat consumption in high-consuming regions (such as Australia)
- Increase ruminant meat productivity per hectare
- reduce the share of food production lost and food waste (animal-based foods account for about half of associated GHG emissions).

Unfortunately, current climate actions related to Australian agriculture focus on limited changes, such as enteric fermentation or manure management, while critical areas are frequently overlooked, such as food loss, food waste, and shifting to sustainable dietary patterns including reducing meat consumption. This pattern is reflected in the Discussion Paper which makes no mention of the potential of changing the way we produce and consume food, or the reduction of livestock numbers as a means of reducing emissions.

The subject of reducing the consumption of animal products was labelled the 'Cow in the room' by Humane Society International at COP26 because of the tendency for governments and thought leaders to avoid direct discussion of this topic and discount the contribution of animal agriculture to emissions in comparison with fossil fuel emissions (Climate Council 2021). HSI UK's policy brief ahead of 2021 Glasgow COP summarised the problem (HSI 2021):

> *Animal agriculture is largely sidelined from the climate conversation, and more importantly, from climate action and the creation of actionable targets.*
>
> *In order to meet the emission reductions that are necessary to achieve the Paris Agreement goals and the 2030 Sustainable Development Goals, a global transformation of our food production system is urgently needed.*
>
> *Building a sustainable food future requires comprehensive policy reform, financial incentives, and widespread collaboration among governments, policy makers, financial institutions, businesses, communities and other stakeholders of the food system.*
>
> *This shift will not happen unless world leaders acknowledge the unsustainability of our current protein landscape and agree on strategies and plans to rapidly reverse the growth in global animal agriculture.*

It is important to emphasise that acknowledging the significant environmental impact of animal agriculture is not an anti-farming position. Instead, it is a call to collaborate and provide support to the farming sector in adapting to necessary change. This sector faces considerable vulnerability due to various environmental factors associated with climate change, which already affect global food production and security.

The implementation of food and agricultural policies that facilitate and incentivise a decisive transition away from intensive animal agriculture towards more sustainable and diverse methods of food production, must be done in a way that is sensitive to the impacts on farmers. Transformation policies should prioritise supporting farmers in a just transition towards a food system that benefits people, animals, and the environment.

> *If we argue that we should eat less meat then we should also care about the livelihoods of the people affected in order to build a consensus for change,* Professor Sir Charles Godfray (2019)

2.1 Why is food systems transformation being ignored?

Global barriers to action on food production policy include a lack of climate finance for shifting agricultural production, concerns about international guidance fitting national contexts, and past experiences of unintended consequences from agricultural policies. However, the influence of entrenched vested interests on policy makers and the reluctance of politicians to tackle issues which involve societal change, are two of the greatest obstacles to global progress.

> *Powerful vested interests—from fossil fuel industry lobbyists to multinational agricultural corporations—still defend the emissions-intensive status quo* (Boehm et al. 2023).

> *Livestock is politically sensitive, but we need to deal with sensitive issues to solve the problem. If we don't tackle the livestock problem, we are not going to solve climate change. The key problem is overconsumption* (de Sousa 2023).

The apparent dilemma between the need to reduce the production and consumption of meat, and the need to ensure access to protein to tackle malnutrition in vulnerable populations while protecting the livelihoods of farmers, has been labelled a 'false wicked problem' by authors Béné and Lundy (2023). They report that narratives on both sides have served to polarise the debate to the point where:

> *At the present time, the international debate between pro-livestock and pro-alternative protein approaches seems to be deadlocked: no general consensus on how to address this thorny problem and to navigate the necessary trade-offs between human health, nutrition, economic and environmental impacts seems to emerge.*

However, they go on to argue that, on closer examination, the apparent insolubility of this problem is due to the deliberate framing of the scientific, technical and societal evidence used, and that the problem is reconcilable, given the right policy frameworks:

> *In fact, there is no technical impossibility to simultaneously reduce the consumption (and production) of red meat directed at consumers in high and middle-income countries, while at the same time boosting protein consumption among the socio-demographic groups and populations for which more protein in their diet would be beneficial. The polarized nature of the debate between the livestock proponents and the alternative protein proponents is therefore the result of a strawman argument that prevents the system from transitioning toward more sustainability, and benefits only those who have strong financial, economic, or professional interests in maintaining the system in its current lock-in. It is up to the rest of us to make this change happen.*

Key to making change happen, is ensuring that the agenda is not controlled by vested interests, particularly the handful of trans-national agri-food companies which wield such significant power and play a critical role in locking in current unsustainable systems (Béné 2022). In some countries the relationship between these actors and government is so entangled that change is currently impossible. Australia is also at high risk of becoming so captured by vested interests that developing effective climate policies for the agriculture and land use sector will be impossible.

