What’s feeding our food?

The environmental and social impacts of the livestock sector

Friends of the Earth December 2008
“Livestock’s contribution to environmental problems is on a massive scale.”

UN Food and Agriculture Organisation 2006
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The global food supply is under increasing scrutiny. Climate change, volatility in the cost of staple foods such as rice and grain, and fluctuations in oil prices have exposed vulnerabilities in a system that is failing to feed some of the poorest people around the world.

Our globalised food system is failing fundamentally. It requires ever-growing quantities of land, water, energy and chemical inputs to produce the food we eat. This is particularly true of intensive livestock production.

Animals in factory farms in the UK and Europe have been bred to require high levels of protein to fuel fast growth and high yields of meat, dairy and eggs. This industry is increasingly global. Even though bacon, burgers, milk and cheese may be produced in the UK, most will have come from animals fed on crops grown on the other side of the world - many of the damaging impacts of mass livestock production are being exported.

According to the UN’s Food and Agriculture Organisation (FAO), the livestock sector “emerges as one of the top two or three most serious contributors to the most serious environmental problems, at every scale from local to global”. In fact it is responsible for 18 per cent of global greenhouse gas emissions. Great swathes of Latin America have been given over to growing soy, which is shipped around the world to be used in animal feed as cheap protein for chicken, pigs and cattle.

Beef raised on cattle ranches in highly biodiverse areas of the Amazon, Cerrado grasslands and Chaco habitats is shipped to Europe and Britain to put meat on our plates. Increasing quantities of chicken and pork are also being imported. As forests and other precious wildlife habitats are destroyed to make way for crops for animal feed and pasture for grazing, indigenous people also lose their territories. Rural communities are being forced off their land, and small scale farmers have nowhere to grow the food they need for their families.

Latin America is a major player in the livestock market. Brazil is responsible for almost a third of global beef exports and 40 per cent of exported chicken. The country is also the second largest exporter of soy after the USA, followed by Argentina and Paraguay. The vast majority of soy grown worldwide is used for animal feed.

This global system is not working for farmers in the UK. With commodity price rises, farmers have seen the cost of animal feed and other inputs increase. The price of fertiliser grew by 156 per cent in the last year. The cost of chicken feed has risen by £80/tonne in the same period. The UK pork sector has already seen its market share shrink as a result, and pig farmers have been hit by volatile feed costs.

Growth in demand for livestock products is set to continue, leading to the conversion of more and more land for crops and grazing, further exacerbating the associated impacts. The developing biofuels market adds to the demand for land.

- This report gives a detailed account of the environmental and social impacts of the current system of producing meat and animal products, in particular from the UK’s reliance on imported soy for animal feed.
- It uncovers the interdependence between intensive livestock farming in the UK and Europe and soy production in Latin America, and investigates the role of agribusiness, global finance and agricultural policies in driving this system.
- It makes the case for an urgent overhaul of the current model, and proposes policy changes in the UK and Europe to help create a sustainable and equitable livestock system for farmers, consumers and the environment.
Cattle ranch in Mexico
Livestock uses 70 per cent of all available agricultural land, and uses 8 per cent of the global human water supply.

Global intensive livestock production has a high environmental price. Rearing animals for food uses large areas of agricultural land, vast quantities of water and significant amounts of energy. It is a cause of deforestation and land use change, generating greenhouse gas emissions and destroying valuable carbon sinks and wildlife habitat. The livestock industry is also a significant source of pollution. Livestock already uses 70 per cent of all available agricultural land, and uses 8 per cent of the global human water supply.

Livestock’s contribution to climate change is greater than that of transport. It is responsible for 18 per cent of global greenhouse gas emissions – including 9 per cent of anthropogenic global carbon dioxide (CO₂) emissions and 37 per cent of anthropogenic methane.

Fattening a cow
1 kg of intensively-reared beef requires up to 10 kg of animal feed and 15,500 litres of water. It produces as much pollution as driving for three hours while leaving the lights switched on at home.

The global spread of intensive farming has led to a major increase in the use of high protein animal feeds, comprising cereals and vegetable proteins such as soy. In fact, 97 per cent of the soymeal produced worldwide is used for animal feed, and with demand set to double by 2050, more and more land is being turned over to feeding livestock.

Land conversion
Land for grazing covers more than a quarter of the planet’s available ice-free surface. An average of 6 million hectares of forest – an area twice the size of Belgium – and 7 million hectares of other land have been converted to agriculture every year for the last 40 years.

This massive demand for land has been heightened by the growing biofuel market – soy is used to make biodiesel, while sugarcane is the main source of ethanol. Government figures show that soy, partially sourced from Brazil, was the main source of biodiesel in the UK following the introduction of the Renewable Fuel Obligation (April - May 2008).

Latin America’s growing agro-industry has led to new roads and waterways being built to transport soy, increasing access to remote areas, often at the expense of natural habitats and communities.
“Livestock impacts on ecosystem goods and services are largely negative, through impacts such as deforestation nutrient overloading, greenhouse gas emissions, nutrient depletion of grazing areas, dryland degradation from overgrazing, dust formation, and bush encroachment.”

Millennium Ecosystem Assessment 2005

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**Cattle ranching in Latin America**

Cattle ranching is big business in Brazil. With 204 million cattle, the country is the world’s largest exporter of beef, producing 7.6 million tonnes in 2003. Exports of leather goods, predominantly shoes, are also growing. Brazilian beef cattle are almost entirely fed on pasture, with some 86 per cent of Brazilian agricultural land used for grazing. This recent expansion has been primarily on forest land which has been cleared to make way for pasture. Land in the Amazon is cheap and provides good quality pasture. Cattle ranching in Mato Grosso traditionally takes place on the Cerrado (savannah) grasslands. But this land is increasingly being converted to arable land for soy, pushing cattle ranchers into the forest, which provides nutrient-rich soil and high quality pasture for cattle rearing. Brazilian beef accounts for 13 per cent of the UK’s total beef imports or 4 per cent of all beef consumed in the UK.
Changes in the way that land is used affects biodiversity as plants and animals lose their natural habitats. Such changes also release huge quantities of carbon dioxide, contributing to climate change.

Land use change – from forest to farmland – also affects the water cycle. Stripped of its vegetation, the soil holds less water and is more vulnerable to erosion as it drains away.

Soy cultivation itself uses fertilisers and pesticides that pollute the soil and ground water. Genetically modified (GM) soy requires an even more intensive chemical regime – almost all soy grown in Argentina and Paraguay is GM.

