

Pastures New

A SUSTAINABLE FUTURE FOR MEAT AND DAIRY FARMING



**Friends of
the Earth**

July 2010



CONTENTS

| | |
|---|-----------|
| EXECUTIVE SUMMARY | 3 |
| THE PROBLEM WITH SOY | 4 |
| LET THEM EAT GRASS: WHY GRAZING IS KEY | 6 |
| Beef cattle and grass | 6 |
| Case study: sustainable beef | 6 |
| Dairy cattle and grass | 6 |
| Case study: sustainable dairy | 7 |
| Sheep and grass | 7 |
| Upland grazing | 7 |
| Case study: upland grazing | 7 |
| LIFE AFTER SOY: THE CASE FOR HOME-GROWN ALTERNATIVES | 8 |
| Case study: sustainable pigs | 8 |
| Soy alternatives – pigs | 9 |
| Soy alternatives – poultry | 9 |
| Case study: sustainable chickens | 9 |
| STRENGTH IN NUMBERS: HOW MUCH SOY COULD BE REPLACED? | 10 |
| CHALLENGES | 11 |
| THE WAY FORWARD | 12 |
| APPENDICES | 14 |
| REFERENCES AND NOTES | 15 |

About this report

Friends of the Earth has commissioned the Royal Agricultural College (RAC) to:

- Explore the potential for home-grown alternatives to soy
- Assess the effect of specific policies relating to animal feed.

This report summarises the RAC's key findings as well as drawing on Friends of the Earth's own research. It includes case studies to illustrate planet-friendly farming in action.

Pastures New is aimed at farmers, policy makers, campaigners and MPs, but will prove essential reading for anyone interested in food and the environment.

It concludes with a series of recommendations, mainly to Government, to achieve a more sustainable future for livestock farming in the UK.

Friends of the Earth, July 2010



EXECUTIVE SUMMARY

Livestock farming is one of the most significant contributors to global environmental damage – yet in the UK we are doing little about it.

Central to the problem is our reliance on imported soy for animal feeds. This comes mostly from South America, where rainforests and grasslands are being ripped up to make way for soy plantations or for beef ranching which has been displaced by soy plantations.

This report draws on new research that shows the barriers to replacing soy are not so much the nutritional needs of animals or what can be grown in the UK – but a lack of policy and market incentives for farmers to change.

It also outlines solutions that would ensure a thriving UK livestock sector at the same time as reducing its massive global impacts.

Key issues, findings and recommendations

- Livestock farming globally is responsible for 18 per cent of greenhouse gas emissions.
- Livestock farming in the UK is dependent on soy in animal feeds. The expansion of soy plantations for animal feeds in Europe is helping to drive the destruction of South American rainforests and other important habitats.
- There are many alternative animal feed crops that would meet the requirements of UK livestock.
- New research by the Royal Agricultural College (RAC) for Friends of the Earth shows that 50 per cent of soy meal currently

used for animal feed in the UK could be directly replaced by home-grown alternatives. This would require 8 per cent of UK arable land.¹

- Our reliance on soy could be reduced further if meat and dairy consumption was reduced in line with healthy eating guidelines. Reduced consumption need not damage the UK livestock industry, and would allow farmers to get off the treadmill of intensive production.
- Some farmers are leading the way in finding alternatives to soy. But while prices remain low, most are unlikely to demand home-grown alternatives.
- There is an imminent threat to existing supplies of UK feeds because the subsidy paid to growers of protein crops is due to end in 2012.
- The Government should do more to support environmentally friendly farming. It should switch the huge amount of taxpayers' money that goes into intensive livestock production to sustainable farming.
- As well as policy and market incentives, there will be specific requirements for infrastructure, advice and further research to make transformation possible.
- The Government urgently needs to set out a strategy for reducing the global impacts of livestock production. It must ensure that it does not simply export problems elsewhere.

In a nutshell: the Food Chain Campaign

This report is a key plank of Friends of the Earth's Food Chain Campaign. The campaign aims to highlight the link between intensive factory farming in the UK and destruction of the South American rainforest and other vital habitats. In order to preserve the world's natural life support systems such as the Amazon rainforest and successfully get to grips with climate change, we need to tackle intensive livestock farming.