There are already very strong links between Meat and Livestock Australia (MLA) and the Australian Government across trade and agriculture portfolios. However, the relationship between the meat industry and government must not be permitted to disable climate action.

As part of the Australian Government delegation to COP28, MLA has received privileged access to Australia's climate negotiations (Sherrington et al. 2023).

> *MLA said it has worked closely with the Australian Government in raising the profile of the Australian livestock sector at COP for the second year running, highlighting the importance of the industry and its performance in delivering food security while mitigating climate impacts* (MLA 2023).

At the same time, MLA is a core strategic partner of the Global Meat Alliance, has strong links to trans-national meat companies and is involved in international efforts to promote meat consumption (Global Meat Alliance 2023). It is crucial that the Australian Government is aware of these conflicts and influences and takes steps to ensure that agriculture climate policy is developed in a transparent and accountable way at arm's length from vested interests.

In the Australian context, polarised views on dietary change, the influence of the agri-food industries, and the broader political climate around animal agriculture, already mean that nuanced public conversations around food systems transformation and associated dietary change are difficult to have. Any discussion of the health and welfare benefits of reduced meat consumption or decreasing livestock production and ending the clearing of land for grazing is met with fierce opposition.

In 2022, animal-based industries attacked the use of meat and dairy descriptors by plant-based food manufacturers, via a Coalition-backed Senate Inquiry into definitions of meat and other animal products (Senate Standing Committee on Rural and Regional Affairs and Transport 2022). In its submission to the inquiry, the Red Meat Advisory Council claimed that:

> *The misuse of the red meat industries' terms is a clear marketing ploy to convince or trick meat eaters into purchasing plant-based protein products through deceptive and misleading tactics.*

However, no quantitative evidence was presented to the inquiry of any widespread consumer confusion over labelling or that other agri-food producers had been economically impacted by the growth of the plant-based sector. Despite this lack of evidence, the Coalition-majority report called for restrictive changes to plant-based product labelling, while the Greens' dissenting report was scathing in its criticism of the inquiry:

> *Farmers of all types deserve better elected representation than to be drawn into a political culture war… It is a betrayal of farmers to prioritise this issue [labelling] while actively ignoring and gaslighting on the wider threat to the entire agriculture industry that is climate change.*

The Australian Government must not fall prey to the false concept that food systems transformation is an intractable problem when, with the right policy framework in place, it presents an unmissable opportunity to reach our net zero climate goals while successfully transitioning and supporting the agricultural sector.

2.2 What will it take to break the impasse?

Transforming our food systems is complex. It requires a cross-sectoral approach, recognising all aspects of the food system, promoting sustainable dietary patterns globally while also considering national contexts, being ambitious yet thoughtful in actions taken, and avoiding strategies that harm environment and vulnerable communities (Osborn 2023).

It also requires significant political leadership and a policy making environment that is conducted at arm's length from vested interests.

Globally, political momentum for addressing sustainable food systems is growing, through initiatives such as national pathways for sustainable food systems and increasing attention given to healthy diets and reducing food waste. To be successful in addressing food the development of the net zero plan must consider the following key points:

- All aspects of the food system and supply chains need to be recognised and addressed, from land use to food waste.
- Global shifts towards more sustainable food consumption patterns are essential, recognising that these shifts will necessarily differ across countries.
- A transition to plant-centric diets is necessary. Australia's position as a significant exporter of red meat means that we should play a role leading the shift in both domestic and international in food systems.
- Ambition for change must be thoughtful and thorough because food systems are intersectional and diverse, impacting multiple issues.

Merely acknowledging that sustainable agriculture contributes to achieving the goals of the Paris Agreement is insufficient; much more comprehensive efforts are needed. The Australian Government needs to develop an ambitious, comprehensive, science-based, food systems transformation strategy.

3. Global support for food systems transformation

The need for food systems transformation has been well documented. A comprehensive assessment of this evidence base should form part of the Department's approach to developing the agriculture sectoral plan. The examples presented here reflect a much wider body of evidence but serve to illustrate why food systems transformation must be a key aspect of Australia's pathway to net zero.

The landmark EAT-Lancet Commission on Food, Planet, Health report, published in 2019, was the first full scientific review of what qualifies as a nutritious and sustainable diet. It is clear in its messaging that food systems transformation is essential and sets out the key actions that can contribute to and expedite this transformation:

> *Can we feed a future population of 10 billion people a healthy diet within planetary boundaries? The answer is yes, but it will be impossible without transforming eating habits, improving food production and reducing food waste* (Willet et al. 2019).

The report found that no combination of improved productivity and reduced waste was sufficient to bring greenhouse gas emissions within the proposed boundary under the 'business as usual' dietary scenario.

