

Food for thought: the real costs of intensive farming

Intensive industrial agriculture is at a crossroads. Trends in intensification and super-scale livestock units seem in conflict with the needs of healthier lifestyles. This article discusses the trends and issues and the alternatives.

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Cows belong in fields, or so said Compassion In World Farming (CIWF) in response to recent planning applications from Nocton Dairies Limited in Lincolnshire for a facility which would house over 8,000 cows in what would have been the largest dairy farm in the UK. The animals in this mega-dairy would have little or no access to the outdoors and would be fed on grain-based diets rather than grazing pasture. The application was recently withdrawn following local and national protests, however similar schemes are in the pipeline. A super-dairy housing 1,000 animals is in planning stages for Leighton in Powys and approval for a facility housing in excess of 20,000 pigs and piglets in Foston, Derbyshire has been sought by Midland Pig Producers. These proposals arguably herald the next stage in the intensification and industrialisation of UK farming and if these are allowed, it is more likely that others will follow. We are at a crossroads, and decisions at this stage, which either endorse or reject these farming models, could have significant implications for the future of farming.

However, the UK food production system is already heavily industrialised: according to CIWF over 90% of UK pigs (over 8 million animals) are kept indoors and an estimated 10% of the UK dairy herd (up to 200 000 animals) are kept in zero-grazing systems where they are housed for most or all of their lactation (which lasts for around 10 months) and are only allowed out to pasture during their dry period (around two months) if at all. This intensification is important because food production, and in particular intensive livestock operations, can have a significant impact on the local and global environment. Food production is estimated to contribute between 19%¹ and 31%² of the UK's consumption related greenhouse gas emissions, and the problems don't end there. A recent UK government report³ listed the problems associated with food production as including "soil loss due to erosion, loss of soil fertility, salination and other forms of degradation; rates of water extraction...over-fishing...and...heavy reliance on fossil fuel-derived energy for synthesis of nitrogen fertilisers and pesticides." Despite this, worldwide population growth and changes in diet mean that food demands are set to increase, and in particular demand for meat is expected to double by 2050. This leads some to argue that intensive factory farming is the only answer, but this could not be further from the truth. Any so-called efficiencies in such systems can only be achieved by ignoring or externalising the damage done to local and global environment, as well as human health and animal welfare.



There are over 30 million hens in the UK laying flock. Over 15 million are kept in cages. Around 800 million chickens are reared for slaughter each year in the UK, with over 600 million of these reared intensively in barren overcrowded conditions.

Photo: ADAS

The effects of intensive livestock farming on land use

Livestock production accounts for a large proportion of total food production based emissions: UK meat and dairy consumption is responsible for greenhouse gas (GHG) emissions of around 60 million tonnes CO₂ equivalent, equivalent to 38% of food's impact¹ and this figure could well be an underestimate because it does not take in to account land use change in other parts of the world to which UK meat consumption may be indirectly contributing. Cattle ranching is the main reason behind deforestation in the Amazon⁴ and after pastures, large areas of land are converted to grow crops such as soya which are used primarily as animal feed. Globally 94% of global soya production is fed to cattle, pigs and poultry, and 40% of cereals is used for livestock consumption. The effect of this land use change should also be included in the calculation of the consuming country's GHG emissions. As

well as increased emissions, widespread conversion of land to monoculture crops or cattle ranches can reduce biodiversity.

The effects of intensive livestock farming on water use

As well as their large carbon footprint, animal products also have a high water footprint. A water footprint attempts to describe the amount of water used to produce a given product, much like a carbon footprint.⁶ The concept is considerably less well developed than its carbon cousin and suffers from wide variability in calculation methods and therefore results, rendering individual values potentially unreliable. However, it can provide a valuable starting point for examining the degree to which water use is sustainable by examining the origins of water inputs. For example, in some systems crops are rain fed and this water would not have been put to some other use were those crops not present. However, some systems in water stressed regions can rely on artificial irrigation which reduces aquifer levels and uses water which may be required for cooking and drinking. The need to irrigate large areas of crop destined for animal feed can result in a relatively high water footprint for animal products, and the location of the crop or livestock operation can determine whether water use is sustainable.