Friends of the Earth's Food Chain Campaign is calling on the Government to commit to:

- A new law
Measure and then reduce the global environmental impacts of the UK's consumption of meat and dairy products.
- Sort out subsidies
Make sure that European farming subsidies support planet-friendly meat and dairy farming and don't prop up intensive factory farms.
- Protect farmers
Introduce a new independent watchdog to protect farmers from supermarket bullying.

More information at www.foe.co.uk



Getty

THE PROBLEM WITH SOY

Above: Deforested land for soy plantations near Sinop, Mato Grosso State, Brazil

Right: Deforestation for soy plantations and cattle ranching on the border of the Amazon rainforest in Para State, Brazil

Global impacts

The impact of the UK and Europe's demand for soy is staggering. Soy plantations are driving deforestation in South America where vast swathes of land have been converted for large-scale crop production. If current trends continue, soy farmers and cattle ranchers will destroy 40 per cent of Amazon rainforest by 2050.²

The Amazon is home to almost a third of the world's known species. Many of them, are only found in Brazil, such as the buffy-headed marmoset and the maned three-toed sloth.

The grasslands of the Brazilian Cerrado, the Atlantic forest and the Chacos region are also being devastated by soy production or for pasture displaced by soy plantations. Cropland and pasture have replaced nearly half of the Cerrado.³

These huge changes in land use are not only a blow for wildlife and natural diversity – they are also stoking climate change. Cutting down rainforests and converting other habitats to cropland releases CO₂. It is calculated that some 18 per cent of global greenhouse gas (GHG) emissions are caused by livestock farming.⁴

Why the UK is dependent on soy

Europe's reliance on imported soy is linked to agricultural and trade policies that make soy a cheap source of protein. Soy is well suited to intensive livestock production because it is high in protein, meaning animals grow rapidly and produce high yields.

In the UK we now use 1,075,000 tonnes of soy⁵ every year to feed livestock, most of which is used for pigs and poultry, followed by dairy. The EU is the biggest market for South American soy meal.⁶

Changes in people's diet are also a factor in soy's popularity. Poultry consumption has doubled in the past 20 years, fuelling demand for more fast-growing broiler chickens.⁷

UK farmers often have little choice about what to give their animals. This is largely determined by feed companies who want to optimise feed rations for the least cost. Besides this, reducing protein content in feed is risky when supermarkets demand high volumes at a low price.

Other problems

Soy is a major commodity traded on a global market where prices can fluctuate wildly. In other words there is no guarantee that soy prices will stay low. Given that feed makes up a large proportion of the cost of livestock production, dependence on soy leaves farmers extremely vulnerable.

Intensive farming is also reliant on similarly unstable oil-based inputs, such as fertiliser. It is clear, therefore, that such a system does not offer long-term security for farmers – or food production.⁸



LET THEM EAT GRASS: WHY GRAZING IS KEY

Grass-fed systems, in which animals feed only on grass for most of the year, are vital to livestock farming's sustainable future.

- Well-managed pastures with less intensive stocking levels and low inputs of artificial fertilisers can host a wide range of wildlife.⁹
- Land used for extensive grazing (essentially low stocking levels and low inputs) has significant potential to store and sequester carbon in the soil.¹⁰ According to the Department for Food, Environment and Rural Affairs (DEFRA): "The soils of the English uplands contain more carbon than all the trees in the UK and France added together."¹¹
- Animals that graze extensively produce more manure, itself a source of greenhouse gas (GHG) emissions. They can also produce more methane (another GHG) simply because they live longer. Emissions can be reduced, however, by grazing on the right species and correct management of manure.¹²
- Incorporating protein into pasture in the form of nitrogen-fixing legumes can reduce livestock farmers' reliance on fertilisers – a significant source of GHG emissions, both in their manufacture and use.
- There is growing evidence that grass-fed beef and lamb has greater nutritional value than factory-farmed meat.¹³ Given the right labelling and promotion, this could add market value to such products.

Overall UK emissions from extensive grazing is a complex issue. But it is a fact that animals which graze are far less reliant on imported soy, meaning global emissions and biodiversity loss is reduced.¹⁴ If animals do need additional protein, this can be incorporated into grazing by adding clover or feeding them

legume-based forages like lucerne.

Where additional feeds are needed, farmers could protect themselves from fluctuating prices on international markets by growing feeds on the farm or encouraging other local farmers to grow feed crops. In winter, they can use grass silage or silage based on home-grown crops.