Ahead of the COP28 summit, the UN's Food and Agriculture Organisation (FAO) flagged the release of a series of reports aimed at addressing the gaps and challenges faced in bringing agri-food industries into line with the Paris climate agreement, and the launch of the first global food systems road map to 1.5°C. (FAO 2023) This will include:

- Pathways towards lower emissions – A global assessment of the greenhouse gas emissions and mitigation options from livestock agrifood systems
- Loss and Damage in Agrifood Systems – Addressing Gaps and Challenges
- Climate-related development finance to agrifood systems—Global and regional trends between 2000 and 2021
- Global Roadmap: Achieving SDG2 without breaching the 1.5°C threshold.

Other reports anticipating COP28 have also identified the importance of accelerating action on food systems. The *State of Climate Action 2023* report asks that world leaders recognise there has been insufficient progress and there is an urgent need to chart a path forward (Boehm et al. 2023):

> *This moment [COP28] should serve as a springboard for accelerated actions to mitigate climate change, including for equitably phasing out fossil fuels and scaling renewable energy, transforming food systems while halting and reversing deforestation, enhancing adaptation and responding to losses and damages, and scaling and shifting finance.*

The UN-backed Climate Change High-Level Champions have also recognised the urgency to accelerate food systems action to deliver climate mitigation and adaptation. UNFCC 2023)

> *Sustainable and resilient food systems are integral for achieving food and nutrition security and realising our global climate and biodiversity goals. We must transform our food systems to ensure access to affordable, healthy, and sustainable food for all, and importantly, to advance equitable livelihoods for smallholder farmers as well as protecting and restoring nature.*

Professor Sir Charles Godfray, the primary author of a leading review of the impact of meat consumption on human health and the environment, flagged the need for urgent action to an Australian audience in 2019 (Godfray et al. 2018; Godfray 2019):

> *We require a new revolution in agriculture of the same magnitude as the industrial and green revolutions that not only boosts productivity but also radically improves resource-use efficiency and sustainability.*
>
> *We need to reduce waste across the food system. We need to make hard decisions about diets and consumption patterns. And we need to accept globalization and refashion a globalized food system that provides public as well as private benefits.*

3.1 Specific support for reducing meat consumption

The 2019 EAT-Lancet report identified adoption of land management practices that shift agriculture from a carbon source to sink, and a fundamental shift in production priorities as a key requirement of transformation to sustainable food production (Willet et al. 2019). Its universal healthy reference diet includes no, or a low, quantity of red meat and processed meat and a low to moderate amount of seafood and poultry:

> *Transformation to healthy diets by 2050 will require substantial dietary shifts, including a greater than 50% reduction in global consumption of unhealthy foods, such as red meat and sugar, and a greater than 100% increase in consumption of healthy foods, such as nuts, fruits, vegetables, and legumes. However, the changes needed differ greatly by region.*

The *State of Climate Action 2023* report also identifies the need to reduce ruminant meat consumption, food loss and food waste (Boehm et al. 2023):

> *Still, an enormous acceleration in effort will be required across all sectors to get on track for 2030. ... The world, for example, needs to take the following steps: ... Shift to healthier, more sustainable diets eight times faster by lowering per capita consumption of ruminant meat (e.g., beef) to approximately two servings per week across high-consuming regions (Europe, the Americas, and Oceania).*
>
> *Halving food loss and waste in all regions, as well as reducing consumption of ruminant meat (e.g., beef) in high-consuming regions, can help curb GHG emissions from both agricultural production and associated land-use changes like deforestation.*
>
> *In particular, a "protein transition" is needed that includes both shifting toward more sustainably produced livestock products, as well as increased consumption of plant proteins and alternative proteins with lower environmental impacts; strategies relying only on production-side or consumption-side measures are likely to be insufficient.*

The 2023 Food for Thought report from Boston Consulting Group and Blue Horizons identifies meat reduction as a net-zero key strategy (Morach et al. 2022):

> *Reducing animal agriculture in the food value chain is one of the highest-impact solutions to the global climate crisis.*

The UN Environment Programme and Climate and Clean Air Coalition *Global Methane Assessment* report (2021) explains how reducing anthropogenic methane emissions is one of the most cost-effective strategies to rapidly reduce the rate of global warming, but that new measures (over and above current policies) are needed to limit the rise to 1.5°C by 2030.