Agricultural expansion in Latin America
Soy production in Latin America has more than doubled in the last 15 years. This rapid expansion is driving the conversion of forests and grasslands to cropland and grazing, devastating vast areas of wildlife habitat with wide-ranging effects on the global environment. It is estimated that a further 100 million hectares of pasture could be converted for crop land in Brazil alone. Cattle farmers, displaced by the expansion of soy, have sought out new land, burning undergrowth to clear areas that were once covered by forest.
Soy expansion has had dramatic effects on rural life, as well as impacting on other areas of agriculture. Many small-scale farmers have been priced off their land or forced to sell to bigger producers, losing their homes and their livelihoods. Rural unemployment has increased as large scale soy farms need little labour. As a result, many rural labourers have migrated to the cities to look for work.

Intensive livestock farms in Europe are a major destination for Latin American soy exports. Agricultural policies and trade agreements with the United States mean that Europe grows few crops for animal protein and now depends on imports for animal feed.
Brazil is the second largest global producer of soybeans after the United States, followed by Argentina and then Paraguay. Production is increasing in all three countries, with a 170 per cent increase in Brazil in the last 15 years. Within Brazil, soy production is concentrated in the state of Mato Grosso (27 per cent), Paraná (22 per cent), Rio Grande do Sul (15 per cent) and Mato Grosso do Sul (12 per cent).

Recent expansion has been concentrated in Mato Grosso, Paraná and Goiás – with half of the growth in Mato Grosso and Goiás at the expense of natural habitat. Mato Grosso forms part of the Amazon region, with forest covering more than half of its total land area. Cerrado (savannah) covers most of the remaining territory. More than half of Brazil’s soy production is in the centre and south of the state on land that was once covered by Cerrado. A study of the displacement impacts of soy expansion in Mato Grosso found that for every four hectares of soy planted, five hectares of natural habitat were destroyed.

Around 92 per cent of the Atlantic Forest’s amphibians are unique to the area.
Biodiversity in the Atlantic Forest
The Atlantic Rainforest is one of the world’s most biodiverse ecosystems, classified as a biodiversity hotspot. It extends from Brazil’s Atlantic coast, inland to Paraguay and into Argentina. It now covers less than 10 per cent of its original area.
The rainforest is home to around 8,000 unique plant species and more than 20 critically endangered species, including the eskimo curlew, white-collared kite, the black-faced lion tamarin and the leatherback and hawksbill sea turtles. Approximately 92 per cent of the forest’s amphibians are unique to the area.
There are fears that soy expansion in the Atlantic Forest could destroy another 1.5 million hectares by 2020.

The Atlantic Forest boasts 20,000 plant species. Yet less than 10 per cent of the forest remains.
Biodiversity in the Amazon
The Amazon rainforest is the world’s largest tropical forest extending across Brazil, Peru, Columbia, Venezuela, Ecuador, Bolivia, Guyana, Suriname and French Guiana. The Amazon is one of the world’s most biodiverse regions comprising a mosaic of ecosystems and vegetation types including rainforests, seasonal and deciduous forests. It is home to almost a third of the world’s known species, with more than 1,300 species of bird alone. These include the toucan, the harpy eagle and more than 300 species of hummingbirds. There are 3,000 fishes and over 100,000 types of invertebrates. Many of these species are only found in Brazil, including the critically endangered black-faced lion tamarin, the buffy-headed marmoset and the maned three-toed sloth. The forest is also home to around 220 groups of indigenous people who have lived in the Amazon for thousands of years.

It is estimated that a further 9.6 million hectares of Cerrado could be lost to soy expansion by 2020.

By 2005 over 6 million hectares had been converted to soy within the legal boundaries of the Amazon. Vast areas of the Amazon have also been cleared to raise cattle, causing much greater indirect impacts due to ranching and slash and burn farmers. The recent soy price boom has also fuelled an increase in deforestation, with more than 3,000 square miles of forest cleared between August 2007 and August 2008 alone. If current trends continue, cattle ranchers and soy farmers alone will destroy 40 per cent of Amazon rainforest by 2050.

Brazil’s forests play a crucial role in the fight against dangerous climate change, storing carbon dioxide which is released when the forest is cleared. Continuing deforestation at the present rate will make it all but impossible to bring greenhouse gas emissions under control.

Biodiversity in the Cerrado
The Cerrado is one of the largest and most biodiverse savannah areas in the world covering an area the size of Western Europe. Its unique habitat is made up of large stretches of grassland, scrub and areas of woodland which run alongside river banks. It is internationally recognised as a biodiversity hotspot – an area that is home to a large number of unique species, and which has already lost more than 70 per cent of its original natural vegetation.

The Cerrado is home to 40 per cent of Brazil’s mammals, reptiles and fish, including a number of endangered species, such as the giant armadillo, the giant otter and the hyacinth macaw. It also provides a habitat for at risk species such as jaguars, maned wolves and ocelots.
Bolivia

Bolivia is not a major global exporter of soy, but plantations have expanded into the country as a result of state and World Bank funding. Soy covered 950,000 hectares in 2006 and plantations are now moving into the Chiquitano forest region, which has been described as one of the largest remaining tracts of “relatively undisturbed tall dry forest in the Neotropics, if not the entire world.” The area provides habitat to vulnerable species including the jaguar, maned wolf, ocelot and spider monkey.

Uruguay

The soy industry is moving into Uruguay, where plantations are concentrated primarily on the west coast – a number of these are owned by Argentine soy farmers who are attracted by Uruguay’s tax regime. The country produced 460,000 tonnes of soy beans in 2005. As more and more land is converted to soy, local food production is reduced. As plantations move into the Sauce region in which fruit and vegetables are grown for the capital, organic farmers and market gardeners are concerned about pollution from the soy fields and the effects of GM soy.

EU efforts to tackle deforestation

The European Union (EU) has put forward proposals to stop global deforestation by 2030 and to halve tropical deforestation by 2020. The EU believes that a Global Forest Carbon Mechanism, operated as part of the United Nations Framework Convention on Climate Change’s (UNFCCC) mitigation measures, will help reduce deforestation by providing a financial reward for retaining forests. It also wants European timber suppliers to seek guarantees that the timber they sell has not been sourced illegally. It has proposed further studies of the links between deforestation and the imports of non-timber products like soy.