Beef cattle and grass

Beef cattle are less reliant on soy than dairy cows. One study suggested that moving to traditional breeds would allow beef production on forage alone, or with only limited additional feed.¹⁵

Some farmers are showing this is possible, using traditional breeds and incorporating protein into the pasture [see case study, page 6].

Dairy cattle and grass

Most of the UK's dairy herd are Holstein-Friesians, bred to yield between 5,000 and 10,000 litres of milk a year. To produce these yields they are fed a high energy, high-protein, soy-based diet. In some cases soy-based feed makes up around half of the animals' food in summer – when grass is available.

However, there are alternatives. The RAC says, for example, that lucerne silage grown in the UK could replace 100 per cent of soy for beef and dairy cows as long as there is sufficient energy in the feed (this can be variable in silage).

Like beef, some dairy farmers are leading the way and reducing the supplementary feed they give their cows by incorporating protein into grazing.

Mixed farming can also work well for dairy herds – for example, allowing farmers to use their own protein crops as a substitute for soy.



John Turner

Case study: sustainable beef

John Turner has a farm of approximately 250 acres in south-west Lincolnshire. His family has been farming this land since the 1930s, and John made the farm organic in 1999. John has a herd of 40 beef cows and grows some cereals. Most of the animals go to the wholesale market. Some, however, are sold through a local box scheme to nearby villages, which John describes as "much more rewarding". All the cattle are fed entirely on grass throughout the year. From spring until

autumn, the cows graze directly on a mixture of rye grass and white clover. During the winter they're fed grass silage and occasionally barley or oat straw. The added clover boosts the protein content of the feed – in John's case removing the need for supplementary sources of protein such as soy. As well as adding protein, clover fixes the nitrogen in the soil – allowing the grass to grow and removing the need for artificial fertilisers. Such fertilisers damage the soil and need large amounts of fossil fuels to produce.

Case study: sustainable dairy

Pat and Daphne Saunders' organic dairy has 350 milking cows producing 1.8 million litres of milk per year, showing that planet-friendly farming can be big as well as profitable. The Saunders have 1,400 acres and produce much of their own animal feed. They have reduced the need for soy by growing a range of feeds including wheat, oats, barley, peas and beans. The grass contains both red and white clover which helps boost its output. "Even in a drought our grass keeps growing," says Pat.

All silage is grown and stored on site and some organic soy is added to the winter feed. They have tried growing soy but they find it requires warmer soil.



Sheep and grass

Sheep can thrive on a soy-free diet. The RAC finds that 100 per cent of soy for sheep could be replaced by dried grass or grass silage, although the nutritional value will be more variable than soy.

But other protein crops such as oilseed rape can also be used as a substitute for soy if necessary. As with other ruminants protein can be incorporated into the grazing using white clover.

Upland grazing

As well as being at the heart of our rural communities, upland farming is a crucial part of sustainable livestock production.¹⁶ Many upland areas are unsuitable for crops, so sheep and cattle

farming can produce food from otherwise unproductive land. Grazing can also help conserve upland wildlife habitats if animals are stocked at appropriate levels.

Although upland beef and lamb production may use protein feeds for finishing – fattening the animals in the last few months of their lives – this type of farming is much less reliant on imported soy from South America. Some upland farmers avoid the use of soy or other protein feeds, for example, by finishing animals on higher-quality grassland.

Yet despite the benefits to the environment and rural economies, hill farmers do not get adequate support from Government or the marketplace. Perversely the incomes of intensive

farmers are propped up with public funds to a much greater extent. More than £700 million is spent annually on intensive livestock farming;¹⁷ yet the new uplands support scheme (Uplands ELS) is worth a mere £25 million a year.



Nigel Elgar

Case study: upland grazing

Nigel Elgar, of Cannon farm in Montgomeryshire, has been fully organic since 1993. His farm consists of 342 hectares of grazing and 25 hectares of woodland. He has both cows (20 Welsh Black and 20 Highland) and sheep (500 Welsh Hill Speckled Face ewes).

The animals are grazed on a mix of natural and improved pastures. The grazing is divided into natural hill grazing (moorland), improved pasture and semi-improved hay meadows. Protein is incorporated into the grazing by using white clover. According to Nigel, this is "both cheaper and labour saving compared to bought in protein". But despite running a model farm and showing that there is no need to buy in protein, Nigel has decided to leave farming. This, he says, is partly due to the uncertainties of future support for hill farmers in Wales (see page 12).

