



# Meat consumption

Trends and environmental implications

A report of the Business Forum  
meeting on 20th November 2007

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## Introduction

According to the UN Food and Agriculture Organisation, livestock account for 18 percent of global greenhouse gas emissions. Meat and dairy production also contributes to biodiversity loss and water scarcity. These pressures will grow as global meat demand rises.

The November meeting of the Food Ethics Council's Business Forum, chaired by Julia Hailes MBE, explored trends in meat production and consumption, their environmental implications, and opportunities to mitigate them.

We are very grateful to Tara Garnett, from the Food Climate Research Network, who spoke at the meeting. She led the discussion with a summary of her recent report *Meat and dairy production and consumption: exploring the livestock sector's contribution to the UK's greenhouse gas emissions and assessing what a less GHG intensive system of production and consumption might look like*.

This report outlines points raised during the meeting. It briefly reviews trends in the meat sector and their environmental implications, which are covered in detail in Tara Garnett's study. It then focuses on key points to consider in using this evidence to inform business, policy and consumer action to promote sustainable development.

We have not attributed points or included references. The report was prepared by Tom MacMillan. It does not represent the views of the Food Ethics Council, the Business Forum or their members.

## Key points

- Livestock contribute about **eight percent** of total greenhouse gas emissions from UK consumption. Meat accounts for more than **two-thirds** of that.
- UK **consumption** of poultry meat has doubled over the past 20 years, whereas red meat and pork has remained static. UK per capita consumption is well above the world average.
- Changes to production can increase efficiency and reduce emissions, but producers should be alert to potential **trade-offs** with other sustainability criteria and animal welfare.
- Policy makers are exploring the scope to reduce emissions by **reducing meat demand**. The economics of this are uncertain and, though potentially costly for UK meat producers, would not necessarily harm them.
- Initiatives to promote sustainable production and consumption must consider: (a) **differences** between livestock species, business models and production systems; (b) **opportunity costs** of sustainability strategies; (c) what foods we would **eat instead** if we ate less meat.
- Businesses should expect a range of public and private sector initiatives intended to improve the sustainability not only of specific products, but also of the **diet** that we produce, sell and eat.

## Footprint

Sir Nicholas Stern, government advisor on climate change economics, has called on the UK and other industrialised countries to cut greenhouse gas emissions by 80 percent by 2050. This would need major reductions across all sectors, hitting food heavily because it accounts for around a fifth of total UK emissions.

Livestock products are a big contributor to the UK's food footprint, at about eight percent of total UK greenhouse gas emissions. Meat accounts for well over two-thirds of that figure.

The main reason livestock account for a bigger part of our climate change footprint globally than in the UK is that, though people in poor countries eat less meat than people in the UK on average, their consumption of other greenhouse gas-intensive products is relatively much lower still.

Life Cycle Assessment (LCA) shows that most emissions are generated before the animals are slaughtered. The main sources include direct emissions from animals, particularly methane produced as they digest. Additional second order emissions come from producing inputs, such as clearing forest or making fertiliser to grow feed crops. Deforestation and the loss of carbon sequestration is not considered in standard LCA but is an important contributor to the much-quoted FAO figure of 18 percent. Transporting meat generally makes a small contribution to emissions.

## Trends

The UN projects global consumption and production to rise as population and incomes increase in poorer countries. By 2050, they expect meat demand to be twice the 229 million tonnes the world ate in 2000.

The UN projections illustrate the scale of environmental, social and economic challenges relating to meat, and forces that will shape the UK market. What will happen in reality may well be more complex than the projections allow.

With the exception of poultry meat, which has doubled over the past 20 years, UK consumption has remained more or less level. Population has grown by seven percent over the same period, implying a slight decline in per capita consumption. However, UK meat consumption is still high in global terms, and accounts for a substantial proportion of the country's total greenhouse gas emissions.