If current trends continue, cattle ranchers and soy farmers alone will destroy 40 per cent of Amazon rainforest by 2050.
1 IMPACTS OF THE LIVESTOCK SECTOR

Local environmental impacts

Damaging soil
The soil on soy plantations is exposed to wind and rain and therefore vulnerable to erosion. Brazil loses 55 million tonnes of soil through erosion each year. As much as 8 tonnes per hectare is lost in the soy fields of the Chaco. Intensive farming methods deplete the soil’s nutrients and require fertiliser to compensate.

Water use and water pollution
Soy plantations need water and can be irrigated to boost yields. Irrigated crops can even provide three rather than two harvests a year. Recent dry years in Paraguay and Brazil have led to smaller than expected harvests. Although Brazil is rich in terms of its water supply, 40 million Brazilian families do not have access to supplies of clean drinking water and parts of the country have suffered severe drought in recent years.

Water supplies in the soy-producing areas are contaminated with the chemicals used by soy growers. Large quantities of mineral fertilisers are needed to compensate for the degraded soil, causing excess nutrients to build up in the soil and in the water, alongside a cocktail of pesticide residues.

The FAO estimates that 7 per cent of global human water use is for growing feed crops for livestock.

Pesticide pollution
Much of the soy in Latin America is grown from Monsanto’s Roundup Ready genetically modified (GM) seed, prompting growers to use even more intensive farming methods. Roundup Ready soy is genetically modified to tolerate Monsanto’s Roundup (glyphosate) herbicide, but reliance on this technology has led to the emergence of herbicide-tolerant weeds. As a result, increased quantities of Roundup, as well as older and more damaging herbicides like 2,4-D and Paraquat, have to be used.

GM soy accounts for 98 per cent of the soy harvest for Argentina and 90 per cent in Paraguay. GM crops have been introduced more slowly in Brazil and some restrictions exist in the Amazon region. It is estimated that around 50 per cent of the Brazilian crop is still non-GM.

Glyphosate has become a major source of pollution which contaminates surface water and aquifers, threatens human health and kills other vegetation. It is sprayed onto crops from huge spraying tractors or from the air. Farmers in neighbouring fields report that the spraying destroys their crops and some have reported poisoned livestock.

Few insects or other wildlife live on soy plantations, making the plants vulnerable to pests and increasingly reliant on pesticides.

In Paraguay, laws requiring soy farmers to plant buffer zones of native vegetation around fields to help protect neighbouring communities are routinely flouted. If any trees are planted at all, they tend to be
non-native eucalyptus or pine trees. The livestock sector is a huge contributor to climate change, generating significant emissions of carbon dioxide, methane and nitrous oxide throughout the production process.

The conversion of forest and grassland to cropland emits stored carbon and reduces the global capacity for absorbing carbon dioxide. Globally, this land-use change set in motion by livestock farming leads to the release of 2.4 billion tonnes of carbon dioxide a year – equivalent to around 6 per cent of global greenhouse emissions.\(^6\)

The manufacture of animal feed is also a major source of emissions through fertiliser production and from processing. Soy is a particularly energy-intensive crop because of the process used to extract oil from the bean.\(^7\)

Methane emissions from livestock contribute around 6 per cent of global greenhouse gas emissions.\(^8\) Cows, sheep and goats emit methane through the digestive process (enteric fermentation), while manure is also high in methane.

As meat and dairy consumption increases, methane emissions are predicted to rise by up to 60 per cent by 2030.\(^9\)

Livestock also generates nitrous oxide emissions from fertilisers, crop waste and the intensive storage systems used for animal waste. This contributes around 6 per cent to total greenhouse gas emissions.\(^10\)
1 IMPACTS OF THE LIVESTOCK SECTOR

Greenhouse gas emissions from soy
Livestock is responsible for 18 per cent of global greenhouse gas emissions.\(^{24}\)
The production of animal feed from soy generates greenhouse gas emissions both at the cultivation and the processing stage.
Soy is a nitrogen-fixing plant, which means it stabilises nitrogen in the soil. But after harvest, nitrogen can be released, producing nitrous oxide (N\(_2\)O) as the plants rot in the soil. Argentina lists soy as a source of greenhouse gas emissions in its report to the United Nations Framework Convention on Climate Change\(^{25}\) after studies showed that plantations increase the country’s emissions of N\(_2\)O. Nitrous oxide is a potent greenhouse gas, but nitrogen also plays a crucial role in the Earth’s living systems through the nitrogen cycle. Nothing can grow without nitrogen but too much stimulates excessive growth, which poisons water courses through eutrophication.\(^{26}\)
Once soybeans have been harvested they are processed to extract the soy oil and the soybean meal. This is an energy-intensive chemical process that was found to be the most significant source of CO\(_2\) emissions\(^{27}\) during a study of energy use in Minnesota, United States.

Energy use
Energy use continues at practically every step of the livestock chain, from feed crop to the fridge. Rearing, slaughter, processing and storage all require energy, as does the transport involved at each stage.\(^{28}\) Once meat has been eaten, its packaging and the uneaten elements are transported and treated, generating further CO\(_2\), methane and nitrous oxide.

In the UK, 18 per cent of greenhouse gas emissions come from food production and consumption.\(^{29}\)

Emissions from agriculture have stabilised within Europe, mainly as a result of reduced fertiliser use. But with large quantities of feed crops and food now imported from Latin America, much of Europe’s greenhouse gas emissions from livestock have effectively been exported rather than reduced.

A recent study by the Tyndall Centre for Climate Change Research highlighted how levels of deforestation and greenhouse gas emissions from food production affect our potential to meet carbon reduction targets elsewhere in the economy. The study found that even if emissions from food production were halved by 2050, and if 70 to 80 per cent of the current forest carbon was preserved, global emissions from other sectors would need to peak by 2015 and then decrease by up to 6.5 per cent a year if there was to be any chance of avoiding dangerous climate change by limiting the temperature rise to 2°C.\(^{30}\)

Placio Duarte, from Organización Campesina del Norte, stands in his brother’s small farm next to an exposed soy field in the state of Concepcion, Paraguay.
Three out of four soy farms in Paraguay are owned by foreign landowners.

**Unemployment and land ownership**
The majority of soy plantations are owned by large landowners and multinational companies and can cover up to 50,000 hectares. Large-scale soy production is highly mechanised and very profitable. The planting and harvesting is carried out by machines, meaning few people are employed – a mechanised farm has an average of one employee per 200 hectares.

