



Animal Source Foods, Food Security and Climate Change: Burden, Blessing or Both?

Workshop Held at LIDC on 12 June 2009

Purpose: The workshop, organized by LIDC and the Food Climate Research Network, University of Surrey, aimed to :

- Assess global and regional trends in livestock production and consumption
- Explore the nutritional and livelihoods role of livestock and animal-source foods today
- Examine, for different communities, the nutritional implications of potential measures that seek to reduce greenhouse gas emissions through limits on the production (and hence consumption) of animal source foods.

Presentations: see powerpoint presentations on the LIDC webpages and on the Food Climate Research Network website at www.fcrn.org.uk .

SESSION ONE: TRENDS IN LIVESTOCK PRODUCTION AND CONSUMPTION

1. Cees de Haan, Consultant, Livestock Development, Agriculture and Rural Development Department, World Bank, and an author of the 2006 FAO report '*Livestock's Long Shadow*' set the scene. He reviewed production and consumption trends for meat and dairy products in developed and developing countries and the demand and supply drivers; and identified the types of livestock systems found across the world, together with their implications for the three public goods of equity, environment and health. The negative environmental effects of increased livestock production and consumption he identified are:

- Land use and land use change: livestock rearing makes use of one third of arable land and contributes to 20 percent of rangeland degradation,
- Climate change: livestock account for 18 percent of anthropogenic GHG emissions
- Water use: livestock account for 15 percent of global agricultural water evapo-transpiration
- Bio-diversity threat: livestock threaten biological diversity in 306 of the 825 terrestrial eco-regions worldwide, while current farming trends are leading to the loss of domestic animal genetic resources

There are, however, some positive effects with respect to carbon sequestration, energy savings, and (through the use of manure) fertilizer savings.

The negative health effects of the livestock revolution are:

- zoonotic and potential pandemic diseases
- the contribution of animal source foods (ASF) to obesity and other food related health risks.

On the positive side, nutritionally, are (particularly for the developing world) the provision of critical nutrients to vulnerable groups, and the strong relationship between intake of animal source food and growth, cognitive behavior in children and reduced morbidity in pregnant and nursing women.

De Haan concluded that reduced consumption of ASF was unlikely in the developing world, and that to make it more sustainable would require the internalizing of externalities – which would result in higher prices. He said that we need to increase the share of the poor in the benefits of the Livestock Revolution. Smallholders are not generally benefiting from the Livestock Revolution, as shown by declines in numbers of smallholder poultry or dairy farmers in China, Brazil, and Thailand. But it is unclear whether this is a push effect or a pull effect. Our health and the health of the planet depend on pushing livestock production in more sustainable directions

2. Michael Appleby, Chief Scientific Advisor for the World Society for the Protection of Animals argued that animal welfare matters: to animals, to people and to the environment. He argued that we need sustainable livestock production that is economically, ecologically and ethically sound. Specific problems and their solutions depend on:

- The numbers of animals farmed
- The type of animals (ruminants vs others)
- Management: housing, feeding, manure treatment
- Processing and transport issues.

He argued that how animals are managed has a bearing on whether they make a positive or negative contribution to: climate change, hunger and poverty reduction, disaster management, human health and social development. He pointed out that the word ‘intensive’ covers a spectrum of different management systems and that in general systems at the ‘extreme’ – including those that are highly intensive and those that are very extensive pose the greatest potential problems for welfare.

SESSION TWO: THE CLIMATE AND NUTRITION BASICS

3. Tara Garnett, Food Climate Research Network, University of Surrey gave an overview of livestock and contribution to climate changing emissions. She highlighted that livestock bring benefits and disbenefits in a range of areas including: in nutrition, non-food products (leather, wool, traction power), soil carbon storage and losses, and resource efficiency (the consumption of byproducts), and pointed out plant based foods tend to have a lower GHG footprint. She argued that the projected doubling in meat and milk demand to 2050 is unsustainable. She summarised the various managerial and technological options that are being considered to reduce livestock emissions including: improving productivity (more milk or meat yield per animal) through breeding and feeding strategies; managing and building soil carbon; better management and treatment of manure; and improvements in farm energy efficiency. However, most approaches being taken are predicated on feeding cereals and proteins. It has also been suggested that we should switch to pork and poultry production (at the expense of ruminant production) on the grounds that the former convert feed to meat more efficiently and do not produce methane. However this approach is problematic since pigs and poultry are heavily cereal and soy dependent (producing a land use change effect). In addition, ruminants are well suited to the consumption of byproducts and, through grazing on pasture land, help lock carbon in the soil (although this effect is countered by overgrazing). In short, pigs and poultry aren’t ‘better’ than ruminants – different livestock types have different pros and cons. Her conclusions were that livestock’s environmental impacts are significant and trends show that the global impacts are set to grow. There are signs that NGOs, govt, industry are waking up to the issue but the current industry focus is on efficiency rather than integrating environmental and social concerns. Two approaches are possible in the context of 9 billion on the planet by 2050 – to put demand centre stage and maximize efficiency, or alternatively to live within ecological constraints.