As well as water use, waterways are often under threat from pollution. The livestock sector is the leading contributor to nitrogen pollution in the USA⁵ which is believed to damage ecosystems by reducing oxygen levels in waterways. The Mississippi drainage basin in the USA contains almost all of the US feed and livestock production⁵ and in 2001 more than 20,000 km² of the coastal waters had such low oxygen levels that shrimp and demersal fish could not survive. In Asia pig and poultry operations concentrated in coastal areas of China, Vietnam and Thailand are a major source of nutrient pollution in the South China Sea.⁴

The preceding sections have shown how current methods of livestock production are using increasing amounts of land and water, and producing increasing amounts of pollution in the form of greenhouse gas emissions and excess nitrogen. Can other, more sustainable sources of animal protein help to feed a growing population?

Fish: the (environmentally) healthy alternative?

Does replacing red meat with fish reduce our demands on the planet? Industrialisation and intensification are a problem for marine food production as much as for livestock and consumers rightly sought alternatives to wild caught fish in response to overfishing and marine habitat destruction. Farmed fish is often marketed as the eco alternative, so much so that aquaculture is now the fastest growing food production sector in the world⁷ but the industrial scale of some operations means that, like their land-based counterparts, so-called efficiencies are actually costing the earth.

The effects of intensive fish farming: pollution

Farmed fish operations can produce high levels of pollution due to the high stocking densities in some sea cages. Jeffrey Masson eloquently describes the incredible journeys undertaken by Pacific salmon during their lifetimes, and the

stark contrast to the life of an equivalent farmed fish: a typical sea cage measures 12 – 20 m² and can house between 5,000 and 7,000 salmon for between one and two years.⁸ These high densities increase risk of disease and parasites, so high levels of antibiotics and other drugs must be added to the cages. Dyes can also be added to colour the fish flesh. Open sea cages are open to the sea and these chemicals along with faecal matter can build up on the seabed below the cage if currents are insufficient to clear it although in either case, high levels of these chemicals are entering the marine ecosystem.⁸

The effects of intensive fishfarming: resource depletion

Systems continue to deplete wild marine resources by feeding wild caught fish to farmed fish (and farmed livestock for that matter) in the form of fishmeal and fish oil, which is favoured by farmers because it promotes growth and flavour. According to a study published in 2009, the average ratio is 0.63 (ie 1lb total species group biomass increase requires 0.63lb feed) which has reduced over time and reflects increased efficiency in conversion from fishmeal input to farmed fish output as a result of pressure to reduce.¹⁰ However, it indicates that fish farming is still a major consumer of wild caught fish (over 33 million tonnes of fish were farmed in 2008, according to FAO statistics⁹) and also hides substantial variability in the feed conversion ratios between different species, production systems and countries. Farmed Atlantic salmon for example have a feed conversion ratio of 5.0.¹⁰ Furthermore predators such as seals will try to bite at fish confined in sea cages, causing fish farmers to shoot thousands of dead seals a year. Other predators are killed by getting caught in the nets and drowning.

The effects of intensive fish farming: risks to wild fish populations

Escapes from fish farms are also a cause for concern as they can carry disease and parasites in to wild fish populations, outcompete them for scarce food resources and also reduce the wild population's genetic diversity by mating with wild fish. In Maine, USA it is estimated that 180,000 fish escape from salmon farms annually, around 100 times the number of wild Atlantic salmon found around New England.⁸ Figures from the Scottish government show that in the five years 2005-2009 over 1.5 million fish were reported escaped from fish farms.¹¹

So there are costs associated with current aquaculture methods, which may in some ways be all the more dangerous than those associated with land-based factory farming, because they are less visible and therefore less widely acknowledged, and because of the extremely rapid rise in the level of worldwide production. Factory farming must be stopped both on land and in the water.

