River Court, Mill Lane, Godalming, Surrey, GU7 1EZ
T: +44 (0)1483 521 950 Email: compassion@ciwf.co.uk

Industrial livestock production: unsustainable and inhumane

Industrial production is *inherently* dependent on feeding cereals to animals

Industrial production is dependent on feeding substantial quantities of cereals and soy to animals. 60% of EU cereal production is used as animal feed.[i]

Feeding cereals to animals is inefficient as much of their food value is lost during conversion from plant to animal matter. Research shows that several kilos of cereals are needed to produce 1 kg of edible meat.[ii] The nutritional value consumed by animals in eating a given quantity of cereals is much greater than that delivered for humans by the resultant meat.[iii]

One study shows that for every 100 calories that we feed to animals in the form of crops, we receive on average just 30 calories in the form of meat and milk.[iv] A report by the UN Environment Programme goes further concluding that a kilo of cereals provides six times as many calories if eaten directly by people than if it is fed to livestock.[v] The FAO reports that grain-fed animals consume more human-edible protein than they provide, while extensively reared ruminants add to the supply of protein.[vi]

As a recent UN food security report put it, "*When livestock are raised in intensive systems, they convert carbohydrates and protein that might otherwise be eaten directly by humans and use them to produce a smaller quantity of energy and protein. In these situations, livestock can be said to reduce the food balance*".[vii]

Using cereals as animal feed is a wasteful use not just of these crops but of the scarce land, water and fossil fuel energy used to grow them. The UK Government's *Foresight* report stresses that, per calorie, grain-fed meat requires considerably more resources to produce than other food items.[viii]

The EU imports around 33 million tonnes of soy from South America per year.[ix] Almost all is used for animal feed. The production of soy for animal feed is a key factor driving deforestation in South America which entails massive biodiversity loss.[x]

Industrial livestock production's adverse impact on environment

Water pollution: The UN report *World economic and social survey 2011* states that "*Intensive livestock production is probably the largest sector-specific source of water pollution*".

The synthetic fertilisers used to grow feed crops contain high levels of nitrogen. Plants, however, only absorb about 50% of the nitrogen fertiliser applied to them. The concentrate feed given to industrially reared animals also contains high levels of nitrogen. Pigs assimilate just 30% and broiler chickens 45% of the nitrogen in their feed; the rest is excreted in their manure.[xi] The unabsorbed nitrogen is washed into rivers and lakes and leaches from the soil into groundwater, contaminating sources of drinking water and damaging aquatic and marine ecosystems.

New research concludes that "*Animal products from industrial systems generally consume and pollute more ground- and surface-water resources than animal products from grazing or mixed systems.*"[xii]

European Nitrogen Assessment 2011 (ENA): This study states that 75% of industrial production of reactive nitrogen (N_r) in Europe is used for fertiliser. It stresses that the primary use of N_r in crops is not directly to feed people but to feed livestock. The ENA states that "*Human use of livestock in Europe, and the consequent need for large amounts of animal feed, is therefore the dominant human driver altering the nitrogen cycle in Europe*".

The ENA describes the huge increase in N_r put into the environment as "*one of the major environmental challenges of the 21st century*". The ENA identifies five key threats associated with excess N_r in the environment: damage to water, soil, air (and hence human health), the greenhouse balance, and ecosystems and biodiversity.

Degradation of land: Worldwide the increasing demand for feed crops is leading to intensification of crop production. This has led to soil degradation as farmers abandon traditional, sustainable methods of ensuring soil quality such as grain-legume rotations, fallow periods and animal manure. The World Bank reports that "*Some sources suggest that globally 5 to 10 million hectares of agricultural land are being lost annually to severe degradation*".[xiii] The Commission points out that "*45% of European soils face problems of soil quality, evidenced by low levels of organic matter*".[xiv] In some countries irrigation is increasingly being used to boost feed crop yields. However, in the medium term irrigation leads to salinisation and hence to reduced soil fertility.

The growing demand for feed crops is also leading to an expansion of the land used for feed crop production. This pushes small farmers and pastoralists into forest and marginal lands. Deforestation results in biodiversity loss and substantial CO_2 emissions. Moreover, increased use of marginal land can lead to overgrazing and in arid areas to eventual desertification.

Biodiversity loss: The European Environment Agency has concluded that "*Biodiversity in agro-ecosystems is under considerable pressure as a result of intensified farming*".[xv] Intensive agriculture has played a major role in the decline in farmland birds, grassland butterflies and pollinators such as bees.[xvi] The contribution of livestock farming to the present global loss of biodiversity is estimated by a Dutch study to be around 30%.[xvii]

Industrial livestock production contributes to climate change

The clearing of forests or savannah to grow animal feed or for cattle rearing releases huge amounts of stored carbon into the atmosphere, thereby contributing to climate change. The FAO estimates that such land-use change is responsible for 34% of livestock-related greenhouse gas (GHG) emissions.[xviii] EU industrial animal production is a major contributor to these GHG emissions due to its substantial imports of soy for animal feed.