> *Behavioural change measures and innovative policies are particularly important to prevent emissions from agriculture, given the limited potential to address the sector's methane emissions through technological measures. Three behavioural changes, reducing food waste and loss, improving livestock management, and the adoption of healthy diets (vegetarian or with a lower meat and dairy content) could reduce methane emissions by 65–80 Mt/yr over the next few decades.*

In its landmark 2020 *Sixth Carbon Budget* report, the UK's Climate Change Committee (2020) recommended reducing the consumption of meat and dairy products by 20% by 2030 and 35% by 2050, in order for the UK to deliver its net-zero carbon emissions target by 2050:

> *There is good evidence that a shift in diets away from meat and dairy products to more plant-based options is good for both climate change mitigation and for human health.*

A 2021 report from thinktank Chatham House, *Food System Impacts on Biodiversity Loss*, identified our global food system as the primary driver of biodiversity loss, with agriculture alone being the identified threat to 24,000 of the 28,000 (86%) species at risk of extinction (Benton et al. 2021). The report called for an urgent reform of food systems, including a shift in global dietary patterns towards more plant-centric diets. It also noted that no countries have included the aim or reducing livestock production in their nationally determined contributions (NDCs):

> *Shifting to plant-rich diets has the most potential as a sole measure – aligning with a 50 per cent chance of global temperature rise staying within 1.5°C – but in combination with reduced food waste, higher yields and improved efficiency, the food system could be net negative in terms of GHG balance. Similarly, to achieve at least a 50 per cent reduction in nitrogen loss levels, diet shift is essential, in addition to technological measures and management at the farm level.*
>
> *Similarly, on the climate change mitigation front, most NDCs do not specify targets and measures for reducing agricultural emissions despite these being included in their scope. Only two countries mention diet change in their revised NDCs (Costa Rica and Ethiopia). Of the 12 countries that include mitigation in their livestock sectors, none aim to reduce production.*

The 2023 State of the Climate Report, a blunt and chilling update on the scale of the climate crisis identified dietary change as a means of surviving the challenges ahead (Ripple et al. 2023):

> *A shift toward plant-based diets, particularly in wealthy countries, could improve global food security and help mitigate climate change.*

Another recent scientific review summarised existing knowledge on how the dietary transformation across the world can help the progress toward multiple sustainable development goals (SDGs) and found that there were multiple benefits for high-consuming countries to shift to more plant-based diets (Chen et al. 2022).

> *Our analysis reveals that dietary change is necessary in all countries as each one has unique priorities and action items…For North America and Europe, shifting toward more plant-based diets would be healthier and simultaneously reduce the per capita environmental footprints. The results can be useful for policymakers in designing country-specific strategies for adoption of sustainable dietary behaviors and for food industry to ensure the supply of sustainable food items customized with regions' need.*

A recent study that modelled meat reduction strategies, predicted substantial reductions in global environmental impacts if meat and dairy consumption were halved (Kizicka et al. 2023):

> *Replacing 50% of meat and milk products with plant-based alternatives by 2050 can reduce agriculture and land use related greenhouse gas (GHG) emissions by 31% and halt the degradation of forest and natural land.*
>
> *If spared agricultural land within forest ecosystems is restored to forest, climate benefits could double, reaching 92% of the previously estimated land sector mitigation potential.*

And most recently, reporting on the FAO's announcement of the release of a global food systems' road map to 1.5°C (De Sousa 2023) has anticipated that:

> *Nations that over-consume meat will be advised to limit their intake, while developing countries — where under-consumption of meat adds to a prevalent nutrition challenge — will need to improve their livestock farming.*

Opportunities to reduce emissions

4. The impact of animal agriculture on emissions

More than 88 billion land animals are bred, raised and slaughtered for food every year (Faunalytics 2020). In Australia 70 million sheep and 22 million beef cattle were raised in 2021/2022 (ABS 2023). As well as causing significant greenhouse gases, the global farm animal production sector is also the single largest anthropogenic user of land, with meat, egg, dairy and aquaculture production systems using about 83% of the world's farmland while providing just 37% of the world's protein and 18% of calories (Poore and Nemecek 2019).

As noted in the Discussion Paper, agriculture as a sector made up 16.8% of national GHG emissions in 2020/21, including 13.2% directly related to livestock production. Around two-thirds of agriculture's emissions are methane produced during digestion by ruminant livestock such as cattle and sheep.

In addition, in Australia, the farm animal production sector is the single largest anthropogenic user of land with 54% of the continent used for animal farming (Climateworks Centre 2023). Emissions arising

from meat, egg, and milk production are not narrowly focused on the rearing and slaughtering of farm animals. Grain production to feed livestock requires substantial energy inputs, with around 40% of total grain production used for animal feed (Nason 2020). Energy expenditures are also required to transport feed, live animals, and animal products.

The clearance of native vegetation for the expansion of farm animal production and growth of their feed grain is a key source of carbon emissions in Australia. After enteric methane, land clearing is the next largest source of emissions from agricultural activity, with about 75% of deforestation attributable to agriculture (Meyer et al. 2020). Thousands of hectares of Australia's forests and bushland are destroyed every year for agricultural expansion, in large part to create pasture to raise cattle for beef. While the climate impact of land clearing is partly offset by land restoration activity elsewhere and management of Australia's forests, land clearing for agriculture nonetheless contributes significantly to Australia's total emissions.

