

CLIMATE AND CARNISM: REGULATORY PATHWAYS TOWARDS A SUSTAINABLE FOOD SYSTEM

VICTORIA CHEN* AND CARY DI LERNIA**

The pervasive societal preference for meat products is accelerating climate change and compromising planetary health. Despite the established links between dominant food systems and climate change, policy research focused on regulatory options for the reduction of emissions from meat production and consumption remains absent in Australia. This article explores regulatory pathways towards the reduction of carbon emissions from this source. Employing a supply-demand regulatory analysis, options across the regulatory spectrum are assessed, ranging from 'softer' instruments (such as industry self-regulation or informational regulation) through to more coercive measures (such as an emissions tax or a direct tax on meat products). This article argues for the prioritisation of demand-side regulatory strategies, yet also considers the potential efficacy of supply-side regulatory methods of emissions mitigation, in light of Australia's commitments to reduce its greenhouse gas emissions pursuant to the Paris Agreement and the United Nations Framework Convention on Climate Change.

I INTRODUCTION

Over the summer of 2019–20, Australia experienced one of its worst bushfire seasons on record. The resulting devastation is difficult to comprehend: at least 33 human lives were lost, a further 445 people died as a result of smoke haze, almost 3 billion animals were killed or displaced by the fires, and over 830 million tonnes of carbon dioxide ('CO₂') were released into the atmosphere.¹ The

* BCom (Economics) (Hons, Business Law), LLB (USYD).

** BCom (Accg) LLB (Hons) (MQU), BA (Phil) (Hons) (MQU), MPhil (UNSW) PhD (USYD), GDipEnvLaw (Melb), Lecturer, Discipline of Business Law, University of Sydney Business School.

1 Joel Werner and Suzannah Lyons, 'The Size of Australia's Bushfire Crisis Captured in Five Big Numbers', *ABC News* (online, 5 March 2020) <<https://www.abc.net.au/news/science/2020-03-05/bushfire-crisis-five-big-numbers/12007716>>; Adam Morton, 'Summer's Bushfires Released More Carbon Dioxide than Australia Does in a Year', *The Guardian* (online, 21 April 2020) <<https://www.theguardian.com/australia-news/2020/apr/21/summers-bushfires-released-more-carbon-dioxide-than-australia-does-in-a-year>>; Luke Henriques-Gomes, 'Bushfires Death Toll Rises to 33 after Body Found in Burnt-Out House near Moruya', *The Guardian* (online, 24 January 2020) <<https://www.theguardian.com/australia-news/2020/jan/24/bushfires-death-toll-rises-to-33-after-body-found-in-burnt-out-house-near-moruya>>;

intensity of the bushfires were fuelled by record-breaking temperatures and the effect of earlier prolonged droughts,² prompting many to reiterate the sentiments of the Intergovernmental Panel on Climate Change ('IPCC') – that governments around the world must take stronger action to mitigate climate change to avoid further catastrophic climate-related outcomes.³ In spite of the clear and present dangers posed to this already 'sunburnt country', the Australian Commonwealth Government has chosen not to amend its internationally-decried Nationally Determined Contribution made pursuant to the *Paris Agreement* that is, a 26–8% reduction in greenhouse gas ('GHG') emissions below 2005 levels by 2030.⁴ It has recently committed to a net zero emissions plan by 2050, yet this plan has garnered significant criticism due to its lack of detailed modelling.⁵

The IPCC has recently released the three instalments of its Sixth Assessment Report ('AR6').⁶ Referred to as the IPCC's 'starkest warning yet', the reports build upon previous assessments in delivering an increasingly unequivocal, 'now-or-never' call to action.⁷ In almost every near-term (2021–40) warming scenario presented – modelling presented just 5 years since the entry into force of the *Paris Agreement* – temperatures are expected to breach the aspirational target of 1.5°C above pre-industrial levels agreed upon thereunder.⁸ For the first time ever, AR6 has highlighted the importance of individual action in effecting wider structural change in climate mitigation.

Graham Readfearn and Adam Morton, 'Almost 3 Billion Animals Affected by Australian Bushfires, Report Shows', *The Guardian* (online, 28 July 2020) <<https://www.theguardian.com/environment/2020/jul/28/almost-3-billion-animals-affected-by-australian-megafires-report-shows-aoe>>; Georgia Hitch, 'Bushfire Royal Commission Hears that Black Summer Smoke Killed Nearly 450 People', *ABC News* (online, 26 May 2020) <https://www.abc.net.au/news/2020-05-26/bushfire-royal-commission-hearings-smoke-killed-445-people/12286094?utm_campaign=abc_news_web&utm_content=link&utm_medium=content_shared&utm_source=abc_news_web%3E>.

2 Colin Gourlay et al, 'How Heat and Drought Turned Australia into a Tinderbox', *ABC News* (online, 24 February 2020) <<https://www.abc.net.au/news/2020-02-19/australia-bushfires-how-heat-and-drought-created-a-tinderbox/11976134>>.

3 See, eg, Fiona Harvey, 'Australia Fires Are Harbinger of Planet's Future, Say Scientists', *The Guardian* (online, 14 Jan 2020) <<https://www.theguardian.com/australia-news/2020/jan/14/australia-bushfires-harbinger-future-scientists>>.

4 Department of the Prime Minister and Cabinet, 'Australia's 2030 Climate Change Target' (Fact Sheet, Australian Government, 2015); *Paris Agreement*, opened for signature 22 April 2016, [2016] ATS 24 (entered into force 4 November 2016) art 2.

5 Sarah Martin, 'Australia Commits to 2050 Net Zero Emissions Plan but with No Detail and No Modelling', *The Guardian* (online, 26 October 2021) <<https://www.theguardian.com/australia-news/2021/oct/26/scott-morrison-says-australia-2050-net-zero-emissions-plan-based-on-choices-not-mandates>>.

6 Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis* (Summary Report, August 2021); Intergovernmental Panel on Climate Change, *Climate Change 2022: Impacts, Adaptation and Vulnerability* (Report, February 2022); Intergovernmental Panel on Climate Change, *Climate Change 2022: Mitigation of Climate Change* (Report, April 2022) (collectively referred to as 'AR6').

7 Intergovernmental Panel on Climate Change, AR6 (n 6); Fiona Harvey, 'Major Climate Changes Inevitable and Irreversible: IPCC's Starkest Warning Yet', *The Guardian* (online, 9 August 2021) <<https://www.theguardian.com/science/2021/aug/09/humans-have-caused-unprecedented-and-irreversible-change-to-climate-scientists-warn>>.

8 Intergovernmental Panel on Climate Change, AR6 (n 6); *Paris Agreement* (n 4).

Another landmark report from the IPCC in 2019 predicted that the global food system accounts for approximately 21–37% of GHG emissions, the majority of which are attributable to animal agriculture.⁹ Transitioning towards a sustainable food system presents a unique opportunity for emissions reductions, given the billions of daily decisions made by both citizens and businesses both in Australia within this sphere, though it is not without its challenges. The consumption (and production) of meat in Australia is a deeply entrenched cultural norm. At 94.8 kg/year, Australia's per capita consumption of meat is the second highest in the world, double the world average.¹⁰ Seldom, however, is the consumption of meat considered from the perspective of public policy (let alone from a climate perspective), despite the interconnectedness between societal dietary patterns and the health of the natural environment.

The dominant societal preference for meat products is referred to in the literature as *carnism*. In contrast to vegetarianism or veganism, carnism is an invisible, yet deeply institutionalised belief system which perpetuates the idea that the choice to consume meat is 'normal, natural and necessary'.¹¹ Carnism, and its associated institutions, pervades the global food system and obstructs meaningful discourse surrounding the negative environmental consequences of animal agriculture and the reduction of its harmful ecological effects.¹² Modern carnism is a significant driver of GHG emissions,¹³ soaring deforestation rates,¹⁴ disruptions to water systems and biodiversity loss.¹⁵ In spite of its wide ranging environmental costs, regrettably little regulatory attention has been paid to addressing the negative implications of meat production and consumption.

9 Intergovernmental Panel on Climate Change, *Climate Change and Land* (Special Report, 7 August 2019) ch 5, 476. Animal agriculture produces approximately 14.5% of global greenhouse gas ('GHG') emissions: Pierre J Gerber et al, *Tackling Climate Change through Livestock: A Global Assessment of Emissions and Mitigation Opportunities* (Report, 2013) 15. In the absence of intervention, the Intergovernmental Panel on Climate Change ('IPCC') has predicted that emissions from the global food system will increase by 30–40% by 2050: Intergovernmental Panel on Climate Change, *Climate Change and Land* (n 9) 440.

10 Rob Smith, 'These Are the Countries That Eat the Most Meat', *World Economic Forum* (Web Page, 29 August 2018) <<https://www.weforum.org/agenda/2018/08/these-countries-eat-the-most-meat-03bdf469-f40a-41e3-ade7-fe4ddb2a709a/>>, citing data from Organisation for Economic Cooperation and Development and Food and Agriculture Organization of the United Nations, *OECD-FAO Agricultural Outlook 2017–2026* (OECD Publishing, 2017). The data here included beef, veal, pork, poultry, and sheep, and excluded fish: Hannah Ritchie and Max Roser, *Meat and Dairy Production* (Report, November 2019) <<https://ourworldindata.org/meat-production>>.

11 Melanie Joy, *Why We Love Dogs, Eat Pigs and Wear Cows: An Introduction to Carnism* (Conari Press, 2011) 28–32, 96 (emphasis removed).

12 Ibid 104.

13 See, eg, United Nations Environment Programme Global Environmental Alert Service, 'Growing Greenhouse Gas Emissions Due to Meat Production' (2013) 5 *Environmental Development* 156, 159 <<https://doi.org/10.1016/j.envdev.2012.11.002>>.

14 See, eg, Yale School of the Environment, 'Cattle Ranching in the Amazon Region', *Global Forest Atlas* (Web Page, 2021) <<https://web.archive.org/web/20210224200921/https://globalforestatlas.yale.edu/amazon/land-use/cattle-ranching>>.

15 See, eg, Javier Mateo-Sagasta, Sara Marjani Zadeh and Hugh Turrall, *Water Pollution from Agriculture: A Global Review* (Report, 2017) 3.

This article challenges the regulatory inertia surrounding the impacts of carnism and offers insights into regulatory pathways towards a more sustainable food system, in light of Australia's commitments pursuant to the *Paris Agreement*. Part II(A) reviews the existing body of literature surrounding the climate impacts of meat production and consumption, highlighting the regulatory gaps in this space. Part II(B) explores existing and proposed efforts to regulate meat *production* in Australia, demonstrating the need for critical engagement with a range of regulatory strategies in order to appropriately address the multidimensional nature of the issue. In view of the limitations of supply-side policies, Part III focuses on regulation targeted at the *consumption* of meat products, drawing upon insights from behavioural economics, such as choice architecture and nudge theory. The discussion is anchored in the context of global population growth and soaring absolute levels of demand for emissions-intensive meat products, irrespective of supply-side regulatory efforts. It concludes with recommendations surrounding the optimal regulatory focus in this area, and notes issues requiring further detailed research. This article ultimately engages with regulatory strategies aimed at driving a transformational shift towards a lower emissions food system, in order to mitigate the destructive impacts of climate change both now and in an increasingly uncertain future.¹⁶

II CARNISM, EMISSIONS AND SUPPLY-SIDE REGULATION

A Carnism and Climate Change

In November 2016, the *Paris Agreement* entered into force, with 197 countries pledging to keep average global temperature increases to 'well below' 2°C above pre-industrial levels, and to pursue efforts to limit temperature increases to 1.5°C.¹⁷ Indeed, the targets set out under the *Paris Agreement* and methods for their achievement have since driven climate exigencies to the forefront of public policy discussion.¹⁸ However, policy discourse surrounding climate regulation has traditionally focused on abating emissions from perceptibly harmful economic sectors, such as the fossil fuel and transportation industries.¹⁹ Until recently, the

16 See, eg, Brian Machovina, Kenneth J Feeley and William J Ripple, 'Biodiversity Conservation: The Key Is Reducing Meat Consumption' (2015) 536 *Science of the Total Environment* 419, 419 <<https://doi.org/10.1016/j.scitotenv.2015.07.022>>.

17 *Paris Agreement* (n 4) art 2.

18 See, eg, Hope Howard, '2020 Candidates Give More Attention to Climate Change than in Past Elections', *ABC News* (online, 11 October 2019) <<https://abcnews.go.com/Politics/2020-candidates-give-attention-climate-change-elections-past/story?id=66184179>>.

19 William J Ripple et al, 'Ruminants, Climate Change and Climate Policy' (2014) 4(1) *Nature Climate Change* 2, 2 <<https://doi.org/10.1038/nclimate2081>>. For a comprehensive chronology of Australia's climate change policies, see, eg, Anita Talberg, Simeon Hui and Kate Loynes, 'Australian Climate Change Policy to 2015: A Chronology' (Research Paper, Parliamentary Library, Parliament of Australia, 5 May 2016).

less conspicuous (though nevertheless significant) drivers of climate change have failed to make the regulatory agenda.²⁰

Successive UN Secretary Generals have stated that the global climate crisis is the defining issue of our time.²¹ There is widespread scientific consensus that contemporary economic and social activities are exceeding scientifically determined safe ‘planetary boundaries’ and accelerating the threat of climate change.²² Yet in spite of the growing scientific consensus calling for transformative,²³ urgent²⁴ and unprecedented²⁵ action to reduce anthropogenic impacts on a rapidly warming planet, political action targeting the issue has remained markedly inadequate.²⁶ Current governmental pledges to emissions reductions are failing to limit global temperatures to ‘well below 2°C above pre-industrial levels’, and as per the IPCC’s latest report noted above, effectively make a mockery of the *Paris Agreement*’s aspirational 1.5°C target.²⁷ Not only are governmental pledges inadequate in reaching climate targets, but current policies themselves fall even shorter in

-
- 20 Rob Bailey, Antony Froggatt and Laura Wellesley, ‘Livestock: Climate Change’s Forgotten Sector’ (Research Paper, Chatham House, Royal Institute of International Affairs, December 2014) 19. Compared to other sectors, policy responses to climate change often overlook the damage caused by the rapidly rising demand for emissions-intensive meat products and the increased industrialisation of animal agribusiness which enable its satisfaction. ‘Meat’ in this article refers to beef, lamb, pork and poultry, and excludes fish. Given the higher emissions intensity of ruminant meats (such as beef and lamb), this article will explore regulatory efforts addressing red meat production. This is not to encourage a widespread shift toward meat originating from monogastric animals (such as pork and poultry), which are themselves associated with higher emissions than their plant-based food counterparts. Non-ruminant meats have a lower carbon equivalent footprint than their ruminant counterparts, however, they still produce approximately 3–10 times more emissions than plant-based sources of protein: see, eg, Ripple et al (n 19) 3. It is also important to note here that the animal agriculture industry as a whole is responsible for an immense amount of broader environmental damage, as well as animal suffering. The disruption of marine ecosystems caused by the rapid depletion of global fish stocks, and the ethics of meat, dairy and egg production warrant their own separate analysis. This article will focus specifically on the climate implications of meat (excluding fish).
 - 21 Ban Ki-Moon, ‘Opening Remarks at 2014 Climate Summit’ (Speech, United Nations General Assembly, 23 September 2014); António Guterres, ‘Secretary-General’s Remarks on Climate Change [As Delivered]’ (Speech, New York, 10 September 2018).
 - 22 See, eg, Will Steffen et al, ‘Planetary Boundaries: Guiding Human Development on a Changing Planet’ (2015) 347(6223) *Science* 1259855:1–10 <<https://doi.org/10.1126/science.1259855>>.
 - 23 Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report* (Report, 2015) 20.
 - 24 United Nations, ‘Goal 13: Take Urgent Action to Combat Climate Change and Its Impacts’, *Sustainable Development Goals* (Web Page) <<https://www.un.org/sustainabledevelopment/climate-change/>>.
 - 25 Intergovernmental Panel on Climate Change, *Global Warming of 1.5°C* (Report, 2018) 15.
 - 26 Independent analyses characterise Australia’s current response to climate change as ‘highly insufficient’: see, eg, ‘Australia’, *Climate Action Tracker* (Web Page, 23 May 2022) <<https://climateactiontracker.org/countries/australia/>>. See also Kate Dooley, ‘Australia’s Major Parties’ Climate Policies Side-by-Side’, *The Conversation* (online, 13 May 2019) <<https://theconversation.com/australias-major-parties-climate-policies-side-by-side-116896>>.
 - 27 *Paris Agreement* (n 4) art 2; Intergovernmental Panel on Climate Change, *AR6* (n 6).

delivering adequate emissions reductions.²⁸ The IPCC has repeatedly emphasised the need to undercut these risks through the acceleration of ‘far-reaching, multilevel and cross-sectoral climate mitigation’.²⁹ Given the estimates of current emissions profiles, it is imperative to address emissions-reduction potential from *all* major economic sectors, including animal agriculture.

Since the publication of *Livestock’s Long Shadow: Environmental Issues and Options* – a seminal report on the nexus between climate and meat consumption from the Food and Agriculture Organization of the United Nations (‘FAO’) – a growing body of scientific literature has reiterated the dangerous climate-warming effects of livestock *production*.³⁰ The global animal agriculture industry is responsible for an estimated 14.5–18% of anthropogenic GHG emissions, exceeding the level of direct exhaust emissions from the global transportation sector.³¹ These figures utilise a holistic ‘life cycle assessment’, which integrates the impacts of all factors associated with the production of meat.³² This method takes a comprehensive approach to measuring emissions by quantifying impacts along the entire supply chain – including changes to land use, feed inputs, on-farm production, processing, transport and retail.³³ Further evidence from the FAO, IPCC and independent scientific organisations has corroborated the significant climate-warming impact of livestock production.³⁴

28 Indeed, existing policies may deliver the planet to a 3.0°C warming scenario in spite of the 1.5–2°C ceiling – heralding calamitous environmental and social outcomes. According to the IPCC, current warming trends are escalating the risks of irreversible ecological damage, which will impose extensive long-term impacts on all facets of natural and human systems: Intergovernmental Panel on Climate Change, *Global Warming of 1.5 °C* (n 25) 5, 18.

29 Ibid 5.

30 Henning Steinfeld et al, *Livestock’s Long Shadow: Environmental Issues and Options* (Report, 2006).

31 Ibid xxi, 112; Gerber et al (n 9) 15.

32 See, eg, Gregory M Peters et al, ‘Red Meat Production in Australia: Life Cycle Assessment and Comparison with Overseas Studies’ (2010) 44(4) *Environmental Science and Technology* 1327, 1327 <<https://doi.org/10.1021/es901131e>>.

33 Gerber et al (n 9) 4.

34 See, eg, Intergovernmental Panel on Climate Change, *Global Warming of 1.5 °C* (n 25) 6; Cees de Haan, Henning Steinfeld and Harvey Blackburn, *Livestock and the Environment: Finding a Balance* (European Commission Directorate-General for Development, 1997) 53–74; David Tilman and Michael Clark, ‘Global Diets Link Environmental Sustainability and Human Health’ (2014) 515(7528) *Nature* 518, 518 <<https://doi.org/10.1038/nature13959>>. For a comprehensive meta-analysis of global farming systems, see also J Poore and T Nemecek, ‘Reducing Food’s Environmental Impacts through Producers and Consumers’ (2018) 360(6392) *Science* 987, 987, 990 <<https://doi.org/10.1126/science.aag0216>>. The authors’ results confirmed the inherently inefficient nature of livestock production – despite using 83% of global farmlands, animal-based foods provide only 37% of global protein and 18% of global calorie intake. Given the vast heterogeneity of production methods, the results demonstrate a 50-fold variation in impacts amongst production of the same foods, signifying considerable (albeit *finite*) supply-side emissions reduction potential. Moreover, the impacts of the lowest level, ‘cleanest’ animal products outweigh those of vegetable substitutes, thus further supporting the impetus for systemic dietary shifts.

