Livestock production and climate change

Submission to the UNFCCC Subsidiary Body for Science and Technological Advice (SBSTA) consultation on livestock and climate change from the World Society for the Protection of Animals

The World Society for the Protection of Animals (WSPA) seeks to create a world where animal welfare matters and animal cruelty ends. WSPA has offices in 16 countries worldwide. Our work on the ground is carried out with local partners for greatest effect, and we are active in more than 50 countries. We campaign effectively to combat the world's most intense and large-scale animal welfare issues, bringing about lasting change by:

- **helping people understand the critical importance of good animal welfare**
- **encouraging nations to commit to animal-friendly practices**
- **building the scientific case for the better treatment of animals**
- **encouraging a worldwide movement towards better animal welfare.**

WSPA submits two papers to the consultation: livestock production and climate change; and livestock production, climate change and disaster management.

1. Summary of recommendations

In light of the evidence presented below, the World Society for the Protection of Animals considers that any policy seeking to tackle greenhouse gas (GHG) emissions from agriculture must meet the triple test of being economically viable, ecologically sound and socially acceptable.

WSPA considers that a sustainable food production system which delivers environmental protection, reduces GHG emissions and ensures good animal welfare, public health and meat quality is possible. **Any mitigation of emissions from livestock must be based on high animal welfare standards to enhance the potential for reducing emissions.**

WSPA makes five recommendations for policy and its implementation and asks that these be included in the outcome of the UNFCCC Subsidiary Body for Science and Technological Advice (SBSTA) consultation on livestock and climate change:

1. Recognise the positive role livestock and animal welfare can have in achieving sustainable agriculture and incorporate specific and regionally-sensitive policies and measures to ensure that global food production is both humane and sustainable;
2. Use investment in research and development to promote and support humane, integrated livestock farming systems to ensure farmers' livelihoods and the climate resiliency of rural communities;
3. Phase out subsidies and public investment for unsustainable, intensive farming systems while providing support for farmers rearing livestock humanely and sustainably;
4. Recognise the importance of livestock in economic development and the role farm animals play in helping to lift people out of poverty and build sustainable livelihoods in developing countries;
5. Recognise and address the challenge of unsustainable demand for farm animal products.

2. Introduction

The world is facing major challenges, from feeding the growing population to tackling severe environmental crises including natural resource degradation and catastrophic climate change.

Most studies that address the future direction of the food system suggest that sustainable agriculture and food security must be key objectives of any global or national strategy. But, with just a few exceptions[1], they fail to grasp the huge significance of livestock production and consumption in achieving these goals. When livestock systems are referred to, the emphasis is often on the 'sustainable intensification' of industrial systems, which has major implications for the welfare of billions of animals, as well as the environment.

This submission examines livestock production in the context of climate change mitigation and analyses how farming solutions to environmental challenges can be both sustainable and humane. It demonstrates that environmental objectives can be met without jeopardising food security, while rearing animals in humane farming systems.

3. The scope of the challenge

Ongoing damage to the environment is seriously affecting the economic sectors that form the basis of our food supply (fisheries, agriculture, freshwater, forestry) and are a critical source of livelihoods for the poor. Already, 60 per cent of the world's major ecosystems – from soils, water, forests and fisheries – on which we depend have been degraded, polluted or used unsustainably.[2]

Climate change is the planet's biggest threat, affecting land and water availability and crop yields at a time when populations are rising fast, periodically causing food crises[3].

Globally, there is an urgent need to reduce the greenhouse gas (GHG) emissions that cause climate change by at least 80 per cent in wealthy countries and to protect the biodiversity which underpins food production.

4. How livestock production affects the environment

Measuring the emissions caused by the food supply system is difficult given the complexity and global nature of feed and food supply chains. Lifecycle analysis (LCA) results for GHG emissions measured by kilogram of output are often lower when output per animal is higher. This can be taken to suggest that intensive animal farming – which includes breeding for high yields, permanent indoor housing and concentrate feeding of animals – is the best way to reduce livestock emissions. However, this assessment is far too simplistic.

It fails to account for significant elements of the farming system, such as co-products (other products arising from the system of production). It also often ignores the most disturbing waste in industrial scale animal production systems, for example the killing at birth of offspring considered unsuitable for production, as seen in egg laying chicken production or some high yield dairy systems. Indeed, when taking into account all aspects of dairy production, including their fertility, productive lifespan and beef production from male dairy calves, evidence shows extensive systems have lower GHG emissions (see below).

When impacts are measured per hectare of land used, less intensive and organic methods often have a smaller environmental footprint. This is significant when assessing local impacts, such as biodiversity loss and water or soil pollution.

Effects on climate change

All food-producing agricultural activities generate GHG emissions, so the question is: how do we feed the growing population while minimising emissions?

According to the United Nations Environment Programme, when considering the entire food chain (including deforestation for grazing, forage production, and so on), meat production accounts for 18-25 per cent of the world's GHG emissions.[4] Left unchecked, animal production is predicted to account for 70 per cent of the sustainable level of all global GHG emissions by 2050.[5] This level of global consumption poses severe sustainability challenges.

Animal farming contributes to GHG emissions through several routes. The most significant are carbon dioxide from land use and its changes (32 per cent), nitrous oxide from manure and slurry (31 per cent) and methane from animal digestion (25 per cent).

Why animal welfare matters to climate change

As noted above, GHG emissions relate to different elements of livestock production. The health and productivity of animals and breeding herds (such as cattle and pigs) are an important factor.