This has had a dramatic impact on rural populations in soy-growing areas. Small landowners, who find soy production is not viable on a small scale, are displaced by the bigger producers, while campesinos (people who live and work in the countryside) are left unemployed. Many have been forced off their land and thousands of others have left rural areas to look for work in the cities.

Around 80 per cent of Paraguay’s soy is destined for export due to the export-orientated agriculture model introduced in the country in the 1960s. This has encouraged companies to develop large-scale soy farms, often ignoring the rights of the rural poor.

There are around 1.5 million small farmers in Paraguay, yet 70 per cent of the land is owned by just 2 per cent of the country’s landowners. The vast majority of the rural population does not own land and lives in extreme poverty. Only 15 per cent of this population has access to safe drinking water and 42 per cent to medical care.

Many soy developers in Paraguay are from abroad, particularly Brazil, attracted by cheap land prices and easy profits. Indigenous communities, whose traditional land rights are not always recognised or respected, have seen their lands and way of life destroyed by the spread of soy.

The growing demand for land has led to conflicts across the soy-growing region, with reports of violent attacks on rural communities. A large number of communities have been forcibly evicted from their homes and their houses burnt, often in the middle of the night. The Paraguayan police and security forces have been accused of operating death squads, with at least 18 rural leaders killed.

Paraguay’s new president, Fernando Lugo, elected in 2008, has promised support for small farmers through land reform, but will have to fight his way through a corrupt system to achieve this.

**Slavery**
Soy producers in Brazil have been found to use slave labour to clear forest land to make way for soy plantations. In 2004, the government intervened and found 1,012 slaves on farms in Mato Grasso, some of whom were children.

Workers clearing the land are paid minimal wages and, in some cases, they are forced to work for free at gunpoint in return for food provided by the companies. Anyone trying to escape is shot or punished. Hundreds of reports of slavery at soy companies are being investigated by the Brazilian Ministry of Labour.
Health impacts of pesticides
Once the plantations have been established, surrounding communities are at risk from the pesticides and herbicides mechanically sprayed on the soy crops. In the Brazilian state of Piauí there were 65 reports of poisoning during 2005, 15 of which were fatal.31

Killed by pesticides in Paraguay
In 2003, Silvino Talavera, an 11-year-old boy in Paraguay, died after a tractor spraying chemicals on a soy field failed to see him in its path. His two sisters were also hospitalised, but survived. Supported by CONAMURI, a peasant and indigenous women’s organisation, the boy’s mother took legal action to seek justice for the murder of her son. As a result, the family were repeatedly threatened, their animals killed and farmland sabotaged.

Silvino’s older brother, a member of the National Peasant Movement in Paraguay, was murdered.

Silvino’s older sister suffered numerous health problems following the pesticide incident and two years ago gave birth to a baby who was diagnosed as suffering from birth defect hydrocephalus.

In November 2006, the two landowners responsible for the spraying were finally sentenced to two years in jail, after their appeal was turned down by the Supreme Court.32

Pesticide poisoning in Argentina33
Villagers in Colonia Loma Senés, a small farming community in Formosa Province, Argentina, were the victims of repeated sprayings from the long-armed tractors used to spray soy, known as mosquitoes. The tractors were spraying glyphosate and 2,4-D.

In February 2003, at least 23 farming families suffered after a northerly wind directed a cloud of pesticides towards their fields. The chemicals destroyed most of their crops, leaving the plants burnt. Chickens in a neighbouring barn were poisoned and died. People suffered vomiting, nausea, nose bleeds, breathing difficulties and problems with their eyes. The damage left the communities without enough food to feed themselves, let alone sell at market. When the authorities checked water supplies, they found they were contaminated with pesticides.

No official action was taken to stop the spraying so the community resorted to legal action, asking for an injunction. The judge granted a six-month ban, which was extended for a further three months, but in September 2003 the farm resumed spraying.34

Communities living near soy plantations report ongoing health problems including continuous headaches, skin rashes, stomach problems, increased rates of miscarriage and babies born with malformations.

Food insecurity
Across the region, the spread of soy has reduced the number of small farms – traditionally the source of food for the local community, as well as changing farming patterns on larger farms.

In Argentina, traditional farming methods used until the 1990s saw farmers rotating maize, wheat and soybeans to allow the soil to recover, but this method of farming has now virtually disappeared.35 The number of dairy farms also halved between 1988 and 2003, while production of corn, rice, oats and beans has decreased substantially.36

The result has been an increase in food insecurity. Figures show that between 1996 and 2003 the number of people in Argentina unable to access a “basic nutrition basket” rose from 3.7 million to 8.7 million. Urban poverty and high unemployment have been exacerbated by the loss of rural employment due to the expansion of soy.37
Meat and dairy products are considered an important source of protein in the human diet, and provide a range of minerals and vitamins including iron, zinc and vitamin A. But the high levels of consumption of livestock products in the industrialised world have been clearly linked to a number of health problems, particularly heart disease, stroke and certain cancers.

Levels of meat and dairy consumption vary significantly between different countries, rural and urban areas, and income groups. Consumption generally rises as incomes increase, and as more people move into towns and cities giving them greater access to refrigerated produce.

From 1997 to 1999, average global consumption for meat and dairy products was 88 kg/year in industrialised countries compared to a global average of just 36 kg/year. In South Asia it was just 5 kg per person per year.

Studies show the total protein requirement from plant or animal sources for a healthy 70 kg adult living in a developed country is approximately 22 kg/year. The exact requirements depend on the individual, age and level of activity.

Most people living in the industrialised world, particularly meat eaters, consume more than their daily protein requirement. Eating more protein than the body needs has been linked to health problems, including an increased risk of kidney problems. A diet rich in animal protein also tends to have high levels of animal fats, which in excess increases the risk of heart disease and stroke.

There is also evidence of a link between the consumption of meat, particularly red meat, and some cancers. The World Health Organisation (WHO) estimates that 30 per cent of cancers in the Western developed world (and 20 per cent in developing countries) are caused by dietary factors. Cancer is responsible for 7.1 million deaths globally each year, and more than 20 million people suffer from cancer worldwide.

The World Cancer Research Fund Expert Report warns that there is strong evidence that red and processed meats cause bowel cancer and recommends limiting consumption of red meat and avoiding all processed meats. The report found that eating 150 g of processed meat a day (equivalent to three sausages) increases the risk of developing bowel cancer by 63 per cent.