Limiting climate change to the targets set out in the *Paris Agreement* necessitates ‘deep reductions’ of not only CO₂ emissions, but also of methane, a highly potent GHG.³⁵ The livestock industry is one of the leading global sources of methane and nitrous oxide emissions – two exceptionally potent GHGs.³⁶ To meet soaring consumer demand, the global animal agriculture industry currently rears over 1.7 billion bovines, 35.1 billion poultry and 2.4 billion goats and sheep in 2020.³⁷ With a rising global middle class, these numbers are expected to grow significantly, leading to the release of immense quantities of methane and nitrous oxide from the digestive systems of ruminant animals (such as cattle and sheep),³⁸ and ensuring such emissions constitute an ever-growing proportion of the remaining carbon budget available under the *Paris Agreement* 2°C limit.³⁹

Likewise, a growing body of global literature is beginning to address the negative environmental ramifications arising from the *consumption* of meat. Climate-related models have unequivocally endorsed the need to transition towards plant-based diets⁴⁰ – on an emissions per gram of protein basis, ruminant meats produce approximately 250 times more emissions than legumes.⁴¹ Indeed, in their 2017 ‘World Scientists’ Warning to Humanity’, over 15,000 scientists promulgated the need for a drastic decrease in meat consumption.⁴² To provide an indication of the significance of meat consumption in reducing carbon emissions, ‘business-as-usual’ food emissions could be reduced by 29% by 2050 through the global adoption of recommended dietary guidelines, by 63% through vegetarian diets and by 70% through vegan diets,⁴³ demonstrating the significant emissions reduction

35 Intergovernmental Panel on Climate Change, *Global Warming of 1.5 °C* (n 25) 95.

36 International Energy Agency, *Methane Tracker 2020* (Report, 2022). Methane has 25 times more warming potential than carbon dioxide. However, carbon dioxide has a shorter atmospheric lifespan: Gabriel Yvon-Durocher et al, ‘Methane Fluxes Show Consistent Temperature Dependence across Microbial to Ecosystem Scales’ (2014) 507(7493) *Nature* 488, 488 <<https://doi.org/10.1038/nature13164>>. See also Peter Grace and Louise Barton, ‘Meet N2O, the Greenhouse Gas 300 Times Worse than CO2’, *The Conversation* (online, 9 December 2014) <<https://theconversation.com/meet-n2o-the-greenhouse-gas-300-times-worse-than-co2-35204>>.

37 Food and Agriculture Organization of the United Nations, ‘Agricultural Production Statistics: 2000–2020’ (Analytical Brief No 41, 2022) 13.

38 Gerber et al (n 9) 20.

39 A carbon budget is the amount of cumulative GHG emissions that can be released before a certain temperature threshold is breached. For a live tracker of estimated cumulative emissions and global carbon budget exhaustion, see, eg, ‘Human-Induced Warming’, *Global Warming Index* (Web Page, 2022) <<https://www.globalwarmingindex.org/>>.

40 See, eg, Poore and Nemecek (n 34).

41 Tilman and Clark (n 34) 518.

42 William J Ripple et al, ‘World Scientists’ Warning to Humanity: A Second Notice’ (2017) 67(12) *BioScience* 1026 <<https://doi.org/10.1093/biosci/bix125>>.

43 Marco Springmann et al, ‘Analysis and Valuation of the Health and Climate Change Cobenefits of Dietary Change’ (2016) 113(15) *Proceedings of the National Academy of Sciences* 4146, 4147 <<https://doi.org/10.1073/pnas.1523119113>>.

gains (not to mention the public health benefits)⁴⁴ from shifting towards plant-based diets.⁴⁵

In spite of the multitude of precise and unambiguous warnings about the ramifications of meat consumption from environmental scientists and public health experts, the global demand for meat continues to increase at an alarming rate.⁴⁶ It is predicted that by 2050, global meat production will double on present levels to meet rising demand, particularly due to population growth and rising incomes in the developing world.⁴⁷ The ‘influence of affluence’ has facilitated the convergence of meat-heavy Western diets with traditionally more plant-based diets in the developing world,⁴⁸ resulting in shifts in consumer preferences towards symbolically ‘higher-value’, animal-based proteins.⁴⁹ In the absence of dedicated and targeted interventions, the environmental impacts of food systems could increase by 50–90%, thus exerting further pressure on natural ecosystems.⁵⁰ These projections underscore the inadequacy of regulatory responses which merely target the impact of meat *production* – if global meat *consumption* is not addressed,

-
- 44 Furthermore, excessive meat consumption imposes significant health costs on society. In 2015, the World Health Organization classified processed meats as Group 1 carcinogens and red meats themselves as ‘probably carcinogenic to humans’: see, eg, ‘Cancer: Carcinogenicity of the Consumption of Red Meat and Processed Meat’, *World Health Organization* (Web Page, 26 October 2015) <<https://www.who.int/news-room/questions-and-answers/item/cancer-carcinogenicity-of-the-consumption-of-red-meat-and-processed-meat>>. See also Christina M Nagle et al, ‘Cancers in Australia in 2010 Attributable to the Consumption of Red and Processed Meat’ (2015) 39(5) *Australian and New Zealand Journal of Public Health* 429 <<https://doi.org/10.1111/1753-6405.12450>>. Experts have proposed a tax on red meat to deter consumption and recoup 75% of the estimated USD285 billion in global healthcare costs spent treating illnesses attributable to red meat consumption: Marco Springmann et al, ‘Health-Motivated Taxes on Red and Processed Meat: A Modelling Study on Optimal Tax Levels and Associated Health Impacts’ (2018) 13(11) *PLoS ONE* 1, 1 <<https://doi.org/10.1371/journal.pone.0204139>> (‘Health-Motivated Taxes’). Moreover, literature from the health sciences has explored the ‘co-benefits’ of a reduction in meat consumption – that is, the potential for systemic dietary changes to generate positive outcomes for *both* population health and the natural environment.
- 45 The widespread belief regarding any ‘need’ for meat in human diets is scientifically unfounded. The American Academy of Nutrition and Dietetics and the British Dietetic Association – the two largest bodies of nutrition professionals worldwide – have confirmed that ‘appropriately planned vegetarian, including vegan, diets are healthful, [and] nutritionally adequate ... for *all* stages of the life cycle’. This disproves the extensive myth that humans ‘need’ meat to satisfy nutritional requirements: Vesanto Melina, Winston Craig and Susan Levin, ‘Position of the Academy of Nutrition and Dietetics: Vegetarian Diets’ (2016) 116(12) *Journal of the Academy of Nutrition and Dietetics* 1970, 1970 (emphasis added) <<https://doi.org/10.1016/j.jand.2016.09.025>>; ‘British Dietetic Association Confirms Well-Planned Vegan Diets Can Support Healthy Living in People of All Ages’, *British Dietetic Association* (Web Page, 7 August 2017) <<https://www.bda.uk.com/news/view?id=179>>. Strict vegan diets need reliable sources of plant-based B12, through fortified foods or supplements.
- 46 Ritchie and Roser (n 10).
- 47 Food and Agriculture Organizations of the United Nations, ‘Global Agriculture towards 2050’ (Forum Paper, 12–13 October 2009).
- 48 Norman Myers and Jennifer Kent, ‘New Consumers: The Influence of Affluence on the Environment’ (2003) 100(8) *Proceedings of the National Academy of Sciences* 4963, 4963 <<https://doi.org/10.1073/pnas.0438061100>>.
- 49 P Sans and P Combris, ‘World Meat Consumption Patterns: An Overview of the Last Fifty Years (1961–2011)’ (2015) 109 *Meat Science* 106, 106 <<https://doi.org/10.1016/j.meatsci.2015.05.012>>.
- 50 Marco Springmann et al, ‘Options for Keeping the Food System within Environmental Limits’ (2018) 562(7728) *Nature* 519, 519 <<https://doi.org/10.1038/s41586-018-0594-0>>.

any emissions reductions achieved through supply-side policies will likely be outweighed by the booming demand for meat.

While the trajectory of meat consumption in industrial nations has plateaued, absolute levels of consumption continue to sit at exceptionally high levels.⁵¹ Australia is said to be a country with a ‘protein surplus’, which refers to countries with excess production *and* high levels of meat and dairy consumption.⁵² Unsurprisingly, such high levels of demand have driven the meat industry towards more economically efficient production methods.⁵³

Several factors have prevented an open and transparent policy debate targeted at moderating excessive meat consumption. It is important for any proposed regulatory strategies to consider and overcome these influences. Significant factors driving inaction include low consumer awareness surrounding the issue,⁵⁴ vested

-
- 51 Ritchie and Roser (n 10). The global production of meat has undergone immense transformative change since the early 1960s: see, eg, Ritchie and Roser (n 10). The advent of industrial agriculture has undoubtedly aided in reducing food scarcity – the Food and Agriculture Organization of the United Nations (‘FAO’) estimates that current crop yields are enough to feed 10 billion people. Yet, the majority of these crops are fed to livestock and used in biofuels, such that globally over 820 million people remain chronically undernourished: Food and Agriculture Organization of the United Nations, *The State of Food Security and Nutrition in the World: Safeguarding against Economic Slowdowns and Downturns* (Report, 2019) 6; Eric Holt-Giménez et al, ‘We Already Grow Enough Food for 10 Billion People ... and Still Can’t End Hunger’ (2012) 36(6) *Journal of Sustainable Agriculture* 595, 595 <<https://doi.org/10.1080/10440046.2012.695331>>. These methods have been developed to allow food producers to exploit economies of scale and increase profit growth, yet they pose significant risks to the sustainability, security and safety of food systems. Since the advent of industrial agriculture, meat production has occupied a growing proportion of the global agribusiness complex and has followed a trajectory of increased intensification: see, eg, Timothy Robinson et al, *Global Livestock Production Systems* (Food and Agriculture Organization of the United Nations and International Livestock Research Institute, 2011) 43. Meat production systems have shifted towards industrialisation and away from small-scale, diverse and subsistence-driven means of production. For a detailed analysis of increased demand catalysed by supply-side processes, see, eg, Marta G Rivera-Ferre, ‘Supply vs. Demand of Agri-Industrial Meat and Fish Products: A Chicken and Egg Paradigm?’ (2009) 16(2) *International Journal of Sociology of Agriculture and Food* 90. Concentrated animal feeding operations, or factory farms, are now the dominant meat production system in developed nations, particularly in the supply of poultry and pork: Steinfeld et al (n 30) 51.
- 52 ‘Emissions Impossible: How Big Meat and Dairy Are Heating Up the Planet’ (Research Paper, GRAIN and Institute for Agriculture and Trade Policy, July 2018) 6. Other nations with a protein surplus include the United States, Canada, countries within the European Union (‘EU’), Brazil, Argentina and New Zealand.
- 53 See, eg, Nil Zacharias, ‘It’s Time to End Factory Farming’, *HuffPost* (online, 19 December 2011) <https://www.huffpost.com/entry/its-time-to-end-factory-f_b_1018840>.
- 54 Pasi Pohjolainen et al, ‘Consumer Consciousness on Meat and the Environment: Exploring Differences’ (2016) 101 *Appetite* 37 <<https://doi.org/10.1016/j.appet.2016.02.012>>. Consumers often do not make the connection, or actively ignore the connection, between their dietary choices and their broader environmental impacts. This comes despite growing societal concern regarding climate change. Many studies have reported negligible consumer awareness surrounding the ramifications of meat consumption, which has fuelled inaction in this area. Given its status as a deeply rooted cultural norm, consumers often lack the impetus to re-evaluate any potential overreliance on meat. Instead, consumers justify their excessive meat intake levels as being ‘normal, natural and necessary’: see, eg, Joy (n 11) 96; Jared Piazza et al, ‘Rationalizing Meat Consumption: The 4Ns’ (2015) 91 *Appetite* 114, 115 <<https://doi.org/10.1016/j.appet.2015.04.011>>. Research has demonstrated that a multitude of both conscious and unconscious biases influence consumers’ purchasing decisions: H Charles J Godfray et al, ‘Meat Consumption, Health, and the Environment’ (2018) 361(6399) *Science* eaam5324:1–8 <<https://doi.org/10.1126/science.aam5324>>.

interests from the private sector,⁵⁵ government fears of isolating their constituents,⁵⁶ and the role of carnism, or ‘meat culture’ in perpetuating diets heavy in meat products.⁵⁷ In view of the upward trajectory of meat consumption, it is unlikely that supply-side policies alone will deliver the necessary transformational dietary shifts

-
- 55 The regulatory vacuum surrounding meat consumption has also been driven by fierce private sector resistance. Corporations constituting the ‘global meat complex’ possess significant lobbying power and have clear interests in keeping consumer awareness levels low: see, eg, David Robinson Simon, *Meatonomics: How the Rigged Economics of Meat and Dairy Make You Consume Too Much* (Conari Press, 2013). This often translates into distorted national dietary guidelines and immense industry subsidies: see, eg, Marion Nestle, ‘Food Lobbies, the Food Pyramid, and US Nutrition Policy’ (1993) 23(3) *International Journal of Health Services* 483 <<https://doi.org/10.2190/32F2-2PFB-MEG7-8HPU>>; Markham Heid, ‘Experts Say Lobbying Skewed the US Dietary Guidelines’, *TIME* (online, 8 January 2016) <<https://time.com/4130043/lobbying-politics-dietary-guidelines/>>. ‘The dearth of policies and funding to tackle livestock emissions stands in marked contrast to the abundance of government support afforded to meat and dairy producers. Livestock subsidies among OECD countries amounted to \$53 billion in 2013. In the EU, cattle subsidies alone exceeded \$731 million, equivalent to \$190 per cow’: Bailey, Froggatt and Wellesley (n 20) 9 (citations omitted). Detailed information and analyses on livestock subsidies in Australia appear absent. A further complication comes in the form of economic benefits. The livestock industry plays a sizeable role in the Australian economy, generating AUD35 billion value of production: Department of Agriculture, Fisheries and Forestry, ‘Agricultural Outlook’, *Australian Government* (Web Page, 2022) <<https://www.agriculture.gov.au/abares/research-topics/agricultural-outlook/livestock>>. The nation’s red meat and livestock industry comprises over 80,000 farming businesses and employs approximately 200,000 workers in on-farm production, processing and retail jobs: Meat & Livestock Australia, *State of the Industry Report: The Australian Red Meat and Livestock Industry* (Report, 2019) 8–11 (‘*State of the Industry*’). Jobs are a crucial consideration in this sphere, yet economic structures are not static and there is an unequivocal need to transition towards a low-carbon economy. As explored by Simon, a transition away from animal products will not result in less overall spending as consumers will not be demanding less food overall, rather, they will merely be shifting towards healthier, lower emissions foods: Simon (n 55) 179–80. As the world’s third largest beef exporter (behind Brazil and India), Australia’s cattle farm businesses are a key player in the global market for red meat: Meat & Livestock Australia, *State of the Industry* (n 55) 4. This renders regulation in this sphere politically contentious, as the short-term economic interests of agribusiness often conflict with broader, long-term environmental goals.
- 56 Bailey, Froggatt and Wellesley (n 20) 15. Both governments and non-government organisations (‘NGOs’) have suffered from fear of backlash from constituents. Constituents include not only voters, but also farmers and industry groups. Governments are generally hesitant to intervene in deeply held lifestyle behaviours, as this often provokes accusations of a ‘nanny-state’: see, eg, Jared Owens, ‘War Declared on Nanny State’, *The Australian* (online, 26 June 2015) <<https://www.theaustralian.com.au/nation/politics/david-leyonhjelm-declares-war-on-nanny-state/news-story/75a9ed02d3c7abb30d6a42fe3889326a>>. Former New South Wales Senator David Leyonhjelm has staunchly defended ‘the right to make bad choices’. For a strikingly contrasting perspective on the ‘nanny industry’, see, eg, M Moore, H Yeatman and R Davey, ‘Which Nanny: The State or Industry? Wowsers, Teetotallers and the Fun Police in Public Health Advocacy’ (2015) 129(8) *Public Health* 1030 <<https://doi.org/10.1016/j.puhe.2015.01.031>>. Addressing the issue of excessive meat consumption is often perceived as politically infeasible. Yet, this fear of criticism is often overestimated – research has found that civil society expects governments to lead on issues of social significance, and the sheer scale of the issue requires a proactive regulatory response from governments: Laura Wellesley, Catherine Happer and Antony Froggatt, *Changing Climate, Changing Diets: Pathways to Lower Meat Consumption* (Report, November 2015) 16.
- 57 Joy (n 11). Meat products are imbued with meaning and are deeply embedded into societal dietary norms. They have become a symbol of affluence and modernity, such that attempts at discourse surrounding the issue are often muffled by arguments concerning the right to consumer choice: Michael Carolan, *The Real Cost of Cheap Food* (Routledge, 2nd ed, 2018) 88 <<https://doi.org/10.4324/9781315113234>>. The mere fact that a practice may be cultural does not, and should not, exempt the issue from scrutiny. Male dominance and the resulting widespread discrimination against women, racism, heterosexual supremacy, and slavery were all once cultural practices (seen as ‘normal, natural and necessary’) in Western societies.

for food systems to align with the *Paris Agreement*.⁵⁸ Rather, adequate climate mitigation efforts require robust demand-side policies which address ‘public attitudes, social values and practices’.⁵⁹

While there remains a general lack of direct government action across the globe, a critical (albeit limited) body of discourse is beginning to emerge. In 2015, the Chinese Government committed to reducing its 1.3 billion citizens’ meat consumption by 50% through its revised dietary guidelines, ostensibly in an attempt to improve public health.⁶⁰ Additionally, a meat tax has been considered by the Parliaments of Denmark, Germany and Sweden – three countries which, similarly to Australia, consume considerable quantities of meat.⁶¹ Further, the United Kingdom’s recent and ambitious pledge to achieve net zero emissions has explicitly prioritised plant-based sources of protein (yet, the plan calls for a mere 20% reduction in beef, lamb and dairy consumption⁶² – a figure much lower than necessary reduction levels suggested by other reports).⁶³ In a similar vein, New Zealand’s climate mitigation pledges specifically establish a goal of reducing methane emissions by 24–47% by 2050.⁶⁴ This is a potentially significant development, considering livestock methane contributes to 37.2% of New Zealand’s total GHG emissions, however whether this will address the core issue of overconsumption is unclear.⁶⁵ It should be noted that New Zealand is amongst the approximately 100 countries which have agreed to participate in the Global Methane Pledge, a collective effort led by the United States (‘US’) and European Union aimed at reducing methane emissions by 30% from 2020 levels by 2030.⁶⁶ Regrettably, Australia has so far refused to sign the pledge. The concerns raised by these countries highlight the growing importance of regulating the impacts of meat production and consumption, despite any economic or cultural role it presently plays in a warming world.

Forms of regulation exist on a vast spectrum, ranging from highly coercive ‘command and control’ mechanisms to ‘softer’ voluntary guiding initiatives.⁶⁷ All forms of regulation intend to influence economic and social behaviours in order

58 Intergovernmental Panel on Climate Change, *Climate Change and Land* (n 9) 472.

59 Intergovernmental Panel on Climate Change, *Global Warming of 1.5 °C* (n 25) 71.

60 Oliver Milman and Stuart Leavenworth, ‘China’s Plan to Cut Meat Consumption by 50% Cheered by Climate Campaigners’, *The Guardian* (online, 21 June 2016) <<https://www.theguardian.com/world/2016/jun/20/chinas-meat-consumption-climate-change>>.

61 Damian Carrington, ‘Meat Tax “Inevitable” to Beat Climate and Health Crises, Says Report’, *The Guardian* (online, 11 December 2017) <<https://www.theguardian.com/environment/2017/dec/11/meat-tax-inevitable-to-beat-climate-and-health-crises-says-report>>; Ritchie and Roser (n 10).