LIFE AFTER SOY: THE CASE FOR HOME-GROWN ALTERNATIVES

Alternative protein crops are not widely grown in the UK but they could play a major role in reducing our reliance on soy (see tables, page 14 and Appendix 1). Some feed crops can bring other benefits too – for example, beans fix nitrogen in the soil, and oil seed rape acts as a “break crop” between arable crops, helping to reduce pests and diseases.

Eliminating soy can be relatively straightforward for extensively-produced cows and sheep (where animals are kept at a low stocking level), but it is a much bigger challenge to replace soy in the diets of chickens and pigs. This is because they need a higher proportion of concentrates and protein in their feeds – particularly lactating sows and broiler chickens. However, it is important to note that the protein element does not have

to come from soy; a major reduction is achievable by using alternative crops.

According to the RAC research, the following are considered to be viable alternatives to soy from a nutritional perspective:

| UK feeds | Cows & sheep | Pigs | Poultry |
|-------------------|--------------|------|---------|
| UK soy bean | • | • | • |
| Oilseed rape meal | • | • | • |
| Lupin | • | • | • |
| Sunflower | • | • | • |
| Dried pea | • | • | • |
| Field bean | • | • | • |
| Linseed | • | • | • |
| Dried grass | • | | |
| Lucerne silage | • | | |

When it comes to replacing soy, protein content is not the only consideration. The balance between energy and protein needs to be taken into account; the right amino acids must be present; and some alternative crops contain more anti-nutritional substances (which may restrict intake and growth) than soy bean, limiting the proportion that can be included in feeds.

These issues can be addressed to some extent by mixing different proteins in the feed and using synthetic amino acids (though the latter are not permitted in organic systems, creating additional challenges for organic farmers).

Despite these challenges, however, the RAC says there are several viable alternatives to soy for each livestock sector.



Case study: sustainable pigs

David Hampton's farm near Manningtree, Essex, has been in the family since 1919. David sells both beef and pork from the farm's own butchers. The pigs are Essex Gilts which have been crossed with wild boar.

While David finds there is no problem feeding his cows sustainably because they graze, pigs are a different matter. “Pigs are the biggest problem organically, as they eat so much cereal,” he says. David uses some organic soy for pig feed, but also grows his own field beans. He says beans grow pretty quickly, so they don't get overtaken by weeds. “We have grown lupins, which have a very good profile for pigs, and also peas,” says David, “but as we are organic and unable to spray, their slow-growing and spreading habit means weeds are a problem.”

David thinks that more research is needed into growing alternative feeds.

Soy alternatives – pigs

Technically there is no reason why imported soy meal cannot be completely removed from pig diets.¹⁸

From a nutritional perspective, UK grown soy, oilseed rape meal, lupins, sunflowers, field beans, peas and linseed are all potential alternatives. The inclusion rates for each of these varies depending on the stage of growth (see Appendix 1).

A recent study in France concluded that combining various alternative protein crops, the pork sector “could be largely released from the use of soybean meal”.¹⁹

Soy alternatives – poultry

Poultry is the most frequently eaten meat in the UK with consumption doubling in the past 20 years. High-protein diets have been developed to make birds grow faster, with soy making up 20-25 per cent

of what they eat. This kind of production is often associated with intensive farming and the pressure to produce fast-growing birds. However, simply switching to free-range production is not the answer because free-range birds use more energy just moving and keeping warm – and they live longer so solutions need to take this into account.

The RAC concludes that a wide range of alternative proteins could be fed to poultry with the best option dependent on the stage of growth and intended use of the birds (see Appendix 1).

However, with the exception of home-grown soy, it is not as simple as a like-for-like protein replacement. A DEFRA study concluded that a mixture of alternative proteins was the best option for poultry.²⁰



Case study: sustainable chickens

Will and Meg Edmonds took over Upper Wick Farm in Warwickshire, in 2000.

They spent two years converting the 190 acres to organic, planting clover and grass to restore the soil. At the same time they opened a farm shop in the nearby village.