Feed crops are often grown intensively with the aid of synthetic nitrogen fertiliser. The manufacture of these fertilisers uses considerable amounts of fossil fuel which results in sizeable CO_2 emissions.[xix] In addition, the application of nitrogen fertiliser leads to substantial emissions of nitrous oxide, the most aggressive GHG.

Cattle and sheep emit methane. However, research shows that the carbon sequestering (storing) benefits of cattle kept on grassland can balance or even outweigh their methane emissions.[xx]

Health

The high levels of meat consumption that have been made possible by industrial farming are having an adverse impact on human health. Some meat and dairy products are high in saturated fat which increases the risk of heart disease, obesity and certain cancers.[xxi] Research published by the University of Cambridge in 2012 concludes that reduced consumption of red and processed meat would lead to reduced risks of heart disease, diabetes mellitus and colorectal cancer and also to reduced GHG emissions.[xxii] The

Foresight report points out that globally "*a billion people are substantially over-consuming, spawning a new public health epidemic involving chronic conditions such as type 2 diabetes and cardiovascular disease*".

Antibiotics are used regularly in industrial pig and poultry farms to forestall the diseases that would otherwise be inevitable in the crowded conditions. This irresponsible use of antibiotics in industrial farming has been a major factor leading to the emergence of bacteria that are resistant to some of the antibiotics used to treat serious human diseases.

Sustainable animal husbandry

The challenge of feeding the growing world population should be addressed in ways that respect animal welfare. Good standards of animal welfare should be included among the strategic objectives of EU food policy.

Further industrialisation of livestock production in Europe and globally is unsustainable as it will entail a substantial increase in demand for feed crops. This in turn will lead to expansion and intensification of feed crop production which will involve land degradation, increased use of artificial fertilisers, pollution and overuse of water, increased GHG emissions and loss of biodiversity. None of this is sustainable. The *Foresight* report concluded "*Demand for the most resource-intensive types of food must be contained*", adding that "*major increases in the consumption of meat, particularly grain-fed meat, would have serious implications for competition for land, water and other inputs*".

Referring to the need to feed over 9 billion people by 2050, the UN Environment Programme (UNEP) stresses that "*simply cranking up the fertilizer and pesticide-led production methods of the 20th Century is unlikely to address the challenge*" as it will increasingly undermine the critical natural inputs on which agriculture depends.[xxiii] We need to find ways of feeding ourselves that are more resource efficient and less damaging to the environment. This means (i) feeding animals in ways that do not involve giving them food that could be more efficiently eaten directly by humans and (ii) reducing the amount of food that is wasted.

UNEP has calculated that the cereals that, on a business-as-usual basis, are expected to be fed to livestock by 2050 could, if they were instead used to feed people directly, provide the necessary food energy for 3.6 billion people.[xxiv] We should avoid the excessive use of feed crops and instead put more emphasis on:

Raising animals on species-rich extensive pastures: These can support biodiversity, store carbon and reduce the use of nitrogen fertilisers by the incorporation into pasture of clover which fixes atmospheric nitrogen in the soil. The great strength of extensively reared cattle and sheep is that they convert grass into food that we can eat and are able to use land that is generally not suitable for other forms of food production.

Integrated crop/livestock production: The World Bank is extremely positive about the benefits of such mixed farming as crop residues and locally grown crops can be used to feed animals. Moreover, their manure, rather than being a pollutant, fertilises the land and improves soil quality.

Reducing food waste: The Commission's *Roadmap to a resource-efficient Europe* points out that in the EU we waste 90 million tonnes of food every year or 180 kg per person. This inevitably also means that huge amounts of the resources used in food production are used in vain. Reducing food waste would enable many more people to be fed. The waste that cannot be avoided should, subject to stringent safeguards, be fed to pigs and poultry replacing much of the cereal- and soy-based feed.

Benefits of reducing meat and dairy consumption

Several studies, including the *Foresight* report, suggest that a reduction in meat and dairy consumption in developed countries would result in improved human health and a reduced demand for grain. More crops would be needed for direct human consumption but this would be outweighed by reduced demand for feed crops. This would allow land to be farmed less intensively with reduced use of artificial fertilisers, reduced degradation of water, soil and air and lower use of water and energy as well as biodiversity gains.

A study published in *The Lancet* pointed out that reduced consumption of livestock products would both reduce GHG emissions and benefit public health. The study concluded that a 30% decrease in intake of saturated fats from animal sources in the UK could reduce the total burden from heart disease by 15%.[xxv] Presumably similar reductions could be achieved in other Member States. The lead author of the *European Nitrogen Assessment* has stressed the need "*to moderate Europeans' consumption of animal protein"* as this would reduce the quantity of crops that need to be grown thereby reducing nitrogen fertiliser inputs and the associated pollution.[xxvi]

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