Australia has repeatedly been identified as a global hotspot for land-clearing, and much of this has occurred to facilitate the growth of the agricultural sector (Climate Council 2021).

In 2021 shifting agriculture was responsible for 7220 ha of tree cover loss and in 2020 4530 ha (Global Forest Watch 2023). In Queensland alone, the beef industry has caused the destruction of 1.4 million hectares of forests and bushland in five years. About 70% of the land clearing and deforestation taking place in Queensland is to create pastures to graze livestock—in particular, cattle raised for beef (Wilderness Society 2023).

Australia's plan to net zero must acknowledge the contribution of animal-agriculture-based land clearing to Australia's emissions as the second largest source of agricultural emissions.

4.1 Proposed mitigation strategies to reduce livestock emissions are not enough

The Discussion Paper lists several potential established and emerging technologies and practices for livestock production which may help reduce the emissions intensity of livestock production.

However, as previously highlighted, mitigation strategies alone are highly unlikely to be sufficient to address the scale and significance of the climate crisis. Accurately predicting the impact of these proposed efficiencies is difficult (Kuepper 2023) and Australia cannot rely on changing livestock management practices or the abatement potential of methane-inhibiting feed supplements to adequately address livestock-related emissions.

The Discussion Paper positions methane-inhibiting feed supplements for ruminants as the primary means of reducing livestock emissions and provides an overview of work done to date on their development and deployment. It is important that such technologies are independently and rigorously tested, and we note that early trials have included some where reductions were less than hoped for (Cowley 2023). There is also the question of whether the technology will be ready, and financially viable, in the timeframe required. While the sector plan's objective will be achieving net zero emissions by 2050, substantial reductions will need to be made well before then to avoid dangerous climate

change. As a potent greenhouse gas, emissions of methane must be reduced substantially in the near future.

Consideration of feed supplements must also acknowledge the possibility of negative animal welfare outcomes from their widespread use. Trials so far have primarily been conducted on feedlots, where supplements are easier to administer. Yet most of Australia's livestock range over large areas without frequent contact with farmers, making it harder to administer such supplements. As the Discussion Paper notes: '*Australia's expansive pasture-based production systems present a particular challenge in terms of delivering supplements to grazing livestock*'.

While research is being undertaken into ways of administering supplements to free grazing livestock, it seems likely that the need to provide frequent, reliable doses of feed supplements to cattle could see more animals spend more of their time in feedlots. This would be a negative animal welfare outcome, as feedlots can compromise the welfare of cattle (RSPCA Australia 2022). Almost half of Australian cattle spend part of their life on a feedlot, and trends show that this percentage is steadily increasing (Jackson 2023). Feedlots are barren environments for cattle, often lacking shade and offer no engagement with the natural environment or the ability of cattle to engage in foraging behaviours and other physical activities essential to their physical and emotional wellbeing. The animal agriculture industry both here and overseas is moving to reduce or eliminate confinement of animals in recognition of the animal welfare consequences. An emissions reduction solution that incentivises greater confinement of cattle and thus compromises their welfare is inconsistent with a One Welfare approach and should be avoided.

Solutions for administering supplements outside of feedlots may also have potential animal welfare consequences. Suggestions have included providing 'licks' on farms or scattering pellets (Macdonald 2022). The potential for non-ruminant native animals to ingest these substances must be investigated to ensure there are not adverse health consequences.

A heavy reliance on feed supplements would also not address emissions from manure, which the Discussion Paper notes are a considerable contribution to the agriculture sector's overall emissions. It would also not address the greenhouse gas emissions from ongoing land clearing for animal agriculture, one of the most impactful threatening processes for native species (Murphy and van Leeuwen 2021).

Given the current uncertainty about the efficacy, timing and cost of feed supplements, a prudent approach would involve consideration of all existing, and emerging, options and technologies. A 2021 assessment of the feasibility of various emerging methane emission reduction technologies found that focusing on this alone is problematic (Reisinger et al. 2021).

> *Measures to reduce demand for emissions-intensive livestock products through dietary change and reduced food loss and waste are essential to not only allow emission reductions but also additional carbon sequestration without threatening food security.*

One obvious strategy to reduce emissions from livestock production is to produce fewer animals under more sustainable conditions. While this may be a challenging option for government to consider, given the power and influence of the agri-food industry and the current trade benefits of animal-based exports, omitting this option from the Discussion Paper is a glaring omission. Evaluating the benefits to agriculture of adapting and responding early should be a priority, rather than being left behind as the rest of the world makes the necessary transformation. All potential solutions must be on the table for Australia to have any real hope of achieving its net zero targets while sustaining a profitable agricultural sector.