62 Committee on Climate Change, *Net Zero: The UK’s Contribution to Stopping Global Warming* (Report, May 2019) 147.

63 See, eg, Poore and Nemecek (n 34).

64 *Climate Change Response (Zero Carbon) Amendment Act 2019* (NZ) s 5Q(1)(b)(ii).

65 ‘New Zealand’s Greenhouse Gas Emissions’, *Stats NZ* (Web Page, 23 February 2022) <<https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions>>.

66 ‘Fast Action on Methane to Keep a 1.5°C Future within Reach’, *Global Methane Pledge* (Web Page) <<https://www.globalmethanepledge.org/>>.

67 Julia Black, ‘Critical Reflections on Regulation’ (2002) 27 *Australian Journal of Legal Philosophy* 1, 9, 20.

to generate improved societal outcomes.⁶⁸ Gunningham, Grabosky and Sinclair have advocated for regulatory plurality by highlighting the importance of ‘smart regulation’, which is characterised by a series of design principles.⁶⁹ This concept rejects the notion that a single regulatory strategy will be effective in rectifying issues of social concern, rather, regulators should implement a complementary mix of instruments.⁷⁰

The concept of ‘ecological regulation’ is particularly salient in the context of meat production and consumption, where regulatory scholars have argued against narrowly defined instrumental or responsively rational regulation as the solution to the harms caused by meat consumption and production. Rather, ecological regulation recognises the complex intersection between ecological, political and social challenges, which must be addressed within the context of planetary boundaries.⁷¹

It is clear that regulators may need to embrace a range of diverse multi-scalar and polycentric strategies in order to address the interconnected nature of the environmental harms of carnism.⁷² This is not to encourage regulatory ‘smorgasbordism’ – the application of all possible regulatory measures⁷³ – but rather to highlight that less interventionist strategies are initially preferred, before the progressive triggering of more coercive strategies.⁷⁴ Moreover, smart regulation harnesses a myriad of actors to engage as ‘surrogate regulators’ (both commercial and non-commercial, such as business and civil society) in order to spare scarce regulatory resources and manage a difficult societal transition away from environmentally damaging behaviours.⁷⁵

68 Ibid 25; Neil Gunningham, ‘Environment Law, Regulation and Governance: Shifting Architectures’ (2009) 21(2) *Journal of Environmental Law* 179, 181–3 <<https://doi.org/10.1093/jel/eqp011>>. This article adopts Freiberg’s definition of regulation, Arie Freiberg, *Regulation in Australia* (Federation Press, 2017) 2:

An intentional form of intervention by public sector actors in the economic and social activities of a target population with the aim of achieving a public policy objective or set of objectives. The intervention can be direct and/or indirect, the activities can be economic and/or non-economic and the regulatee may be a public or private sector actor.

69 Neil Gunningham, Peter Grabosky and Darren Sinclair, *Smart Regulation: Designing Environmental Policy* (Clarendon Press, 1998); Neil Gunningham and Darren Sinclair, ‘Smart Regulation’ in Peter Drahos (ed), *Regulatory Theory: Foundations and Applications* (Australian National University Press, 2017) 133 <<https://doi.org/10.22459/RT.02.2017.08>>.

70 Gunningham and Sinclair, ‘Smart Regulation’ (n 69) 133.

71 Christine Parker, Fiona Haines and Laura Boehm, ‘The Promise of Ecological Regulation: The Case of Intensive Meat’ (2018) 59 (Fall) *Jurimetrics* 15, 31.

72 See, eg, Elizabeth Fisher, ‘Environmental Law as “Hot” Law’ (2013) 25(3) *Journal of Environmental Law* 347 <<https://doi.org/10.1093/jel/eqt025>>.

73 Gunningham and Sinclair, ‘Smart Regulation’ (n 69) 134.

74 Ibid 135.

75 Christine Parker et al, ‘Can the Hidden Hand of the Market Be an Effective and Legitimate Regulator? The Case of Animal Welfare under a Labeling for Consumer Choice Policy Approach’ (2017) 11(4) *Regulation and Governance* 368, 370–82 <<https://doi.org/10.1111/rego.12147>>. The concept of regulatory pluralism sheds light on the networks of regulators, other than government, which dominate and regulate the market. Even where governments disassociate and minimise their involvement in markets, networks of public and private actors often exert considerable influence on regulation. For example, when agricultural ministries left regulation of the free-range egg industry to the market, a network of actors consisting of industry, NGOs and supermarkets stepped into the regulatory sphere in an attempt to effect desired animal welfare standards. This myriad of actors may give the impression of

As carnism is a pervasive and environmentally damaging social practice, it is necessary to consider its regulation from both the supply- and demand-side, that is, by influencing both producers' practices to reduce relative carbon emissions, and by steering societal consumption behaviours to influence the trajectory of consumption trends at an absolute level. While the latter is likely to be of greater efficacy in achieving a decrease in net emissions, it is important to consider all options available, given the significance of the current climate emergency.⁷⁶

B Supply-Side Regulation

Global meat production is a disparate, dynamic and complex industry; each stage of production demands numerous inputs and engages a multitude of stakeholders, complicating any proposed regulatory efforts.⁷⁷ The processes of meat production are highly context-specific – they are dependent on land and resource availability, regional weather patterns and local economic conditions.⁷⁸

The value chain of industrial meat production can be categorised into 4 key components – input feed production, on-farm production, processing and sales.⁷⁹ Of these 4 stages of production, the on-farm rearing of livestock is the most emissions-intensive stage, with enteric fermentation (methane release) and animal manure producing approximately 65% of overall production emissions.⁸⁰ Taking a risk-based approach to regulation, regulatory efforts aimed at production should therefore primarily be targeted at on-farm emissions mitigation measures, with a particular focus on the most emissions-intensive meat products (such as beef and lamb).⁸¹ Additional sources of emissions stem from pre-farm production (through the use of nitrogen fertilisers used to grow feed inputs), on-farm processes (through the release of carbon stored in the soil of overgrazed pastures, deforestation and savannah burning to manage land) and post-farm processes (through the transportation and processing of meat).⁸²

Direct livestock emissions have been estimated to account for 11% of Australia's total GHG emissions profile (importantly, this figure does not account

regulatory action, yet in the absence of sustained government intervention, these efforts have resulted in largely 'business-as-usual' actions, with only incremental changes to welfare standards.

76 *Paris Agreement* (n 4) art 2.

77 See, eg, Madeleine Pullman and Zhaohui Wu, *Food Supply Chain Management: Economic, Social and Environmental Perspectives* (Routledge, 2012) 36–40 <<https://doi.org/10.4324/9780203806043>>.

78 See, eg, Philip K Thornton, 'Livestock Production: Recent Trends, Future Prospects' (2010) 365(1554) *Philosophical Transactions of the Royal Society B* 2853 <<https://doi.org/10.1098/rstb.2010.0134>>.

79 Australian Beef Sustainability Framework, *Australian Beef Sustainability: Annual Update* (Report, 2019) 8 ('*Australian Beef Sustainability 2019 Annual Update*'); Carsten Gerhardt et al, *How Will Cultured Meat and Meat Alternatives Disrupt the Agricultural and Food Industry?* (Report, 2019) 5–6 <<https://doi.org/10.1089/ind.2020.29227.cge>>.

80 Bailey, Froggatt and Wellesley (n 20) 7.

81 Black (n 67).

82 Zoran Petrovic et al, 'Meat Production and Consumption: Environmental Consequences' (2015) 5 *Procedia Food Science* 235, 235–6 <<https://doi.org/10.1016/j.profoo.2015.09.041>>; Australian Beef Sustainability Framework, *Australian Beef Sustainability: Annual Update* (Report, 2021) 35 ('*Australian Beef Sustainability 2021 Annual Update*').

for the aforementioned indirect emissions produced by livestock rearing, such as emissions from feed inputs, land clearing or transportation of feed and carcasses).⁸³ In Australia, roughly two-thirds of cattle and sheep are raised on extensive grazing systems (grass-fed),⁸⁴ principally due to the widespread availability of pasture. Cattle producers, predominantly in the northern regions of Australia, manage over 28 million cattle over a collective 200 million hectares of land.⁸⁵

The Australian red meat and livestock industry comprises over 80,000 farming businesses, with beef cattle being the most prevalent type of farm nationally.⁸⁶ The structure of the industry is agreed upon under a Memorandum of Understanding between the red meat industry and the Commonwealth Government.⁸⁷ Amongst

83 Department of Primary Industries and Regional Development, 'Reducing Livestock Greenhouse Gas Emissions', *Government of Western Australia* (Web Page, 11 October 2021) <<https://www.agric.wa.gov.au/climate-change/reducing-livestock-greenhouse-gas-emissions>>. This figure calculated by the Western Australian Government does not take a holistic approach to the quantification of livestock emissions. It is lower than the FAO's 14.5–18% statistic because it does not use the Life Cycle Assessment approach, which quantifies emissions along the *entire* supply chain: see above n 30. Further, this figure is a *relative* proportion – over 60% of Australia's emissions are attributable to the high proportion of energy (electricity and direct combustion) and fugitive emissions (coal, natural gas and oil extraction and associated processes): Department of the Environment and Energy, *Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2019* (Report, March 2019) 7.

84 'What Is the Difference between Grassfed and Grainfed Meat?', *Meat & Livestock Australia* (Web Page, 2015) <<https://www.mlahealthymeals.com.au/faqs/grassfed-and-grainfed/#>>.

85 PricewaterhouseCoopers, *The Australian Beef Industry: The Basics* (Report, 2011) 1. The widespread consumer perception that grass-fed cattle are less environmentally damaging than their intensive grain-fed counterparts, extensive systems may produce relatively higher emissions: Beverley Henry et al, 'Livestock Production in a Changing Climate: Adaptation and Mitigation Research in Australia' (2012) 63(3) *Crop and Pasture Science* 191, 196 <<https://doi.org/10.1071/CP11169>>. This is predominantly because grass-fed cattle generally take longer to reach slaughter weight, thus producing more emissions over their lifetime: Matthew N Hayek and Rachael D Garrett, 'Nationwide Shift to Grass-Fed Beef Requires Larger Cattle Population' (2018) 13(8) *Environmental Research Letters* 084005:1–8, 6 <<https://doi.org/10.1088/1748-9326/aad401>>. While some research has found that well managed cattle grazing can aid in carbon sequestration efforts (through stimulating the soil to absorb more carbon), recent evidence suggests that the emissions released by cattle in their lifetime exceed their capacity to offset them through carbon storage and soil sequestration: Tara Garnett et al, *Grazed and Confused? Ruminating on Cattle, Grazing Systems, Methane, Nitrous Oxide, the Soil Carbon Sequestration Question* (Report, 2017). This report finds that '[t]he sequestration potential from grazing management is between 295–800 Mt CO₂-eq/year: this offsets only 20–60% of annual average emissions from the grazing ruminant sector, and makes a *negligible* dent on overall livestock emissions': at 33 (emphasis added). Moreover, extensive grazing systems face unique methane reduction challenges. For example, it is difficult to administer anti-methanogenic feed supplements to livestock grazing on vast pastures. Nonetheless, land and resource constraints, high costs of production and rising consumer demand serve as barriers to the increased 'extensification' of meat production systems: Henning Steinfeld, 'Economic Constraints on Production and Consumption of Animal Source Foods for Nutrition in Developing Countries' (2003) 133(11) *Journal of Nutrition* 4054S, 4060S <<https://doi.org/10.1093/jn/133.11.4054S>>.

86 Meat & Livestock Australia, *State of the Industry* (n 55) 11.

87 The structural and funding arrangements of the red meat industry are set out in the *Australian Meat and Live-Stock Industry Act 1997* (Cth). However, it is the Memorandum of Understanding which underpins these arrangements: *Memorandum of Understanding between Cattle Council of Australia, Sheepmeat Council of Australia, Australian Meat Industry Council, Australian Livestock Exporters' Council, Australian Lot Feeders' Association, Meat & Livestock Australia, Australian Meat Processor Corporation, Australian Livestock Export Corporation, Commonwealth of Australia represented by the Minister for Agriculture, Fisheries and Forestry*, signed 27 April 1998.

the multitude of industry-specific advisory councils, Meat & Livestock Australia ('MLA') is regarded as a significant service provider to the industry and is tasked with marketing and research.⁸⁸ MLA is supported by producer levies collected by the government and redistributed along with matching grants and research and development funds.⁸⁹ It is important to note that there is increasing concern surrounding government subsidisation of industries which perpetuate climate change, and the meat industry should be no exception.⁹⁰

While the red meat industry is primarily self-regulating and self-determining over its future strategic direction, there exists a highly interdependent relationship between the industry and government.⁹¹ The Australian Government collaborates closely with industry to boost overseas market access, research output and opportunities for growth. Research suggests the connections between government and the meat industry are deeply institutionalised, co-dependent and protectionist, perpetuated by the ideologies of carnism and neoliberalism.⁹² This represents an area of tension for the government, which is tasked with both promoting the economic interests of agribusiness, and reducing Australia's GHG emissions pursuant to the *Paris Agreement*, given the meat industry's growing carbon footprint.

The liberalisation of trade policies has facilitated considerable growth for the Australian meat industry.⁹³ Approximately 60% of cattle produced in Australia is

88 'What We Do', *Meat & Livestock Australia* (Web Page, 2021) <<https://www.mla.com.au/about-mla/what-we-do/#>>. Meat & Livestock Australia ('MLA') is the declared marketing and industry research body under sections 60(1) and 60(2) of the *Australian Meat and Live-stock Industry Act 1997* (Cth).

89 'How We Are Funded', *Meat & Livestock Australia* (Web Page, 2021) <<https://www.mla.com.au/about-mla/how-we-are-funded/#>>. MLA is supported by producer levies paid on livestock sales, with the majority of these funds being allocated to various marketing activities, such as securing market access and boosting consumer demand. The Australian Government imposes, collects and disperses these levies as per the *Primary Industries (Excise) Levies Act 1999* (Cth). However, it also provides matching grants and research and development funds to the industry: Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Industry Structures and Systems Governing Levies on Grass-Fed Cattle* (Report, September 2014) 16–17.

90 Damian Carrington, '\$1m a Minute: The Farming Subsidies Destroying the World', *The Guardian* (online, 16 September 2019) <<https://www.theguardian.com/environment/2019/sep/16/1m-a-minute-the-farming-subsidies-destroying-the-world>>. Environmentally damaging subsidies are rampant in the fishing industry: see, eg, Margaret A Young, 'Energy Transitions and Trade Law: Lessons from the Reform of Fisheries Subsidies' (2017) 17(3) *International Environmental Agreements: Politics, Law and Economics* 371 <<https://doi.org/10.1007/s10784-017-9360-2>>.

91 Department of Agriculture, Water and Environment, 'Red Meat Livestock Industry Structure', *Australian Government* (Web Page, 11 August 2021) <<http://www.agriculture.gov.au/ag-farm-food/meat-wool-dairy/red-meat-livestock/facts>>.

92 Katherine Sievert et al, 'Understanding the Political Challenge of Red and Processed Meat Reduction for Healthy and Sustainable Food Systems: A Narrative Review of the Literature' (2021) 10(12) *International Journal of Health Policy and Management* 793, 798 <<https://doi.org/10.34172/ijhpm.2020.238>>. See also Simon (n 55); Elle Hunt, 'Meatonomics Author Says Government Working with Meat and Dairy Industry to Boost Consumption', *The Guardian* (online, 6 May 2017) <<https://www.theguardian.com/science/2017/may/06/meatonomics-author-says-government-working-with-meat-and-dairy-industry-to-boost-consumption>>.

93 See, eg, 'Rising Demand in Indonesia Supported by Trade Deal', *Meat & Livestock Australia* (Web Page, 5 September 2018) <<https://www.mla.com.au/prices-markets/market-news/2018/trade-deal-supports-rising-demand-in-indonesia/>>.

exported to overseas markets, predominantly in Asia.⁹⁴ As the world's third leading exporter of beef, export demand will be a key determinant of livestock numbers, and thus, emissions levels.⁹⁵ Given projections indicating booming demand for meat in Asia, emissions from production are likely to increase in the absence of government intervention.⁹⁶ On the other hand, recent proposed policy responses to address meat consumption in overseas jurisdictions, in the form of reduction goals or meat taxes, may constitute a threat to Australian farming businesses.⁹⁷ The internationally-traded nature of Australian meat products represents a further complication in regulating the emissions produced by the industry.

Agricultural policy in Australia (insofar as it relates to climate change) sits within a regulatory framework historically characterised by a lack of political commitment towards achieving better environmental outcomes. Having been expressly exempt from the imposition of the Commonwealth Government's 2011 carbon pricing scheme,⁹⁸ the Carbon Farming Initiative ('CFI') was created as a voluntary carbon offsets scheme,⁹⁹ aimed at extending the scope of emissions-reduction incentives through the awarding of carbon credits for projects involving carbon sequestration or the alteration of land use.¹⁰⁰ However, a review undertaken by the Climate Change Authority in 2014 found the program suffered from low participation levels, which undermined its emissions-reduction potential.¹⁰¹ The

94 PricewaterhouseCoopers (n 84) 1.

95 Centre for International Economics, *Australian Agricultural Emissions Projections: To 2050* (Report, October 2013) 7; Meat & Livestock Australia, *State of the Industry* (n 55) 4.

96 *Australian Agricultural Emissions Projections: To 2050* (n 95) 7.

97 Meat taxes are discussed in Part III.

98 *Clean Energy Act 2011* (Cth) s 30(4), as repealed by *Clean Energy Legislation (Carbon Tax Repeal) Act 2014* (Cth). The agricultural sector was expressly exempt from the carbon pricing scheme, ostensibly due to administrative complexities and the difficulty in measuring emissions levels from individual farms. Yet, there existed a clear contemporaneous industry recognition of the indirect negative implications for farmers' profits, such as an increase in input costs voiced by agribusiness representatives: see, eg, Sally Davison, 'Agriculture's Excluded, so a Carbon Price Won't Add Cost. Right?' (2011) 8(3) *Farm Institute Insights* 1.

99 *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth). The Carbon Farming Initiative ('CFI') was complemented by various initiatives to support participation rates: 'Successful Five Years of the Carbon Farming Futures Programme', *Landcare Australia* (Web Page, May 2017) <<https://landcareaustralia.org.au/project/successful-five-years-carbon-farming-futures-programme/#:~:text=The%20%24139%20million%20Carbon%20Farming,extension%20agents%20across%20the%20country.>>. Carbon Farming Futures (2012–17) allocated AUD139 million to research, on-farm trials and education for farmers. It remains the only government effort to promote emissions reduction research and regionally tailored techniques and has not been replaced: 'Australia: Current Policy Projections', *Climate Action Tracker* (Web Page, 22 September 2020) <<https://climateactiontracker.org/countries/australia/2020-09-22/current-policy-projections/>>.

100 See, eg, Climate Change Authority, *Carbon Farming Initiative Review* (Report, 22 December 2014) 30; Dianne Mayberry et al., 'Pathways to Carbon-Neutrality for the Australian Red Meat Sector' (2019) 175 *Agricultural Systems* 13, 15 <<https://doi.org/10.1016/j.agsy.2019.05.009>>. Such alteration projects included afforestation or revegetation. To be eligible, CFI projects are measured against a defined 'business-as-usual' baseline and are required to satisfy legislated criteria and accredited methodological determinations (to estimate reduction levels) in order to ensure 'real and additional' abatement: Climate Change Authority (n 100) 9, 16. Following approval by the Minister and independent audits proving emissions abatement, participants are issued Australian carbon credit units ('ACCUs') by the Clean Energy Regulator. All ACCUs can be traded or sold to businesses with liabilities under the carbon pricing system: Clean Energy Regulator, 'Australian Carbon Credit Units', *Australian Government* (Web Page, 17 September 2020) <<http://www.cleanenergyregulator.gov.au/OSR/ANREU/types-of-emissions-units/australian-carbon-credit-units>>.