4. Joe Millward, Professor of Human Nutrition at the University of Surrey, gave a nutritionist’s overview of animal source foods, illustrated from a UK diet perspective. After describing consumption patterns, energy intakes, UK recommendations, individual nutrients and their deficiencies, he concluded that:

Milk & dairy foods are a useful package of nutrients especially for growing children and the elderly. but

- Most of the global human population can't drink milk
- Milk is not recommended for infants <1 year old
- Current intakes may be in excess of that needed for optimal bone health
- Dairy foods provide the most potent hypercholesterolemic saturated fat, more so than meat
- Dairy products provide no clear benefit and represent a possible risk for cancer

Reductions in dairy food intake are unlikely to be detrimental for human health but questions remain about riboflavin, B12 and iodine nutrition.

For meat, epidemiological studies suggest an increased risk of colorectal cancer with increasing intakes of red and processed meat. A recent SACN report on iron concluded from their analysis of the evidence that "Overall, the available evidence suggests that red and processed meat intake is probably associated with increased colorectal cancer risk, but the effects of confounding cannot be excluded". Meat is the main source of haem iron and since most dietary iron is not absorbed, luminal exposure to excessive dietary iron may result in direct oxidative damage to the colorectal lumen. Also haem iron, but not inorganic iron, increases production of N-nitroso compounds in the lumen of the gastrointestinal tract which have been shown to be human and animal carcinogens. Higher concentrations of body iron may also increase cancer risk by increasing oxidative stress to cells and by providing iron for growth and replication of cancer cells.

- Reduced intakes of red/processed meat are a government recommendation in the recently published SACN report on iron.
- Reduced intakes of all meat could occur without appreciable nutritional risk although questions remain about zinc
- Although the SACN iron report has modelled the likely impact of reductions in red meat intake on iron status and iron-deficiency anaemia, showing no appreciable risk with reduced intakes, nutritional knowledge is not good enough to conduct comprehensive quantitative risk assessment on reduced meat or dairy intakes.

The demonstrable value to basic nutrition of increased consumption of animal sourced foods is limited to very particular circumstances. With the exception of chronic under-nutrition in populations consuming very poor diets, there is little justification for increasing animal source food production as a development and nutritional strategy. It is only necessary to ensure affordable access to ASFs by the poor.

Given the current state of nutritional knowledge it is not possible to make a conclusive recommendation as to what level of ASF in the diet is optimal. The context within which ASFs are consumed (ie. what else is being eaten, and the presence of otherwise of adequate sanitation) is critical to overall nutritional wellbeing.

SESSION THREE: THE ROLE OF LIVESTOCK, FOOD SECURITY, AND LIVELIHOODS

5. Nigel Poole, Centre for Development, Environment and Policy, School of Oriental and African Studies, University of London reviewed the livelihoods role of livestock for poor people. The poorest people live in rural areas of tropical developing countries, and most keep farm animals - cattle, buffalo, sheep, goats, pigs and poultry are among the most important assets of the poor and are the mainstays of their farming. Many other species are important to the very diverse production and ecological systems of developing countries. Livestock are a source of income, food and fertilizer, they sustain their livelihoods, assets, health and environments in very diverse ways. Livestock is one of the fastest growing sub-sectors in developing countries, where it often accounts for a third of agricultural GDP'. The demand for livestock foods in developing countries is projected to more than double over the next twenty years, and offers several hundred million people the opportunity to raise themselves out of absolute poverty; this will entail intensification of production. He gave examples from developing regions (Indonesia, Ethiopia, Laos, Peru) of the impact of the 'livestock revolution'. An understated use of livestock is for draught purposes and transport, which have a potentially

significant energy-saving function as well as substituting for animal traction for human power and 'drudgery'.

Socially and culturally there remains a fundamental difference in animal production between industrialized and traditional societies. In the latter:

- 'management is not directed towards maximum performance and short-term economic gain, but instead geared towards minimizing risks and ensuring long-term survival...
- animals represent not just a production factor, but form a part of the lifestyle and cultural identity of groups such as pastoralists. Livestock may have ritual and religious meaning and often figure as important items in social exchange and relationships...
- survival of humans and animals is still closely interlinked

Discussion points from Sessions 1, 2, and 3

1. Intensification doesn't necessarily lead to increased risk of zoonotic diseases – if intensive systems are well-managed they decrease disease risks. Many small farms aren't well-managed and may actually pose greater disease risks.

