

Progress towards a sustainable future for livestock farming

April 2012

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Foreword by Jim Paice MP



The sustainability of the UK's livestock industry is of prime importance to all of us, and is at the centre of my priorities as Minister for Food and Farming. As a farmer myself, I recognise the responsibilities farmers have to ensure that they manage Britain's abundant natural advantages for future generations. And I also recognise the many things farmers do, and have for generations, to ensure that all of us can enjoy the legacy of our fantastic landscapes, biodiversity, and thriving rural ways of life.

The Government believes that by working together to mobilise the efforts and expertise of our farmers, we can succeed in meeting the challenges of sustainably producing livestock and livestock products for generations to come. We recognise that no one individual, group, or organisation has a monopoly of wisdom about these challenges, but we do know that in order to meet them we need to embrace new approaches. That's why the Government has empowered farming organisations to come up with their own approaches to more sustainable livestock production.

Of course, the Government has a role too. That's why Defra and the devolved administrations have committed £12.6 m. to research designed to deliver answers to questions about the environmental fate of greenhouse gases, and why we're working internationally through the Global Research Alliance on Agricultural Greenhouse Gases to coordinate research and exchange findings. The answers we're investing in will help us to understand what works to reduce GHGs at farm-level. And we're investing with industry on research into key questions in other areas: alternative protein sources for pigs and poultry, diets to reduce GHGs in ruminants, the health and welfare of dairy cows, and life cycle analysis of poultry production, to name a few. This is the government as enabler: investing in the evidence so that farmers can make the right choices for sustainability in the future.

We also recognise our responsibilities to the global community in other ways. That's why we're working to address the global impacts associated with livestock production, particularly the drivers of deforestation. We're investing with our EU and international partners to tackle illegal logging which destroys forests and biodiversity, contributes to GHG emissions, and impacts disproportionately on the poorest in communities. That's why we're addressing our consumption of commodities by leading a programme of work with businesses and NGOs to encourage the use of palm oil with a less damaging forest footprint. Industry partners are also participating in research into alternatives to the use of soy in animal feed, and discussing ways to improve the availability and use of sustainable soy products. I urge them to continue their discussions about sustainable sourcing, and

agree ways to get more sustainably sourced soy into supply chains. It's an important step in providing consumers with the better information they want about the products they buy.

I am encouraged by much of what is in this report. Importantly, this is not a Defra report, but a report with contributions from a wide community of actors and interests in the future of our livestock sectors. I am struck by the extent to which stakeholders from different perspectives are finding common ground on what needs to be done, and engaging in dialogue on achieving our common goals.

We all have a stake in ensuring that the legacy of livestock farming is handed on to future generations assured that we have addressed the challenges it faces squarely. There's much to do, and we need to be prepared to listen to and engage in debate based on sound evidence and respect for different perspectives. That's why I welcome the efforts of all those who work to ensure that sustainable food and farming is, and remains, a high priority in the UK. I hope that this report can help to continue the dialogue about what that sustainable future looks like and how to achieve it.

A handwritten signature in black ink, reading "Jim Paice". The signature is written in a cursive style with a horizontal line underneath the name.

Jim Paice
Minister of State for Agriculture and Food

About this Report

In responding to concerns expressed by Friends of the Earth about the sustainability of UK livestock production and consumption, Jim Paice MP, Minister for Agriculture and Food, encouraged them to convene a stakeholder conference of interested parties in early 2011 to take stock of and discuss progress. Addressing that conference, the Minister welcomed Friends of the Earth's initiative, encouraged attendees to search for consensus on the challenges facing the industry, and reiterated an earlier offer to produce a one-year-on report on the role of all parties with an interest in the issues raised. This document is that report, and draws on the contributions of many different stakeholders. In producing the report, Defra has encouraged different contributors to share their thoughts on present and future responses to the challenges facing the industry. No attempt has been made by Defra to edit the content of these contributions.

As a collection of viewpoints, this report concentrates largely on activities for sustainability in England. Responsibilities for food and farming policies are, in large measure, shared with the devolved administrations, and further information on their activities can be found at the website addresses provided below.

Wales: <http://wales.gov.uk/topics/environmentcountryside/?lang=en>

Northern Ireland: <http://www.dardni.gov.uk/>

Scotland: <http://www.scotland.gov.uk/Topics/farmingrural/Agriculture>

Introduction

The sustainability of our livestock industry is vitally important to all of us. In fact, there are few areas of our lives in Britain that aren't affected by livestock farming in one way or another. The agri-food sector made up 7.1% of national market sector gross value added in 2010, and 14% of national employment in the third quarter of 2011. All of which activity was fuelled by consumer expenditure of £182 billion on food and drink during 2010.¹ In addition, livestock farming has moulded and manages our landscapes, protects our biodiversity, and enhances the viability of our rural communities.

