

Tom MacMillan & Rachael Durrant

Livestock consumption and climate change

A framework for dialogue

September 2009



Summary

The UK's appetite for livestock products accounts for around 8% of our total greenhouse gas (GHG) emissions. Efforts to reduce these emissions, such as campaigns for consumers to eat less meat, have alienated livestock producers, who are concerned that they are being unfairly targeted, and who have pointed to potential unintended consequences. It is in the public interest to address such concerns and involve producers in shaping this important policy agenda.

This report sets out a framework to help producers, policy-makers and environmental groups to discuss and address the contribution of livestock products to climate change. The framework was developed by means of desk research, interviews with producer organisations, and a stakeholder roundtable.

The framework highlights the fact that livestock production affects not only climate change, but also other environmental issues, animal welfare and the lives of producers and consumers. Changing livestock consumption to tackle climate change may have knock-on effects for any of these wider sustainable development issues. Scrutinising those effects systematically can help move stakeholders out of deadlock and into negotiation over the steps policy-makers can take to move forward. The report ends with recommendations for promoting further dialogue, pursuing research priorities, comparing different policy interventions and pushing ahead with 'no regret' policies.

"This is a debate that is urgently needed! We need to understand much better the environmental balance sheet as far as livestock farming is concerned. The framework in this report provides a strong base for moving forward" – *Sir Don Curry, adviser on food and farming to the Secretary of State for Environment, Food and Rural Affairs*

"This is a good paper. It successfully makes the case for all stakeholders to engage in shaping policy to cut consumption-related greenhouse gas emissions" – *Nicholas Saphir, Chair, Organic Milk Suppliers Cooperative (Omsco)*

"This report is a useful contribution to the important and complex debate about the relationship between the meat and livestock industry and climate change" – *Stephen Rossides, Head of Economic and Policy Analysis Group, AHDB Meat Services*

Contents

Foreword.....	4
1. Introduction.....	5
2. Why consumption?.....	6
3. Why livestock?	7
4. Is technical abatement enough?.....	10
5. A framework.....	14
6. Using the framework.....	22
7. Recommendations.....	24

Foreword

The consumption of food is responsible for around a fifth of the UK's greenhouse gas emissions, and for a range of other environmental impacts, from water availability and quality to changes in biodiversity. However, recent calls for people to eat more 'sustainably' – most notably by reducing their consumption of meat and dairy products – have put policy-makers and industry representatives in a difficult position. They often see such calls as misguided, anti-competitive and contrary to the public will. They also (rightly) point out the benefits and trade-offs associated with changes in consumption behaviour, particularly in relation to nutrition, social norms, aesthetics and economics. As a result, the complex but crucial challenge of reducing the negative impacts of, say, meat and dairy consumption has been hampered by a state of deadlock.

As part of our One Planet Food initiative, WWF-UK is working to help guide and support the development of a food system that can fulfil the UK's nutritional, social and economic needs, while reducing key environmental impacts. As part of this work, WWF-UK commissioned the Food Ethics Council to examine the policy options for sustainable food consumption, and to propose a route out of deadlock. This report is the result.

As part of the research for this report, the FEC invited 25 delegates from industry and government to consider how they might help reduce the environmental impacts of food consumption in the UK. The delegates were asked to consider four broad strategies: changing the types of products we eat (red meat vs. white meat vs. fish, etc.); changing *when* we eat them (such as when they are in season); changing the *quantities* we eat ('less but better'); and reducing their carbon intensity. By highlighting the potential unintended consequences of those strategies, the delegates were shown how they might move forward with policies to improve the environmental footprint of the UK's meat and dairy consumption. The tone was also set for further conversations, perhaps as part of the One Planet Food system change process.

To discuss the implications of this report, or any other aspect of the One Planet Food programme, please contact Mark Driscoll, who leads our One Planet Food initiative, at mdriscoll@wwf.org.uk.

Anthony Kleanthous

Senior Policy Adviser, Sustainable Business and Economics
WWF-UK

1. Introduction

This report provides a framework to help producers, policy-makers and environmental groups break out of a stalemate over the role that changing meat and dairy consumption should play in mitigating climate change. It is in the public interest to engage producers in a dialogue with government over this controversial issue because it will result in better policy. It is in the interests of producers too, because they would otherwise be left on the margins of this increasingly prominent agenda.

This report takes a series of steps to identify basic assumptions that are shared by government, producers and environmental groups, and then to work out mutually agreed conditions under which policy can move forward. The report:

- Explains the consensus that, in general, it is appropriate for the UK government to seek to reduce greenhouse gas (GHG) emissions relating to what we consume, as well as seeking to meet our legally binding targets to reduce emissions from production.
- Describes how emissions relating to livestock production and consumption have become a focus for attention and controversy.
- Outlines the full range of ways in which emissions relating to the consumption of livestock products could be reduced, including technical abatement to reduce the GHG-intensity of products and changes in consumption behaviour.
- Highlights important efforts already under way to reduce the GHG-intensity of livestock products, and explains the relevance of the more controversial question of changing consumption behaviour.
- Identifies a wide array of measures by which government might change consumption behaviour, from ways to influence public preferences to fiscal measures that would change the relative prices of different food products. Many of the interventions would affect all foods to varying degrees, rather than being specific to livestock products.
- Considers the obstacles to rationally implementing each measure. These include knowledge gaps; the risk of 'offshoring' economic activity to other countries, along with its associated emissions; and potential unintended consequences for the environment, animals, producers and consumers.
- Specifies generic ways of addressing each type of obstacle. For example, knowledge gaps can be addressed by undertaking further research.
- Offers a framework for multi-stakeholder dialogue based on these steps, and recommendations to government.

This report focuses specifically on climate change and GHG emissions. We do not consider these to be the only policy, sustainability or ethical issues relating to livestock production and consumption. Others include environmental concerns relating to water use, pollution and biodiversity loss; social issues, such as working conditions, producer livelihoods, consumer health, freedom of choice and global equity; and questions relating to the animals themselves, such as their physical welfare, behavioural freedom and intrinsic worth. The Food Ethics Council has considered many of these issues in previous publications.¹ We focus here on climate change because it is a major area of controversy that we want to help resolve. Our approach in this report is to consider systematically how measures to reduce GHG emissions from livestock could affect this array of wider concerns.

¹ Food Ethics Council (2000) Farming animals for food: towards a moral menu. FEC, Southwell. Food Ethics Council (2007) Meat: facing the dilemmas. Food Ethics 2(4).

2. Why consumption?

The UK Climate Change Act, which came into force in 2008, puts in place a legally binding target of an 80% cut in greenhouse gas (GHG) emissions against 1990 levels by 2050.² That target is for emissions from production across all sectors of the economy. It covers emissions relating to UK products and services that are consumed in this country, and to those that are exported.

It is now widely accepted that the UK and other countries should also consider and seek to reduce the GHG emissions associated with their consumption. These would exclude emissions associated with products and services that are produced in the UK for export, and include those associated with products and services produced in other countries and then imported.

Attributing GHG emissions according to production or to consumption provides overlapping but different assessments of the UK's contribution to global emissions. Research for Defra by the Stockholm Environment Institute suggests that the UK's consumption-related emissions are 21% higher than its production-related emissions calculated on the same basis, and 37% higher than the production total reported to the UN Framework Convention on Climate Change.³

A consumption approach to accounting for GHG emissions has both advantages and disadvantages compared with a production approach. The main advantage is that it directly addresses a concern shared by UK businesses and environmental groups that, in seeking to reduce our GHG gas emissions by production, we simply 'offshore' those emissions, along with any economic gains associated with making them. A consumption approach is in keeping with the 'one planet' thinking set out in the UK's Sustainable Development Strategy.⁴

The UK Committee on Climate Change, which advises the UK government on GHG reduction targets, recognises the need to avoid "displacement of production abroad with no environmental benefit".⁵ A key reason that the committee recommended a production-based target is that emissions from production can be measured more readily, and the target has to apply to a readily measurable indicator in order to be legally binding.

So, one disadvantage of a consumption-based approach to accounting for our GHG emissions concerns measurement, and the need for clear international conventions to avoid double counting. Furthermore, giving rich importing countries the responsibility to reduce the global emissions associated with their consumption may reduce the 'ecological space' for poorer countries to generate income from GHG-intensive exports.⁶ These issues will both be discussed at the Copenhagen climate change conference in December 2009.

With these caveats, it is appropriate for the UK government to seek to reduce GHG emissions relating to what we consume, as well as seeking to meet our legally binding targets to reduce emissions from production.