In acting on this evidence, it is important to consider the full range of supply-side and demand-side measures for mitigating climate change in the livestock sector, and key factors that affect the relationships between supply and demand.

## Supply

When it comes to climate change, animal feed is the most significant agricultural input to meat production. Depending on the type of animal and the production system, feeding regimes can include cereals, oilseeds and pasture.

Changing how animals are fed is one way to reduce the climate impact of meat production. Changes might include the balance between feeds that are by-products of food production for human consumption and others where the feed market directly drives emissions by encouraging deforestation or fertiliser use. For ruminants, the balance in the diet between feed concentrates and grazing affects emissions in several ways: feeding a high proportion of concentrates can reduce methane emissions from digestion and increase the ratio of feed that gets converted into meat; however, well-managed permanent pasture may sequester carbon.

Feeding regimes cannot be changed in isolation. They are tied to other aspects of farm management. The 'dual-use' of dairy cattle for beef production is a case in point. In general, the business model on which a farm is managed is more important in affecting how animals are reared and used than the breed of the animal. Nevertheless, breeds have been selected for their productivity within specific systems.

Defra's have contracted the Genesis Faraday partnership to evaluate the long term contribution of animal breeding to greenhouse gas reduction. One illustration of the difference breeding might make comes from comparing sheep and kangaroos – they graze alongside each other but the kangaroos have different gut flora and do not produce methane

Some measures to increase the greenhouse gas efficiency of meat production have

bad side-effects. Grazing on grass with a high sugar content reduces the biodiversity of pasture, for example. Other changes, for example to feeding regimes, may compromise animal welfare. Conversely, production systems that tap into a wide set of public values and aspirations, such as organic livestock husbandry, have mixed results on greenhouse gas efficiency.

A key issue for business and policy is how to avoid or negotiate such trade-offs in line with public opinion. When it comes to the behavioural freedom of animals, where are the lines we should not cross, even if doing so might reduce greenhouse gas emissions *and* improve scores on some animal welfare measures?

## Demand

The most obvious way of changing demand to reduce greenhouse gas emissions is to eat less meat. This could have additional benefits for public health. In any case, current levels of meat consumption in the UK provide us with much higher levels of protein than nutritionists recommend.

Eating less meat promises to reduce greenhouse gas emissions without the potential animal welfare or biodiversity trade-offs associated with some strategies for improving production efficiency. However, it raises other ethical and practical issues.

How much meat do we 'need' – enough to provide all our protein, whatever can be

produced from food waste and marginal land or none at all – and who decides? How would a needs-based approach work in practice, given that businesses respond to demand not need? Would it steamroll freedom of choice for producers and consumers?

UK producers might welcome a trend towards less meat consumption as long as it came hand-in-hand with higher prices and margins, supporting profit – eat less meat, but pay more for it. However, UK producers may be less well placed than others, for example in Brazil, to exploit higher prices, so marginal grazing land in the UK may fall into disuse. Moreover, if demand simply fell, so might prices. So a scenario that has demand fall and prices rise, yet that also ensures production is concentrated where it is best for the environment, implies producers are also responding to environmental price signals, such as a consumer premium for ‘environmental quality’ or carbon pricing for agriculture.

Even if we envisage that we will have to eat less meat in future, is a demand-side approach – exhorting consumers to eat less meat – the right way to go about it? Might it be better to ensure producers account for full environmental costs, whether for meat or any other product, and then let the marketplace respond? And what are the social implications? Higher meat prices would hit people on low incomes hardest, yet food poverty research emphasises that the cost of food is only one of many factors that affect how low-income households eat.

## Differences

The relationships between supply, demand and environmental consequences are complicated by a host of other factors. These include differences between livestock species and production systems. The impact on climate change of our meat eating depends which meat we eat and how it is produced.