Will and Meg have 250 laying hens and 1,000 Sasso meat chickens, as well as beef cattle and sheep. They produce 50 chickens a week (they even do the plucking themselves) and sell them at the farm shop and local farmers market for between £10 and £12.

They buy organic chicken feed that contains some soy (around 20 per cent) and water this down with cereals, mainly wheat, from their own farm. “We’d love to see more protein crops grown in the UK as it would be nice to be able to replace the soy in the chicken feed with something more local,” says Will.

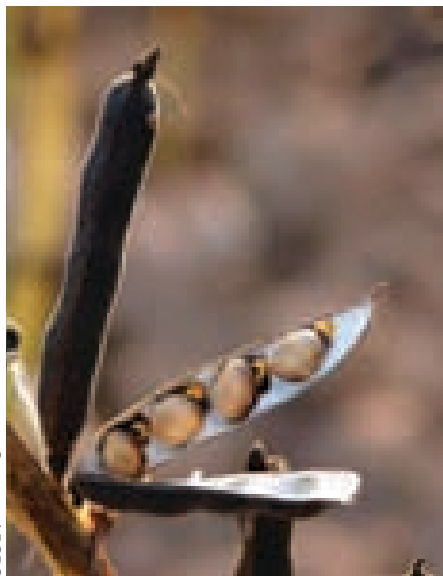
STRENGTH IN NUMBERS: HOW MUCH SOY COULD BE REPLACED?

The RAC's research for Friends of the Earth estimates the proportion of soy bean meal that could be replaced by UK protein crops – based on nutritional analysis – and the area that would need to be planted. These show that:

- Field beans could substitute 14 per cent of soy bean, requiring 221,000 hectares of land
- Peas could substitute 17 per cent, requiring 323,000 hectares
- Lupins could substitute 15 per cent, requiring 263,000 hectares
- Oilseed rape could replace 14 per cent, requiring 214,000 hectares
- Sunflower could replace 17 per cent, requiring 512,000 hectares
- Linseed could replace 14 per cent, requiring 425,000 hectares

In addition, lucerne silage from some 438,000 hectares of pasture or leys could replace 42 per cent of soy bean for ruminants.²¹

When alternatives are combined, a higher rate of substitution could be achieved as long as these are combined carefully to avoid any adverse effects.



Courtesy of PGRO



Courtesy of PGRO

istock

Replacing 50 per cent of soy animal feed imports

The RAC calculates that if sufficient land could be made available (8 per cent of cereal land), it would be possible to halve the UK's current use of soy for animal feed by around 500,000 tonnes annually. This would be through growing the following alternatives:

- **On arable** land 35,000 hectares of winter beans, 34,000 hectares of winter oilseed rape, 80,000 hectares of sunflower and 67,000 hectares of winter linseed. Collectively these could substitute around 30 per cent of soy bean meal
- **On pasture** land or leys Lucerne silage could substitute 20 per cent of soy bean meal (69,000 hectares).

There is potential to further reduce reliance on soy. The RAC assumes that livestock farmers would use recommended levels of protein – but feedback from farmers and the feed industry suggests that it's possible to achieve lower inclusion rates of protein.

The RAC also finds that predicted climate change is likely to mean more protein crops can be grown in the UK – sunflowers, for example, could be reliably grown further north.

Even so, all the above reductions in imported soy are not enough. To reduce the UK's global environmental impacts we need to be aiming much higher.



CHALLENGES

The RAC interviewed farmers and representatives of the feed industry. It found that even reaching 50 per cent soy replacement could be challenging without changes in policy and the market:

- There are currently few incentives to grow alternative crops. There are also other more lucrative markets for some crops: beans can be exported for human consumption, for example.
- While soy prices remain low, there is unlikely to be more demand for home-grown alternatives.
- There is a lack of a constant supply of alternative feeds.
- Farmers find it difficult to get advice on such things as growing, mixing and nutrition when it comes to alternative feeds.
- Farmers looking to grow alternative crops need to be convinced of their yield and performance.
- There are a number of potential technical and infrastructure problems:
 - i) Suppliers will need additional storage if a mix of alternative crops is to be used.
 - ii) Additional processing requirements for some crops are a barrier.

Many of the issues raised by farmers are down to the fact that they cannot afford to take risks when they are struggling to make a living. So the level of change that is needed will not come about unless it is clear a profit can be made growing protein crops and using them to feed livestock.