The WHO has also raised concerns about the health impacts of food produced intensively with high levels of fertilisers and pesticides, residues of which can contaminate food supplies. Longer food chains mean longer storage and transport routes, creating a greater risk of food products deteriorating and increased use of preservatives.
2 WHAT’S DRIVING LIVESTOCK EXPANSION?

Growing consumption
The livestock sector is estimated to double in size by 2050.\(^{107}\) As figure 2 shows, the United States consumes the most livestock produce globally, with each American eating an average 125 kg of meat a year – equivalent to more than 400 sirloin steaks.\(^{109}\) Per capita meat consumption in Europe averaged 74 kg in 2002, while the UK consumed an average 80 kg/person\(^{110}\) – equivalent to 1,400 pork sausages – nearly 4 a day.\(^{110}\) What's more, poultry consumption in the UK has doubled in the last 20 years.\(^{111}\)

Demand is also growing in some developing countries as a result of rising incomes and a growing urban middle class\(^{112}\), although it is still well below European and US levels. Meat consumption in China has gone from an average of 20 kg per capita in 1980 to 52 kg today.\(^{113}\) Although in India meat consumption has grown by 40 per cent in the last 15 years, it is still 40 times less than average consumption in the UK.

Soy and animal feed
Soy contains high levels of vegetable protein and has a lower oil content than other seeds, making it suitable for protein-rich feed meal. Soy accounts for 65 per cent of all proteins used for animal feed in Europe (40 per cent in the UK).

How soy is used
Soy is a legume which grows in North and South America, Asia and Europe. It produces beans containing high levels of protein and oil. The harvested beans are processed to extract the oil (around 20 per cent of the bean), which is used for human consumption, animal feed and biofuels. The high protein soymeal left over after oil extraction (around 75 per cent) is toasted and ground. Animal feed accounts for 97 per cent of global soymeal production.

Europe’s reliance on imported soy is a legacy of European agricultural policy dating from the start of the Common Agricultural Policy (CAP), which stated that imports of animal feed were not subject to the same tariffs as other agricultural produce. This meant it made sense for farmers to import feed, initially from the United States.

In 1992 the United States negotiated a limit on European oilseed production as part of the Blair House Agreement which led to even greater dependency on imported soy.\(^{114}\)

A further significant increase in demand for soy came after the ban on processed animal proteins in feed as a result of bovine spongiform encephalopathy (BSE) crisis. Meat and bone meal were a common source of protein for livestock feed prior to the outbreak in the 1990s. The reduction in availability of fishmeal due to increased demand from aquaculture was also a significant factor in the switch to soy.\(^{115}\)

It is possible to grow alternative sources of protein within the UK and Europe – including oilseed rape meal, peas and beans – but the distorting effect of the CAP and trade barriers introduced by the United States, mean that for many European countries it has been cheaper and more convenient not to do so.
Europe’s land grab
The amount of land needed to produce soy for the European market since the ban on meat and bone meal in 1996 is roughly equal to the area of deforestation in the Brazilian rainforest since that date.\textsuperscript{116}

Exporting soy to Europe
The European Union (EU) relies on Brazil for 64 per cent of soybean imports and Argentina for 61 per cent of soymeal imports.\textsuperscript{116} This demand accounts for almost a third of Brazil’s total soybean harvest – see figure 3.

In 2007 more than 78 per cent of UK soybean imports and 34 per cent of soymeal imports came from Brazil. A further 47 per cent of the UK’s soymeal was imported from Argentina. A small percentage of soy was imported from Paraguay,\textsuperscript{117} although as the country exports most of its soy to Brazil and Argentina, it is likely that the EU is indirectly consuming significant amounts of Paraguayan soy.

\textbf{Percentage of total soybean harvest exported to EU by Latin American countries 2006-07}

\begin{figure}[h]
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\caption{Food and Agriculture Organization of the United Nations (FAO)\protect\footnotesize{\textsuperscript{116}}}
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\includegraphics[width=\textwidth]{Sacks-of-soy-beans-for-export.png}

\textbf{Sacks of soy beans for export}
Soy and animal feed in the UK
Soy is a particularly significant feed ingredient for pigs and poultry where high protein levels are needed to achieve the quick growth rates. Other sectors, such as dairy, are also reliant on soy to provide the protein element of the feed. Figure 4 shows the relative quantities of soy needed to produce the livestock products consumed in the UK.

Poultry production
Poultry is the fastest growing sector in the global livestock industry and is the most frequently eaten meat in the UK. There are around 3,000 broiler farms in the UK (raising chickens for meat) with approximately 120 million broiler chickens in production at any one time.

High-protein diets have been developed to make birds grow faster, keeping the cost of the meat low. Most chickens now reach their desired weight within about 40 days, compared to 84 days for organic birds. Cereals, soy and legumes form the basis of most poultry feed, with soy making up between 20 and 25 per cent.

The UK poultry industry supplies around 88 per cent of the overall UK market, but imports roughly twice the quantity of chicken that it exports.

Three million chickens each week
The UK’s poultry market is dominated by five companies who process more than 50 per cent of the chicken meat on sale. The biggest of these is Grampian which was acquired by Dutch company VION in 2008. Grampian processes 19 per cent of chickens sold in the UK – almost 3 million chickens a week that are sold as fresh, frozen and cooked products. Other big players in the UK include Faccenda (2 million chickens a week), 2 Sisters Food Group which supplies Tesco, Waitrose and Marks & Spencer, the rapidly expanding Northern Irish company Moy Park, and Sun Valley, which is owned by the US grain giant Cargill and supplies McDonalds and Morrisons.

Pork production
The UK consumes approximately 803,000 tonnes of pork and 488,000 tonnes of bacon – that is 74 pork chops and 270 bacon rashers – per person a year.

Around two thirds of this is reared in the UK, with the remainder imported from Europe. Cereal, oilseed (soy) and pulses are used for pig feed. Amounts vary according to the age of the pig and the price of cereal compared to soy – soy usually makes up 8 to 10 per cent of the total feed.

Poultry feed accounts for more than half of all the soy used in the UK livestock sector.
Soybean equivalent required to produce a UK citizen’s average annual intake of meat and dairy products (in kilograms per person)

- Other products: 5.6
- Cheese: 1.7
- Eggs: 6.7
- Poultry meat: 22.2
- Pork: 12.5
- Milk: 1.9
- Beef & veal: 3.8

Fig 4. Van 1.7 Gelder et al, Soy Consumption for Feed and Fuel in the European Union, October 2008
Dairy production
Most of the UK’s dairy herd are Holstein-Friesians which have been bred to yield between 5 and 10,000 litres of milk a year. Soy is an important source of protein in their diet – even during the summer when grass is available, animal feed constitutes around half of their food. Varying quantities of soy are used in dairy cattle feed, but estimates suggest it can make up as much as 10 per cent.