As already stated, reducing livestock production in high-consuming regions, including Australia, is now considered by many to be a key strategy for achieving climate goals:

> *Different research comes to different results concerning the share of livestock in global GHG emissions, depending on the year used, the considered emission sources, the total global emission estimate used for comparison, and the global warming potential (GWP)a values applied for methane (CH_4) and nitrous oxide (N_2O). However, with different estimates from recent years falling within a range of 11.1% to 21% of global GHG emissions, the importance of reducing livestock production to achieve climate goals is clear. Moreover, it is essential to consider that land freed from grazing and feed production could even help to remove CO_2 from the atmosphere* (Kuepper et al. 2023).

> *Dietary shifts away from ruminant meat and other animal-based foods and toward plant-based foods, in contrast, should be concentrated within high-consuming regions like North and South America, Europe, and Oceania, where such shifts in consumption (and their associated impacts on global supply chains) can have the largest impacts on reducing both agricultural land demands and GHG emissions* (Boehm et al. 2023).

4.2 Strategies to address land clearing

A credible land use policy involves avoiding land clearing and protecting vegetation regrowth, as well as restoring vegetation on previously cleared lands (Steffen and Dean 2018). An immediate step for the agricultural sector plan should be to enact stricter controls on vegetation clearing through the federal legislative levers, and to secure commitments from state jurisdictions to prevent the clearance of native vegetation. Queensland has historically had Australia's highest deforestation rates and there is currently strong interest in agricultural expansion in the Northern Territory.

At the federal level, stricter control of vegetation clearance could be achieved through more effective enforcement of the Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act). The Independent Review of the EPBC Act conducted in 2020 found that the federal environment department had a poor compliance culture, describing it as passive and reactive with no active surveillance and relying on voluntary compliance (DCCEW 2020). Compliance with the EPBC Act has been consistently poor in the agricultural sector with a low number of referrals submitted for

approval (Aither 2018). In addition to more pro-active compliance, stricter regulation of land clearing at the federal level could be achieved from adding a vegetation clearing 'trigger' to the law. Such a trigger could include three elements, based on scale (proposals to clear 100 hectares or more of native vegetation in any two-year period), sensitivity (a schedule of regulated activities, regardless of the scale of clearing proposed), and high conservation value. Any of these would constitute significant land clearing that requires Commonwealth assessment, approval to proceed, or outright prohibition, so that federal approval would be required for proposals to clear in excess of a certain number of hectares. The reforms to the EPBC Act currently under development offer further opportunities to more strictly regulate the clearance of native vegetation.

Land clearing causes direct and indirect harm to animals including causing injury, pain, hunger, fear, distress, displacement, and death (Finn and Stephens 2017). Therefore, preventing clearance of native vegetation in the agricultural sector has co-benefits for native animal welfare and conservation. Vegetation clearance is a key driver of species endangerment through habitat loss and scientists estimate tree-clearing in Queensland alone kills 34 million animals each year: 900,000 mammals like koalas, possums and gliders, 2.6 million birds like cockatoos and 30.6 million reptiles including goannas, dragons, skinks and geckos (WWF 2017). Vegetation clearing has been listed as a Key Threatening Process to threatened species under the EPBC Act since 2001 (following a nomination from HSI) and the listing remains just as relevant today. For example, between 2015 and 2020 the Wilderness Society estimated that 724,070 ha of likely or known koala habitat was impacted by clearing activity linked to grazing cattle for beef in Queensland alone. The koala was listed as Endangered under the EPBC Act in 2022 (following a nomination by HSI, ACF and IFAW).

In addition to regulation, retaining native vegetation in agricultural landscapes can also be better incentivised, for example through mechanisms to encourage landholders to retain primary native vegetation and regrowth on their properties.

We also have concerns over the claim in the Discussion Paper in relation to land use, land use change and forestry (LULUCF) which states that "LULUCF is currently a net carbon sink in Australia, contributing 13.7% of the national total in 2020–21". Recent assessments of national climate pledges and commitments has found that these are based on unrealistic levels of land-based carbon removal and unscientific accounting methods. We share the concerns raised in *The Land Gap Report* (Dooley et al. 2022) which reported that:

> *Current 'net accounting' methods assume that planting new trees offsets fossil fuel emissions or the destruction of primary forest, but this ignores scientific and ecological principles.*
>
> *Framing climate targets as 'net zero' risks undermining mitigation action by allowing a trade-off between emissions reductions and removals. Targets based on net accounting obscure the extent to which countries are relying on land removals for meeting climate mitigation commitments.*

Supporting and enabling change

5. Strategies for incentivising food systems transformation

The need for immediate and decisive action to transform our food systems is clear – and the development of Australia's plan for net zero offers the opportunity to play an ambitious and leading role in supporting and enabling food systems change.

> *The data are both sufficient and strong enough to warrant immediate action. Delaying action will only increase the likelihood of serious, even disastrous, consequences. It is clear too that a Great Food Transformation will not occur without widespread multi-sector, multi-level action, which must be guided by scientific targets* (EAT-Lancet 2019).