Many studies confirm that animal health and welfare are integral to environmental sustainability. Breeding for health can create productivity and welfare benefits and result in lower emissions. Robust breeds of animals reared in extensive systems often have longer productive lifetimes and these systems often have lower reliance on fossil fuel and grain inputs.

Intensive 'high input, high output' systems that appear highly efficient at first glance are in fact energy and resource hungry. By focusing on high yields, these systems have unintended consequences, including shortening animals' productive lives and introducing massive waste, such as the breeding of surplus animals that are not seen as economically viable.

Therefore, climate mitigation proposals focused on simply increasing yield per animal can be counterproductive. Apparent increases in yield in high input systems may even be deceptive when the whole farm output is measured.

5. *What needs to happen now*

Method of production change: intensification is not the answer

Most climate-related and other environmental impacts of livestock production are closely related to the normal biological functions of animals (food intake, digestion and manure production). Any adaptation of their natural biological functioning has potentially significant impacts on animal welfare, The effects of any change for emissions may be limited, especially in countries where agricultural technology and breeding and feeding for high yield are already advanced. Most studies suggest the maximum reduction in emissions from livestock achievable affordably is around 20 per cent.[6 7] This is a small reduction, compared to the very large reductions of total GHG emissions – 80 per cent – that are needed in developed countries, compared to 1990 levels.

Intensification of livestock production is likely to exacerbate GHG emissions in a number of ways:

- Selection of animals for high yield is often directly associated with poor welfare which in itself can significantly contribute to increasing carbon emissions. Intensification of farming to increase, for instance, cow milk yield or pig litter size (frequency of births and piglet size), reduces the productive lifetimes of the animals through poor fertility, lameness and physical exhaustion.[8 9] In one study, a 9 per cent reduction in emission levels per kilo of milk was found when a lower yielding but longer living cow was used.[10] Therefore, GHGs can be generated unproductively on high yield livestock farms due to compromised animal health and poor survival rates.

- Feed production is the major environmental burden in poultry and egg production.[11] While some suggest intensive chicken systems have lower GHG emissions and a smaller environmental footprint per kilogram of output than free range systems, evidence from other studies suggests the opposite: higher welfare systems can decrease emissions while delivering good animal welfare and meat quality, issues not considered by basic GHG analysis.[12] Furthermore, pasture-based beef systems that use grass as food rather than grains and soy have the potential to produce sufficient yield while significantly reducing emissions from feed inputs, as well as reducing emissions from energy inputs used to power farm infrastructure.

- Industrial farming has still more consequences for GHG emissions: further intensification of global animal production would inevitably increase the amount of land converted to grow feed crops and so increase carbon emissions through land-use change.

Permanent indoor housing versus pasture based systems

There is an assumption that pasture-based and low input systems are inefficient. LCA studies of dairy farms are beginning to show that well-managed pasture-based farming, more consistent with the natural behaviour of cows, can be equally or more efficient than intensive milk production. Pasture-based systems can also utilise land otherwise unfit for food production.

Overall, there is increasing evidence that pasture-based systems can reduce GHG emissions through grassland's capacity for carbon storage (sequestration).

- Land and vegetation has the capacity to store carbon at different concentrations – when tropical forest is converted to cropland, two-thirds of its carbon stock is lost; conversely, if cropland is restored to grassland, carbon storage increases.[13]

- A 2009 study of New Zealand pasture-based dairy farms showed that the lowest input system was the most ecologically efficient.[14] Other studies have found a wide range of GHG emissions in both extensive and industrial farms, but discovered no statistical difference between emissions from the extensive organic and industrial intensive farm types[15 16], suggesting the perceived benefit of industrialisation for emissions is not grounded in fact.

- One study comparing beef systems initially showed that industrial feedlot finishing produced lower GHGs and other environmental implications per kilogram of meat. However, when carbon storage in grassland was taken into account, the results were reversed.[17]

- There are few studies available regarding pork, however organic and outdoor bred pig production[18] and semi-extensive indoor housing has been shown to reduce GHG emissions (per kilogram of meat produced) compared to conventional intensive production.

Climate adaptation in livestock

Climate change will have far-reaching consequences for dairy and meat production, especially in vulnerable parts of the world where it is vital for nutrition and livelihoods. The impact of climate change can heighten the vulnerability of livestock systems and exacerbate existing stresses upon them, such as drought. Ensuring good animal welfare will be paramount to addressing these challenges; breeds suited to the local environment are often more robust and resilient than industrially farmed breeds.[19]

Dietary shifts

Dietary shifts, especially in high income regions, could make a significant difference to emissions and other environmental impacts related to livestock production. Using a number of diet and livestock production scenarios, scientists in Sweden calculated the impacts of food production on land use and GHGs in 2030. They found that reducing meat consumption by 25 per cent in high income regions and reducing food waste would be more successful than intensifying livestock production in order to increase productivity per animal.[20]

Further analysis is needed to identify the best regional and global strategies for diet and what opportunities, costs and benefits could be derived from dietary shifts.

6. Recommendations

A sustainable food production system is possible – one which delivers environmental protection, reduces GHG emissions and ensures good animal welfare, public health and meat quality. **Any mitigation of emissions from livestock must be based on high animal welfare standards to enhance the potential for reducing emissions.**

WSPA believes that any policy seeking to tackle GHG emissions from agriculture must meet the triple test of being economically viable, ecologically sound and socially acceptable.

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5. Recognise and address the challenge of unsustainable demand for farm animal products.

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