Pigs and poultry (monogastrics) are quite different from cattle and sheep (ruminants). They digest food in different ways and monogastrics convert their food into meat at lower, more efficient, ratio. While it takes fewer direct emissions to produce a kilo of chicken than a kilo beef, ruminants have the advantage that grazing land can act as a carbon sink. Beef cattle, meanwhile, are managed differently from dairy cows with different implications for the environment.

It is crucial to recognise these differences. However, it is always possible to break down our environmental footprint to ever finer levels of detail. This should not distract from the big challenges we face, from the benefits of sectors working collectively to address them, or from our shared responsibilities.

We also need to see such differences not only in terms of climate change, but also against the backdrop of all the other implications of livestock farming. Consuming a higher ratio of white to red meat may result in fewer direct emissions per kilo of meat produced, yet it might also divert edible grain away from human consumption.

## Opportunity costs

A second complicating issue is the opportunity cost of meat production or of strategies intended to mitigate environmental consequences. If we did not use resources to produce meat, or to produce a particular kind of meat, what would we do with them instead?

Some resources might simply drop out of production. Marginal land might be abandoned, for example. However, this might not happen in ways that are optimal from an environmental point of view and may have negative side-effects, for example on rural livelihoods or landscape values.

So the balance of opportunity costs also depends on the non-food benefits of livestock production including to livelihoods, landscapes and the wildlife.

The opportunity costs of feed and inputs to feed production are complex. Cake based on oilseeds, for example, is sometimes classed as a byproduct of oilseed production for human consumption. However, feed production may in fact drive oilseed production because it accounts for around two-thirds of the economic value of soybeans.

We cannot assume that resources released from meat production will be used instead to produce food for direct human consumption. In practice, one of the key sectors competing for land and feed crops with livestock is bioenergy. The future direction of bioenergy markets and the policies around them is uncertain.

## Substitution and waste

Just as we need to consider how else we might use inputs to meat production, so we also need to think what we would eat instead of meat if we ate any less of it.

If we ate less meat our total food consumption might simply fall. But if we filled the gap it left in our diets with other foods, then these too would have emissions. Many other products have a lower environmental footprint than meat production and do not pose the same issues around animal welfare. However, some potential substitutes, such as fish or air-freighted vegetables, present difficult dilemmas of their own.

Cutting consumer waste, meanwhile, could see us produce less meat yet still eat the same amount. As the new WRAP campaign highlights, waste is an environmental problem in its own right and cutting waste also saves all the resources embodied in products that are not thrown away. However, we cannot assume that reducing waste would translate simply into reduced production.

Waste is linked to prices. Significant price inflation for beef and bacon has kept consumer waste down. Chicken, which has been getting cheaper, is a different story. Further price inflation is on the horizon and this can be expected to reduce consumer waste.

International markets for offal, carcasses and other byproducts of the meat eaten by UK consumers keep waste down within the supply chain. However, the level of supply chain waste is difficult to pin down. It depends in part on the role of products not-destined for human

consumption, such as pet food, in supporting meat production.

## Governance

While it can be helpful for businesses and policy makers to explore a range of consumption and production scenarios, it is also important to consider what mechanisms might in practice promote sustainable consumption and production. Policy cannot simply implement a particular scenario. Such mechanisms might include policy or regulatory measures yet also, crucially, private sector supply chain management. Supply chain management is crucial in passing incentives and pollution penalties between producers and consumers, and retail competition on environmental issues can also directly drive innovation.

For example, Wal-Mart has said it will use sustainability criteria to select its preferred suppliers. Missing are suitable sustainability criteria to use for such selection – there is currently little consensus on which production systems and practices perform best across an array of sustainability criteria. Introducing a wider range of sustainability criteria through an existing initiative such as GLOBALGAP, including nitrogen, methane and carbon dioxide emissions, might be one way forward.

Existing regulatory mechanisms, such as Integrated Pollution Prevention and Control, may also offer some scope for addressing a wider array of sustainability issues.