101 Climate Change Authority (n 100) 31.

CFI was largely ineffective for a variety of reasons, including carbon policy uncertainty and longer term returns for businesses considering participation.¹⁰²

With the repeal of the carbon price in 2014, the Abbott Coalition Government expanded the CFI to form the Emissions Reduction Fund ('ERF') (now rebranded the 'Climate Solution Fund' by the Morrison Government).¹⁰³ Operating on a wholly voluntary basis, interested entities bid to undertake emissions-reduction projects at 'reverse auctions', whereby the lowest cost abatement strategy is purchased by the Government, Australian Carbon Credit Units are issued and a contract is formed.¹⁰⁴ The standard ERF contract features a fixed price for up to seven years and is designed to overcome price uncertainties under the prior CFI provisions (and thereby boost participation rates),¹⁰⁵ yet only a limited number of 'methodolog[ical] determinations' are available to meat producers under this scheme.¹⁰⁶

As its centrepiece strategy in emissions reduction, the ERF has not delivered anticipated levels of emissions abatement.¹⁰⁷ While few analyses of the specific impact of the ERF on the animal agriculture industry exist, holistic analyses of the scheme reveal several shortcomings. A significant feature of the ERF is its 'safeguard mechanism', aimed at ensuring that large businesses do not increase net emissions levels above specified 'baselines'.¹⁰⁸ Yet, the regulations surrounding these baselines have been progressively loosened.¹⁰⁹ Consequently, cumulative abatement

102 Ibid 31–4. One major factor that discouraged industry participation was the high level of uncertainty surrounding carbon policy in Australia, which in turn fostered reservations about the future price of ACCUs and its longer-term returns for business. Restrictions regarding project eligibility and the unavailability of offset methods further deterred participation amongst producers. Moreover, the CFI suffered from high transaction costs in the form of lengthy methods approval processes, in addition to high method development, audit, verification and reporting costs. These requirements were arguably necessary to preserve the integrity of the scheme, however, evidence suggests that these transaction costs were unnecessarily high.

103 *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) ss 20A–G.

104 Climate Change Authority (n 100) 35.

105 Ibid. For example, farmers may voluntarily apply to undertake projects such as pasture-based beef cattle herd management, feeding cattle nitrate supplements, combustion of pig methane through engineered bio-digesters and soil carbon sequestration: Department of Industry, Science, Energy and Resources, 'Methods for the Emissions Reduction Fund', *Australian Government* (Web Page, 19 April 2022) <<https://www.industry.gov.au/regulations-and-standards/methods-for-the-emissions-reduction-fund>>.

106 Climate Change Authority (n 100) 16.

107 See, eg, Greg Bourne et al, 'Australia's Rising Greenhouse Gas Emissions' (Working Paper, Climate Council of Australia, 2018) 6.

108 *National Greenhouse and Energy Reporting Act 2007* (Cth) s 3(2).

109 Baselines have been set at the *highest* level of historical emissions over the period of 2009–10 to 2013–14: Clean Energy Regulator, 'Reported Baseline', *National Greenhouse and Energy Reporting* (Web Page, 1 July 2021) <<http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines/Reported-baseline>>; Ian a MacKenzie, 'Australia's Emissions Reduction Fund Is Almost Empty. It Shouldn't Be Refilled', *The Conversation* (online, 26 February 2018) <<https://theconversation.com/australias-emissions-reduction-fund-is-almost-empty-it-shouldnt-be-refilled-92283>>. Indeed, documents from the Department of the Environment and Energy express a preference for 'annually updating baselines for actual production' to facilitate business growth, particularly for 'emissions-intensive trade-exposed businesses': Department of the Environment and Energy, 'Emissions Reduction Fund: Safeguard Mechanism' (Consultation Paper, February 2018) 7. Additionally, many contracts have remained unfulfilled or have been revoked, and low-cost projects, such as burning methane waste gas, have largely been exhausted: Michael Slezak, 'Australia's Emissions Reduction Fund Is Failing to Deliver, Government Data Shows', *ABC News* (online, 17 June 2019) <<https://www.abc.net.au/news/2019-06-17/australian-emissions-reduction-fund-data-analysis/11164476>>.

levels have stagnated since 2017, and the scheme has been labelled ‘largely a sham’ by Professor Andrew Macintosh, the former head of the Government’s Emissions Reduction Assurance Committee.¹¹⁰ The inadequacy of the ERF demonstrates a lack of political commitment towards robust climate mitigation policy more generally, and emissions reductions from animal agriculture more specifically, as they remain a significant proportion of Australia’s emissions profile.

While the government fails to address agricultural emissions with effective policy options, environmental exigencies have led to a growing recognition from the animal agriculture industry of the risks a changing climate poses to business and the economy. This is evidenced by the self-regulatory strategies adopted by various industry bodies, which may be characterised by a conciliatory ‘business as part of the solution’ approach, as opposed to aggressive denialism of the negative environmental impacts of meat production.¹¹¹ The Australian Beef Sustainability framework has labelled beef producers ‘some of the nation’s most important environmental custodians’.¹¹² In response to mounting climate-related reputational risks, MLA has announced its goal to achieve carbon neutrality by 2030 (‘CN30’), recently commissioning the CSIRO to research pathways towards this.¹¹³ CN30 falls under the recently developed Australian Beef Sustainability Framework, which is characterised by six main priorities, including managing climate risk.¹¹⁴ MLA has actively pronounced its intentions to ‘demonstrate that the red meat industry is a global leader in ... carbon farming innovation, economic development and environmental stewardship’.¹¹⁵

CSIRO research has stated that the industry reduced absolute emissions by 44.61% from 2005–15.¹¹⁶ This was primarily achieved through reductions in deforestation on livestock farms, particularly due to laws which restricted the deforestation of native vegetation.¹¹⁷ This is undoubtedly a positive step by the industry, however, considering that these reductions represent the lowest cost, most attainable mitigation methods, the extent to which these reductions can be sustained towards a position of net zero emissions by 2030 remains doubtful, particularly against the backdrop of rising absolute levels of demand.

110 Slezak (n 109); Adam Morton, ‘Australia’s Carbon Credit Scheme “Largely a Sham”, Says Whistleblower Who Tried to Rein It In’, *The Guardian* (online, 23 March 2022) <<https://www.theguardian.com/environment/2022/mar/23/australias-carbon-credit-scheme-largely-a-sham-says-whistleblower-who-tried-to-rein-it-in>>. See also Climate Change Authority (n 100) 14; Australian Farm Institute, *The Implications of the Australian Government’s Carbon Farming Initiative for Beef Producers* (Report, March 2011).

111 This conciliatory approach stands in contrast with the tobacco industry, which spent a significant amount of resources denying the link between smoking and ill health: see, eg, Clive Bates and Andy Rowell, *Tobacco Explained: The Truth about the Tobacco Industry ... in Its Own Words* (Report No WHO4, 1999) 2.

112 Australian Beef Sustainability Framework, *Annual Update 2022* (Report, 2022) 27.

113 ‘Red Meat Industry Can Be Carbon Neutral by 2030’, *Meat & Livestock Australia* (Web Page, 22 November 2017) <<https://web.archive.org/web/20190227231151/https://www.mla.com.au/news-and-events/industry-news/red-meat-industry-can-be-carbon-neutral-by-2030/>>.

114 *Australian Beef Sustainability 2021 Annual Update* (n 82) 14.

115 *Ibid* 34.

116 *Ibid* 36.

117 Mayberry et al (n 100) 15.

Indeed, considering that ruminant meats produce 250 times more emissions than legumes (on a protein equivalent basis),¹¹⁸ and that the Australian Government estimates that emissions from agriculture will increase by 9% by 2030,¹¹⁹ it is difficult to comprehend precisely how carbon neutrality might be achieved in the short timeframe of under 10 years. Proposed strategies such as best-practice land management, vegetation management, feed additives and genetic manipulation will impose significant costs onto business.¹²⁰ Many of these technologies have not yet been commercialised.¹²¹ Despite several years of research and environmental pronouncements, MLA has not released concrete plans to disseminate or scale up mitigation technologies to the over 80,000 red meat and livestock farms in Australia. As highlighted earlier, the heterogeneous agglomeration of farming businesses serves as a major barrier to systemic supply-side action.

Recognising this, MLA has stated that carbon offsets are necessary to achieve net zero or carbon neutrality under the CN30 plan.¹²² Carbon offsets do not address emissions at their source, rather, they attempt to compensate for excess emissions elsewhere and may provide a ‘dangerous illusion of a fix’.¹²³ As such, the economic incentives provided by the government under the ERF to engage in carbon storage are outweighed by implementation, measurement and administrative costs. Given the rapidly diminishing carbon budget, placing more faith than is deserved in such industry claims may result in a failure to reach an adequate level of emissions abatement.

Research has demonstrated that industry generally tends to engage in such ‘policy substitution’ behaviours in response to the threat of more intrusive government intervention.¹²⁴ An industry’s self-regulatory efforts likely constitute an attempt to forestall, or ‘risk manage’ more coercive forms of government regulation.¹²⁵ Self-regulation undoubtedly supports private interests through preserving decision-making autonomy, enhancing business reputation and minimising commercial risks,¹²⁶ however the extent to which self-regulatory schemes support the broader public interest remains to be seen. MLA itself has described its goal of carbon

118 Tilman and Clark (n 34) 518.

119 Department of the Environment and Energy, *Australia’s Emissions Projects 2018* (Report, 2018) 27.

120 *Australian Beef Sustainability 2019 Annual Update* (n 79) 47.

121 Ibid 48.

122 ‘Impact and Investment’, *Meat & Livestock Australia* (Web Page, 2021) <www.mla.com.au/cn30>.

123 Niklas Hagelberg, ‘Carbon Offsets Are Not Our Get-Out-Of-Jail Free Card’, *United Nations Environment Programme* (Web Page, 12 June 2019) <<https://www.unep.org/news-and-stories/story/carbon-offsets-are-not-our-get-out-jail-free-card>>.

124 See, eg, ‘Policy Substitution’, *Institute of Alcohol Studies* (Web Page, December 2017) <<https://web.archive.org/web/20171023181533/http://www.ias.org.uk/Alcohol-knowledge-centre/The-alcohol-industry/Factsheets/Policy-substitution.aspx>>.

125 See, eg, Cary Coglianese and Evan Mendelson, ‘Meta-Regulation and Self-Regulation’ in Robert Baldwin, Martin Cave and Martin Lodge (eds), *The Oxford Handbook of Regulation* (Oxford University Press, 2010) 146, 152 <<https://doi.org/10.1093/oxfordhb/9780199560219.003.0008>>.

126 Kernaghan R Webb, ‘Understanding the Voluntary Codes Phenomenon’ in Kernaghan R Webb (ed), *Voluntary Codes: Private Governance, the Public Interest and Innovation* (Carleton Research Unit for Innovation, Science and Environment, 2004) 3.

neutrality as ‘ambitious’, and only achievable with significant investment and business cooperation.¹²⁷

Indeed, MLA’s goal appears *incompatible* with the industry’s commitments to long-term growth, in both domestic and international markets. Carbon neutrality is likely a strategic attempt to strengthen public perceptions of the industry, boost marketing opportunities and capitalise on environmental claims, in light of escalating consumer concerns regarding environmental exigencies. MLA has actively pronounced its goal to maintain its ‘social license to operate’, however, the self-regulating, self-monitoring and self-enforcing nature of its initiatives raises the question as to whether the industry’s claims are analogous to ‘greenwashing’.¹²⁸ Nonetheless, the industry’s ostensible willingness to voluntarily reduce sector emissions presents an opportunity for government engagement, and may indicate a certain level of industry receptiveness to the need for government intervention.

Recognised pathways towards the reduction of the intensity of GHG emissions of on-farm emissions can be categorised into three overarching realms: modifications to on-farm management practices (such as genetic manipulation and feed additives),¹²⁹ increases in business productivity and technical mitigation policies.¹³⁰ Distinct from these options are technical mitigation policies that facilitate the development and implementation of these methods and encapsulate a broad range of regulatory approaches, such as a carbon tax or emissions trading scheme.¹³¹ A further method of mitigating GHG emissions is through offsetting existing carbon emissions, the limitations of which are highlighted above.

Importantly, each practical pathway towards supply-side emissions reduction faces significant trade-offs and limitations. Not only is there a finitude to increasing the efficiency of farming practices and productivity, transitioning towards a knowledge and capital-intensive industry risks pushing small firms out of the market and further industry consolidation. While intensifying production may result in relatively lower GHG emissions in the short term, many studies have demonstrated that confined animal feeding operations release adverse contaminants into nearby localities, imposing significant hazards to public health and natural ecosystems.¹³²

127 ‘Carbon Neutral and DEXA under the Senate Spotlight’, *Meat & Livestock Australia* (Web Page, 11 April 2019) <<https://www.mla.com.au/news-and-events/industry-news/carbon-neutral-and-dexa-under-the-senate-spotlight/#>>; Mayberry et al (n 100) 18.

128 See, eg, Jerome Ramirez, *Quantifying the Impact of MLA’s Supply Chain Sustainability Program in Contributing to the Australian Red Meat Industry’s Social License to Operate* (Final Report, 13 July 2018).

129 See, eg, Pierre J Gerber, Benjamin Henderson and Harinder PS Makkar (eds), ‘Mitigation of Greenhouse Gas Emissions in Livestock Production: A Review of Technical Options for Non-CO2 Emissions’ (Research Paper No 177, Food and Agriculture Organization of the United Nations, 2013) 9–100.

130 Bailey, Froggatt and Wellesley (n 20) 10–11.

131 *Ibid.*

132 See, eg, Michael Greger and Gowri Koneswaran, ‘The Public Health Impacts of Concentrated Animal Feeding Operations on Local Communities’ (2010) 33(1) *Family and Community Health* 11 <<https://doi.org/10.1097/FCH.0b013e3181c4e22a>>. This epitomises the danger of adopting a non-integrative, narrow approach to environmental regulation and governance. Steffen et al (n 22) 8 highlight the fact that changes in one planetary boundary may trigger problems in another, creating ‘destabilizing feedbacks’.

Perhaps more saliently, gains in productive efficiency are likely to engender a ‘rebound effect’ in the long term, where industry intensification places downward pressure on the price of meat and eventually increases consumption levels, thus potentially undercutting any emissions reduction benefits.¹³³

It is imperative to note that most proposed strategies largely fail to address the crux of the issue: that the industry’s vast environmental footprint is predominantly attributable to soaring *consumption* rates which demand mass quantities of livestock populations.¹³⁴ Unsurprisingly, given the current cultural and economic value of carnism, the overwhelming importance of this demand-side facet of the issue is rarely acknowledged by governments or the meat industry.¹³⁵ Reductions in on-farm livestock numbers can only be achieved through two means – increasing the slaughter weight of each animal in a shorter amount of time (which has considerable limitations and trade-offs),¹³⁶ or through the more sustainable route of shifting dietary patterns away from meat products.

As they currently stand, the efforts undertaken by the meat industry to reduce emissions represent a wholly voluntary form of self-regulation, where organisations have unilaterally developed emissions mitigation initiatives in the absence of external pressure to do so. Yet, a fundamental conflict persists between business interests and broader public goals – that is, between short-term profit maximisation and climate objectives.¹³⁷ In view of historical inaction and a different set of priorities, it is likely idealistic to expect the industry to take meaningful emissions reduction action, particularly given the costs of such action is likely to impose on business operations. Past reports indicate that the industry has been aware of mitigation options for over a decade yet are only now beginning to announce emission reductions goals through CN30.¹³⁸

As noted above, the red meat farming industry is an immense agglomeration of over 80,000 farming businesses. The industry is heterogeneous and dynamic, meaning it is not easily amenable to prescriptive command and control forms of regulation.¹³⁹ Moreover, emissions reduction in this sector is heavily innovation

133 Bailey, Froggatt and Wellesley (n 20) 10.

134 Ibid 5–6.

135 One exception comes from the Government of Western Australia’s Department of Primary Industries and Regional Development, which acknowledges that the numbers of livestock is an approach to mitigating livestock emissions but states that this would run ‘counter to the objectives of the livestock industry’: Department of Primary Industries and Regional Development (n 83).

136 *Australian Beef Sustainability 2019 Annual Update* (n 79) 47.

137 See, eg, Mishelle Doorasamy and Kiran Baldavaloo, ‘Compromising Long-Term Sustainability for Short-Term Profit Maximization: Unethical Business Practice’ (2016) 8(1) *Foundations of Management* 79 <<https://doi.org/10.1515/fman-2016-0007>>.

138 See, eg, Richard Ekard, *Greenhouse Gas Emissions and the Australian Red Meat Industry* (Final Report, June 2006).

139 Freiberg (n 68) 234–5. Some analyses of the outcomes of mitigation options examine *relative*, not absolute, reductions in emissions. This means that these analyses consider the expanding global demand profile of meat as a justification for increasing emissions, despite the unequivocal need to transition towards a lower emissions food system, and lower emissions overall. For example, CSIRO research has stated: ‘[s]uccess in contributing to addressing greenhouse gas emissions can be measured as a decrease in the emissions intensity of food products, *even when absolute emissions rise* with increasing

dependent, and the rigidity of prescriptive regulatory strategies often do not allow for rapid changes in technology.¹⁴⁰ Therefore, regulatory measures which strengthen the credibility of the industry's extant self-regulatory schemes may be an important interim step in addressing this sector's climate impacts, and for preparing businesses for the risks and impacts of climate change itself.

In this vein, meta-regulation presents a unique strategy for governments to avoid direct legislative intervention, while holding the meat industry accountable for its self-regulatory regimes (such as the MLA's CN30 goal).¹⁴¹ This form of regulation involves governments risk-managing and regulating industry compliance at a distance; indeed, it may be conceptualised as a form of co-regulation.¹⁴² Meta-regulation encourages organisations to develop their own self-regulatory responses to emissions, while monitoring and enforcing mitigation goals.¹⁴³ Gilad has noted:

Meta-regulation ... would seem most pertinent when regulators and organizations face high levels of uncertainty regarding the nature of the risks to regulatory goals and the appropriate means to enhance organizations' performance and regulatory effectiveness.¹⁴⁴

These conditions appear to match with emissions reduction efforts within the meat industry. Individual farms are in the most favourable position to identify the specific climate mitigation pathways best suited to their operating situations, given the diverse contexts and production methods in place. Meta-regulation affords flexibility to the meat industry and allows businesses to develop tailored emissions reduction solutions.¹⁴⁵ However, monitoring on-farm emissions across 80,000 farms is likely to be a significant challenge. Governments can enforce targets by indicating their intention to implement more prescriptive, coercive forms of regulation, or through providing rewards and incentives to firms who achieve real

production to feed an expanding global population': Henry et al (n 85) 199 (emphasis added). A failure to regulate absolute emissions in an industry which is projected to represent an ever-growing percentage of Australia's emissions profile (should other sectors reduce their 'footprints') exemplifies a poor conceptualisation of the risk of an already changing climate. Given limited carbon budgets, governments cannot afford to allow absolute increases in emissions from food production if they are to stay in line with emissions reduction goals under the *Paris Agreement*. To put this into perspective, research by the Climate Council of Australia has found that if emissions continue along current trajectories, Australia will have entirely exhausted its carbon budget by 2030. The exact degree to which climate change will impinge on the operations of agribusiness cannot be predicted, and the emissions-reduction potential of the science and technologies surrounding CN30 methods such as soil carbon sequestration, genetic manipulation and feed additives are inherently unclear. Unsurprisingly, the Climate Council of Australia has stated that emissions abatement prospects in this sector are low: Bourne et al (n 107) 9, 21–3.