2. Improvements in technology, breeding and management could lead to a possible 50% reduction in livestock related GHG emissions on a per kg basis (or 30% by 2020). However, given current the anticipated doubling in demand and production by 2050, all these reductions will be negated. At the same time, globally the IPCC warns that we need to reduce global emissions by at least 50% and as much as 80% by 2050.

3. There is huge potential for increased production of ASF (e.g. milk yield) due to technological progress although such improvements are dependent on the breeding of animals that are inherently dependent on cereals, soy and other concentrates and we do not know what the knock on effects will be for animal welfare.

4. Other effects of disease threats on the wider economy, not just the food economy, must be taken into account e.g. losses to tourism caused by foot and mouth disease.

5. A combination of optimising efficiency while keeping within ecological and ethical constraints is needed.

6. Policymakers don't focus on livestock as a major cause of climate change because ASF consumption is deeply embedded culturally within societies. Also the agricultural lobby is politically strong. Even in the case of transport, which has long been acknowledged as a major global GHG contributor, the policy focus is still overwhelmingly on efficiency and decarbonisation (rather than reductions in demand). Awareness of livestock's contribution is more recent and the debate is still new.

7. The effects of urbanization will drive climate change more than expected.

8. Two and a half earths would be needed to accommodate all the people aspiring to live the current lifestyle of the developed world. This Malthusian view was disputed by optimists who maintained that technology such as genetic modification could enable the earth to cope.

SESSION FOUR: INTEGRATING CLIMATE CHANGE AND NUTRITIONAL POLICY –GENERAL DISCUSSION

Some specific action points and research questions were posed for discussion:

- What would be optimal intensification in the developing world (e.g. by animal, feed forage, breed, housing)?

- Where are the gaps in the evidence base needed to predict the nutritional roles and climate effects of livestock production?
- How might we start to develop policies that actively seek to combine GG mitigation with improvements in nutritional well-being?

Points made:

1. The FAO'S *Livestock's long shadow* report places too much emphasis on solutions arising from the livestock industry. Other fiscal and regulatory measures are needed, as is education and awareness raising.

2. A major question that needs addressing is 'How can livestock production be part of sustainable land use?' One view was that intensification is already happening, and the challenge will be how to manage it for least possible damage. Another view was that given the urgency of the climate change problem (and the need to reduce global GHG emissions by up to 80% globally by 2050) we cannot afford to take a fatalistic approach. We need a new vision of the role that livestock production and ASF consumption should play in a food secure sustainable world. This is a priority for Copenhagen. One useful research approach may be to examine what such a vision would look like.

3. We need to clarify further what is meant by 'intensification' – at the moment it means different things to different people. Intensification can mean further productivity increases and inputs to already highly intensive systems in the developed world – or it can mean improving the quality of forage grasses for undernourished goats in the developing world. The term is context dependent and we need to consider the merits (from animal welfare, GHG, and health perspectives) of intensifying based on what that context is. There is moreover no such thing as an *optimal* intensification- there will be specific scenarios for specific parts of developing world.

4. It was pointed out that the danger of focusing on efficiency as a goal in itself is that it drives increases in scale, producing a rebound effect. Intensification and large scale production tend to go hand in hand.

5. How can we ensure that livestock questions be taken more seriously by policymakers ? One approach would be to propose radical solutions– for example rationing, the removal of subsidies and legislation. The rationing approach may however risk alienating people to the extent that it is ultimately counterproductive. The removal of production subsidies would need to be balanced by payments for environmental subsidies (other wise subsidy removal simply triggers the development of large scale highly intensive systems).

6. Modelling studies would be needed to show the potential effects of different scenarios. Already the VLA and the LSHTM Climate Change study are using these approaches. Another radical way forward might be for the WHO to include environmental as well as health standards in their nutritional recommendations.

7. There do not appear to be any initiatives either in the developed or developing world that seek to develop nutrition-oriented agricultural policies. The focus of climate change mitigation activity in the developing world tends to be on adaptation rather than mitigation –there do not appear to be any agriculturally focused, mitigation-oriented initiatives.

8. The issue of land use rights, agreements and their relationship with environmental outcomes needs further exploration.

9. It was commented that currently about 95 percent of meat exports come from developed countries- but that we need to concentrate on supporting more local production and consumption , and a reduction in transport on oil-fuelled ships.