Top left: Field bean flower, UK
Below: Field beans, UK
Above: Sunflowers in Kent



THE WAY FORWARD

Reforming the Common Agricultural Policy (CAP)

Reform of the CAP is key to a sustainable future for livestock farming in the UK. While some changes can be made to the UK distribution of CAP money in the short term, other more fundamental changes need to be made as CAP is reformed in 2013.

Friends of the Earth has set out some options for how this could be done.

i) Immediate action on the protein supplement. Currently farmers can claim a supplement for growing certain protein crops. But this is due to be removed in 2012. The Government should extend this payment until there is a stronger market for home-grown feed crops.

The RAC concludes that supplements need to raise gross margins to at least £420 per hectare and has calculated what this means for each crop (Appendix 2).

ii) Support for grazing and uplands farming. There is a strong case for better rewarding farmers who deliver environmental benefits through extensive grazing and diversifying livestock breeds. (see pages 6 and 7).

Rewarding farmers for reducing greenhouse gas emissions is a logical policy progression for CAP in the 2013 reforms. This is a complex issue but could include the above as well as:

- Removal of soy from animal feed
- Good practice in low-impact application and storage of manure
- Elimination of artificial fertilisers.

It is clear that the current support for upland farmers is failing to ensure that sustainable food production will continue in these areas. An urgent review is needed. And in Wales, where support is being reviewed, upland farmers need to be assured they will be adequately rewarded for the benefits they deliver.

iii) Rural development measures Money is available under CAP for improving the quality and marketing of products (under Pillar 1). And under the Rural Development budget, there is money for training, new technologies and innovation, processing activities and adding value to products. This cash could be used to provide both the technical support and marketing to boost home-grown proteins and grass-fed livestock.

Reducing consumption

Research for Friends of the Earth and Compassion in World Farming²² shows that reduced consumption of meat and dairy products in western diets would:

- Reduce the global impacts of intensive livestock production
- Allow sufficient food and fuel for a growing world population.

More research is needed into the level of soy reduction which could be achieved by consumers eating less meat and dairy in the UK. But Friends of the Earth believes there is already enough evidence of the benefits of adopting such a diet in the UK, and that the Government should commit to the following measures:

- A public information campaign promoting the health and environmental benefits of reduced meat and dairy consumption.
- A public procurement policy which includes mandatory health and environmental standards for food sourced by all departments and the wider public sector, including schools and hospitals.



Measures would need to be clearly linked to support for “better”, less environmentally damaging meat.

Fair price for farmers

Farmers need a fair price for producing good-quality meat and dairy products. The appointment of an effective supermarket watchdog is crucial in ensuring fair trading between supermarkets and farmers.

Farmers need to be better rewarded by the subsidy system. Producing home-bred-and-fed meat and dairy, centred on the environment and animal welfare, must be seen to pay.

The role of retailers

- Retailers should commit to finding alternatives to soy in their supply chains.
- Retailers should promote grass-fed and soy-free meat and dairy products to stimulate a market for home-bred-and-fed.
- Retailers and food companies should reduce the amount of meat and dairy in processed foods and ensure vegetarian alternatives are available.

Clear standards

Grass-fed products need to be clearly identified to consumers by labelling, in order to stimulate the market.

Grass fed systems will need to be more clearly defined so that consumers can be confident that they are buying a product from animals that have been genuinely grass fed.

Research

Research into sustainable farming methods is vital to ensure we can continue to feed a growing population at the same time as reducing environmental impacts. It should include:

- Alternative feed crops
- Breeds best suited to extensive grazing and lower protein diets
- Best grass and forage varieties for adequate protein and low methane emissions
- Ration mixes for the highest substitution rate.

The case for a Government strategy

With the right action in the UK it will be possible to:

- Tackle global impacts
- Provide benefits for human health
- Provide gains for animal welfare
- Create a thriving, sustainable livestock farming sector.

This is why Friends of the Earth is urging the Government to set out a strategy to improve the sustainability of livestock farming and consumption. The Government needs to consult widely to ensure it delivers the right package of measures. But the strategy must address global impacts and set out a way to reduce them. It should include the kind of policies we have outlined in this report.

Friends of the Earth, July 2010

Appendix 1

Theoretical percentage of Hipro soybean meal (at maximum inclusion rate) that could be substituted by UK proteins (at maximum inclusion rates). Assumes land is not limiting.