> *Despite the essential role of food system transformation in meeting biodiversity and climate change mitigation goals, this is not currently a strategy proposed by any nation and it represents a major opportunity. The onus is on high-income nations – as significant land users, GHG emitters and contributors to the loss of biodiversity and carbon sinks – to lead the way by addressing their impacts at home and abroad…efforts must be made to link the climate and biodiversity agendas, and to integrate food system transformation within this strategy* (Benton et al. 2022).

In this section we focus on two strategies which are key to a food systems transformation but have been overlooked in the discussion paper:

- Incentivising investment in plant-based foods
- Supporting dietary change

We note a third key strategy, reducing the share of food production lost (before market waste) and food waste (post-market loss) to half of 2016 levels is also missing from the Discussion Paper. *The State of Climate Action 2023 Report* indicates that globally, the share of food production lost is still increasing, and targets for reducing food waste are slipping out of reach (Boehm et al. 2023).

We urge the government to ensure the development of the sectoral plan also includes a strategy and target for food loss and waste reduction (in line with global expectations) in consultation with the Fight Food Waste CRC (https://fightfoodwastecrc.com.au/) and Stop Food Waste initiative (https://www.stopfoodwaste.com.au/). Consultation with the bid leads for the proposed Alt Protein CRC (https://www.altproteincrc.com/) should also be included as part of the sectoral plan development.

5.1 Incentivising investment in plant-based foods

The Discussion Paper is silent on the potential for plant-based, cell-based and precision fermented food products to assist in reducing emissions by providing alternatives to meat and dairy products that would see fewer ruminant animals farmed while also providing jobs and revenue for the Australian agriculture sector. As well as providing climate action benefits, novel alternatives to animal-sourced foods offer huge potential to drastically reduce harm to animals in the food system (UNEP 2023).

> *Consumers are already displaying an increasing interest in and demand for plant-based food commodities, and recently it has been suggested that research focusing on the transition to an increasingly plant-based agricultural sector should be prioritized over further research into improvements in animal agriculture* (Prag and Henriksen 2020).

The market for these products both in Australia and overseas is already significant and will grow in coming decades. Consumer trend data suggests that revenue from plant-based meat alternatives is projected to grow 37.1% over the next five years and consumer expenditure in plant-based meat sector in 2030 will be AU$2.9 billion (IBIS World 2023; Statista 2023).

The CSIRO's 2022 protein roadmap for Australia, developed with government and industry, identifies a $13 billion domestic and export market opportunity for Australia. Key to the strategy were ten growth opportunities that included plant-based products and ingredients, precision fermentation and cultivated meat (CSIRO 2022).

These alternative products should not be seen as a threat to the profitability of Australia's agriculture industry or the Australian economy, but a profitable diversification of it. Many existing animal protein industries already partner with or invest in alternative protein companies, both in Australia and overseas. As an example, Norco, Australia's oldest dairy cooperative, has partnered with venture capital firm Main Sequence and the CSIRO to back Eden Brew, a start-up that uses precision fermentation to produce alternative dairy products. The investment will provide another source of revenue for Norco's 326-member dairy farmers (CSIRO 2023).

Food Frontier, an independent think tank on alternative proteins in Australia and New Zealand, has called for government and industry to provide the necessary support for the sector to have the impact needed to meet our climate goals:

> *We are at an inflection point where this needs to move beyond the push for consumer acceptance and an internal food industry battle between competing manufacturing sectors and recognise that the way forward involves collaboration and support that, with collective responsibility and accountability, can provide the impetus for governments to do more and act faster* (Food Frontier 2023).

We urge the Australia Government to provide funding and support for companies developing alternative proteins and novel plant-based foods, noting both the greenhouse gas mitigation and economic benefits that would result. Shifting subsidies and financial incentives from livestock

production to more sustainable plant-based agriculture would help support a just transition in Australia's agriculture sector.

The development of a national plant-centric food strategy would provide the necessary framework to enable this industry growth. This year Denmark and South Korea became the first two countries in the world to launch such strategies:

- The Danish national plant-based action plan includes a strategy to transition to a plant-centric food diet and boost plant protein production, and includes a plant-based food grant, a US$196 million fund for plant-based transition to 2030 (De Lorenzo 2023).
- South Korea's initiative is intended to stimulate the plant-based food sector and includes the establishment of a research centre for alternative foods and support for the export of related products (The Korea Bizwire 2023).

A national plant-centric food strategy would help accelerate the approval process for novel proteins, including fermentation-based and cell-based products, to ensure Australia does not lag behind other countries (Morach et al. 2022).

5.2 Supporting dietary change

As set out in Section 3, there is a growing global consensus that dietary change towards a plant-centric diet is integral to successful climate action, with dietary change having the potential to contribute up to one-fifth of the mitigation needed to hold warming below 2°C.