140 Freiberg (n 68) 235.

141 Peter Grabosky, 'Meta-Regulation' in Peter Drahos (ed), *Regulatory Theory: Foundations and Applications* (Australian National University Press, 2017) 149, 152–5 <<https://doi.org/10.22459/RT.02.2017.09>>.

142 Ibid 154; Fiona Haines, 'Regulation and Risk' in Peter Drahos (ed), *Regulatory Theory: Foundations and Applications* (Australian National University Press, 2017) 181, 188.

143 Grabosky (n 141) 152–5.

144 Sharon Gilad, 'It Runs in the Family: Meta-Regulation and Its Siblings' (2010) 4(4) *Regulation and Governance* 485, 489 <<https://doi.org/10.1111/j.1748-5991.2010.01090.x>>.

145 Freiberg (n 68) 122, 124.

emissions reductions.¹⁴⁶ Mutually reinforcing interventions at other levels of the value chain – such as pre- and post-farm processes – may also be of interest to governments once on-farm emissions abatement reaches adequate levels.

Depending on the level of industry cooperation and the efficacy of ‘softer’ regulatory measures (such as meta-regulation), governments may need to adopt more coercive forms of regulation targeted at the emissions produced by the meat industry. A carbon price levied on agricultural emissions represents a coercive regulatory technique available to governments, in which farmers must respond to the price shift by either absorbing the cost of the tax or achieving emissions output. As an alternative to a fixed carbon price, tradeable permits or ‘cap-and-trade’ schemes, limit and price emissions, allow the market to decide the most efficient configuration of emissions reduction.¹⁴⁷ This form of economic regulation creates a market for agricultural emissions – where one would not have otherwise existed – by encouraging agribusiness to internalise their climate costs.

The Australian Government is unlikely to introduce such direct legislative measures, particularly considering its historic lack of adequate climate action, let alone climate action targets within the sphere of animal agriculture. The New Zealand Government, however, is considering implementing market-based regulatory approaches to facilitate emissions reduction within the livestock sector, should farmers fail to reduce their emissions by 2022.¹⁴⁸ Indeed, New Zealand’s Interim Committee on Climate Change has recommended incorporating animal agriculture into the country’s Emissions Trading Scheme.¹⁴⁹

Supply-side regulation is vital to the extent that it aids in mitigating and minimising direct emissions from this sector. As noted by the IPCC, ‘every bit of warming matters’, and governments must facilitate and encourage emissions reductions wherever possible.¹⁵⁰ This Part has demonstrated that government regulation in Australia, which does not mandate industry participation and provides little incentive to do so (pursuant to the ERF), has failed to deliver adequate levels of emissions abatement. In view of these factors, and taking a ‘smart regulation’ escalating approach, it becomes clear that the Australian

146 Roger Magnusson and Belinda Reeve, “‘Steering’ Private Regulation? A New Strategy for Reducing Population Salt Intake in Australia” (2014) 36(2) *Sydney Law Review* 255, 275.

147 Freiberg (n 6) 256–7.

148 See, eg, Eleanor Ainge Roy, ‘Arden Tells New Zealand Farmers to Cut Carbon Emissions or Face Penalties’, *The Guardian* (online, 24 October 2019) <<https://www.theguardian.com/world/2019/oct/24/arden-tells-new-zealand-farmers-to-cut-carbon-emissions-or-face-penalties>>.

149 Interim Climate Change Committee, *Action on Agricultural Emissions: Evidence, Analysis and Recommendations* (Report, 30 April 2019) 6–7. The proposed two-stage process would first price emissions at the processor level, before imposing a compulsory emissions price at the farm-level via a rebate scheme. The emissions price is designed to encourage farmers to account for the costs of their emissions in their everyday on-farm practices, with the revenue raised being invested into programs which aid in mitigation efforts. The New Zealand Government has been vocal about driving innovation in the animal agriculture industry, citing reputation and trade as key reasons to address emissions: see, eg, New Zealand Government, Ministry for Primary Industries, *Fit for a Better World: Accelerating Our Economic Potential* (Report, July 2020) (‘*Fit for a Better World*’).

150 Petteri Taalas and Joyce Msuya, ‘Foreword’, *Intergovernmental Panel on Climate Change* (Web Page, 2018) <<https://www.ipcc.ch/sr15/about/foreword/>>.

Government should, at a minimum, hold the meat industry accountable for their own self-regulatory regimes. This may be achieved through the meta-regulation or co-regulation of MLA's CN30 targets, before potentially escalating up to more prescriptive measures. This responsive approach falls under the broader principles of 'smart regulation' explored in Part III – the selective and progressive triggering of regulatory strategies not only frees up limited regulatory resources, but also harnesses agribusiness itself as a surrogate regulator.

CN30 represents a bold and ambitious claim by the meat industry to reduce its emissions in light of the escalating societal concerns surrounding climate change. However, claims regarding the feasibility of carbon neutrality within the Australian meat industry rely heavily on the development of novel methods of carbon sequestration, feed additives and gene manipulation technologies. The extent to which these strategies can be scaled up as to cover the 80,000 red meat and livestock farming businesses in Australia remains to be seen. Indeed, as noted above, there is an inherently finite capacity to mitigate or offset carbon emissions from this sector.¹⁵¹

Yet any overreliance on supply-side regulation would ultimately reinforce the existing status quo of a populace fixated on the consumption of large quantities of emissions-intensive animal-based foods. It is imperative to recognise – and communicate more widely – the scientific consensus that the consumption behaviours enabling the rapid growth of the meat industry (and its ecologically damaging production practices) are *irreconcilable* with emissions mitigation objectives under the *Paris Agreement*.¹⁵² Perhaps a more salient limitation of supply-side regulation is the stark reality that any reductions in emissions achieved via this path will be significantly outweighed by the soaring global demand for meat.¹⁵³ Population growth and wealthier middle classes will ensure that without appropriate regulatory steering, current societal preferences for carbon-intensive meat products will remain at excessively high levels. Pledges by agribusiness to address supply-side emissions will likely prove deeply inadequate in the face of rising demand, therefore necessitating more active future regulatory attention.¹⁵⁴

151 See, eg, Poore and Nemecek (n 34).

152 As noted above, the global demand for meat is set to double on current levels by 2050: Food and Agriculture Organization of the United Nations (n 47) 9.

153 Ibid.

154 New Zealand's recent *Climate Change Response (Zero Carbon) Amendment Act 2019* (NZ) sets ambitious climate targets but adopts a 'two-basket approach' to emissions reduction. Under the proposed legislation, all GHGs *excluding* biogenic methane are to reach net zero by 2050: at s 5Q(1)(a). Instead, separate targets have been created for methane – emissions are to decrease by 10% by 2030 and between 24–47% by 2050: at s 5Q(1)(b). There are parallels between meat production in New Zealand and Australia, such as extensive 'grazing' farming systems, economic contributions and the cultural role of meat consumption: see, eg, New Zealand Government, Ministry for Primary Industries, *Fit for a Better World* (n 149).

III REGULATING MEAT CONSUMPTION

Recent research has demonstrated that supply-side mitigation measures alone will not be sufficient to drive food system sustainability or security,¹⁵⁵ meaning that a transformational shift in dietary patterns critical to meeting emissions reduction targets under the *Paris Agreement*.¹⁵⁶ This Part explores two overarching styles of economic regulation – coercive and facilitative – as potential pathways towards reduced meat consumption. Certain economic regulatory strategies, such as the imposition of taxes and subsidies, are well-established forms of behavioural regulation and have been utilised in analogous food contexts to both encourage and deter the consumption of deleterious goods.¹⁵⁷ However, in recognition of the political and structural barriers to consumer acceptance of any such regulatory interventions, this Part analyses informational regulation as a potential pathway towards reduced meat consumption and thereby reduced sectoral emissions.

A Economic Regulation

Economic regulation comprises a multitude of financial mechanisms to influence individual and firm behaviours through price signals, which may be achieved through the creation of new markets, through to the alteration of existing market conditions.¹⁵⁸ The core purpose of economic regulation is to remedy adverse market outcomes, or market failures.¹⁵⁹ The unregulated market for meat is a prime example of a market failure – in developed nations, meat is significantly underpriced and overconsumed as compared to its true cost¹⁶⁰ – through its

-
- 155 Bojana Bajželj et al, 'Importance of Food-Demand Management for Climate Mitigation' (2014) 4(10) *Nature Climate Change* 924 <<https://doi.org/10.1038/nclimate2353>>; Springmann et al, 'Health-Motivated Taxes' (n 44). Demand-side regulatory strategies sit under a broader framework aimed at encouraging widespread 'climatarianism', whereby society makes more conscious, informed decisions regarding the climate impact of their food choices. This diet has been promulgated by 'Less Meat Less Heat', a grassroots non-profit organisation aimed at shifting climate-damaging diets: 'What Is a Climatarian Diet?', *Less Meat Less Heat* (Web Page, 2017) <<https://web.archive.org/web/20200206165652/https://www.lessmeatlessheat.org/climatarian-diet/>>. At a minimum, this may involve reducing consumption of ruminant meats (beef and lamb) to one standard serving a week. The Harvard School of Public Health recommends '[getting] your protein from plants when possible': Harvard TH Chan School of Public Health, 'Protein', *The Nutrition Source* (Web Page, 2022) <<https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/protein/>>. See also Harvard TH Chan School of Public Health, 'Plate and the Planet', *The Nutrition Source* (Web Page, 2019) <<https://www.hsph.harvard.edu/nutritionsource/sustainability/plate-and-planet/>>. These experts recommend a maximum limit of 98 g of red meat and 203 g of poultry per week. This equates to approximately 15.6 kg of red meat and poultry a year, as compared to the average Australian's consumption of 94.8 kg/year: see Smith, 'These Are the Countries That Eat the Most Meat' (n 10).
- 156 Ritchie and Roser (n 10). The global average per capita level of meat consumption has doubled in the past 50 years and is projected to continue along a trajectory of intense, sustained growth. Given the highly emissions and resource-intensive nature of meat production, further increases in the demand for meat will inevitably accelerate climate warming trends, particularly if it is one of the only economic sectors left unregulated.
- 157 See, eg, Magnusson and Reeve (n 146).
- 158 Freiberg (n 68) 254.
- 159 Ibid 252–3.
- 160 See, eg, Simon (n 55).

imposition of negative externalities on society in the form of poor environmental, public health and animal welfare outcomes. The economic tools noted in Part II (such as emissions trading schemes) are primarily aimed at generating an *ancillary* market for agricultural emissions, where one would not have otherwise existed (although this may have flow on effects on the prices within the existing market for meat).¹⁶¹ On the other hand, fiscal regulatory measures such as taxes and subsidies hold potential as a powerful mechanism to influence the *existing* market for meat.¹⁶² This Part will draw upon regulatory and economic theory to explore the applicability of these market-based instruments and their capacity to influence meat consumption in the context of climate change.

1 *The Subsidisation and Taxation of Meat*

A tax on meat represents one of the most coercive market-based pathways towards the achievement of lower emissions. Taxes often aim to correct market failures by incorporating the unrecognised social cost of a good into its private cost, thereby increasing its price and reducing demand.¹⁶³ This form of tax is commonly used by governments as a tool to both deter undesirable levels of consumption and raise revenue.¹⁶⁴ Such taxes have been shown to lower the consumption of the product they are levied upon, the extent to which depends on the demand elasticity of the product.¹⁶⁵

As noted in Part II, monitoring emissions at the input or farm-level is likely to be highly costly and administratively complex, due to the number of producers and the disparate nature of their production practices.¹⁶⁶ Moreover, the non-point source and intrinsically inefficient nature of animal agriculture undercuts the capacity for technological mitigation.¹⁶⁷ Finally, a wide range of substitutes exist in this context,

161 Freiberg (n 68) 254.

162 Ibid 262–71.

163 Ibid 264–7.

164 A tax on tobacco represents one of the most common examples worldwide: see, eg, Cancer Council Victoria, 'Impact of Price Increases on Tobacco Consumption in Australia', *Tobacco in Australia* (Web Page, 2019) <<https://www.tobaccoin australia.org.au/chapter-13-taxation/13-5-impact-of-price-increases-on-tobacco-consumpt>>.

165 Ibid. Within the sphere of environmental taxes, regulators are faced with a decision between levying a tax on emissions (such as a direct carbon tax on producers, highlighted in Part I) or imposing a tax on the inputs or outputs correlated with those emissions (such as on the end product itself): Armin Schmutzler and Lawrence H Goulder, 'The Choice between Emission Taxes and Output Taxes under Imperfect Monitoring' (1997) 32(1) *Journal of Environmental Economics and Management* 51, 51 <<https://doi.org/10.1006/jeem.1996.0953>>.

166 See, eg, Keith R Lassey, 'Livestock Methane Emission: From the Individual Grazing Animal through National Inventories to the Global Methane Cycle' (2007) 142(2–4) *Agricultural and Forest Meteorology* 120 <<https://doi.org/10.1016/j.agrformet.2006.03.028>>; Stefan Wirsenius, Fredrik Hedenus and Kristina Mohlin, 'Greenhouse Gas Taxes on Animal Food Products: Rationale, Tax Scheme and Climate Mitigation Effects' (2011) 108(1–2) *Climatic Change* 159, 162–3 <<https://doi.org/10.1007/s10584-010-9971-x>>. See also Pete Smith et al, 'Policy and Technological Constraints to Implementation of Greenhouse Gas Mitigation Options in Agriculture' (2007) 118(1–4) *Agriculture, Ecosystems and Environment* 6 <<https://doi.org/10.1016/j.agee.2006.06.006>>.

167 Lassey (n 166); Alla Golub et al, 'Global Climate Policy Impacts on Livestock, Land Use, Livelihoods, and Food Security' (2013) 110(52) *Proceedings of the National Academy of Sciences* 20894 <<https://doi.org/10.1073/pnas.1108772109>>; Wirsenius, Hedenus and Mohlin (n 166) 163.

as nutritional requirements can be satisfied with lower emissions intensity foods, the implication being that society will not be adversely affected from a health perspective. For example, if beans are substituted for beef, on a protein equivalent basis, emissions are reduced by over 99%.¹⁶⁸ Therefore, if a tax is pursued as a regulatory tool in the market for meat, it is likely preferable to implement it as a value-added goods and services tax ('GST') or excise tax on *consumption*.

In Australia, all meats for human consumption fall under a list of foods exempt from GST (with the exception of meat in prepared meals and savoury snack foods).¹⁶⁹ The rationale behind this concessionary tax treatment is often made on grounds of equity,¹⁷⁰ as most foods that are GST exempt in Australia are regarded as 'basic foods'.¹⁷¹ However, in considering that meat (including processed meats) falls under the same GST exemption as fruit and vegetables,¹⁷² the question arises as to whether this exemption has fuelled the suboptimal, emissions-intensive dietary patterns of Australians. A move to implement a tax on meat products in Australia must therefore, at a minimum, begin by removing meat from the list of foods exempt from GST, before potentially escalating up to an excise tax.

It is estimated that 80% of the emissions reduction effect of a meat tax can be realised through taxing beef and lamb alone.¹⁷³ Further, the demand for beef and lamb is significantly more price-sensitive than poultry, meaning that consumers are likely to substitute ruminant meats for white meats.¹⁷⁴ However, while shifting consumption away from ruminant-based meats towards white meats may initially yield substantial climate benefits, this should not be regarded as the end objective. Globally, poultry and pork are already the most commonly consumed types of meat,¹⁷⁵ and are associated with poor animal welfare¹⁷⁶ and a higher climate and overall ecological footprint than plant-based foods.¹⁷⁷ As such, a tax may eventually

168 Wirsenius, Hedenus and Mohlin (n 166) 163.

169 *A New Tax System (Goods and Services Tax) Act 1999* (Cth) s 38-2 sch 1 cl 1; 'GST-Free Food', *Australian Taxation Office* (Web Page, 15 December 2021) <<https://www.ato.gov.au/print-publications/gst-and-food/?page=4>>.

170 Paul Kenny, 'The GST Food Exemption' (2000) 3(6) *Journal of Australian Taxation* 424, 424.

171 'GST-Free Sales', *Australian Taxation Office* (Web Page, 7 July 2021) <[https://www.ato.gov.au/Business/GST/When-to-charge-GST-\(and-when-not-to\)/GST-free-sales](https://www.ato.gov.au/Business/GST/When-to-charge-GST-(and-when-not-to)/GST-free-sales)>.

172 Ibid. For a list of taxable foods, such as processed sweet foods and sugary drinks, see 'Taxable Foods', *Australian Taxation Office* (Web Page, 15 December 2021) <<https://www.ato.gov.au/print-publications/gst-and-food/?anchor=Taxablefood#Taxablefood>>.

173 Wirsenius, Hedenus and Mohlin (n 166) 181. See also Anders Nordgren, 'A Climate Tax on Meat?' in Thomas Potthast and Simon Meisch (eds), *Climate Change and Sustainable Development: Ethical Perspectives on Land Use and Food Production* (Wageningen Academic Publishers, 2012) 109, 112; Rosemary Green et al, 'The Potential to Reduce Greenhouse Gas Emissions in the UK through Healthy and Realistic Dietary Change' (2015) 129(1–2) *Climatic Change* 253, 259 <<https://doi.org/10.1007/s10584-015-1329-y>>; Helen Harwatt, 'Including Animal to Plant Protein Shifts in Climate Change Mitigation Policy: A Proposed Three-Step Strategy' (2019) 19(5) *Climate Policy* 533, 536 <<https://doi.org/10.1080/14693062.2018.1528965>>.

174 Craig A Gallet, 'A Meta-Analysis of the Price Elasticity of Meat: Evidence of Regional Differences' (2012) 2(2) *Business and Economic Research* 14, 15 <<https://doi.org/10.5296/ber.v2i2.2115>>.

175 Tom Rees, 'The Future of Meat' (Briefing, Euromonitor International, August 2019) 9.

176 See, eg, W Bessei, 'Impact of Animal Welfare on Worldwide Poultry Production' (2018) 74(2) *World's Poultry Science Journal* 211 <<https://doi.org/10.1017/S0043933918000028>>.

177 See, eg, Green et al (n 173) 259.

transition towards a non GHG-weighted excise tax, in order to facilitate an overall reduction in meat consumption, and thereby reducing emissions.¹⁷⁸

In light of the mounting weight of evidence surrounding the ramifications of meat consumption, a number of studies have evaluated the potential effect of a tax on meat. In 2016, the Oxford Martin Programme recommended a tax on meat and dairy after modelling the emissions mitigation potential of food related taxes.¹⁷⁹ Their study demonstrated that a 40% tax on beef would result in a 13% reduction in consumption, and that overall, optimally designed taxation arrangements could yield a reduction in emissions of 1 billion tonnes – equivalent to the global aviation industry.¹⁸⁰ Similarly, another study calculated that a tax on 7 meat and dairy products in Sweden could reduce emissions from the livestock sector by up to 12%.¹⁸¹ While meat taxes do not currently appear to exist in any jurisdiction, their imposition may be forthcoming, with a small number of key meat-consuming countries including Denmark and Germany recently considering their potential,¹⁸² as compared with Australia which, as noted, maintains a GST *exemption* for meat products.¹⁸³

178 Given that GHG emissions are the relevant externality to be addressed, an excise tax may be most effective if it is levied on the products with the highest emissions profiles. A meat tax might, at least initially, be differentiated by emissions intensity per food unit. For example, beef, with its higher GHG footprint, may be taxed at a higher rate than pork or poultry. This ‘worst first’, risk-based regulatory approach allows policymakers to incrementally assess and learn from the imposition of each tax, while allowing for enough time to build public acceptance: Harwatt (n 173).