About Appendix 1

This table shows what proportion of imported soy in livestock feed rations could be replaced by either home-grown soy or an alternative home-grown protein crop. The proportion varies depending on the type of animal and its age.

The table shows maximum levels of inclusion for imported soy (ie, Hipro soy bean) although in practice animals may be fed with less soy in their ration. For example, the maximum rate for soy in the ration for beef cattle is 35 per cent

of the feed, but in practice this rate may be lower. However, it was not possible to obtain commercial data on current inclusion rates from feed companies.

Figures given for the alternatives show what proportion of the soy could be replaced directly with an alternative without exceeding any anti-nutritional factors. So for beef cattle, for example, the 35 per cent of soy that could be used to make up the protein content of their feed could be wholly replaced by lucerne silage.

| Protein crop | Ruminants | | | | | Pigs | | | | | Poultry | | | |
|---|-----------|-------|------|------|-----|-------|--------|--------|----------|-----|---------|---------|---------|-------|
| | Calf | Dairy | Beef | Lamb | Ewe | Creep | Weaner | Grower | Finisher | Sow | Chick | Broiler | Breeder | Layer |
| Hipro (high protein) soy bean (max inclusion) | 20 | 35 | 35 | 20 | 30 | 20 | 25 | 30 | 30 | 30 | 30 | 30 | 35 | 35 |
| Lopro (low protein) soy bean meal | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 58 | 91 | 91 | 91 |
| Full fat soy (UK grown) | 37 | 31 | 31 | 37 | 31 | 73 | 58 | 37 | 24 | 24 | 0 | 61 | 42 | 42 |
| Field beans | 13 | 29 | 29 | 13 | 29 | 0 | 0 | 13 | 17 | 17 | 0 | 8 | 7 | 7 |
| Dried peas | 22 | 38 | 38 | 22 | 38 | 0 | 9 | 15 | 11 | 11 | 0 | 0 | 10 | 10 |
| Lupin (white) | 20 | 23 | 23 | 7 | 22 | 0 | 0 | 0 | 13 | 13 | 0 | 9 | 12 | 12 |
| Oilseed rape meal | 15 | 44 | 44 | 15 | 41 | 0 | 0 | 5 | 10 | 15 | 0 | 5 | 0 | 9 |
| Sunflower | 7 | 39 | 39 | 7 | 39 | 0 | 0 | 5 | 9 | 18 | 0 | 9 | 15 | 15 |
| Lucerne silage | 100 | 100 | 100 | 100 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Linseed | 13 | 20 | 20 | 13 | 20 | 0 | 0 | 0 | 12 | 12 | 0 | 0 | 3 | 3 |
| Dried lucerne | 23 | 20 | 20 | 23 | 23 | 0 | 0 | 0 | 0 | 0.5 | 0 | 0 | 0 | 2 |
| Dried grass | 16 | 29 | 29 | 25 | 34 | 0 | 0 | 3 | 3 | 3 | 0 | 0 | 5 | 5 |

Appendix 2

The level of area payment required to maintain and increase the area of UK protein crops planted.

| Protein crop | Gross margin minus protein supplement £/ha | Maintenance of current area £/ha | Increase in area grown £/ha |
|--------------|--|----------------------------------|-----------------------------|
| Field beans | 377 | 23 | 43 |
| Dried peas | 307 | 93 | 113 |
| White lupin | 297 | 103 | 123 |
| Yellow lupin | 132 | 268 | 288 |

Source: RAC The potential for replacing imported soy with alternative home grown protein feeds for UK livestock.