² Climate Change Act (2008) http://www.opsi.gov.uk/acts/acts2008/pdf/ukpga_20080027_en.pdf

³ Stockholm Environment Institute and the Centre for Integrated Sustainability Analysis (2008) Development of an embedded carbon emissions indicator. Defra.

⁴ HM Government (2005) Securing the future: the UK government sustainable development strategy. TSO, London.

⁵ Committee on Climate Change (2008) Building a low-carbon economy: the UK's contribution to tackling climate change. TSO, London: 348.

⁶ MacGregor, J. and Vorley, B. (2006) Fair miles? The concept of 'food miles' through a sustainable development lens. Sustainable Development Opinion, IIED.

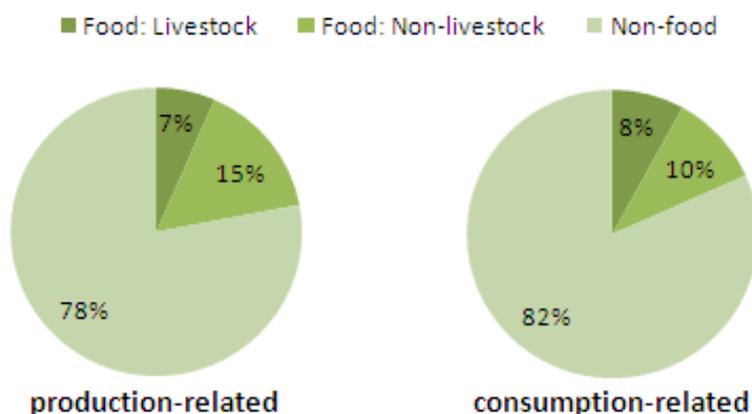
3. Why livestock?

The UK's consumption footprint derives from the full range of products and services that we consume. The consumption of food accounts for one part of that total, and food products from livestock account, in turn, for a portion of that. The consumption of livestock products can be broken down further by the type of animal (e.g. sheep, poultry), the type of product (e.g. meat, dairy) the production system (e.g. organic, free-range) and other factors. So is it arbitrary to focus on livestock?

This report focuses on livestock-related emissions for two reasons: on the one hand, they appear to add up to a significant portion of the UK's consumption footprint; on the other, their links to rural livelihoods, land use, animal welfare, nutrition and cultural identity mean that reducing them presents particularly difficult dilemmas. We believe it is in the interests of livestock producers, as well as policy-makers and the wider public, to encourage analysis, scrutiny and debate about these dilemmas.

First, then, how significant a contribution does our appetite for meat, dairy and other livestock products make to climate change? The Food Climate Research Network (FCRN) puts food-related emissions at 18% of the UK's total consumption footprint, with livestock products accounting for 8% of the total, or 43% of food-related emissions (Figure 1).⁷ These estimates include non-CO₂ GHGs – methane and nitrous oxide – that account for a large share of the global warming potential (GWP) of emissions from livestock production. They do not take into account whether permanent pasture acts as a carbon sink, nor do they attribute to the UK any indirect share of deforestation in other countries, which is a major source of global emissions driven in part by livestock production for world markets.⁸

Figure 1: The share of food and livestock products within UK production- and consumption-related emissions⁹



⁷ Garnett, T. (2009) Livestock related greenhouse gas emissions: impacts and options for policy makers. Food Climate Research Network, University of Surrey.

⁸ Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V. and Rosales, M. (2006) Livestock's Long Shadow: Environmental issues and options. Food and Agriculture Organisation, Rome.

⁹ Garnett, T. (2009) Livestock related greenhouse gas emissions: impacts and options for policy makers. Food Climate Research Network, University of Surrey.

Like all estimates of the GHG emissions associated with different aspects of consumption and production, these figures are uncertain. While they suggest that consuming livestock products accounts for a substantial share of the UK's contribution to climate change, the case for focusing on livestock does not hinge on their accuracy. Meeting the UK's target of an 80% cut in production-related emissions will call for substantial reductions across every sector.

So, the second reason to talk about livestock is that reducing consumption-related emissions in this area is particularly controversial and poses difficult dilemmas. Pressure is mounting on consumers to reduce meat and dairy consumption, and on government and businesses to help them. Yet there is also concern that simply cutting back on meat and dairy may backfire with unintended consequences.

Calls to cut the consumption of livestock products have come from celebrities, campaign groups, scientists and governments. Most claim benefits not only for the climate, but also for human health, global equity and animal welfare.

Rajendra Pachauri, chair of the Intergovernmental Panel on Climate Change, has suggested that eating less meat could bring significant and rapid reductions in global emissions.¹⁰ Sir Paul McCartney is campaigning for 'meat-free Mondays', while the city of Ghent, in Belgium, is promoting vegetarian Thursdays.¹¹ In a similar vein, Oxfam argues that each person who replaces red meat and dairy with vegetables for one day a week for a year cuts their GHG emissions as much as if they skipped a 1,160-mile car trip.¹² A group of physicians has called for 'contraction and convergence' on livestock products, with consumption cutbacks in the richest countries and increases in the poorest, adding up to a net global reduction in consumption and benefits for public health.¹³ A team at Imperial College has suggested that retailers promote portion awareness and labelling for red meat, dairy and their substitutes.¹⁴ The Swedish government, meanwhile, is consulting on new guidelines on sustainable healthy eating, which include a recommendation to eat less red meat.¹⁵

These calls have caused controversy. London Mayor Boris Johnson called Pachauri's suggestion "a load of bull", replying: "I am not going to have one meat-free day per week... In fact, the whole proposition is so irritating that I am almost minded to eat more meat in response."¹⁶ McCartney's 'meat free Mondays' campaign has meanwhile met with a frosty response from producers. Alistair MacKintosh, chairman of the National Farmers' Union (NFU) board for livestock, told *The Grocer* magazine that red meat was part of a healthy diet and that farmers were already looking to reduce

¹⁰ Jowit, J. (2008) UN says eat less meat to curb global warming. *Guardian*, 7 September.

<http://www.guardian.co.uk/environment/2008/sep/07/food.foodanddrink>

¹¹ Blanchard, T. (2009) Paul McCartney's meat free Monday mission. *Telegraph*, 25 June.

<http://www.telegraph.co.uk/earth/5621148/Paul-McCartneys-Meat-Free-Monday-mission.html>. Traynor, I.

(2009) Day of the lentil burghers: Ghent goes veggie to lose weight and save the planet. *Guardian*, 14 May.

<http://www.guardian.co.uk/environment/2009/may/13/ghent-belgium-vegetarian-day>

¹² Oxfam (2009) 4-a-day: Changing Food consumption in the UK... Oxfam UK. Weber, C. L. and Matthews, H. S. (2008) Food-Miles and the Relative Climate Impacts of Food Choices in the United States. *Environmental Science & Technology*, 42(10): 3508-3513.

¹³ McMichael, A.J., Powles, R.W., Butler, C.D. and Uauy, R. (2007) Food, livestock production, energy, climate change, and health. *The Lancet* 370(9594): 1253-1263.

¹⁴ *The Grocer* (2009) Retailers told to push low meat/dairy diets. 27th June. Jackson, B., Lee-Woolf, C., Higginson, F., Wallace, J. and Agathou, N. (to be published) Strategies for reducing red meat and dairy consumption in the UK. Imperial College / WWF-UK.

¹⁵ EurActiv (2009) Sweden promotes climate-friendly food choices. *EurActiv*, 22 June.

<http://www.euractiv.com/en/cap/sweden-promotes-climate-friendly-food-choices/article-183349>

¹⁶ Johnson, B. (2008) Save the planet by cutting down on meat: that's just a load of bull. *Telegraph*, 9 September. <http://www.telegraph.co.uk/comment/columnists/borisjohnson/3562013/Save-the-planet-by-cutting-down-on-meat-Thats-just-a-load-of-bull.html>

their environmental impact: "I'd rather listen to science than some hippified vegetarian."¹⁷ Phil Hambling, of the British Meat Processors Association, responded to reports about the Imperial College proposals by saying that "we should also bear in mind that food, including livestock and meat production, has important environmental, social and economic benefits too".¹⁸

The main concerns voiced over calls to reduce meat and dairy consumption are that they appear not to:

- recognise GHG savings that are already being made through more efficient production;
- distinguish between different types of livestock product and production system;
- understand that some forms of livestock production may sequester GHGs and benefit biodiversity;
- consider the opportunity costs of land use and consumption decisions, which mean that reductions in demand for livestock products might lead to secondary increases in overall GHG emissions;
- take account of differences in current consumption levels and dietary requirements which, for example, see deficiencies in some population groups of iron, for which red meat is a source; and
- acknowledge the importance that consumers attach to eating meat and dairy products.