Each year we consume an average of 118 litres of milk per person in the UK, 3.6kg of butter, and 10.2kg of cheese. Most of this milk is sourced from UK dairy farms, but significant proportions of butter, cheese and yoghurt are imported.

The role of agribusiness
Corporations involved in the soy trade are key drivers of expansion and intensive production. US companies Bunge and Cargill (the world’s largest commodity trader) dominate the soy industry in Brazil and Argentina, buying the beans from farmers, running crushing mills and exporting soymeal and oil to the UK and the rest of Europe.

Cargill also runs crushing mills for soy and rape seed in the UK. Archer Daniel Midland (ADM), Dreyfus and Brazilian company André Maggi are important players in Brazil.

Trading companies, like Cargill and Bunge, have a crucial role in controlling the whole soy production process because farmers depend on them to provide credit and supplies of fertiliser and pesticides. These companies also manage the logistics, arranging storage, transport and processing.

Although the largest public UK companies are required to report on their environmental and social impacts under the Companies Act 2006, there are no standards in place that dictate how they should report and few actually provide comprehensive information on their activities.

Global finance
The rapid expansion in soy production has also been facilitated by multilateral banks, including the World Bank and the Inter-American Development Bank, who are keen to encourage agriculture for export.

The International Financial Corporation (IFC), which is part of the World Bank, provides investment in the livestock sector, and its approach has been criticised by the World Bank’s former environmental director Robert Goodland.

According to Goodland, the IFC has contributed $732 million (around £460 million) to damaging livestock projects in South America, Asia and Eastern Europe, of which $36.6 million (around £23 million) would have come from British tax payers.

One of these projects involved a $90 million loan to Bertin Ltda, one of Brazil’s leading beef and leather producers, to fund the expansion of the Bertin Amazon Cattle Ranching project, which poses a recognised risk of deforestation in the Amazon. The IFC funding enabled the project to secure $250 million (around £158 million) in further loans from the Inter-American Development Bank.

2 WHAT’S DRIVING LIVESTOCK EXPANSION?
UK taxpayers’ money is also being used to finance intensive livestock production through the European Bank of Reconstruction and Development (EBRD). The EBRD has provided funding for thousands of agricultural projects in central Europe, including a contribution of £7.8 million to intensive livestock production in 2007-08.

British and European banks play an important part in financing the soy trade by holding shares and providing finance for key companies:

- Barclays has investments in ADM, Bunge and Cargill.
- Barclays and HSBC both provide credit for ADM and Bunge.
- HSBC and the Royal Bank of Scotland hold bonds in Cargill.

### Dominating the soy feed chain
US commodity trader Cargill owns one of the UK’s main chicken processing companies, Sun Valley. The company operates across Europe and processes around 1 million chickens a week in the UK. Customers include McDonalds and supermarket chain Morrisons. Sun Valley chickens are fed on Cargill soy, imported through the company’s plant in Liverpool, 25 per cent of which is sourced from Brazil.

### Soy certification
Soy certification schemes are increasingly being proposed as a way of managing the damaging impacts of production. The Round Table on Responsible Soy (RTRS) was established in November 2006, representing different stakeholders from the industry, with the big soy producers dominant. NGOs in Latin America have largely rejected or boycotted certification and most schemes have failed to consult with affected communities while developing their criteria. The RTRS has so far only established draft criteria, but these do not take into account the damaging impacts of soy expansion. An earlier attempt at setting a sustainability standard led to the Basel Criteria – a broad set of principles which can be applied to local schemes. Pro Terra is the only Brazilian scheme in operation that meets the Basel Criteria and there is relatively little Basel-accredited soy available on the market. The UK Foreign and Commonwealth Office has invested £236,520 in a soy certification project in Brazil aimed at reducing deforestation. While the scheme was successful in reducing deforestation rates, there are concerns that such schemes displace problems and disregard property and land rights. Questions remain about the enforcement of sustainability standards for any scheme. Evidence suggests that criteria will be used to justify expansion while having little impact on the methods of production or the macro effects of large-scale expansion.
Agricultural policy and soy

UK and European agricultural policies have played a key role in developing Europe’s reliance on imported soy for animal feed. When the Common Agricultural Policy (CAP) was established in Europe in 1962, it established an agreement with the United States that animal feed would not be subject to import tariffs.

Under the CAP, the European Community effectively guaranteed prices for most European farm produce when the market price fell below an agreed target level. This encouraged farmers to focus on producing cereals, milk, beef and sugar – where the price was guaranteed – and to import animal feed. This meant that land previously used to grow feed was converted to produce cereals.146

As a result, Europe became dependent on soy imports, initially from the United States. Attempts to reform the CAP met with considerable resistance from the United States and the European animal feed industry. In 1992, European farmers limited the amount of oilseed that they could grow by signing a 10-year deal with the United States.147 When this expired BSE was already having an impact on farming – in 1996, the use of meat and bone meal in animal feed had been banned and farmers turned to soy as an alternative protein source.

The European Union currently spends £34 billion each year on the CAP of which £3.4 billion comes from the UK – the equivalent of £500 per family. Around 88 per cent of this is spent on direct aid to farming and food production. The rest is used to protect farmers from sudden drops in market prices.

Farmers receive funds according to the size of the farm, meaning large-scale farmers and agribusinesses receive most of the aid – 80 per cent of funds reach just 20 per cent of farms.

In 2002, more than 60 per cent of the CAP budget went to livestock-related production. Following changes in the way payments were made, it is no longer possible to know how much money goes to livestock production, but 14 of the top 20 UK recipients are involved in dairy production.

For example, Meadow Foods, a leading manufacturer of bulk fats and proteins used in ice cream, spreads, sports drinks, processed meats and confectionery, received nearly £26 million in 2003-04.
Farmers receive subsidy funding according to their size so large-scale farmers and agri-business receive most of the aid.
It is clear that the current model of livestock production is no longer affordable in environmental or social terms. The climate, water systems, soil and wildlife cannot sustain the damage that is being caused.

There are increasing pressures on land use. Our demand for food is growing in line with the world population and there is an urgent need to maintain our forest and grasslands and to prevent the erosion of soils.