179 Marco Springmann et al, ‘Mitigation Potential and Global Health Impacts from Emissions Pricing of Food Commodities’ (2017) 7(1) *Nature Climate Change* 69 <<https://doi.org/10.1038/nclimate3155>>.

180 Ibid 70, 72.

181 Sarah Säll and Ing-Marie Gren, ‘Effects of an Environmental Tax on Meat and Dairy Consumption in Sweden’ (2015) 55 *Food Policy* 41, 41 <<https://doi.org/10.1016/j.foodpol.2015.05.008>>.

182 In 2016, the Danish Council on Ethics, an advisory committee to the Danish Parliament, recommended a tax on red meat to mitigate its climate impacts: Danish Council on Ethics, *The Ethical Consumer* (Report, October 2016) 4. The Council highlighted the need to levy a point-of-sale tax on meat consumption, as opposed to production, as the latter may undermine domestic competitive advantage and shift production to overseas jurisdictions, resulting in ‘carbon leakage’: at 73. Farm Animal Investment Risk and Return, ‘The Livestock Levy: Are Regulators Considering Meat Taxes?’ (Policy White Paper, 11 December 2017) 22 (‘The Livestock Levy’). Reactions to the Council’s recommendation were mixed, and ultimately did not materialise in a policy change. However, public engagement and responses to the proposition reached an all-time high: at 23. Further, recent political discourse in Germany has centred upon increasing the value-added tax (GST) on meat from 7% (in line with all other food and agricultural products) to the standard 19% rate. In this regard, Germany’s concessionary tax position for meat may be regarded as analogous to Australia’s, notwithstanding the fact that meat is entirely GST-free in Australia: at 25.

183 Further research originating from Denmark critiques existing international emissions accounting mechanisms, which are underpinned by ‘territorially oriented policy frameworks’. Under the *United Nations Framework Convention on Climate Change*, reduction targets are measured against aggregate emissions produced within the borders of a single state. In this way, the consumption of internationally traded goods may not be directly targeted by these frameworks. For example, a reduction in the consumption of imported meat will not contribute towards a country’s GHG reduction goals, which may render policy instruments, such as a meat tax, unappealing to governments: Dario Caro et al, ‘Toward a More Consistent Combined Approach of Reduction Targets and Climate Policy Regulations: The Illustrative Case of a Meat Tax in Denmark’ (2017) 76 *Environmental Science and Policy* 78, 78–9 <<https://doi.org/10.1016/j.envsci.2017.06.013>>. This highlights the need to develop multilateral frameworks which facilitate emissions reductions in traded products. If a tax on meat is levied in one country, producers are likely to shift production efforts to exports, but not if there is global action targeted at reducing the consumption of emissions-intensive meat products: Centre for International Economics, *The Merits of a Consumption Approach to Agricultural Emissions: Compared with Emissions Trading* (Report, November 2009) 6.

Synergies exist between environmental and broader public health goals, and as such many public health researchers have endorsed the need for price signalling policy instruments targeting meat products. Governments around the world have increasingly used taxes to steer societal behaviour away from the consumption of harmful goods. Notable examples include taxes on tobacco,¹⁸⁴ sugar,¹⁸⁵ and

-
- 184 Excise taxes on tobacco represent one of the most successful Pigouvian tax schemes: see, eg, Frank J Chaloupka, Kurt Straif and Maria E Leon, 'Effectiveness of Tax and Price Policies in Tobacco Control' (2011) 20(3) *Tobacco Control* 235 <<https://doi.org/10.1136/tc.2010.039982>>. Originally, cigarette taxes were imposed as a means of generating revenue but are now commonly used by governments as part of a broader suite of anti-smoking policies: Farm Animal Investment Risk and Return, 'The Livestock Levy' (n 182) 8. Globally, smoking-related healthcare expenses and productivity losses amount to over USD1.436 trillion: Elizabeth Mendes, 'Diseases Linked to Smoking Cost the World \$422 Billion in Health-Related Expenses', *American Cancer Society* (Web Page, 31 January 2017) <<https://www.cancer.org/latest-news/diseases-linked-to-smoking-cost-the-world-422-billion-in-health-related-expenses.html>>. The World Health Organization's *Framework Convention on Tobacco Control* (the 'Convention') formalises international commitments towards lower tobacco demand. Article 6 of the *Convention* calls upon signatory states to adopt or maintain appropriate control techniques, which, among other measures, can include implementing tax-based policies: *WHO Framework Convention on Tobacco Control*, opened for signature 21 May 2003, 2302 UNTS 166 (entered into force 27 February 2005). Consequently, these taxes are now near ubiquitous – over 160 countries levy a tax on tobacco. While the rate at which cigarettes are taxed varies across low- and high-income countries, they fall between the range of 25–53% of the retail price. The evidence is unequivocal – globally, taxes on tobacco are strongly correlated to lower rates of cigarette usage. As an average, a 10% increase on a packet of cigarettes approximately yields a 4% decrease in demand, in addition to generating significant levels of government revenue: World Health Organization, 'WHO Technical Manual on Tobacco Tax Administration' (Technical Manual, 2011) 21, 28, 51–3. Indeed, tobacco taxes are often accompanied by a basket of complementary regulatory measures – including public health campaigns, restrictions in advertising, promotions and sponsorships, changes to labelling laws and smoke-free zones: see, eg, Nancy L Fleischer et al, 'Mexico *SimSmoke*: How Changes in Tobacco Control Policies Would Impact Smoking Prevalence and Smoking Attributable Deaths in Mexico' (2017) 12(7) *Global Public Health* 830 <<https://doi.org/10.1080/17441692.2015.1123749>>. Yet, even in the absence of widespread informational regulatory measures, taxes remain an effective strategy to deter consumption: Frank J Chaloupka, Ayda Yurekli and Geoffrey T Fong, 'Tobacco Taxes as a Tobacco Control Strategy' (2012) 21(2) *Tobacco Control* 172 <<https://doi.org/10.1136/tobaccocontrol-2011-050417>>. For example, despite a lack of strong complementary policy measures, taxes on tobacco implemented in Mexico between 1981–2007 halved consumption levels: 'Mexico', *The Tobacco Atlas* (Web Page, 2022) <<https://web.archive.org/web/20200708025345/https://tobaccoatlas.org/country/mexico/>>.
- 185 In light of the staggering global rates of obesity and diabetes, several jurisdictions have implemented a tax on sugar-sweetened beverages ('SSBs'). In Mexico, population obesity rates sit at over 70% and over 70% of added sugar consumption is attributable to SSBs: Sarah Boseley, 'Mexico's Sugar Tax Leads to Fall in Consumption for Second Year Running', *The Guardian* (online, 23 February 2017) <<https://www.theguardian.com/society/2017/feb/22/mexico-sugar-tax-lower-consumption-second-year-running>>. Interestingly, the consumption of Coca-Cola is deeply cultural in Mexico, with the average Mexican consuming 745 cups per year: 'Per Capita Consumption of Company Beverage Products', *The Coca-Cola Company* (Web Page, 2013) <<https://web.archive.org/web/20170321132603/https://www.coca-colacompany.com/cs/tccc-yir2012/pdf/2012-per-capita-consumption.pdf>>. In response to this public health crisis, the country enacted a sugar tax in 2014, which imposed a roughly 10% price increase on sugary beverages: María Eugenia Bonilla-Chacín et al, 'Learning from the Mexican Experience with Taxes on Sugar-Sweetened Beverages and Energy-Dense Foods of Low Nutritional Value: Poverty and Social Impact Analysis' (Discussion Paper, World Bank Group, June 2016) 6 <<https://doi.org/10.1596/24701>>. This resulted in a 5.5% and 9.7% decline in SSB sales its first and second years, with low socioeconomic groups experiencing the largest decline: M Arantxa Colchero et al, 'In Mexico, Evidence of Sustained Consumer Response Two Years after Implementing a Sugar-Sweetened Beverage Tax' (2017) 36(3) *Health Affairs* 564, 564 <<https://doi.org/10.1377/hlthaff.2016.1231>>. While it is still too early to assess the direct health-related benefits of the tax, a reduction in the consumption of SSBs is indisputably positive from a public-health perspective. In 2018, the United Kingdom followed a similar

unhealthy foods.¹⁸⁶ In their recent report, the investor network Farm Animal Investment Risk and Return note that while a tax on meat is ‘not a short-term risk for investors’, animal products are likely to follow the trajectory of tobacco, sugar and carbon taxes.¹⁸⁷ Indeed, taxes on these products were once perceived as being politically unrealistic, yet now enjoy relatively strong support.¹⁸⁸

The idea of a meat tax has not escaped its fair share of criticism. As economist Sowell remarks regarding policy formulation, ‘trade-offs freely accepted are essentially solutions’.¹⁸⁹ Common critiques of a meat tax include considerations of equity,¹⁹⁰ uncertainty regarding the efficacy of the tax¹⁹¹ and disapproval of government overreach.¹⁹² One frequently cited argument opposing a meat tax is that it may constitute a regressive tax – that is, one that does not discriminate based on wage levels and thus disproportionately penalises lower-income households.¹⁹³ A rise in the price of meat may encourage poorer households to purchase lower-quality sources of protein, which could undermine public health goals. This concern highlights the dangers of imposing a tax in isolation.¹⁹⁴ The potentially regressive nature of a meat tax may be addressed through tax credits,¹⁹⁵ or compensated through more progressive redistribution measures. In recognition of this critique, the EAT-Lancet Commission noted:

We believe that food prices should fully reflect the costs of food. ... As a result, food prices might increase. ... Social protection or safety nets could substantially

pathway and implemented a tax on sugary drinks. SSBs with sugar content levels exceeding a certain threshold are subject to a tax, and as a result, over half of the United Kingdom’s soft drink manufacturers have reformulated and reduced their products’ sugar levels. The Soft Drinks Industry Levy was introduced by section 31(1) of the *Finance Act 2017* (UK). The tax is expected to generate £240 million in revenue, which will be directed towards complementary programs designed to address obesity: HM Treasury, ‘Soft Drinks Industry Levy Comes into Effect’, *GOV.UK* (Web Page, 5 April 2018) <<https://www.gov.uk/government/news/soft-drinks-industry-levy-comes-into-effect>>.

186 See, eg, Evan Blecher, ‘Taxes on Tobacco, Alcohol and Sugar Sweetened Beverages: Linkages and Lessons Learned’ (2015) 136–7 *Social Science and Medicine* 175 <<https://doi.org/10.1016/j.socscimed.2015.05.022>>.

187 Farm Animal Investment Risk and Return, ‘The Livestock Levy’ (n 182) 5.

188 See, eg, Damian Carrington, ‘UK Health Professions Call for Climate Tax on Meat’, *The Guardian* (online, 4 November 2020) <<https://www.theguardian.com/environment/2020/nov/04/uk-health-professions-call-for-climate-tax-on-meat>>.

189 Thomas Sowell, *A Conflict of Visions: Ideological Origins of Political Struggles* (Basic Books, 2007) 107.

190 Poppy Noor, ‘Caroline Lucas Is Wrong: A Meat Tax Would Only Hurt the Poor’, *The Guardian* (online, 8 January 2019) <<https://www.theguardian.com/commentisfree/2019/jan/07/caroline-lucas-is-wrong-meat-tax-climate-crisis>>.

191 See, eg, Sylvain Charlebois, ‘Meat Is Not the “New Tobacco,” and Shouldn’t Be Taxed’, *The Conversation* (online, 9 January 2018) <<https://theconversation.com/meat-is-not-the-new-tobacco-and-shouldnt-be-taxed-89673>>.

192 ‘Should There Be a Tax on Red Meat?’, *BBC News* (online, 7 November 2018) <<https://www.bbc.com/news/uk-46122227>>.

193 Noor (n 190).

194 This highlights the need for smart regulation in this sphere, explored further on in this Part.

195 Simon (n 55) 173.

improve nutrition outcomes in low-income households, but these programmes should be explicitly nutrition-sensitive to be effective.¹⁹⁶

Moreover, it is relevant to note that the existing structure and economics of meat systems *already* place the poor at a disadvantage,¹⁹⁷ with lower income groups consistently suffering from poorer health outcomes often correlated with heavily processed, meat-based diets.¹⁹⁸ Subsidies of healthier, plant-based proteins, funded by meat tax revenues, would likely play an integral role in rectifying equity concerns. Lessons can be learned in this regard from Denmark's now-revoked saturated fat tax, which was unsuccessful partially due to the fact that much of its political support hinged upon fiscal, rather than health considerations.¹⁹⁹ Another argument against a meat tax is that it may not deliver the desired changes to consumption levels. For example, some critics have argued that producers will internalise the costs of a tax, thereby mitigating the effect on consumer demand.²⁰⁰ Yet this is improbable if the level of the tax is appropriately set, particularly given the harsh environmental conditions the industry is already beginning to face and the relevant costs to be borne as a result.²⁰¹

A tax on meat will inevitably be met with fierce opposition from industry and members of civil society. Critics of the proposition regard a meat tax as 'nanny-statism' and argue that governments should not interfere with the 'personal choice' of diets (which are often subject to fluxes in popularity).²⁰² Instead, the preference is to defer to industry self-regulation, or at best, informational regulation. However, when individual lifestyle choices impose tangible externalities and significant detriments on society – as with the case of tobacco, alcohol, drugs and unhealthy foods – proactive regulatory action is required to steer consumption behaviours away from collective harm.²⁰³ Moreover, research has demonstrated that a tax on meat is 'far less unpalatable' than governments perceive.²⁰⁴ As public concern

196 Walter Willett et al, 'Food in the Anthropocene: The EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems' (2019) 393(10170) *Lancet* 447, 479 <[https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)>.

197 See, eg, Sharon Friel, Mickey Chopra and David Satcher, 'Unequal Weight: Equity Oriented Policy Responses to the Global Obesity Epidemic' (2007) 335(7632) *British Medical Journal* 1241 <<https://doi.org/10.1136/bmj.39377.622882.47>>; Simon (n 55) 177.

198 See, eg, Angie Clonan, Katharine E Roberts and Michelle Holdsworth, 'Socioeconomic and Demographic Drivers of Red and Processed Meat Consumption: Implications for Health and Environmental Sustainability' (2016) 75(3) *Proceedings of the Nutrition Society* 367 <<https://doi.org/10.1017/S0029665116000100>>.

199 S Vallgård, L Holm and JD Jensen, 'The Danish Tax on Saturated Fat: Why It Did Not Survive' (2015) 69(2) *European Journal of Clinical Nutrition* 223 <<https://doi.org/10.1038/ejcn.2014.224>>; Damian Carrington, 'Tax Meat and Dairy to Cut Emissions and Save Lives, Study Urges', *The Guardian* (online, 8 November 2016) <<https://www.theguardian.com/environment/2016/nov/07/tax-meat-and-dairy-to-cut-emissions-and-save-lives-study-urges>>.

200 Simon (n 55) 179.

201 Harsh environmental conditions include droughts exacerbated by climate change.

202 See, eg, Owens (n 56).

203 See, eg, *WHO Framework Convention on Tobacco Control* (n 184).

204 Damian Carrington, 'Meat Tax Far Less Unpalatable than Government Thinks, Research Finds', *The Guardian* (online, 24 November 2015) <<https://www.theguardian.com/environment/2015/nov/24/meat-tax-far-less-unpalatable-than-government-thinks-research-finds>>.

surrounding climate change escalates, constituents may be more likely to accept more interventionist policy instruments surrounding meat consumption and its role in driving climate change.

Nonetheless, given the current political climate and the Australian Government's reluctance to impose a sugar tax, a meat tax is unlikely to be implemented in the near future.²⁰⁵ In the interim, along with the removal of meat from the list of products exempt from the GST, recourse should be made to less coercive forms of regulation to begin the necessary transition towards less emissions-intensive diets.

2 Meat Analogues

Alternative meat products represent an opportunity for governments to engage in *facilitative* forms of regulation by encouraging the expansion of less emissions-intensive market offerings. As concerns surrounding the negative repercussions of meat consumption grow, so too has the market for alternative sources of protein. The value of the global meat substitutes market is expected to increase from USD4.6 billion in 2018 to USD6.4 billion by 2023.²⁰⁶ However, the scale of this market remains relatively small in comparison to the USD90 billion global meat market.²⁰⁷ Nonetheless, the recent growth in alternative meats is indicative of the escalating search for more ecologically sound sources of protein. One recent model predicts that alternative meats will capture 60% of the market share of meat by 2040.²⁰⁸

Alongside traditional plant-based meat alternatives (such as tofu, seitan and jackfruit) and insect-based meats (which recent research demonstrates are unlikely to be accepted in Western societies),²⁰⁹ several novel vegan meat substitutes have emerged on the market. These meat substitutes claim to have comparable nutritional profiles to traditional beef,²¹⁰ however are estimated to use 46% less energy, produce 90% less GHG emissions and require 99.5% less water and land than conventional ground beef.²¹¹

205 Melissa Davey, 'Sugar Tax: Why Health Experts Want It but Politicians and Industry Are Resisting', *The Guardian* (online, 10 January 2018) <<https://www.theguardian.com/australia-news/2018/jan/10/sugar-tax-why-health-experts-want-it-but-politicians-and-industry-are-resisting>>.

206 'Meat Substitutes Market Worth 6.43 Billion USD by 2023', *Markets and Markets* (Web Page, 2018) <<https://web.archive.org/web/20180207152523/https://www.marketsandmarkets.com/PressReleases/meat-substitutes.asp>>.

207 'Burgers, Bugs and the Shift to a New Way of Eating', *World Economic Forum* (Web Page, 23 September 2019) <<https://www.weforum.org/agenda/2019/09/sustainable-food-alternative-proteins/>>.

208 Gerhardt et al (n 79) 17.

209 See, eg, P Marijn Poortvliet et al, 'Healthy, but Disgusting: An Investigation into Consumers' Willingness to Try Insect Meat' (2019) 112(3) *Journal of Economic Entomology* 1005 <<https://doi.org/10.1093/jee/toz043>>.

210 Note however the higher levels of sodium in meat substitutes: see, eg, Erica Sweeney, 'Are Beyond Meat and Impossible Burgers Better for You? Nutritionists Weigh In', *HuffPost* (online, 10 July 2019) <https://www.huffingtonpost.com.au/entry/beyond-meat-impossible-burger-healthy_1_5d164ad1e4b07f6ca57cc3ed>.

211 Martin C Heller and Gregory A Keoleian, *Beyond Meat's Beyond Burger Life Cycle Assessment: A Detailed Comparison between a Plant-Based and an Animal-Based Protein Source* (Report No CSS18-10, 14 September 2018) 27.

Start-ups such as Beyond Meat and Impossible Foods are two key players in this field.²¹² Both have attracted significant levels of investment – in 2019, finance for the two companies reached over USD404 million and USD806 million respectively – which has driven the commercialisation of their products and their entry into major retail outlets across the US, recently emerging in Australia.²¹³ As such, protein diversification has been identified as an important business growth strategy for food retailers.²¹⁴ The growing prevalence and demand for these products signifies an expanding niche market, and perhaps growing levels of consumer receptiveness, which will serve to reduce emissions over time. Further, vegan meat substitutes have piqued the interest of existing meat conglomerates. For example, Tyson Foods and Cargill, two of the world's largest meat producers, have made significant investments in Beyond Meat and Memphis Meats.²¹⁵ Moreover, Cargill has recently made a USD75 million investment in Beyond Meat's pea protein supplier.²¹⁶ These investments clearly indicate meat corporations' belief in the growth of the alternative meat sector and a desire to hedge their asset portfolios.²¹⁷

'Cultured meats' represent the most recent foray into technological efforts aimed at generating a 'cultivated meat revolution'.²¹⁸ Cell-cultured meat involves growing animal tissue and flesh in a laboratory, and has been marketed as an eco-friendly, antibiotic, hormone and slaughter-free alternative to conventional meat.²¹⁹ Unlike plant-based meat substitutes, these products aim to be molecularly identical to animal-based meats.²²⁰ Two Australian start-ups have recently entered the cultured-meat sector, joining existing firms in Europe, Israel and the US.²²¹

Nevertheless, despite its ostensible promise, the future of cultured meat appears at present uncertain. Significant technical, economic and regulatory barriers remain, and shifting society's perceptions of these products may prove challenging. Further, one analysis demonstrates that the current level of GHG

212 See, eg, 'Our Mission', *Beyond Meat* (Web Page, 2022) <<https://www.beyondmeat.com/about/>>; 'Impossible', *Impossible Foods* (Web Page, 2022) <<https://impossiblefoods.com/>>.