In short, calls to 'eat less meat' on climate change grounds have been opposed, particularly by producer organisations, as simplistic, unlikely to succeed and prone to unintended consequences. Yet, as we have seen, a consumption approach to GHG reductions in general is legitimate. So what would such an approach need to look like in the livestock sector in order to address such concerns?

¹⁷Ford, R. (2009) Beef industry gives Meat Free Mondays short shrift . The Grocer.
<http://www.thegrocer.co.uk/articles.aspx?page=articles&ID=200887>

¹⁸ Halliday, J. (2009) Calls to curb meat consumption through labelling. Food Navigator.
<http://www.foodnavigator.com/Product-Categories/Meat-fish-and-savoury-ingredients/Calls-to-curb-meat-consumption-through-labelling>

4. Is technical abatement enough?

Reducing consumption-related emissions does not necessarily imply changing consumer behaviour, since reducing the GHG-intensity of the products and services being consumed would also reduce consumption-related emissions (Figure 2 – see column 3). Thus, technical abatement in livestock production, in the UK and countries from which we import, can contribute to reducing the UK's consumption footprint.

Figure 3 gives examples of production and consumption changes that could reduce the GHG footprint of consuming livestock products. The 'eat less meat' campaigns described above fall along one branch of a much broader decision tree. There are other respects in which consumer behaviour might change in order to reduce emissions, and there is a wide array of measures that can be taken to reduce the GHG-intensity of meat, dairy and other products.

This report focuses on changes in consumption behaviour, but not because we misunderstand this to be the only way of reducing our consumption footprint. Rather, we focus on consumption behaviour because technical abatement is more advanced,¹⁹ less controversial, and unlikely to reduce GHGs from livestock consumption by enough to reach targets.

Estimates of technical abatement potential in the livestock sector suggest that, even if every tool in the box were thrown at lowering emissions from livestock production, we would fail to cut our footprint as far as we need. A recent report on the climate change and wider environmental impacts of meat and dairy from the EU's Joint Research Centre has concluded that all the technical abatement measures they looked at would only cut the total environmental impact by about 20%.²⁰ It concludes that "large reductions in the overall impacts from meat and dairy products cannot be obtained from the identified improvement options alone, but would require targeting the level and mode of consumption as such".

All estimates of technical abatement potential are open to question. They make assumptions about many factors including the uptake of innovations. Thus, even the best estimates of the 'gap' between abatement potential and GHG reduction targets cannot amount to a watertight case that changes in consumption behaviour are necessary.

But even if, optimistically, we were to assume that technical abatement measures might add up on paper to meet GHG reduction targets, there are three further reasons why producers might find a shared interest with government and environmental groups in changing the consumption of livestock products.

The first is flexibility. Most ways of reducing emissions imply trade-offs or win-wins, and the greater the range of tools we can use, the better equipped we are to manage those side effects. For example, increasing carbon efficiency by intensifying production may compromise animal welfare and behavioural freedom. Meanwhile, reducing the consumption of some livestock products might threaten farm incomes yet at the same time, for some consumers, lower the risk of diet-related diseases. The more options that are on the table, the greater the scope to find ways of reducing emissions that are fair to all stakeholder groups.

¹⁹ Defra (2008) Progress report on sustainable products and materials.

<http://www.defra.gov.uk/environment/business/pdf/prod-materials-report0708.pdf>

²⁰ Weidema, B.P., Wesnaes, M., Hemansen, J., Krsitensen, T. and Halberg, N. (2009) Environmental improvement potentials of meat and dairy products, EUR 23491 EN. Joint Research Centre, Institute for Prospective Technological Studies.

Figure 2: decision tree showing where consumer behaviour change strategies fit within generic approaches to reducing consumption-related GHG emissions.

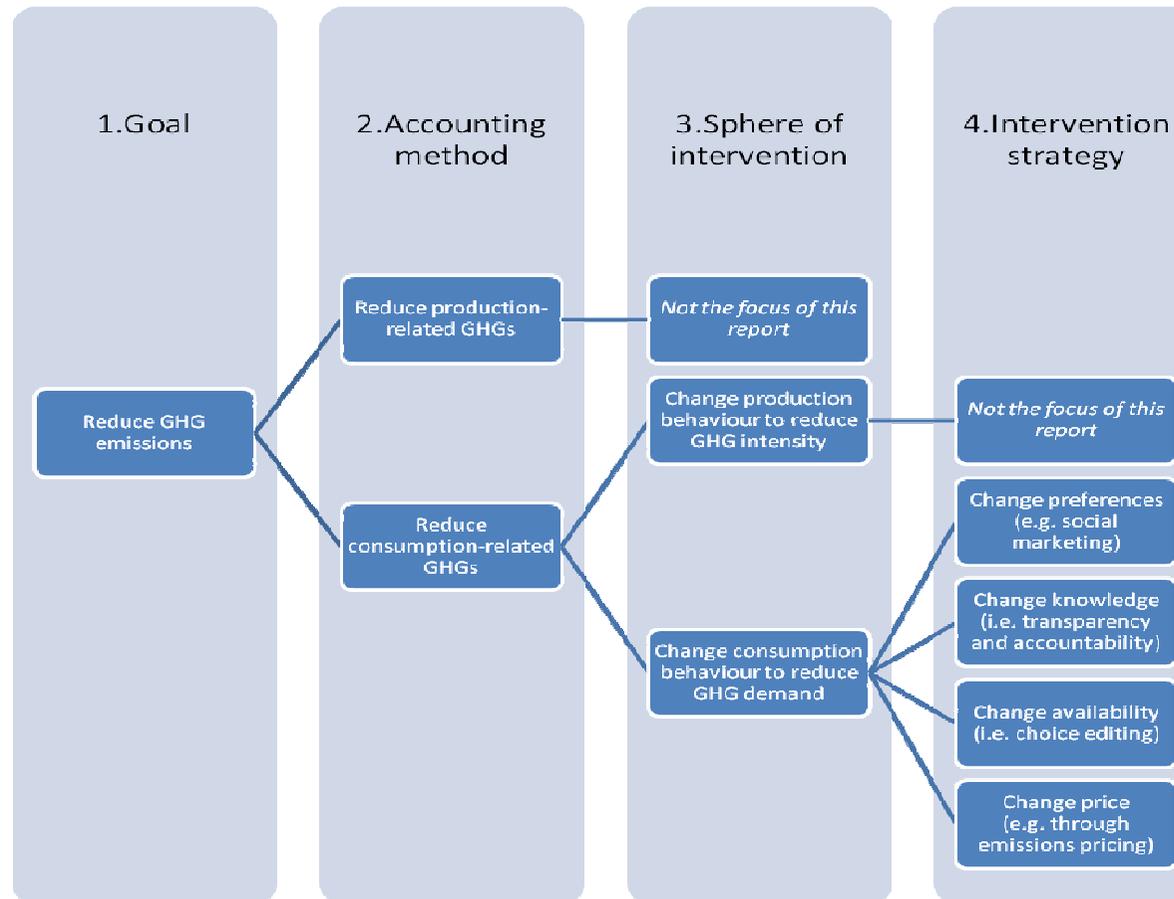
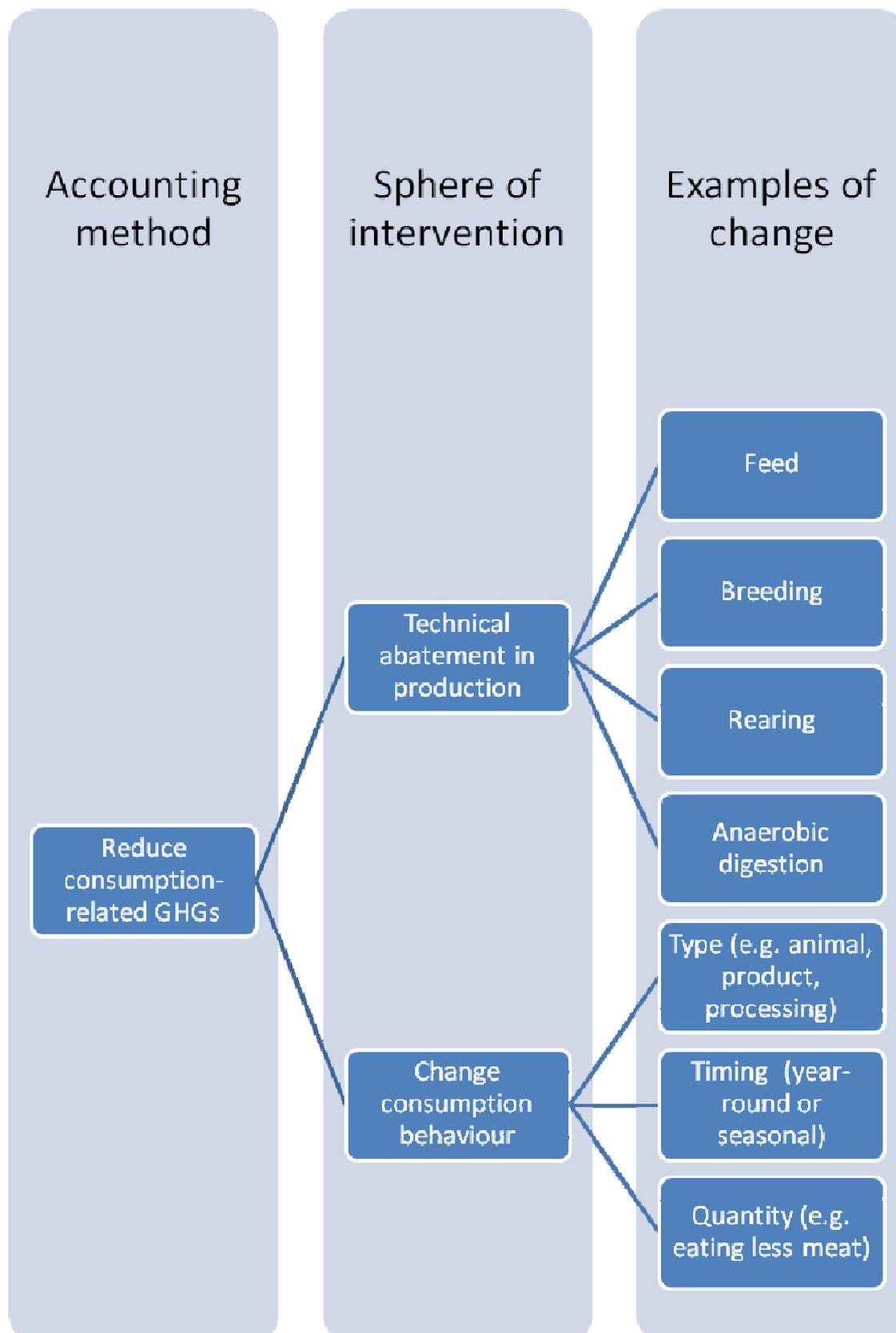