Soy is not the only available source of vegetable proteins suitable for animal feed. Alternatives include hemp, lupins, legumes and oilseed rape. Many of these are already produced in the UK and some are suitable for production on farms, reducing the need for transportation. For example, in France peas are grown for use in pig and poultry feed.

A more localised system of food production – using animal feed grown in Europe to feed animals reared in Europe – would help to reduce the devastating impacts of habitat loss in Latin America, as well as reducing the climate-changing emissions generated by land use change and transporting vast quantities of feed.

Local food production also encourages the production of a wider range of food crops, locally-appropriate diets, greater local control over food supplies and less price volatility for farmers.

Less intensive production systems and a greater reliance on organic production can reduce the damaging environmental effects of over-reliance on pesticides and other inputs, as well as reducing farmers’ costs.

However, a switch to more sustainable livestock systems will necessitate an overall reduction in livestock production and consumption.

The considerable environmental and social damage caused by the livestock sector requires a significant policy response. There is no single policy that can address the complex factors driving unsustainable consumption. Action from governments in producing and consuming countries will be required to initiate the necessary changes across the whole supply chain.

Friends of the Earth has identified eight key policy areas where action by the UK Government, including changes to UK and European policy, could help to significantly reduce the impact of our livestock consumption.
“If we are serious about tackling food-related greenhouse gas emissions, we need to consider making significant reductions in our overall production of livestock products, while seeking to maximise the benefits that livestock can bring.”

Food Climate Research Network 2007

1 Changes to agricultural and rural policy

The UK currently spends large amounts of taxpayers’ money subsidising damaging large-scale intensive food production, processing and export through the CAP.

The Government must work within Europe to transform the CAP objectives (as set out in Article 33 of the Treaty of Rome) to reflect the wider needs of sustainable modern farming policy with reduced greenhouse gas emissions.

The subsidies which underpin intensive livestock farming should be removed.

New measures must be introduced to promote low-impact livestock systems, the domestic production of sustainable feeds, and research into the introduction of different livestock breeds better suited to a new feeding regime.

A sustainable livestock system, with locally-grown feed, will lead to reduced livestock consumption. The UK does not have sufficient agricultural land to grow the levels of feed crops it currently consumes. Investment is needed in raising public awareness of the environmental impact of intensive meat and dairy production and the health benefits of eating less meat.

Support and incentives must be made available to farmers to help them adopt less environmentally damaging practices while maintaining a thriving UK industry – it is crucial that farmers receive a fair price for their produce.

2 Changes to the Government’s food procurement policy

Around £2.2 billion of public money is currently spent on food in schools, hospitals, prisons and care homes. Little consideration is given to where this food comes from or its wider impacts, despite the Government’s Public Sector Food Procurement Initiative. A ‘cheapest is best’ approach dominates.

The Government must introduce new enabling legislation by 2012 to ensure that food procurement in the public sector: complies with carbon reduction targets and national environmental legislation; does not damage biodiversity; and supports local sustainable organic livestock production where possible.

Such measures are already in use as some local authorities and NHS trusts are finding ways to reduce the levels of meat and dairy in the meals they provide in schools and hospitals.

In the Netherlands, the government has set a target of 100 per cent sustainable food procurement by 2010. A similar UK government policy could deliver real environmental and health benefits, while also influencing the European green procurement policy currently being discussed in the European Council and Parliament.
The Climate Change Act requires the Government to find ways of substantially reducing greenhouse gas emissions from the food sector, particularly from UK livestock farming. Measures already being considered include reducing the number of animals and using maize silage for beef and dairy farming to improve dairy yields. Ireland, Poland, Austria and Belgium are already addressing livestock numbers as a means of meeting environmental goals.

However, the Act does not take into account the global impacts of importing food or animal feed. The Government must look at effective measures for reducing our unsustainable dependence on imported feeds. As part of this, the Government must push for equitable solutions to forest loss through agricultural expansion and over consumption at international climate talks.

The impact of agriculture on climate change must also be a primary consideration in future European discussion on the CAP to ensure that it includes financial support for climate adaptation measures.

In recognising the urgent need for new ways of farming to reduce global greenhouse gas emissions and biodiversity impact, the government must increase public funding (or redirect existing funds, such as those destined for agricultural biotechnology research) for research into modern sustainable farming systems which use lower levels of livestock and inputs and which maximise the potential for mixed farming. This research needs to investigate changes to livestock breeds, feed plant varieties and cropping systems to deliver a UK farming system that matches need with environmental, rural development and public health goals.

To facilitate this research and to provide an appropriate and well-funded institutional setting, the government should set up a Sustainable Agricultural Research Council.

Organic mixed farming systems in the UK provide a valuable base from which to start as they have benefited from a period of considerable investment in breeding, cropping and input testing to maximise outputs whilst minimising impacts. Public funds must also be directed into finding ways to help consumers choose diets containing lower levels of livestock products.
Measures to hold those businesses that profit from soy and livestock production accountable for their impacts on people and the environment abroad are inadequate.

The buying power of UK supermarkets makes them key players in the supply chain, but they have been criticised for failing to use that power responsibly, demanding low price goods regardless of the impacts on farmers and the environment. The Competition Commission has recommended a Groceries Supply Code of Practice as a remedy. The Government must also introduce a watchdog with powers to oversee relations between supermarkets and their suppliers and ensure that the Code of Practice is enforced.

More must be done to ensure that the victims of UK corporate abuse are able to seek legal redress from those companies when there is a failure of governance in the host country. We support the formation of an independent UK Commission for Business, Human Rights and the Environment to investigate and redress claims of harm to people and the environment by UK companies operating overseas.

The Government must produce clear guidance for companies on how to report on their social and environmental impacts, as required under the Companies Act 2006.

The Government’s Sustainable Consumption and Production Strategy was set up to measure and improve the sustainability of key products and services. It must be revised so that it considers the global environmental impacts of UK consumption and, instead of accepting current trends, it must assess the potential for reduced consumption levels. Plans for a meat ‘road map’ under the strategy have been shelved.

The intensive farming methods used for livestock products means that they consistently score the highest in any environmental impact assessment at EU or UK level. The Department for Food and Rural Affairs (DEFRA) must work with the Food Standards Agency to investigate the potential for a strategy to reduce production impacts and address demand for the benefit of the environment and human health.

A full and immediate review of Europe’s trade strategy is needed, given the serious social and environmental impacts of its trade in livestock and animal feed. The review must ensure that development, environmental sustainability and human rights are priorities.