213 'Impossible Foods', *CB Insights* (Web Page, 2019) <<https://web.archive.org/web/20191018144518/https://www.cbinsights.com/company/impossible-foods>>. See also Kate Taylor, 'McDonald's Is Teaming Up with Beyond Meat to Serve a Plant-Based Burger at 28 Restaurants: Here's How to Get One', *Business Insider* (online, 26 September 2019) <<https://www.businessinsider.com.au/mcdonalds-beyond-meat-plant-based-plt-burger-where-to-buy-2019-9>>; 'The Beyond Burger Arrives in Australia!', *Beyond Meat* (Web Page, 3 December 2018) <<https://www.beyondmeat.com/whats-new/the-beyond-burger-arrives-in-australia/>>.

214 Farm Animal Investment Risk and Return, *Appetite for Disruption: How Leading Food Companies Are Responding to the Alternative Protein Boom* (Report, 2019) 6.

215 CB Insights, 'Tyson, Cargill, and Other Meat Incumbents Invest in a Meatless Future', *Research Briefs* (Web Page, 10 May 2018) <<https://www.cbinsights.com/research/tyson-cargill-meatless-future/>>.

216 Amelia Lucas, 'Beyond Meat's Pea Protein Supplier Receives Additional \$75 Million Investment from Cargill', *CNBC* (online, 28 August 2019) <<https://www.cnn.com/2019/08/28/beyond-meats-pea-protein-supplier-receives-additional-75-million-investment-from-cargill.html>>.

217 Oxford Martin School, 'Meat: The Future Series' (White Paper, World Economic Forum, January 2019) 5.

218 See, eg, Good Food Institute, *Growing Meat Sustainably: The Cultivated Meat Revolution* (Report, 2018) 1.

219 Gerhardt et al (n 79) 9.

220 Ibid.

221 Marty McCarthy, 'Lab-Grown Meat Industry Start-Ups Join Australian Market to Tackle Issue of Mass Production', *ABC News* (online, 1 August 2019) <<https://www.abc.net.au/news/rural/2019-07-30/australia-joins-lab-grown-meat-industry/11360506>>.

emissions generated by cultured meats are similar to conventional meat, due to the significant amount of energy required in production.²²² However, this may be overcome with advances towards renewable energy sources and through shifting the location of supply chain operations.²²³ Additionally, cultured meat is yet to be commercialised and remains relatively expensive to produce, although some estimates state the patties could retail for USD9.80 each in 2022 (the first patties were valued at USD330,000 each in 2013).²²⁴

A robust regulatory environment is crucial in accelerating the uptake of climate-friendlier alternative meats. It is clear that subsidies for further innovation, investment and marketing are needed to scale-up production and place downward pressure on prices. This may be realised through multi-level stakeholder engagement to encourage innovation, achieve economies of scale and promote consumer acceptance.²²⁵ Consumer acceptance of novel vegan substitutes must satisfy two dimensions – material (physical similarity to animal-based meats) and ideological (acceptance of the product as a legitimate substitute for animal flesh).²²⁶ While subsidisation of existing vegetable proteins would provide a more obvious solution, given Australian society's seemingly insatiable appetite for animal proteins, this may be an important stopgap in the transition away from emissions-intensive meat products.

Most plant-based substitutes contain ingredients that are already available on the market, and therefore do not require additional regulatory approval.²²⁷ On the other hand, the regulatory environment for cultured meats remains less clear, although it appears such products may fall under existing food safety laws.²²⁸ Clarity over which agencies should regulate these novel meats is critical. In 2019, it was announced that the US Food and Drug Administration would jointly regulate cultured meat with the US Department of Agriculture.²²⁹ Food Standards Australia New Zealand ('FSANZ') have stated that it will assess the safety of cultivated meats under its 'novel food' regulations, which involves manufacturers applying to have their products included in the schedule of approved novel foods for sale, however to date no such applications have been made.²³⁰

222 Oxford Martin School (n 217) 22.

223 Ibid.

224 Lana Bandoim, 'Making Meat Affordable: Progress since the \$330,000 Lab-Grown Burger', *Forbes* (online, 8 March 2022) <<https://www.forbes.com/sites/lanabandoim/2022/03/08/making-meat-affordable-progress-since-the-330000-lab-grown-burger/?sh=1dfbc2d84667>>.

225 Oxford Martin School (n 217) 22.

226 Alexandra Sexton, 'Alternative Proteins and the (Non)Stuff of "Meat"' (2016) 16(3) *Gastronomica* 66, 66 <<https://doi.org/10.1525/gfc.2016.16.3.66>>.

227 Oxford Martin School (n 217) 10–11, 21.

228 Ibid 21.

229 *Formal Agreement between the US Department of Health and Human Services Food and Drug Administration and US Department of Agriculture Office of Food Safety*, signed 7 March 2019.

230 'Cell Based Meat', *Food Standards Australia New Zealand* (Web Page, 2021) <<https://www.foodstandards.gov.au/consumer/generalissues/Pages/Cell-based-meat.aspx>>.

The labelling of alternative meats has also recently come under scrutiny. Unsurprisingly, resistance has arisen from the meat industry, which opposes the use of the term ‘meat’ for cultured meat products.²³¹ This argument is premised on the assumption that the use of like terms will ‘confuse’ consumers, which makes it easier for alternative protein companies to capture the existing market share of conventional meat.²³² In Australia, the definition of the term ‘meat’ varies widely amongst regulatory bodies. However, FSANZ’s definition of ‘meat’ states that the product must be derived from ‘the whole or part of the carcass’.²³³ It is likely that once alternative meats occupy a larger share of the market, these definitions will be subject to scrutiny and open for interpretation. A similar regulatory debate has arisen within the Australian dairy industry – the Cattle Council of Australia has fiercely opposed the use of the term ‘milk’ for non-dairy milk products.²³⁴ Definitional ‘openness’ is critical in fostering consumer acceptance of animal product substitutes, as restrictions surrounding the use of product terms hinders innovation and competition.²³⁵

Cultured meats have been projected to ‘disrupt’ current meat production and consumption practices by capturing the market share of conventionally reared livestock.²³⁶ While support for such industry innovations may make sense in a transitional phase away from meat consumption, it is important to recognise the development of cultured meat is underpinned by a perspective which assumes the issue of meat’s emissions-intensity lies with animals’ bodies, as opposed to the human *demand* for animals’ bodies. It sets increased consumption of animal products as a normative objective to shape regulatory responses (or at a minimum, concedes that current levels of consumption will persist).²³⁷ Bio-fabricated meat does not challenge the existing structural dynamics which have perpetuated the overconsumption of animal products, rather, they implicitly yield to a cultural paradigm which embraces and legitimises the mass commodification and consumption of animals.²³⁸ Consequently, consumers may lack the impetus to fundamentally rethink the sustainability impacts of their consumption choices, which may hinder the ‘climatarian’ behaviours necessary to effect transformative

231 See, eg, Marty McCarthy and Matt Brann, ‘Cattle Industry Looks to Defend “Meat” Label from Lab-Grown and Plant-Based Products’, *ABC News* (online, 7 May 2018) <<https://www.abc.net.au/news/rural/2018-05-07/australian-cattle-lobby-group-considers-calling-for-meat-change/9728928>>.

232 Oxford Martin School (n 217) 21.

233 *Australia New Zealand Food Standards Code 2016* (Cth) s 2.2.1-2(a). This instrument falls under the *Food Standards Australia New Zealand Act 1991* (Cth).

234 See, eg, McCarthy and Brann (n 231).

235 See, eg, Heather Bray and Rachel A Ankeny, ‘Crying Over Plant-Based Milk: Neither Science nor History Favours a Dairy Monopoly’, *The Conversation* (24 September 2019) <<https://theconversation.com/crying-over-plant-based-milk-neither-science-nor-history-favours-a-dairy-monopoly-123852>>.

236 Gerhardt et al (n 79) 15–17.

237 Hope Johnson, ‘From “Meat Culture” to “Cultured Meat”: Critically Evaluating the Contested Ontologies and Transformative Potential of Biofabricated Animal Material on Culture and Law’ (2019) 22(2) *Media/Culture Journal* <<https://doi.org/10.5204/mcj.1504>>.

238 The CEO of Memphis Meats, a cultured meat company, has stated the company retains ‘a deep respect for meat culture’: see Annie Lowrey, ‘What’s Different about the Impossible Burger?’, *The Atlantic* (online, 23 September 2019) <<https://www.theatlantic.com/ideas/archive/2019/09/vegan-food-goes-mainstream/598558/>>.

dietary shifts.²³⁹ Considering the urgency of the climate crisis, any effort to reduce emissions is preferable to no action, however, an overreliance on technological advances must be scrutinised.

Nevertheless, the alignment of cultured meat with the dominant structural paradigm of carnism may contribute to its success in reducing the environmental footprint of meat consumption. If the forces of carnism initially prove unyielding in shifting global diets, these products may serve as a viable initial pathway towards a more sustainable food choice. It should be stressed that alternative meats are merely one pathway towards lower emissions food systems and that less carbon-intensive, widely accessible, unprocessed, nutrient-rich, plant-based sources of protein *already exist* on the market, the consumption of which should be prioritised.²⁴⁰ Regulation and financial support to assist the uptake of these foods will be an important immediate step in the pathway towards less emissions-intensive diets. Indeed, it will be difficult for meat analogues to compete with a heavily subsidised livestock industry if their prices are not comparable.

B Informational Regulation

In recognition of the structural barriers facing the types of economic regulation outlined above, this Part will explore a further – and importantly in this space, potentially less politically fraught – regulatory approach to reduced meat consumption in the form of informational regulation. Coercive or facilitative interventions are unlikely to be implemented or accepted if the populace is not aware of the ramifications of excessive meat consumption. Research has demonstrated that policies which encourage reflection on behaviours (in connection with individual values) *increases* support of climate friendly policies.²⁴¹

Public information campaigns are perhaps the most recognisable form of informational regulation, however, they are merely one method of conveying essential knowledge to consumers.²⁴² While public information campaigns might represent a more explicit, intentional form of information provision and potentially lead to behavioural change, more implicit forms including behavioural nudging through ‘choice architecture’ and product labelling are further useful options in the informational regulation toolkit.²⁴³ Via these options, informational regulation can be used to facilitate the flow of knowledge between regulated entities and consumers, in order to rectify information imbalances or asymmetries.²⁴⁴ In contrast to command and control regulation, informational regulation does not constrain or prohibit consumer choice; rather, it seeks to provide a targeted audience with

239 See, eg, Jennifer L Wilkins, ‘Eating Right Here: Moving from Consumer to Food Citizen’ (2005) 22(3) *Agriculture and Human Values* 269 <<https://doi.org/10.1007/s10460-005-6042-4>>.

240 Harvard TH Chan School of Public Health, ‘Protein’ (n 155).

241 Gregg Sparkman, Shahzeen Z Attari and Elke U Weber, ‘Moderating Spillover: Focusing on Personal Sustainable Behavior Rarely Hinders and Can Boost Climate Policy Support’ (2021) 78 *Energy Research and Social Science* 102150:1–9 <<https://doi.org/10.1016/j.erss.2021.102150>>.

242 Cass R Sunstein, ‘Informational Regulation and Informational Standing: *Akins* and Beyond’ (1999) 147(3) *University of Pennsylvania Law Review* 613, 624 <<https://doi.org/10.2307/3312719>>.

243 Freiberg (n 68) 335–6.

244 Ibid 331.

relevant knowledge of a product's characteristics, thereby enhancing their ability to make informed purchasing decisions.²⁴⁵ This is particularly vital, given that organisations are likely to disclose only the favourable aspects of their products, which appeal to consumers and assist in revenue growth. The objective of informational regulation in the context of carnism would be to induce widespread behavioural change, and thereby assist in aligning the behaviour of the market with broader regulatory goals.²⁴⁶ This communication-based technique is premised upon a form of 'indirect social pressure', and leverages education, greater awareness and social norms to influence individual decision-making.²⁴⁷

Fundamental to this form of regulation is the notion of consumer empowerment, where the informed buyer votes with their wallet and thereby exerts considerable influence over which products and producers succeed on the market.²⁴⁸ While this phenomenon might translate into better 'market' outcomes, additional exogenous factors are often at play in influencing consumers' purchasing decisions, and which may therefore hamper the effectiveness of any associated regulatory measures.²⁴⁹

In the context of meat and its ecological implications, the impetus for informational regulation rests upon an asymmetry of relevant knowledge regarding its environmental ramifications, which results in suboptimal market outcomes or market failures.²⁵⁰ This may be due to a complete lack of information, or through the provision of incomplete information to consumers.²⁵¹ In the absence of precise, clear and transparent product information, consumers rely on imperfect measures when making purchasing decisions and will often defer to habits or heuristics.²⁵² Studies have demonstrated that many consumers are unaware of the ecological repercussions of meat consumption, or at best, underestimate or hold 'neutral' views towards the issue.²⁵³ Despite the significant potential of the widespread uptake of plant-based diets to achieve improved climate, land management, water use and biodiversity outcomes, consumers often lack an understanding of the links between meat consumption and environmental degradation.²⁵⁴ Even when

245 Bronwen Morgan and Karen Yeung, *An Introduction to Law and Regulation: Text and Materials* (Cambridge University Press, 2007) 96 <<https://doi.org/10.1017/CBO9780511801112>>.

246 Ibid.

247 Ibid.

248 Mike Radford, *Animal Welfare Law in Britain: Regulation and Responsibility* (Oxford University Press, 2001) 127.

249 Aaron C Timoshanko, 'Limitations of the Market-Based Approach to the Regulation of Farm Animal Welfare' (2015) 38(2) *University of New South Wales Law Journal* 514, 532.

250 Freiberg (n 68) 331.

251 Ibid.

252 See, eg, Benjamin Scheibehenne, Linda Miesler and Peter M Todd, 'Fast and Frugal Food Choices: Uncovering Individual Decision Heuristics' (2007) 49(3) *Appetite* 578, 578 <<https://doi.org/10.1016/j.appet.2007.03.224>>.

253 One Australian study found that 61% of Australian meat buyers held 'neutral' views towards meat and its environmental impacts: Lenka Malek, Wendy J Umberger and John Rolfe, 'Segmentation of Australian Meat Consumers on the Basis of Attitudes Regarding Farm Animal Welfare and the Environmental Impact of Meat Production' (2018) 58(3) *Animal Production Science* 424, 432 <<https://doi.org/10.1071/AN17058>>.

254 Jennie I Macdiarmid, Flora Douglas and Jonina Campbell, 'Eating Like There's No Tomorrow: Public Awareness of the Environmental Impact of Food and Reluctance to Eat Less Meat as Part of a Sustainable

consumers are conscious of the impact of meat consumption, they have been shown to perceive the issue of personal diets as inconsequential in the worldwide context of climate change, and tend to prioritise the importance of non-food related behaviours, such as shifting transportation habits.²⁵⁵ In spite of the unambiguous body of scientific literature demonstrating that shifting dietary patterns is a crucial pathway towards meeting targets under the *Paris Agreement*, scepticism regarding the environmental impacts of meat consumption also remains prevalent.²⁵⁶

As noted in Part II, virtually no direct government action has been taken in Australia to address the negative implications of meat consumption. Since 2013, the Australian Dietary Guidelines have highlighted the health risks of red and processed meats and placed specific limits on their intake.²⁵⁷ Yet, public awareness of these guidelines remains low. This is evidenced by studies demonstrating that less than 4% of Australian adults meet their daily recommended vegetable intake.²⁵⁸ In the absence of systemic education or knowledge transfer surrounding the ramifications of meat consumption, it is unlikely that consumers will shift their dietary patterns towards plant-based options.

In response to this lack of information, certain civil society groups have sought to educate the public through ‘name and shame’ tactics.²⁵⁹ Yet, the recent proliferation of ‘ag-gag’ laws, or anti-whistleblower laws which seek to criminalise undercover expositions of farming practices signify an alarming trend of censorship in relation to animal agriculture.²⁶⁰ Although these activist exposés are made with animal welfare considerations in mind, the legislative measures taken to protect the industry are indicative of a broader issue – the severe lack of transparency surrounding the procurement of meat and its wider ramifications. Such regulatory interventions perpetuate the industry’s harmful practices by undermining any form of effective oversight or accountability,²⁶¹ and further emphasise the need to educate consumers effectively. The Australian Meat Processor Corporation has itself categorised the trend of ‘increased consumer awareness’ as an industry specific risk,²⁶² which demonstrates the importance of efforts to inform buyers, and the potential for informational regulation to influence the demand for meat.

Diet’ (2016) 96 *Appetite* 487, 489–91 <<https://doi.org/10.1016/j.appet.2015.10.011>>.

255 Ibid 491.

256 Ibid 490.

257 National Health and Medical Research Council, ‘Eat for Health: Australian Dietary Guidelines’ (Guidelines, Department of Health and Ageing, 2013) 49.

258 Australian Bureau of Statistics, ‘Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011–12’ (Catalogue No 4364.0.55.012, 11 May 2016) <<https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.012main+features12011-12>>.

259 See, eg, ‘Vegan Protesters Charged after Melbourne’s CBD Brought to a Standstill during Peak Hour’, *ABC News* (online, 8 April 2019) <<https://www.abc.net.au/news/2019-04-08/melbourne-vegan-protest-blocks-trams-traffic-causes-chaos/10980056>>.

260 See, eg, *Criminal Code Amendment (Agricultural Protection) Act 2019* (Cth).

261 See, eg, Will Potter, ‘Ag-Gag Laws: Corporate Attempts to Keep Consumers in the Dark’ (2017) 5(1) *Griffith Journal of Law and Human Dignity* 1.

262 Australian Meat Processor Corporation, *Strategic Risks Facing the Australian Red Meat Industry* (Report, August 2016) 40.

In contrast to such civil society led public information campaigns, behavioural change might also be implicitly executed by framing the contexts in which consumption choices are made. For example, the concept of ‘choice architecture’ refers to the deliberate alteration of the design and context in which consumers make decisions, and has increasingly been utilised by regulators of food environments as a relatively inexpensive technique to ‘nudge’ consumption choices in a desired direction.²⁶³ Choice architecture as a regulatory tool draws upon behavioural economics and is shaped by an understanding that consumers do not make purchasing decisions in a vacuum.²⁶⁴ The objective is to construct a physical environment which ‘softly’ nudges consumers towards certain choices, without constraining choice or altering prices.²⁶⁵ This technique contrasts with informational campaigns, in that consumers are not necessarily cognisant of the fact that their decisions are being influenced by the ‘choice architect’ acting as a regulator of behaviour.²⁶⁶

Nudges are typically employed in contexts which involve low effort decision-making, where the characteristics of the choice environment may potentially impinge upon consumer behaviours.²⁶⁷ Food retail environments undoubtedly fit this archetype – the visibility, salience of food choices and packaging design have been shown to influence the choices consumers make. Governments may implement nudges in public institutions or provide incentives to firms who do so. For example, one study conducted at a Swedish university has analysed the effectiveness of ‘nudging’ consumers towards reducing their meat consumption.²⁶⁸ Vegetarian options were made more visible through reordering menus and the preferential positioning of vegetarian meals.²⁶⁹ The proportion of vegetarian lunches sold increased by 6%.²⁷⁰ After original configurations were reinstated at these restaurants, the share of vegetarian lunches sold remained at 4% above baseline levels.²⁷¹ Although these figures are small, they demonstrate the potential for inexpensive and minimal interventions to decrease meat consumption. Nonetheless, given the scope and urgency of the issue, it is necessary to provide consumers with more direct, explicit information about their consumption choices.