Figure 3: decision tree for consumption-related livestock emissions showing examples of technical abatement and consumer behaviour change.



Second, the market may be changing anyway. Research for Defra in 2006 found people unwilling to reduce their consumption of meat and dairy products in order to cut their environmental footprint.²¹ However, this is not static, and Defra has commissioned additional research in this area. In the meantime, survey research with young people shows that awareness of climate change and participants' sense of own capacity to address it have increased significantly, even since 2006.²² It is important for policy-makers and producers to be prepared for greener consumption behaviour, and to help ensure it achieves the benefits consumers intend it to. Communicating green consumption trends to producers may further encourage them to take up innovations in sustainable production.

Third, UK producers should see an incentive to focus effort on changes in consumption behaviour that would reduce emissions. Promoting the consumption of 'less but better' (i.e. premium quality) meat and dairy could, in principle, preserve or boost profitability for producers by increasing margins. Indeed, focusing reduction efforts on UK consumption potentially takes the strain off UK producers. It leaves open the possibility that the UK might have an environmental comparative advantage in some forms of livestock production compared with hotter, drier countries. If this advantage increased with climate change, the UK might become a more important exporter in spite of falling domestic consumption. In practice, these arguments are most relevant to red meat producers and least relevant to large-scale poultry operations, which are mainly owned internationally and vertically integrated with international feed production.

So, many livestock producers should see benefits in proactively engaging with government, environment groups and the wider public in discussing ways of changing consumption behaviour to reduce GHG emissions. However, even producers who do not accept that changing consumption behaviour is necessary or advantageous have a material interest in ensuring that, *if* government intervenes in this area, the potential unintended consequences of doing so are pre-empted.

²¹ Defra (2008) A framework for pro-environmental behaviours. Defra.

<http://www.defra.gov.uk/evidence/social/behaviour/pdf/behaviours-jan08-report.pdf>

²² COI (2008) Attitudes to climate change amongst young people: wave 2. Summary for Defra.

<http://www.defra.gov.uk/environment/climatechange/uk/individual/attitudes/pdf/cc-youth-tracker-presentation.pdf>

5. A framework

Most current discussions about changing the consumption of livestock products to reduce GHG emissions focus either on overarching scenarios – projecting how overall consumption patterns could change in order to meet specified environmental, social and animal welfare criteria – or on specific measures, notably eating less meat.

These approaches have not as yet enabled an ongoing, constructive dialogue between government, livestock producers and other stakeholders about consumption behaviour: scenarios, while important thought experiments, hinge on contested assumptions about political will, consumer culture and the impact of different specific changes. Focusing on specific measures, meanwhile, seems arbitrary in advance of any systematic attempt to compare a wide range of possible interventions, consider their potential shortfalls, and act to pre-empt likely unintended consequences.

In order to create a framework for a constructive dialogue, we have therefore sought to map a wide range of interventions that could change consumption behaviour with the effect of reducing livestock-related GHG emissions. As the state is ultimately responsible for balancing competing demands in the public interest, we have focused on interventions by government. These include measures that are specific to the livestock sector or its products, and wider measures that could have a bearing on consumption in this sector. They range from interventions that directly seek to influence consumer demand (for example through marketing) to fiscal measures and multilateral policies that would put a higher price on emissions and deforestation on the supply side, potentially leading to retail price changes that could indirectly shape consumer behaviour.

We have grouped these potential interventions under the four headings shown in column 4 of Figure 2, above. Table 1 (pp.16-20) lists 27 potential interventions. They are drawn from actual experience or proposals relating to livestock and other sectors, in the UK or internationally. They were identified from published literature and from points made by stakeholders in interview or correspondence. The table is intended to be extensive but not exhaustive.

Thus, the table lists interventions that are regarded as plausible by at least some experts or stakeholders. We have not sought to compare how effective these interventions would be and, by listing them, we are not endorsing them. Instead, the table focuses on the opportunities and obstacles that would face attempts to implement any of the interventions that are listed. The opportunities refer to ways in which interventions might chime with wider political and social trends. The obstacles refer to factors that could stymie the effective implementation of each measure. The table also includes examples and parallels from the livestock sector and beyond.

Table 2 (p.21) is a simplified version of Table 1. It reduces each intervention to a headline and identifies the types of obstacle that it would face. We distinguish between three main types:

- **Knowledge** gaps, where not enough is known to be confident of intervening successfully.
- Problems of **scope**, where there is a risk of ‘offshoring’ emissions – pushing them to other sectors or countries – or, conversely, that the measures government would need to take to avoid that happening would be vulnerable to challenge in the EU or the World Trade Organisation.
- **Unintended consequences** or unfair treatment, where there is a risk that by trying to solve one problem we cause another. Even where a measure might reduce emissions, this might be at the expense of other environmental goods/services, animal welfare, producers (e.g. loss of livelihood, unfair cost burdens) or consumers (e.g. reduced access to a healthy diet, higher food costs, reduced autonomy). In Table 2, these are described, for short, as ‘risks’.

In each row, we have placed dots under these headings to represent the obstacles described in Table 1. For example, Table 2's 'Seasonality and storage', which abbreviates 'Promote more seasonal consumption and lower-impact forms of storage' from Table 1, includes a dot in the 'Risk to consumers' column to represent the potential problem identified in Table 1 that 'Consumers may consider lower-impact forms of storage to compromise taste or quality'.

The number of dots in each row of Table 2a does not quantify how difficult or costly each measure would be to implement – a row with four dots is not necessarily twice as difficult or costly as a row with two dots. The dots simply provide an overview of the main challenges that would need to be addressed in order to pursue a particular intervention or package of measures.

Nor is our assessment of the obstacles intended to be definitive. It is intended to open a conversation between government and stakeholders about how best to address the challenge of changing consumption to reduce livestock-related emissions. Stakeholders will bring their own assessments of the main challenges to that conversation. What we offer here is a framework to help express those challenges clearly, consistently and constructively.

The final step in this framework is to consider how to address each type of obstacle. Table 2b lists, in general terms, how each type of obstacle might be addressed:

- Knowledge gaps can be addressed by further research.
- A key response to offshoring – the problem of GHG leakage to other sectors or countries – is to agree clear boundaries and allocations of responsibility, at a national level, within the EU and internationally. Another response to offshoring is to put in place guarantees that enforcement will be even-handed across different sectors.
- The risk of unintended consequences can be reduced by undertaking full environmental, animal welfare and social impact assessments of proposed interventions, and upgrading regulation or compensation where necessary.