In order to address the risk of ‘pollution swapping’ – substituting cuts in emissions

of one greenhouse gas for growth in another – policy instruments such as carbon pricing may be needed to ensure that producers meet the environmental costs of production and can pass those down the supply chain. To take into account opportunity costs and substitution, such measures could not be confined to the livestock sector and would need an international reach. If we can introduce fiscal measures that control emissions from motor vehicles, that may also be feasible for agriculture.

Shoppers respond to price and so it is crucial to internalise environmental costs. However, governance mechanisms for addressing this issues are not limited to measures that impose new costs or regulations on producers. They also include creating incentives for sustainable consumption that can be passed up the supply chain. These might include strengthening the evidence behind products and brands that carry an environmental premium. In general, however, the sheer amount of information that shoppers are now faced with means that ‘choice editing’ may be preferable to introducing further labels – life’s complicated enough and people just want to buy their dinner!

Shoppers are most interested in the issues closest to them. If policies aim to reduce meat consumption, they may seek to tie in with public health messages around meat. One retailer’s bacon sales fell by 30 percent immediately following coverage of the World Cancer Research Fund report on diet and cancer.



## Closing thoughts

For producers and other small businesses in the livestock sector, a key challenge is to plan for supply-chain and policy initiatives to reduce emissions relating to meat and other livestock products. Strategies may include differentiating products or brands using robust sustainability claims, or diversifying into lower-impact business opportunities.

A major challenge for larger businesses is to get beyond the logic of supply-chain

efficiency to consider the performance of their portfolio of products and brands against sustainability criteria and wider ethical issues. Strategies for addressing this challenge may include product reformulation and new acquisitions, as well as further improvements in assurance.

## Speaker biographies



**Julia Hailes MBE** is a leading opinion former, consultant and speaker on social, environmental and ethical issues. She has worked with a number of blue chip companies, including British Airways, Procter & Gamble and Marks & Spencer. In 1987 she co-founded SustainAbility Ltd, a think tank and consultancy company, where she was a director until 1994, when she started working freelance from her home in Somerset. Julia is co-author of eight books, including the number one best-selling *Green consumer guide*, which sold over a million copies worldwide and *The new foods guide* published in 1999. *The new green consumer guide* was published in May 2007. She is a member of the Food Ethics Council. ([www.juliahailles.com](http://www.juliahailles.com)).



**Tara Garnett** is a research fellow at the University of Surrey. She researches the contribution that our food consumption makes to UK greenhouse gas emissions and the scope for reducing emissions. She looks both at the technological options for tackling food-related GHG emissions and at consumer behaviour around food, and how this might be influenced in more sustainable directions.

Tara also runs the Food Climate Research Network. This brings together over 600 individuals from across the food industry, NGOs, government and the research community to share information on issues relating to food and climate change. The Network is funded by the Engineering and Physical Sciences Research Council and is based at the University of Surrey's Centre for Environmental Strategy. Tara's latest paper for the Network, published this month, is *Meat and dairy production & consumption: Exploring the livestock sector's contribution to the UK's greenhouse gas emissions and assessing what less greenhouse gas intensive systems of production and consumption might look like*. The paper is available [www.fcrn.org.uk](http://www.fcrn.org.uk).

## About the Business Forum

Ethical questions around climate change, obesity and new technologies are becoming core concerns for food businesses. We have launched the Business Forum to help senior executives gain expert insights into the big issues of the day. Membership is by invitation only and is strictly limited.

Forum members set the meeting agenda. The outstanding speakers who have agreed to lead forum discussions include:

- **Sir Don Curry**, senior advisor on food and farming;
- **Will Hutton**, Chief Executive of The Work Foundation;
- **Paul Whitehouse**, Chair of the Gangmasters' Licensing Authority;
- **Stephen Joseph OBE**, Executive Director of Transport 2000;
- **Shaun Spiers**, Chief Executive of the Campaign to Protect Rural England; and
- **Professor Richard Jones**, author of *Soft Machines: Nanotechnology for Life*.

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