The Global Europe strategy must be put on hold. This is business driven and currently involves negotiations with African, Caribbean and Pacific countries aiming for bilateral trade deals with the EU. There is concern these deals will have disastrous impacts on jobs, livelihoods, human rights and the environment in the developing countries that sign up. From an environmental perspective, the deals will require countries to lift export restrictions on raw materials, denying them a key tool to protect the environment and prevent the overexploitation of natural resources like forests.

Europe must also make its trade policy-making more democratic, transparent and accountable, by opening-up closed-door proceedings to Parliamentarians and civil society in the global South and in Europe.

Adopting these measures would see the UK Government taking its first steps towards developing a more sustainable approach to livestock farming and food.
REFERENCES

1. Livestock’s Long Shadow, UN FAO, 2006, Executive Summary, pXX
2. Livestock’s Long Shadow, UN FAO, 2006, pXXI
6. GM and the food chain roundtable report, June 2008
7. The role of UK companies in driving soy expansion in South America, Profundo Economic Research, 2008
9. Livestock’s Long Shadow, UN FAO, 2006, Executive Summary, pXXI
13. Livestock’s Long Shadow, UN FAO, 2006, p43
14. Livestock’s Long Shadow, UN FAO, 2006, Executive Summary, pXXI
17. The Cattle Ranching Chain in the Brazilian Amazon, Smeraldi R, 2006
19. The Cattle Ranching Chain in the Brazilian Amazon, Smeraldi R, 2006
20. The Cattle Ranching Chain in the Brazilian Amazon, Smeraldi R, 2006
22. Livestock’s Long Shadow, UN FAO, 2006, p83
23. Livestock’s Long Shadow, UN FAO, 2006, p185
24. Livestock’s Long Shadow, UN FAO, 2006, p165
25. Livestock’s Long Shadow, UN FAO, 2006
26. The Boom Beyond Commodities, Rabobank, 2008, p26
30. Fuelling destruction in Latin America, Friends of the Earth Europe, 2008, p21
33. Livestock’s Long Shadow, UN FAO, 2006, Table 11
34. IBGE, http://www.ibge.gov.br/english/
35. AIDEnvironment, quoted in Commodity Chains, poverty and biodiversity, Table 6, p20
36. AIDEnvironment, quoted in Commodity Chains, poverty and biodiversity
37. WWF, http://www.panda.org/about_wwf/where_we_work/ecoregions/atlantic_forests.cfm
39. AIDEnvironment
42. The Fate of the Amazonian Areas of Endemism, Da Silva et al., Conservation Biology 19 (3): 689-694, 2005, quoted on http://www.panda.org/about_wwf/where_we_work/latin_america_and_caribbean/region/amazon/the_area/wildlife_amazon/index.cfm
45. Indigenous peoples in Brazil, Instituto Socioambiental
46. The impact of soya production on South American ecosystems, AIDEnvironment
47. Eating up the Amazon, Greenpeace, April 2006
REFERENCES


107 Livestock’s Long Shadow, UN FAO, 2006

108 Average steak weight 300g taken from http://www.ocado.com/webshop/getCategories.do?tags=3|1085|113


110 Taking average sausage weight of 57g a sausage (8 sausages = 454g Sainsburys).

111 Meat and dairy production and consumption, Garnett T, Food Climate Research Network, 2007, p21

112 Livestock’s Long Shadow, UN FAO, 2006


114 Animal Feed, A key Common Agricultural issue, CPE, March 2003

115 Livestock’s Long Shadow, UN FAO, 2006, p43


121 Meat and dairy production and consumption, Garnett T, Food Climate Research Network, 2007, p41

124 Research on alternative feeds, Diamand E, March 2008, p7
126 The role of UK companies in driving soy expansion in South America, Profundo, September 2008, p22
127 The Poultry Site, http://www.thepoultrysite.com/poultrynews/15163/vion-to-take-over-grampian
128 The role of UK companies in driving soy expansion in South America, Profundo Economic Research, August 2008, p23
132 Assuming 30g / rasher - six rasher pack of bacon 180g at ocado. com and http://www.redmeatindustryforum.org.uk/supplychain/PigMeatConsumption.htm
133 Research on alternative feeds, Diamand E, March 2008
139 Soya and Oilseed Bluebook, 2008
140 IFC’s recent livestock projects, Goodland R, 2008
145 Sustainability as a smokescreen, Friends of the Earth Europe, 2008
146 Animal Feed, A key Common Agricultural Issue, CPE, March 2003
148 Compassion in World Farming defines this as ‘factory farming’ - where animals are treated like production machines rather than individual sentient beings with welfare needs. It involves intensive farming, characterised by the use of close confinement (cages and crates) or in overcrowded sheds or barren outdoor feedlots. It also involves the use of fast-growing or high-yield breeds where the animals are prone to painful production-related diseases. Factory farming is energy-intensive, using concentrated feed and high mechanisation but has low labour requirements. Intensive farming is often practiced on a massive scale and is often referred to as ‘industrial’ agriculture.
149 The development of systems with low levels of external inputs based on forage legumes offer good opportunities for economic and sustainable production in the UK, but have had relatively little adoption, apart from in the organic sector. The absence of information from whole systems studies, combined with the relatively low costs of soya protein imports, are two of the factors contributing to limited adoption.
150 East Anglia Food Links have been working with their local NHS trust. See http://www.eafli.org.uk/WhatWeDo.asp. Sustain has been working with London NHS Trust Hospitals to develop sustainable meat procurement. See http://www.sustainweb.org/page.php?id=83
152 Sustainability as a smokescreen, Friends of the Earth Europe, 2008
154 Under the Reducing Emissions from Developing Countries (REDD) talks at the UN climate negotiations
This is an in-depth review of the impacts of intensive livestock production. It reports that:

- The factory farms we rely on for our meat and dairy in the UK are driving climate change, wildlife loss and loss of livelihoods among people in developing countries.

- Industrial soy farming for cheap protein to fuel UK factory farms is one of the main drivers of deforestation in Latin America.

- In the UK, neither farmers nor consumers are benefitting from this model of farming.

- It identifies the need for fundamental changes to the funding, feeding and procurement of livestock in the UK and Europe.

Friends of the Earth is calling on the Government to revolutionise the way we produce meat and dairy in this country. Urgent action is needed to reduce the impact of the sector – and to support thriving and sustainable livestock farming in the UK.