The costs of taking such measures should be considered in evaluating and comparing possible interventions. The list given here is intended to open up a constructive, practical dialogue about how to solve a difficult problem in the best possible way; it is not intended to be the last word.

Table 1a: opportunities and obstacles associated with different ways government can influence meat and dairy consumption (change preferences 1).

Strategy	Approach	Intervention	Opportunities	Obstacles	Examples
Change preferences (continues overleaf)	Inform and educate (continues overleaf)	1. Adapt FSA 'eatwell plate' and dietary advice to reflect a sustainable balanced diet	FSA due to co-ordinate integrated government advice to consumers, as recommended by Cabinet Office [a]	Finding agreement between competing visions of a sustainable diet	Defra's Council of Food Policy Advisors is considering sustainability metrics for the low impact healthy diet 'plate' [b] Sustainable Development Commission is undertaking a review for Defra [c] Swedish authorities put advice to eat less meat and rice out to consultation [d]
		2. Public health campaign to reduce consumption of some livestock products on disease risk grounds	Personal health is a common motivator for changing behaviour [e]	Diet data may overestimate meat consumption and the reduction in disease risk is smaller than for some other potential changes in diet May hit meat cuts harder than processed products People may change their diets in ways that cause other nutritional problems Producers are concerned about being demonised	The Scientific Advisory Committee on Nutrition advises high consumers of red and processed meat to reduce intakes [f] The FSA salt campaign combined partnership work on reformulation with information and advice about salt on packets and in advertising [g]
		3. Campaign directly to promote lower impact diets by encouraging people to consume 'less but better' meat	Implies a shift to lower volume, higher value production systems, potentially maintaining profitability for producers while reaping other benefits to biodiversity, animal welfare and disease control	Defra research on pro-environmental behaviour shows that people are less willing to eat a lower impact diet than change their lifestyles in other ways [h] Meat processors are unlikely to favour this approach as their business is volume driven May reduce carcass utilisation	Local government in Ghent and Camden, Oxfam and Sir Paul McCartney are among those who have called for meat-free days [i]
		4. Encourage people to substitute lower-impact livestock products	Potentially easier to encourage people to eat different meat instead of less meat	The type of product may be less important than the production system in determining GHG-intensity No agreed method of accounting for land use change and sequestration, which would affect advice Highly intensive production systems may reduce GHGs but have other environmental impacts and raise animal welfare concerns Politically difficult to promote one sector only Public health not a direct consideration	BBC Bloom climate change advice recommends eating more pork and chicken [j]
		5. Promote consumption of less popular meat cuts	Creates higher value markets for more of the whole animal, potentially increasing profitability	The effects depend on promoting the right cuts, on what foods these cuts replace in consumers' diets and on how the lower value markets currently receiving 'less used' cuts (exports, pet food) substitute for them	Jamie Oliver's 'Jamie saves your bacon' campaign promoting pork shoulder, belly and neck [k]

Table continues overleaf

- a The Strategy Unit (2008) Food matters: towards a strategy for the 21st century. Cabinet Office, London.
- b Defra (2009) Council of Food Policy Advisors: work programme/priorities. www.defra.gov.uk/foodrin/policy/council/priorities.htm
- c Sustainable Development Commission (2009) Sustainable healthy diet workshop, Reading.
- d National Food Administration (2009) Environmentally effective food choices: proposal notified to the EU 15.05.09. http://www.slv.se/upload/dokument/miljo/environmentally_effective_food_choices_propos
- e Defra (2008) A framework for pro-environmental behaviours. Defra. <http://www.defra.gov.uk/evidence/social/behaviour/pdf/behaviours-jan08-report.pdf>.
- f Scientific Advisory Committee on Nutrition (2009) Iron and health (draft). SACN, London. http://www.sacn.gov.uk/pdfs/draft_iron_and_health_report_complete_june_2009_consultation.pdf
- g FSA (2009) Salt timeline of key events. <http://www.food.gov.uk/healthiereating/salt/salttimeline>
- h Defra (2008) A framework for pro-environmental behaviours. Defra. <http://www.defra.gov.uk/evidence/social/behaviour/pdf/behaviours-jan08-report.pdf>.
- i See section 3 of this report.
- j BBC Bloom (2009) Cutting down on meat and dairy. <http://www.bbc.co.uk/bloom/actions/eatinglessbeef.shtml>
- k Channel 4 (2009) Jamie saves our bacon. http://www.channel4.com/food/on-tv/jamie-oliver/jamie-saves-our-bacon/jamie-saves-our-bacon-08-12-12_p_1.html

Table 1b: opportunities and obstacles associated with different ways government can influence meat and dairy consumption (change preferences 2).

Strategy	Approach	Intervention	Opportunities	Obstacles	Examples
Change preferences (continued)	Inform and educate (continued)	6. Promote more seasonal consumption and lower-impact forms of storage	May support innovation and restructuring towards less GHG-intensive and lower impact production systems Research shows that consumers aspire to eat with the seasons [a]	More extensive seasonal production systems for beef and dairy may have lower total factor productivity Heavy capital investment in processing for year-round availability Consumers may consider lower-impact forms of storage (e.g. UHT milk) to compromise taste or quality	Dairy roadmap considered the implications of a liquid milk market that was predominantly UHT [b]
		7. Facilitate community action by providing information or funds to group processes or movements promoting low-carbon living	Supports and extends initiatives that are already operating Encourages a balanced approach to lower carbon living in which eating a lower impact diet is only one component	Unless community initiatives are based on robust evidence they have small or unexpected consequences Government support for third sector can make it look like government is shirking responsibility	Group and community behaviour change programmes have been tried and tested by organisations including Global Action Plan. Examples include Action at School, Environment Champions, Ecoteams and the Transition Town movement [c] The Scottish government's Climate Challenge Fund is preparing information for community groups about the carbon impacts of food and will be introducing people to issues around livestock consumption [d]
		8. Education on lower carbon living in schools delivered through the national curriculum	Complements school programmes on environmental issues and various attempts to change school dinner menus to promote healthy eating Children take messages home to their families	A systematic approach would require this to be routine school practice, inspected by Ofsted, increasing the audit burden on schools	Sustainable development is one of seven cross-curriculum themes [e]
	Regulate advertising	9. Extend nutrient profiling on advertising to children to restrict advertising for highly GHG-intensive or high environmental footprint foods	High fat products and marketing are becoming socially less acceptable, so it might be possible to achieve the same for highly GHG-intensive foods	Nutritional deficits (e.g. of calcium) if alternative sources are not communicated Environmental profiles would need to consider wider issues (e.g. animal welfare)	Television advertising to children of foods that are high in fat, salt and sugar, potentially including some meat and dairy products, is already restricted [f]
	Promote other foods	10. Work with retailers and caterers to increase the number of meat- and dairy-free SKUs, recipe suggestions and promotions	Potential health benefits from higher fruit and vegetable consumption	Limited success in increasing fruit and vegetable consumption in spite of increased public awareness of 5 a day Concern about fulfilling iron and other nutritional needs and over safety of soya and rice-based dairy substitutes	M&S and Sainsbury's have been increasing their range of vegetables, while other retailers have launched promotional campaigns such as Aldi's 'super six' and The Co-operative's 'mix your colours' [g]
	Lead by example	11. Government explicitly reduces its own consumption of high environmental impact products, especially at public functions	This would gain publicity for the issue and give legitimacy to wider initiatives to promote low-impact diets	Risk of penalising highly visible sectors out of proportion with the potential for GHG savings	Cabinet Secretary announces phasing out of bottled water across government estate [h]

a IGD (2005) Connecting consumers with farming and farm produce. Cited in Hampson, S (2006) Differentiation: a sustainable future for UK agriculture. RASE, Stoneleigh.

b Dairy Supply Chain Forum SCP Taskforce (2008) The milk roadmap. Defra. <http://www.defra.gov.uk/environment/business/pdf/milk-roadmap.pdf>

c E.g. Global Action Plan (2009) Ecoteams. www.ecoteams.org.uk

d Scottish Government (2009) Climate challenge fund. <http://www.scotland.gov.uk/Topics/SustainableDevelopment/funding/ClimateChallengeFund>

e Teachernet (2009) Teaching sustainable development. <http://www.teachernet.gov.uk/sustainable/schools/about/about.cfm?levelselected=4&id=4>

f FSA (2007) Restrictions on TV advertising of foods to children come into force. <http://www.food.gov.uk/news/newsarchive/2007/mar/tvads>

g e.g. Aldi (2009) Super 6. http://www.aldi.co.uk/uk/html/product_range/4862.htm

h Cabinet Office (2008) Cabinet Secretary announces phasing out of bottled water across government estate. www.cabinetoffice.gov.uk/newsroom/news_releases/2008/080306_bottled_water.aspx?rss=yes

Table continues overleaf

Table 1c: opportunities and obstacles associated with different ways government can influence meat and dairy consumption (change knowledge).