Food labelling is a prominent form of informational disclosure which requires characteristics such as ingredients, allergies and intolerances, nutritional claims,

263 See, eg, Richard H Thaler, Cass R Sunstein and John P Balz, ‘Choice Architecture’ in Eldar Shafir (ed), *The Behavioral Foundations of Public Policy* (Princeton University Press, 2013) 428, 428 <<https://doi.org/10.2307/j.ctv550cbm.31>>.

264 Ibid.

265 Verena Kurz, ‘Nudging to Reduce Meat Consumption: Immediate and Persistent Effects of an Intervention at a University Restaurant’ (2018) 90 *Journal of Environmental Economics and Management* 317, 318 <<https://doi.org/10.1016/j.jeem.2018.06.005>>. It is important, however, to note the demographic of this study – university students – may be more receptive to dietary changes for a wide range of reasons.

266 Freiberg (n 68) 351.

267 Kurz (n 265) 318.

268 Ibid.

269 Ibid.

270 Ibid 319.

271 Ibid.

and the country of origin to be displayed on a product's packaging.²⁷² Food labelling requirements have progressively shifted away from mere marketing and sales concerns to include broader public health and environmental considerations.²⁷³ Parker and de Costa have described the product label as 'an important space for democratic engagement' due to its potential to allow consumers to alter the networks of public and private actors which dominate the processes of food production.²⁷⁴

Eco-labelling for food has been proposed as a potential informational regulatory strategy, whereby a food's ecological characteristics are attached to the product.²⁷⁵ An existing (although relatively weak) example of this is the organic label.²⁷⁶ Further labels more applicable to meat products may include a carbon label, or more broadly, a grade or diagram based on holistic analysis of the product's water, emissions, pesticide use and biodiversity impact, such as the following presented by Poore from the University of Oxford:

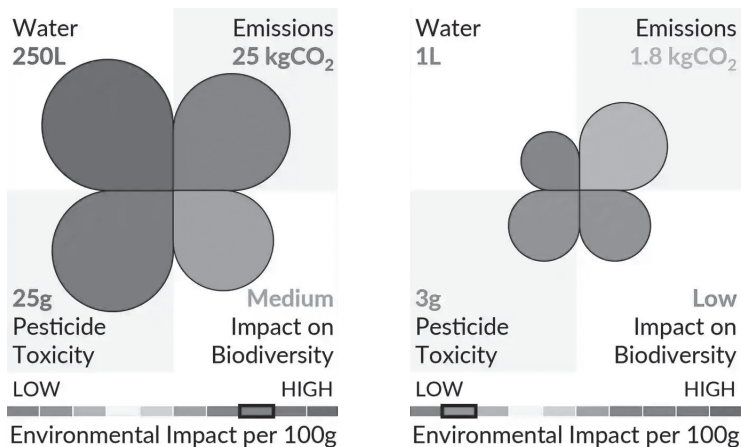


Figure 1: Examples of radar chart labels showing environmental impacts.²⁷⁷

On average, meat products are far more emissions and resource intensive than their plant-based counterparts, and would therefore receive a less favourable label, allowing consumers to determine the impacts which are acceptable to them as

272 'Labelling', *Food Standards Australia New Zealand* (Web Page, 7 September 2020) <<http://www.foodstandards.gov.au/industry/labelling/Pages/default.aspx>>.

273 Jason J Czarnezki, 'The Future of Food Eco-Labeling: Organic, Carbon Footprint, and Environmental Life-Cycle Analysis' (2011) 30(1) *Stanford Environmental Law Journal* 3, 13.

274 Christine Parker and Josephine de Costa, 'Misleading the Ethical Consumer: The Regulation of Free-Range Egg Labelling' (2016) 39(3) *Melbourne University Law Review* 895, 912.

275 Carsten Daugbjerg et al, 'Improving Eco-Labeling as an Environmental Policy Instrument: Knowledge, Trust and Organic Consumption' (2014) 16(4) *Journal of Environmental Policy and Planning* 559, 559 <<https://doi.org/10.1080/1523908X.2013.879038>>.

276 Parker and de Costa (n 274) 941.

277 See, eg, Joseph Poore, 'We Label Fridges to Show Their Environmental Impact: Why Not Food?', *The Guardian* (online, 11 October 2018) <<https://www.theguardian.com/environment/2018/oct/10/we-label-fridges-to-show-their-environmental-impact-why-not-food>>.

consumers. The objective is to inform the consumer about the ecological impact of the manufacture of meat, in order to incentivise eco-friendlier purchasing behaviours.²⁷⁸ Indeed, recent research has demonstrated that consumers significantly underestimate the emissions-intensity of their food choices and will shift their purchases away from emissions-intensive foods when presented with a clear, well-designed and prominent carbon label.²⁷⁹

It is important to recognise that the potential of eco-labels in motivating large-scale behavioural change is premised upon the significant assumption that a critical mass of consumers might wish to purchase eco-friendlier alternatives.²⁸⁰ Several studies have demonstrated that while many consumers are willing to pay for environmentally-friendly food products, the market share of these products remains low.²⁸¹ This phenomenon has partly been attributed to the ‘value-action’ gap, which refers to the discrepancy between environmental concerns and public engagement.²⁸² Communication-based regulation, such as labels, aims to bridge the gap by making pro-environmental behaviours more accessible to the general public, yet is far from anything resembling a holistic solution to emissions from the meat industry.

A 2011 study in Australia employed a ‘traffic light’ system to communicate the emissions intensity of 37 products.²⁸³ It found relatively modest shifts in consumers’ purchasing behaviour – black-labelled (above average emissions) products experienced a 6% decrease in sales, while purchases of green-labelled (below average emissions) foods increased by 4%.²⁸⁴ However, when green-labelled products were also the most inexpensive option, consumers responded with a 20% preference shift from black to green-label sales.²⁸⁵ This supports the notion that informational regulation, implemented in tandem with price-based mechanisms, is likely to drive the most behavioural change. The challenge for policymakers then is how to best design eco-labels in order to maximise the prospect of behavioural shifts and combine them with other regulatory mechanisms (such as taxes and subsidies) to simultaneously influence financial considerations. The debate over nutrition labelling is a prominent example of the contested nature of food label designs. As Sunstein has remarked:

278 Mario F Teisl, Brian Roe and Robert L Hicks, ‘Can Eco-Labels Tune a Market? Evidence from Dolphin-Safe Labeling’ (2002) 43(3) *Journal of Environmental Economics and Management* 339, 340 <<https://doi.org/10.1006/jeem.2000.1186>>.

279 See, eg, Adrian R Camilleri et al, ‘Consumers Underestimate the Emissions Associated with Food but Are Aided by Labels’ (2019) 9(1) *Nature Climate Change* 53, 57 <<https://doi.org/10.1038/s41558-018-0354-z>>.

280 Teisl, Roe and Hicks (n 278).

281 See, eg, Sandra Rousseau and Liesbet Vranken, ‘Green Market Expansion by Reducing Information Asymmetries: Evidence for Labeled Organic Food Products’ (2013) 40 *Food Policy* 31, 31 <<https://doi.org/10.1016/j.foodpol.2013.01.006>>.

282 See, eg, Pohjolainen (n 54) 38.

283 Jerome K Vanclay et al, ‘Customer Response to Carbon Labelling of Groceries’ (2011) 34(1) *Journal of Consumer Policy* 153, 155 <<https://doi.org/10.1007/s10603-010-9140-7>>.

284 Ibid 156.

285 Ibid.

[D]isclosure as such may not be enough; it is important to consider *how, not only whether, disclosure occurs*. Clarity and simplicity are often critical. ... Disclosure requirements should be designed for *homo sapiens*, not *homo economicus* ...²⁸⁶

Research has shown that a graded eco-label, accounting for the diversity of environmental impacts and featuring standardised colours, may be effective in allowing consumers to differentiate between green and dirty food products.²⁸⁷ Nonetheless, further inquiry into this area is needed as the benefits of labelling grow in prominence. There are inherent complications and decisions which must be made by the regulator – including the size of the label, its placement on the package as to appear prominent to customers and the inapplicability of labels to meat products that are not pre-packaged.

Another important consideration is the extent to which any disclosure requirements regarding meat product emissions are voluntary or mandatory, as the former are unlikely to effect adequate levels of behavioural change, from both a producer and consumer perspective. For example, existing eco-labels such as Roundtable on Sustainable Palm Oil, which seeks to draw attention to the devastating effects of the commercialisation of palm oil, have effected limited change in consumers' purchasing behaviour.²⁸⁸ Their voluntary nature means that low-impact producers will choose to label their products, while those with high environmental footprints will likely omit a label altogether.

Parker and de Costa have also noted that the product label is a 'highly contested "governance space" in which a network of government, industry and civil society actors all vie for influence over what can be put on the label'.²⁸⁹ Indeed, voluntary labelling standards in the free-range egg industry have proven to be significantly contentious due to disputes over definitions and potential behaviour amounting to misleading and deceptive conduct.²⁹⁰ Decades of controversy surrounding production conditions have resulted in a new national standard for free-range eggs.²⁹¹

Mandatory informational requirements may be conceptualised as an amalgamation of market-based regulation and traditional command and control regulation.²⁹² This means mandatory labelling is less politically contentious than its more coercive alternatives (such as a tax), while still sending signals to the market regarding the climate impacts of meat products. Moreover, legislative measures which mandate company disclosure not only encourage producers to re-evaluate

286 Cass R Sunstein, 'Empirically Informed Regulation' (2011) 78(4) *University of Chicago Law Review* 1349, 1369 (emphasis in original). *Homo economicus* refers to the rational agent in the study of economics.

287 Pieter Vlaeminck, Ting Jiang and Liesbet Vranken, 'Food Labeling and Eco-Friendly Consumption: Experimental Evidence from a Belgian Supermarket' (2014) 108 *Ecological Economics* 180, 187 <<https://doi.org/10.1016/j.ecolecon.2014.10.019>>.

288 See, eg, Poore (n 277).

289 Parker and de Costa (n 274) 912.

290 Ibid 910–12.

291 Victor Dominello, 'Agreement Reached on Free Range Egg Labelling Standards' (Media Release, 31 March 2016).

292 Karen Yeung, 'Government by Publicity Management: Sunlight or Spin?' [2005] (Summer) *Public Law* 360, 367.

their production processes, but also provide a standardised method of measuring ecological impacts across both high and low impact producers.²⁹³

Informational regulation appears to be the most politically feasible, and potentially promising short-term pathway towards less emissions-intensive diets. However, it is far from a panacea for the issue of excessive meat consumption. Most importantly, because of the method by which informational regulation attempts to address an issue – that is, by co-opting and influencing consumer behaviours within the marketplace – it is subject to the (often fickle) preferences and characteristics of the individual consumer. These consumers may or may not be conscious of the current state of the climate crisis, which serves as the basis upon which the provision of information is intended to alter consumption behaviours. Indeed, information provision does not exist in isolation; knowledge is situated within and processed by consumers in a social context.²⁹⁴ Consumers' decisions to purchase meat extends beyond health and ecological concerns. Meat consumption is linked to considerations of taste, habit, price, tradition, and status.²⁹⁵

Studies have found that there exists a form of 'moral disengagement' amongst consumers regarding meat consumption, where many remain unwilling to change their food-related habits, despite recognising a personal duty concerning environmental, health and animal welfare outcomes.²⁹⁶ This dissonance has been attributed to three overarching consumer behaviours. The first involves a reconceptualisation of the harmful conduct ('Yes, but ...'), where consumers accept the negative repercussions of meat, but are inclined to relativise, justify and legitimise current consumption practices.²⁹⁷ The second behaviour involves a renouncement of personal responsibility ('It's not up to me'), which often involves pushing the onus to act on business or government.²⁹⁸ The final set of disengagement behaviours are characterised by a blatant disregard of the evidence ('It's not that bad'), whereby consumers downplay the severity of the emissions caused by meat.²⁹⁹ The tendency for consumers to disengage with the evidence is likely a symptom of the deeply embedded social and cultural role meat consumption plays in global diets. The fact that mere discourse triggers defensiveness and cognitive dissonance highlights some of the potential limitations of informational regulation.

Shifting the consumption behaviours embedded within carnism will not be a straightforward task for regulators, however, given the mounting regulatory discourse outlined in both this Part and Part II, it is likely to be one which requires significant attention in the near future. The deep-rooted cultural status of meat products will inevitably serve as a major barrier towards lower meat consumption, yet this does not mean societal dietary patterns will be entirely unresponsive to

293 Poore (n 277).

294 Freiberg (n 68) 336.

295 Timoshanko (n 249) 522–39.

296 João Graça, Maria Manuela Calheiros and Abílio Oliveira, 'Moral Disengagement in Harmful but Cherished Food Practices? An Exploration into the Case of Meat' (2014) 27(5) *Journal of Agricultural and Environmental Ethics* 749, 749 <<https://doi.org/10.1007/s10806-014-9488-9>>.

297 Ibid 755.

298 Ibid.

299 Ibid.

change. Indeed, this Part has explored several contexts in which regulators have successfully altered consumption behaviours in order to achieve broader public policy objectives (such as tobacco and sugar consumption), and which might be fruitfully applied to the context of meat consumption.

Undeniably, informational regulation *alone* is unlikely to make a meaningful contribution to meat emission reduction (and thereby climate mitigation targets).³⁰⁰ Left to the devices of voluntary consumer behavioural changes, it remains unclear whether voluntary individual reductions in meat consumption will reach adequately sustainable levels.³⁰¹ Government intervention in this area would be attempting to remedy a market failure much broader than the individual consumer; the issue is a quintessential ‘tragedy of the commons’, where discrepancies exist between individually and collectively rational behaviours.³⁰²

Nonetheless, informational regulation in the form of labelling may build the *foundation* for stronger forms of regulatory action. As noted in Part II, smart regulation harnesses a *range* of flexible regulatory measures, as multiple forms are required to tackle the multifaceted issue of carnism. A staggered approach is likely to be the most effective in shifting meat consumption behaviours. Information and education are the crucial first steps towards a structural shift in dietary patterns, particularly given the limited state of current regulatory action. The provision of information aims to rectify cognitive dissonance around meat consumption and its environmental impacts and equips the marketplace with the knowledge necessary to make climate-friendly consumption decisions. It steers behaviour at the point of purchase, in a way which is light-handed enough as to avoid any potential significant political backlash. Once public awareness is raised, society may be much more likely to receive and respond to more efficacious regulatory instruments, including removing meat from the list of GST-exempt foods and subsequently imposing an excise tax, in addition to government subsidies for alternative meats.

IV CONCLUSION

*Meat has long stood for the freedom to exploit freely.*³⁰³

The link between carnism and the global climate crisis is demonstrably clear. Scientific research has consistently established the powerful climate-warming effects of livestock production. As such, the issue of excessive meat consumption is gradually progressing to the forefront of environmental policy concern as a

300 See, eg, Stephen D Sugarman, ‘Salt, High Blood Pressure, and Performance-Based Regulation’ (2009) 3(1) *Regulation and Governance* 84, 99 <<https://doi.org/10.1111/j.1748-5991.2009.01048.x>>.

301 See, eg, Anders Nordgren, ‘Ethical Issues in Mitigation of Climate Change: The Option of Reduced Meat Production and Consumption’ (2012) 25(4) *Journal of Agricultural and Environmental Ethics* 563, 578 <<https://doi.org/10.1007/s10806-011-9335-1>>.

302 Garrett Hardin, ‘The Tragedy of the Commons’ (1968) 162(3859) *Science* 1243 <<https://doi.org/10.1126/science.162.3859.1243>>.

303 Nick Fiddes, *Meat: A Natural Symbol* (Routledge, 1991) 64.

potential climate mitigation pathway in industrialised nations. Supply and demand type regulation, as a means of steering economic and social behaviours, consists of a range of tools through which governments can encourage a widespread, structural dietary shift towards a lower emissions-intensive food system. It is imperative that the appropriate strategies are implemented in the context of meat production and consumption in light of the escalating threats posed by climate change.

The 2°C warming goal pursuant to the *Paris Agreement* requires every economic sector to contribute towards emissions mitigation efforts – this includes the complex and dynamic meat industry. As food systems have become industrialised, the production of meat has undergone radical change, driven by population growth and rising demand for animal-based foods. As demonstrated in Part I of this article, current governmental efforts are fraught with uncertainty and exhibit a lack of commitment towards reducing emissions in a sector which accounts for a significant portion of Australia's emissions profile. Existing schemes, such as the ERF, are characterised by voluntary participation and have not delivered a sufficient reduction in emissions.

As such, regulatory efforts have largely been left to the private sphere. MLA's pledge to become carbon neutral by 2030, while an important step, relies heavily on the widespread dissemination of novel technologies, many of which, as noted above, appear not to have yet been invented. In this way, CN30 is likely to fail to deliver on its promises, particularly in the absence of government oversight. Given the political infeasibility of direct legislative intervention in the production of meat, meta-regulation provides a potential pathway to holding the industry to account on its promises, while allowing for flexibility in the attainment of these targets. Indeed, the principles of smart regulation advocate beginning the regulatory task with less interventionist strategies, before gradually escalating up to more coercive forms of regulation, such as a carbon tax or mandatory emissions trading. There are however fundamental limitations to the regulation of livestock emissions; every supply-side mitigation pathway faces significant ecological trade-offs. There is *finite* capacity for technological improvements and increases in productivity, and any gains from these methods will be outweighed by soaring demand levels.

Given the limitations of supply-side regulatory efforts, the regulation of meat consumption provides a more effective and sustainable route towards meeting the *Paris Agreement* targets. Drawing on lessons from smart regulation, implementing taxes and subsidies are merely two measures in the regulator's toolkit, which must be supplemented, or preceded by, mutually reinforcing informational regulation. Indeed, economic regulation is unlikely to be accepted by the general public without sufficient awareness raising. Informational regulation serves as the most appropriate starting point for shifting the tide towards greater consumer awareness of the negative repercussions of meat consumption and provides a base for more 'interventionist' regulatory actions in the future should they be necessary, as they likely will be, in view of the growing scientific evidence of the climate impact of carnism. Strategies such as eco-labelling empower civil society in their role as consumers to make more informed purchasing decisions, in order to encourage conscious, 'climatarian' food behaviours.

Given that regulation targeting the climate impacts of meat production and consumption in Australia has not yet been formally considered, this article represents an initial foray into a politically fraught area, yet one which is essential for regulators and societies to consider in the context of the current climate crisis. Indeed, the regulatory strategies considered in this article fall squarely under Australia's commitments to lower carbon emissions pursuant to the *Paris Agreement*. Further research should begin to focus on the most effective methods relating to the informational and economic regulatory options analysed above, such as the precise development of each instrument and the construction of any necessary legislation. Further comparative studies into other jurisdictions, such as the developments seen in New Zealand and their impact on emissions reduction efforts, will be useful in shaping reform in Australia.

An issue as multifaceted as the climate ramifications of carnism resists a narrow regulatory approach. Smart regulation recommends leveraging upon a suite of regulatory measures and actors, beginning with informational regulation and gradually escalating up to more coercive, direct measures, such as a tax on meat. Ultimately, whichever tools are selected, the regulation of meat production and consumption in Australia should be aimed at challenging the dominant societal paradigm of carnism, so as to mitigate the environmental damage caused by this deeply entrenched cultural, yet ultimately malleable, practice.