An agricultural neo-Luddite revolution

Simon Fairlie's recent collection of essays on the role of livestock in a sustainable agricultural system examines how the land use requirements of various farming regimes, from vegan through to mixed arable-pastoral and from organic to intensive, chemical-based systems.¹² His conclusion is that animals have a valuable role to play in a balanced, sustainable farming system, but this is not a vindication of business as usual because he explicitly rejects meat and dairy in its intensive factory-farming

form. His vision of “default livestock farming” promotes production of meat, dairy and other animal products where they are a co-product of a mixed farming system. Animals should be kept to the extent that they make use of marginal and otherwise unproductive land, or consume “waste” products from other parts of the system (such as feeding swill to pigs – now illegal in the UK after the Foot and Mouth outbreak in 2001), and in this case their production is from an environmental point of view, benign or even, he argues, beneficial. However, intensive farming systems intended to meet soaring demand are not part of such a system. They compete with other products for land area by requiring large grain inputs rather than taking up outputs and by-products from other processes, and it is at this point that they can start to have a destabilising effect. A return to organic, mixed farming systems is needed and this will mean farming driven by resource availability rather than consumer demand.

Reducing farming intensity is crucial, and that means changing diets; eating more seasonally, locally produced food and also consuming less meat. It will be possible to feed the predicted human population in 2050 humanely and sustainably if the major meat consuming nations reduce their consumption.² Even in the UK, evidence shows that we can produce sufficient food for ourselves under an organic regime, if we fit our diet to the produce available.

Lifestyle choices

Eating less meat: This simple act confers multiple benefits to individuals through better health; to society through lower public health costs; to animals through higher welfare standards; and to the planet by reducing or removing all the examples of environmental degradation discussed here. As a benchmark, even Simon Fairlie and his defence of the carnivore, reports that he eats meat twice a week. Try Meat-free Mondays¹³ or *New York Times* food writer Mark Bittman’s VB6 philosophy (vegan before 6pm – eat a vegan diet all day and then anything you like for dinner) to get started.¹⁴ Many meat-based recipes and dishes are easily adapted, and there are countless dedicated vegetarian and vegan recipes, recipe books and websites available for further inspiration.

Nutritionally sound diets: A common concern is that a diet without meat/fish protein cannot be nutritionally complete, and whilst it is certainly true in poorer societies where there are serious problems of malnutrition, that meals which are largely grain or tuber based can be nutritionally boosted by the addition of a small quantity of meat, this is absolutely not the case in the UK or any of the other rich nations currently experiencing the public health epidemic euphemistically referred to as “over-nutrition”. When a nutritionally adequate range of plant-based foods is available, high levels of fat and calorie-rich animal products can actually be disadvantageous.

Know your labels: Food producers know that there is a lot of mileage in convincing consumers that they have some animal- or environmental-welfare credentials, but the array of labelling schemes and the lack of regulation mean that some expressions mean more than others. See the table below for some examples:

Label	Background	What it means	What it doesn’t mean
‘Organic’	Six separate bodies in the UK can certify food as organic, to at least an EU minimum standard. Some bodies impose greater requirements.	No synthetic fertilisers Avoid pesticides All animals are free range Restricted antibiotic use No growth hormones No GM.	Local Low air miles Sourced from small producers Minimal packaging
‘Conservation Grade’	UK-based scheme under which farmers must set aside 10% of their land to create habitats for wildlife	Preserves natural habitat Fewer pesticides UK production	Organic Pesticide free Minimal packaging
Marine Stewardship Council	The is one of the leading certification schemes promoting sustainable fisheries.	Sustainably managed fisheries Attempts to re-establish endangered species Best practice in catching fish	Sustainable practices used after the fish are caught Farmed fish excluded Fish never taken from depleted stocks Fair access to certification for small-scale fishermen
Freedom Food	RSPCA certification for eggs, dairy, meat, poultry and salmon products.	Welfare standards may be above minimum No battery cages for hens	Free range/ access to outdoors High environmental standards on farms No mutilations (tail docking or beak trimming) Animals fed natural diets Organic
Red Tractor	Use of this logo is granted by the Assured Food Standards, an umbrella group representing the National Farmers Union, the Meat and Livestock Commission, Dairy UK and the British Retail Consortium. A British flag in the logo denotes products produced, processed and packed in the UK.	Food produced to a minimum UK/European standard	Not intensively reared Outdoor access for animals No mutilations No GM No growth promoters Locally grown ingredients Organic

Table information adapted from *Decoding the Label*.¹⁵

Now is the time to stand up to the threat of a factory farm invasion, and abstaining is not an option because we all make a choice about the sort of food system we want (at least) three times a day. Eating is a political and moral act and it’s time to vote with your fork!

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