Strategy	Approach	Intervention	Opportunities	Obstacles	Examples
Change knowledge	Highlight opportunities	12. Inform industry about consumer preferences as business community underestimates support for the green agenda compared with evidence from consumer research	Serve latent market for greener products	Public preferences for lower impact products are not necessarily reflected in willingness to pay	Department for Business, Innovation and Skills market intelligence on Low-Carbon Business Opportunities [a]
	Improve labelling	13. Introduce a numerical or colour-coded GHG labelling system on food products sold by retailers	GHG audit process drives carbon reduction throughout supply chain	Requires accelerated LCA, particularly complex for products with multiple ingredients Unless labels applied to imports, production could be offshored Unless other environmental and animal welfare factors are included, scope for negative sustainable development outcomes Costs of implementation passed to producers Labelling may not affect purchasing behaviour because supermarkets arrange foods by product groups, so the difference between livestock and non-livestock products may not be apparent	The Carbon Trust's carbon reduction label [b] Sustain's proposed omnistandard label [c]
		14. Introduce a numerical or colour-coded GHG labelling system on menus in catering outlets	Raises awareness at the time of consumption allowing direct choices in favour of a lower impact diets	As for retail labelling (above) Even basic nutritional information is only starting to appear on menus The food service sector is fragmented, so the cost to business would be high and enforcement could be difficult	FSA to trial nutrition information on restaurant and takeaway menus [d]
		15. Tighter rules and enforcement of country of origin labels for livestock products	Enables consumers to express more accurately any preference for British produce, potentially supporting unilateral increases in production standards and higher value, lower volume business models	EU rules are currently said by some decision-makers to constrain the UK's freedom to tighten rules on country of origin labelling The production system is the major factor in GHG emissions, so country of origin is only relevant if the UK regulates to ensure domestic production is low-GHG	Government claims to be working in Europe for a new directive that makes this possible, while the Conservatives have a Bill calling for greater country of origin information to be published on labels [e]

Table continues overleaf

a BIS (2009) Low carbon business opportunities: market intelligence. <http://www.berr.gov.uk/whatwedo/sectors/lowcarbon/marketintelligence/page50106.html>b Carbon Trust (2008) Product carbon labelling case study: Walkers. <http://www.carbontrust.co.uk/Publications/publicationdetail.htm?productid=CTS058&metaNoCache=1>c Sustain (2007) Pictorial representations for sustainability scoring. Sustain, London. http://www.sustainweb.org/pdf/sustainability_labelling_flowers.pdfd FSA (2009) FSA announces first steps to introduce nutrition information for consumers when eating out of home. <http://www.food.gov.uk/news/pressreleases/2009/jan/nutinfoeatingout>e Conservatives (2009) Food labelling regulations (amendment) bill. http://www.conservatives.com/Campaigns/~/_media/Files/Downloadable%20Files/Honest%20Food/bill.ashx

Table 1d: opportunities and obstacles associated with different ways government can influence meat and dairy consumption (change availability).

Strategy	Approach	Intervention	Opportunities	Obstacles	Examples
Change availability	Create production standards	16. Introduce a maximum standard for the GHG intensity of all foods, e.g. measured in gCO ₂ e/kg or gCO ₂ e/kj	Stimulates innovation in production and supply chains to ensure products can remain available	Ignores that highly GHG-intensive foods could potentially be consumed in small quantities in a low carbon world Tighter legal standards might be required on sustainable development issues and animal welfare to avoid trade-offs Applying to imports may violate WTO rules and be challenged by large meat exporting countries such as US and Brazil	Cf. maximum residue levels/limits for pesticides and veterinary drugs, which relate to health risks rather than production practices [a]
		17. Apply very high animal welfare standards that require extensive, higher cost production systems	Producers raise animal welfare standards, which is good in itself, while being protected from lower-welfare imports	GHG reductions would depend on significant reductions in consumption, which would be price driven and fall on poorer consumers Applying to imports may violate WTO rules and be challenged by large meat exporting countries such as the US and Brazil	The UK's unilateral ban on sow stalls, without comparable standards on imports, left the industry feeling very exposed [b] EU ban on the use of hormone growth promoters [c]
	Voluntary agreements or bans	18. Encourage or require major retailers to reduce the average GHG intensity of their product ranges	Exploits retailers' power to change their supply chains The prospect of naming and shaming by government has proved sufficient to stimulate product reformulation	Depends on major LCA effort Other criteria besides GHG intensity needed to avoid unintended consequences As retailers start with different ranges it may be difficult to operate fairly	Some retailer environmental commitments (e.g. waste reduction) apply across their entire range [d]
		19. Encourage or require retailers to remove the most GHG intensive products from sale	Research shows consumers do not expect to be able to buy products that are environmentally damaging [e]	Even retailers that have actively edited their customers choices on environmental grounds are wary of intervening where there are complex trade-offs	Wynvale have stopped selling patio heaters [f]
		20. Work with processors, caterers and retailers to reformulate food and meals to reduce their GHG intensity, including by reducing meat and dairy content	Can ensure products remain nutritionally balanced by compensating for changes Gradual changes transform consumer tastes	Reduces volume demand for livestock products without increasing quality and margins, so producers lose Consumers may regard portion size reductions as a swindle	Reformulation to reduce salt, sugar and fats led by the Food Standards Agency [g]
	Improve public procurement	21. Change procurement rules and practices to favour lower impact diets, including by increasing the availability and promotion of vegetarian and vegan meals	Directly reduces the footprint of up to 1 billion meals a year Offers an opportunity to communicate with consumers about climate change Increases the credibility of voluntary standards with retailers	Past improvements in public procurement have proved difficult to put into practice in a sector that has become fragmented and deskilled Careful menu planning would be needed to ensure meals remained nutritionally balanced Potential trade-offs with animal welfare and other sustainable development objectives Reduces volume demand for livestock products without increasing quality and margins, so producers lose	The director of the NHS sustainable development unit was reported as saying in January that "we should not expect to see meat on every menu" served by the NHS [h]

a Pesticides Safety Directorate (2009) Maximum residue levels. <http://www.pesticides.gov.uk/prc.asp?id=956>

b The Pig Site (2007) Cross-compliance gold-plating. <http://www.thepigsite.com/swinews/15116/crosscompliance-goldplating>

c Farmers Weekly (2009) EU and USA settle hormone beef dispute. <http://www.fwi.co.uk/Articles/2009/05/14/115625/eu-and-usa-settle-hormone-beef-dispute.html>

d E.g. Marks & Spencer (2007) Plan A. <http://plana.marksandspencer.com/about/the-plan/>

e Sustainable Consumption Roundtable (2006) I will if you will: towards sustainable consumption. SDC, London. http://www.sd-commission.org.uk/publications/downloads/I_Will_if_You_Will.pdf

f Osborne, H. (2007) Garden chain drops patio heaters. Guardian. <http://www.guardian.co.uk/business/2007/apr/05/energy.environment>

g FSA (2009) FSA launches saturated fat campaign to help prevent heart disease, the UK's biggest killer. <http://www.food.gov.uk/news/pressreleases/2009/feb/launchsatfatcampaign>

h Jowitz, J. (2009) Hospitals will take meat off menus in bid to cut carbon. Guardian. <http://www.guardian.co.uk/society/2009/jan/26/hospitals-nhs-meat-carbon>

Table continues overleaf

Table 1e: opportunities and obstacles associated with different ways government can influence meat and dairy consumption (change price).