Policies operating across the food system, including policies that influence dietary choices, would allow for more sustainable land-use management, result in greater food security and low emissions trajectories, contribute to climate change adaptation and mitigation, and improve public health.

The determinants of diets are complex and driven by availability and affordability of food, geography and cultural habits. It is therefore imperative that government-led policy is part of the solution.

The UN-backed 2021 Global Methane Assessment report highlights the importance of government-led measures in supporting a dietary shift:

> [To] *implement structural and long-lasting changes in individual dietary intake…will likely require strong intervention, mitigation and incentivisation by governments through innovative policies.*

The IPCC has determined with high confidence that policies operating across the food system, including policies that influence dietary choices, would not only enable more sustainable land-use management and result in enhanced food security and low emissions trajectories, but could also contribute to climate change adaptation and mitigation, alongside improving public health (IPCC 2019).

The EAT-Lancet report cited the need to seek international and national commitments to shift toward healthy diets, with their planetary reference diet recommending that global consumption of red meat should be reduced by two-thirds (Willett et al.2023).

The State of Climate Action Report, which assesses progress against targets aligned with the Paris Agreement's temperature limits, found that current rates of reducing meat consumption would need to accelerate by a factor of 8 to meet the 1.5°C-aligned targets (79 kcal/capita/day by 2030 and 60 kcal/capita/day by 2050 for high-consuming countries such as Australia). Australia and New Zealand's daily ruminant meat consumption was recorded as 179 kcal/capita/day in 2020. (Boehm 2023)

The Australian Government must lead this change through the revision of dietary guidelines and campaigns to educate the public about the benefits of increased consumption of plant-based proteins. This will be challenging. Significant behaviour change is required to improve the healthiness and environmental sustainability of population dietary habits in Australia (Hendrie et al. 2022). But without government support, agri-food businesses will continue to control the dietary agenda.

There are many existing examples of government-led policies and initiatives to make food production and consumption patterns more compatible with climate and other environmental goals (Boehm et al. 2023):

- The Danish government updated dietary guidelines in 2021 to consider the climate impact of foods.
- Milan Urban Food Policy Pact and C40 Cities Good Food Cities Accelerator are examples of policy efforts to advance more sustainable and climate-friendly food systems at the municipality level
- The Food for the Planet campaign in the UK has a toolkit of suggested policies, planning, and other actions for local councils to drive action on food, climate, and nature
- The US Conference of Mayors passed a resolution to support a shift toward more plant-based diets to address chronic disease, climate change, and financial sustainability in 2023
- The Coolfood pledge is a promising target-setting and action initiative. Its early adopters have seen a 10% reduction in food-related GHG emissions intensity per 1000 kcal through 2022, relative to a 2015-2018 baseline. Members commit to ambitious targets, draw from recent behavioural research and plan and test interventions through a structured process each year.

Conclusion

Climate change poses an unprecedented global crisis which is already having profound impacts on the welfare of humans, animals and the environment. We fully support the Australian Government's commitment to ambitious emission reductions goals, including reaching net zero emissions by 2050.

However, we are concerned that the current approach to reducing emissions from the agriculture and land use sector is not ambitious enough and leaves out key strategies, without which reaching net zero by 2050 will be impossible to achieve.

We are also concerned about the level of influence of the global agri-food industries and the red meat lobby in Australia on the development of Australia's climate policy in this sector. We urge the Australian Government to take steps to ensure that agriculture climate policy is developed in a transparent and accountable way, at arm's length from vested interests.

The Discussion Paper documents several established strategies to reduce emissions from livestock which are based on adaptations of current farming practices. While some of these may yield beneficial results, many are untested, and they do not represent all potential and proven options. All possible solutions must be considered for Australia to have any real hope of achieving its net zero targets.

Understanding the potential animal welfare consequences of mitigation strategies is particularly relevant in the agriculture and land use sector, where policies, if not thoughtfully designed, can have serious detrimental consequences for animal welfare. We ask that the development of the sectoral plan to considers a One Welfare approach to ensure that animal welfare is not overlooked.

Food systems transformation is now regarded by multiple respected global organisations, thinktanks and scientists as a fundamental of a net zero strategy. Its implementation has already begun in some countries, and it is clear that without such change it will not be possible to reach our current targets. Transforming our food systems is a win-win strategy that offers Australia an opportunity to not only play a crucial role in preventing global warming but also to help lead the delivery of additional public health, nutrition, environmental, economic and animal welfare benefits.

Building a sustainable food system requires comprehensive policy reform, financial incentives, and widespread collaboration among governments, policy makers, financial institutions, researchers, businesses, communities and other stakeholders of the food system. To have any hope of slowing the rate of global warming to below 1.5°C, the Australian Government must take the lead and start planning now for this transformation.

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