REFERENCES AND NOTES

- 1 Baines, RN and Jones, JVH (2010) The potential for replacing imported soy with alternative home grown protein feeds for UK livestock, report for Friends of the Earth by the Royal Agricultural College www.rac.ac.uk
- 2 Modelling conservation in the Amazon basin, Soares-Filho BS et al., *Nature* 440: 520-523, March 20062
- 3 UN convention on Biological Diversity 2010 Global Biodiversity Outlook
- 4 Livestock's long shadow, UN FAO, 2006
- 5 RAC's assessment is based on: Defra (2010) GB Animal Feed Statistical Notice – April 2010 – and relates to compound animal feeds
- 6 USDA foreign agricultural service
<http://www.fas.usda.gov/oilseeds/circular/Current.asp>
- 7 Meat and dairy production and consumption, Garnett T, Food Climate Research Network, 2007, p21
- 8 IAASTD (2009) Agriculture at a Crossroads. International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), Global Report, Island Press, Washington D.C.
- 9 According to the RSPB, "Extensively grazed grassland creates a diverse sward structure, rich in plants and invertebrates and beneficial to a variety of birds". RSPB, "Advice for farmers" <http://www.rspb.org.uk/ourwork/farming/advice/details.asp?id=204307>
- 10 NJ Ostle, PE Levy, CD Evans, P Smith, UK Land use and soil carbon sequestration, *Land Use Policy* 26S (2009) S274 – S283
- 11 Safeguarding our Soils, Defra, 24 September 2009
- 12 More research is needed but for example - Mike Abberton, a scientist at the Institute of Grassland and Environmental Research in Aberystwyth suggests farmers could help tackle climate change by growing grass varieties bred to have high sugar levels, white clover and birdsfoot trefoil, a leafy legume, for their animals to eat (reported in *The Guardian*, Tuesday 10 July 2007)
- 13 Rural Economy and Land Use Programme (2008) "Eating Biodiversity: an Investigation of the Links Between Quality Food Production and Biodiversity Protection" <http://www.relu.ac.uk/news/Buller%20Policy%20&%20Practice%20Notes.pdf>
- 14 They should not need supplementary protein because of the protein provided by the microbial community in the rumen. Diamand, E (2008) Research on alternative Feeds for Friends of the Earth (unpublished).
- 15 Hancock J, Weller R & H Mccalman (2003) 100% organic livestock feeds: preparing for 2005 Organic Centre Wales, Institute of Rural Studies, University of Wales, Aberystwyth
- 16 Friends of the Earth (2010), briefing on the benefits of hill farming
- 17 Friends of the Earth Briefing (2009) Feeding the beast - how public money is propping up factory farms http://www.foe.co.uk/resource/briefings/feeding_the_beast.pdf
- 18 Diamand, E (2008) Research on Alternative Feeds for Friends of the Earth (unpublished)
- 19 General Commission for Sustainable Development no. 40 January 2010: Environmental and economic advantages of a revival of legumes in France
- 20 Defra, 2004, Optimising the use of home grown oilseeds and pulses for poultry
- 21 The RAC notes, for example, that: "Combining both peas and sunflower at maximum inclusion levels would create a problem as both have a laxative effect. However using either of these protein sources in association with another UK protein source that does not have a laxative effect could allow a greater proportion of combined UK proteins to be used in rationing as opposed to imported soybean meal."
- 22 Friends of the Earth & Compassion in World Farming (2009) Eating the Planet? How we can feed the world without trashing it http://www.foe.co.uk/resource/briefings/eating_planet_briefing.pdf

Pastures New

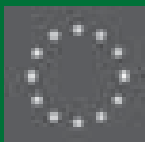
A SUSTAINABLE FUTURE FOR MEAT AND DAIRY FARMING

Livestock farming is one of the most significant contributors to climate change, yet little is being done to reduce its impact.

Central to the problem is animal feed that uses soy grown in South America – where rainforests and grasslands are being ripped up to make way for soy plantations.

Friends of the Earth's groundbreaking research lays out the alternatives to imported soy in the UK, along with other practical solutions to reduce the impact of livestock farming.

It shows how we can create a more environmentally friendly farming sector in the UK – while at the same time continuing to enjoy meat and dairy.



This document has been produced with the financial assistance of the European Commission. The contents of this document are the sole responsibility of Friends of the Earth and can under no circumstances be regarded as reflecting the position of the European Commission.



**Friends of
the Earth**

Making life better for people by inspiring solutions to environmental problems

Friends of the Earth, England Wales and Northern Ireland
26-28 Underwood Street, London N1 7JQ, United Kingdom
Tel 020 7490 1555 Fax 020 7490 0881 Website www.foe.co.uk
Trust company number 1533942, charity number 281681

Credits | Author: Sandra Bell | Editors: Dominic Murphy, Nicky Stocks
Art direction: Luke Henrion | Design: Ed Andrews | Picture research: Amelia Collins

♻️ Printed in the UK on paper made from 100 per cent post-consumer waste

JULY 2010