Strategy	Approach	Intervention	Opportunities	Obstacles	Examples
Change price	Tax GHG-intensive practices	22. Introduce VAT-style taxes on the sale of GHG-intensive foods	Taxation can stimulate rapid changes in behaviour and in the marketplace	Taxation may need to be set at high levels to change behaviour Reduces volume demand for livestock products without increasing quality and margins, so producers lose Disproportionately affects poorer consumers Intervening only on GHGs risks trade-offs with other aspects of sustainable development and with animal welfare	The Irish government's levy on plastic bags in 2002 cut use by over 90% per person [a]
		23. Introduce taxes on the sale or trade of GHG-intensive agricultural inputs including fertiliser and animal feed	Taxes could be designed also to address other environmental issues such as biodiversity loss Tariffs on feed trade could complement efforts to rebuild grain stocks, regulate the impact of first-generation biofuels of food prices and improve global food security	Unilateral taxation could offshore production or be vulnerable to challenge through the WTO if applied to imports Product or sector-specific taxes risk irrational or unfair outcomes compared with cross-sector taxation or emissions trading 'Feed' is moving target - animals will be fed other human food if their value is high enough	Sweden and Norway have taxed nitrogen fertiliser to control pollution [b]
	Subsidise lower-impact practices	24. Provide tax advantages or direct support for low-impact production systems	Helps producers and processors to carry the cost of restructuring towards a low-carbon economy Support for innovation and restructuring is potentially less regressive for consumers than price support or VAT changes	Demands public spending at time of budget cuts Would need to comply with WTO 'green box' criteria	Rural development support under pillar II of the Common Agricultural Policy, including production-related initiatives which compensate for income foregone such as the Organic Entry Level Stewardship [c]
		25. Eliminate direct subsidies or price support that promotes high-impact production systems	Support better regulation by joining up policy across government	Though much of livestock policy is the responsibility of EU member states, the Common Agricultural Policy sets the existing framework, so the UK cannot change all policies unilaterally	Previous rounds of CAP reform have eliminated some incentives for environmental pollution and biodiversity loss, though Defra considers that much of the CAP still has a negative impact on the environment [d]
	Price natural resources	26. Cap and trade systems at EU for all GHGs	Promotes a fair and balanced approach based on the 'polluter pays' principle	Accurately assessing and pricing emissions from agriculture presents a major technical challenge Depends on international framework about the allocation of responsibility for emissions UK emissions targets for agriculture not expected until 2018	Agriculture fully enters New Zealand's emissions trading scheme in 2013 [e] Methane and nitrous oxide are included in UK carbon budgets, and the UK government committed in Food Matters to take a lead in Europe on this issue [f]
		27. Value forest to limit deforestation, which contributes to the global footprint of livestock products	Recognises that our consumption indirectly drives unsustainable production internationally, even if the methods used to produce the food we eat are environmentally efficient	Incentive frameworks may ignore the needs of marginal producers and communities	The UN Collaborative Programme on Reducing Emissions from Deforestation and Degradation in Developing Countries (REDD) intends to address GHG emissions from deforestation, driven in part by livestock production [g]

a KPMG (2008) More green taxes may not be best route to environmental protection, says KPMG. Press release. <https://www.kpmg.com/global/pressroom/pressreleases/Pages/Moregreentaxes.aspx>

b Shortle, J.S. and Abler, D.G. (2001) Environmental policies for agricultural pollution control. CAB International, Wallingford.

c Defra (2009) The Rural Development Programme for England 2007-2013. <http://www.defra.gov.uk/rural/rdpe/index.htm>

d Defra (2009) CAP reform. <http://www.defra.gov.uk/farm/policy/capreform/>

e Ministry of Agriculture and Forestry (2009) Agriculture in a New Zealand emissions trading scheme. <http://www.maf.govt.nz/climatechange/agriculture/>

f The Strategy Unit (2008) Food matters: towards a strategy for the 21st century. Cabinet Office, London.

g SciDevNet (2009) Reducing forest emissions. <http://www.scidev.net/en/climate-change-and-energy/reducing-forest-emissions>

Table 2: a framework for dialogue.**Table 2a: types of obstacle.**

Unintended consequences/unfair treatment: environment, animals or people
Problems of scope: risk of off-shoring emissions
Knowledge gaps: not enough known to be confident of successful intervention

Table 2b: which interventions face which obstacles (Table 1 for detail).

Strategy	Approach	Intervention	Knowledge	Scope	Environment	Risk to		
						Animals	Producers	Consumers
Change preferences	Inform and educate	1. Adapt dietary advice	●					
		2. Public health campaign	●	●			●	●
		3. Less but better meat campaign						●
		4. Eat different meat campaign	●	●	●	●	●	●
		5. Promote less used cuts		●				●
		6. Seasonality and storage	●					●
		7. Facilitate community action	●	●				
		8. Education in schools						
	Regulate advertising	9. Restrict advertising			●	●		●
	Promote other foods	10. Meat- and dairy-free SKUs					●	●
	Lead by example	11. Government reduces consumption		●			●	
Change knowledge	Highlight opportunities	12. Promote green markets to business					●	
	Improve labelling	13. GHG labels in retail	●	●	●	●	●	●
		14. GHG labels in catering	●	●	●	●	●	●
		15. Tighter on country of origin		●				
Change availability	Create production standards	16. Maximum limit on GHG intensity		●	●	●		
		17. Higher animal welfare standards		●				●
	Voluntary agreements or bans	18. Reduce GHG-intensity of ranges	●		●	●	●	
		19. Remove most GHG-intensive						●
	Improve public procurement	20. Reformulate foods and meals					●	●
	21. Low-impact procurement		●	●	●	●	●	
Change price	Tax GHG-intensive practices	22. Tax GHG-intensive foods			●	●	●	●
		23. Tax GHG-intensive inputs		●				
	Subsidise lower-impact practices	24. Support low-impact production		●				
		25. No support for high-impact systems		●				
	Price natural resources	26. EU cap and trade for all GHGs	●	●				
	27. Value forests						●	

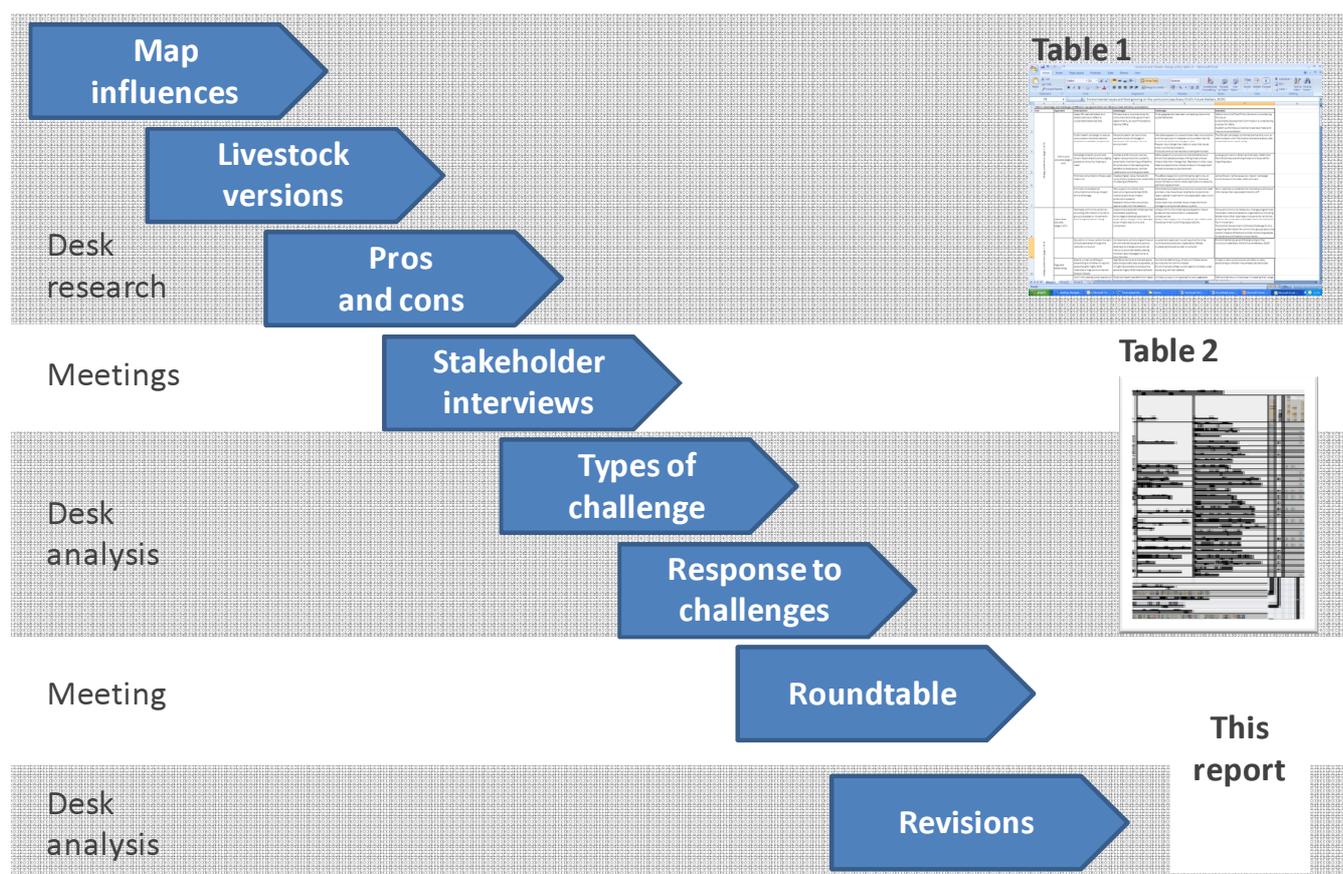
Table 2c: how to address obstacles.

Commission research and knowledge transfer
Agree sector boundaries and GHG allocations
Lead international negotiations
Enforce rules fairly across full scope
Assess consequences by environmental, welfare or social impact assessment
Regulate or compensate to address specific side-effects

6. Using the framework

We developed this framework through a process of desk research, analysis and stakeholder interviews (Appendix 1), mainly with organisations representing livestock producers (Figure 4). We also received comments from a wider network of stakeholders on an early version of Table 1, openly circulated by email. The process of developing the framework culminated in a roundtable meeting in June 2009, at which we tested it with a group of 25 key stakeholders, experts and decision-makers from Defra, the Food Standards Agency, HM Treasury, the Sustainable Development Commission, producer organisations, livestock sector levy boards and businesses that are major purchasers of livestock products (Appendix 2). Insights from that meeting have been incorporated in this report.

Figure 4: how we developed and trialled the framework set out in this report.



The roundtable meeting took participants through the main steps outlined in this report:

- We first explained the rationale for a taking a consumption approach to accounting for GHG emissions. The chair sought to identify any issues or concerns arising at this stage and obtained the group's consent before proceeding further.
- Next, we explained why we believed it was legitimate and helpful to discuss the implications for the consumption of livestock products. Again, the chair identified issues arising and sought the group's consent to move forward.
- Finally, we introduced and discussed Tables 1 and 2.

We found that livestock producers are willing to engage with government and environmental groups in constructive discussion about how to change the consumption of livestock products to reduce GHG emissions. Producers are understandably wary of simplistic consumer campaign messages, and find it more comfortable to discuss technical abatement in production, where a wide range of initiatives are already under way. Yet, taking

our roundtable meeting through the framework outlined in this report revealed a strong consensus across the group that:

- a consumption approach to GHG emissions is legitimate;
- it is prudent to consider what this implies for the livestock sector; and
- it is important to pursue GHG emissions reductions in the livestock sector through changes in consumption, as well as through technical abatement in production.

We found the steps we went through in the roundtable meeting to be effective in enabling livestock producers and other stakeholder to have a constructive conversation about policy options for changing consumer behaviour to reduce livestock-related GHG emissions. The process could readily be repeated or adapted to promote further dialogue on this issue involving additional stakeholders.

7. Recommendations

The process of analysis and stakeholder engagement outlined in previous sections focused on what government could do to reduce GHG emissions relating to the consumption of livestock products. Based on this process, we make the following recommendations to government.

Promote dialogue

- This project involved livestock producers in a constructive dialogue about consumption-related emissions. Defra should use or adapt the framework set out in Table 2 to continue and widen that dialogue, expanding government's mandate for action on this difficult issue.

Focus research

- While the whole debate over livestock and climate change is riddled with uncertainty, this work shows that some knowledge gaps are more relevant to successful intervention than others. For example, further research on public attitudes to pro-environmental behaviour is of limited relevance, whereas understanding the GHG and wider impacts of land use change is crucial. Defra and the research councils should focus their efforts accordingly.
- To stakeholders, research sometimes looks like an excuse for government inaction. Defra and the FSA should communicate their research priorities in ways that demonstrate beyond question that they are taking a strategic approach, and recognise the urgency of action to tackle climate change.

Compare actions

- We have sought to identify intervention options and the obstacles they face, but not to evaluate them. Defra should systematically evaluate the efficacy, time horizon and reach/scale of the government's full range of options for influencing consumption behaviour to reduce emissions relating to the livestock sector.
- These evaluations should take into account the cost of implementation, including the cost of proactively mitigating potential unintended consequences, such as those highlighted in this report.

Push 'no regret' options

- The government should fast-track efforts on emerging 'no regret' options – those that only face obstacles of knowledge and scope. Our own analysis in Table 2 is open to review, but offers the following as a preliminary indication of those 'no regret' options.
- For Defra working with the FSA, the priorities should be to adapt dietary advice to reflect sustainable development commitments, and to facilitate community action to promote low-carbon living. Our analysis suggests that additional impetus should be given to initiatives under way in this area.
- For Defra working with HM Treasury, the priorities should include: more active and conciliatory work in the EU to reform the Common Agricultural Policy to support innovation and restructuring towards sustainable farming and rural development; and ensuring agricultural GHGs are urgently included EU-wide mechanisms to reduce GHG emissions.
- 'Low regret' interventions should also be pursued as a priority, such as ensuring the UN Collaborative Programme on Reducing Emissions from Deforestation and Degradation in Developing Countries takes account of the needs of marginal producers and communities.

Appendix 1: people interviewed for this project

Tracy Boshier	Food Standards Agency
Peter Bradnock	British Poultry Council
Helen Browning	Soil Association/Eastbrook Farm
Andrew Curry	The Futures Company
Sir Donald Curry	UK government adviser
Sue Dibb	Sustainable Development Commission
Tara Garnett	Food Climate Research Network
Kim Haywood	National Beef Association
Terry Jones	National Farmers' Union
Ceris Jones	National Farmers' Union
Kate McGeevor	Policy Studies Institute
Duncan Pullar	English Beef and Lamb Executive
Stephen Rossides	Agriculture and Horticulture Development Board
Nicholas Saphir	Omsco
Alison Spalding	Food Standards Agency
Alison Tedstone	Food Standards Agency

Appendix 2: participants in the roundtable meeting (28/06/09)

Roland Bonney	Food Animal Initiative
John Bourne	Defra
Peter Bradnock	British Poultry Council
Chris Brown	Asda
Helen Browning (chair)	Food Ethics Council
Fliss Cox	Kerry Foods
Andrew Curry	The Futures Company
Karen Dell	Food Standards Agency
Mark Driscoll	WWF-UK
Tara Garnett	Food Climate Research Network
Naomi Jefferies	HM Treasury
Bronwen Jones	Defra
Terry Jones	National Farmers' Union
Keith Kenny	McDonald's
Ed Komorowski	Dairy UK
Tom MacMillan	Food Ethics Council
Dean McKenna	McDonald's
Fergus McReynolds	Dairy UK
Robert Pickard	English Beef and Lamb Executive
Duncan Pullar	English Beef and Lamb Executive
Shivani Reddy	Sustainable Development Commission
Stephen Rossides	Agriculture and Horticulture Development Board
Nicholas Saphir	Omsco
Duncan Williamson	WWF-UK

Acknowledgements

We extend our thanks to all who took part in the interviews and roundtable meeting for this project (Appendices 1 and 2), and who contributed ideas by email. They offered many helpful insights but bear no responsibility for the contents of this report.

We are grateful to WWF-UK for commissioning this project.

About the Food Ethics Council

The Food Ethics Council provides independent advice on the ethics of food and farming. We:

- Help guide the way through difficult issues by analysing problems, challenging accepted opinion and creating a space for dialogue; and
- Build tools to put ethics at the heart of decisions about food in business, policy and civil society.

Our Council members include bioethicists and moral philosophers, farmers and food industry executives, scientists and sociologists, academics and authors. Our work has covered topics including the personalisation of public health, the control of food research, the use of veterinary drugs and the growing challenge of water scarcity.

Find out more about our work, including the members of the Council, our Business Forum, and our must-read magazine, *Food Ethics*, on our website at www.foodethicscouncil.org.

About WWF-UK

WWF's mission is to stop the degradation of the Earth's natural environment, and to build a future in which humans live in harmony with nature by:

- conserving the world's biological biodiversity
- ensuring that the use of natural resources is sustainable
- reducing pollution and wasteful consumption.

In January 2009, WWF-UK launched the One Planet Food programme, which aims to work collaboratively with other key stakeholders to reduce the environmental and social impacts of UK food consumption, and to begin building a sustainable 'One Planet' food system.

Further information

For further information about this report or the issues it discusses, contact:

Dr Tom MacMillan (Executive Director)

Food Ethics Council

39-41 Surrey Street

Brighton

BN1 3PB

United Kingdom

e: tom@foodethicscouncil.org

t: +44 (0)1273 766 654

To discuss the relevance of this report to WWF-UK's One Planet Food programme, please contact:

Mark Driscoll (Head of Sustainable Consumption Policy)

WWF-UK

Panda House

Weyside Park

Godalming

GU7 1XR

United Kingdom

e: mdriscoll@wwf.org.uk

t: +44 (0)7909 882892