We have wonderfully rich grassland resources in this country, making the ability of our livestock to turn these into products of high dietary value for human consumption of real significance as we grapple with feeding an ever increasing global population. Much livestock is maintained on grasslands that are unsuitable for arable crops. Such production systems will, if managed well, sequester and store significant amounts of carbon in their soil (though total carbon storage is normally higher in forests due to woody biomass accumulation).

The Government Chief Scientist's Global Food and Farming Futures Foresight project published in January 2011² set out the need to work towards the sustainable intensification of our global food supply chain and argued that without change the global food system will continue to:-

- degrade the environment
- compromise the world's capacity to produce food in the future, and
- contribute to climate change and the destruction of biodiversity.

Importantly, while the Foresight project identified the complexities against which policy decisions on the consumption and production of meat need to be considered in different parts of the world, it also highlighted successes from the sustainable intensification of agriculture. The project looked, for example, at projects involving African experts across 20 countries, with a view to learning lessons and informing the spread of such practice. The cases included crop improvements, agro-forestry and soil conservation, conservation agriculture, integrated pest management, horticulture, livestock and fodder crops, aquaculture, and novel policies and partnerships. By early 2010, these projects had documented benefits for 10.4 million farmers and their families and improvements on approximately 12.75 million hectares. They show that where there is political, institutional and economic domestic recognition that 'agriculture matters', then food outputs can be

¹ Food Statistics Pocketbook 2011, Defra, page 10 <http://www.defra.gov.uk/statistics/files/defra-stats-foodfarm-food-pocketbook-120402.pdf>

² <http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf>

increased sustainably. Importantly, these examples also demonstrate the potential for benefits to flow into other areas, such as national domestic food budgets; the strengthening of environmental services; the development of new social infrastructure and cultural relations; the emergence of new businesses; and driving local economic growth.³ Many of these case examples have common approaches to working with farmers, involving agricultural research, building social infrastructure, working in novel partnerships and developing new private sector opportunities.

In the UK, Defra's Business Plan sets out three priorities, each of which recognise the natural advantages we have, and the contribution livestock farming and its associated supply chains make to the UK. These are:-

- Support for British farming and the encouragement of sustainable food production
- Enhancing the environment and biodiversity to improve quality of life, and
- Support for a strong and sustainable green economy resilient to climate change.

The Government believes that sustainability is best ensured by supporting livestock farmers and food chain businesses and consumers to maximise efficiency, share learning and eliminate waste. It supports the initiatives underway through the livestock sector product roadmaps for dairy, beef and sheep, and pig meat in England; the undertaking by the agricultural industry partnership to meet its target of three million tonnes of greenhouse gas abatement per annum by 2020; and, the many examples of knowledge transfer activities undertaken by the Agriculture and Horticulture Development Board (AHDB) and others in both private and public spheres.

Defra is also a major sponsor of the research required to underpin a sustainable livestock industry for the future. Defra-supported LINK sustainable livestock production projects and other sponsored research activities are highlighted elsewhere in this report. These projects constitute a major investment, together with the devolved administrations, in research to provide greater clarity on the environmental fate of greenhouse gases and ways to reduce these.

The sections of this report which follow begin with the work underway by different livestock sectors to deliver greater sustainability, followed by an overview of industry and government progress and activity of general interest to all livestock farmers and food producers. This is followed by a section highlighting the Government's investment in promoting sustainable agriculture abroad. A final section features a critique provided by Friends of the Earth highlighting progress to date and its sense of the gaps remaining in delivery of a more sustainable livestock industry.

³ Taken from *ibid*, pp. 127-128

Beef and Sheep

This section provides information on initiatives and activities specific to the beef and sheep sectors and their supply chains.

This text has been provided by EBLEX.

The story so far

EBLEX, the beef and sheep meat division of the Agriculture and Horticulture Development Board (AHDB), began its environmental roadmap journey in 2008. It came from a desire to better understand the environmental challenges faced by the sector and to develop practical messages to help livestock farmers reduce their carbon footprint and meet tough emissions targets.

From the start it was a collaborative approach, working with key stakeholders, trade associations, research institutions and Defra to form a steering group to identify principal areas for research. This collaboration has continued through the Greenhouse Gas Action Plan of which EBLEX, as part of AHDB, is an active member.

Four years on, we have provided the industry with benchmarking data for on-farm carbon footprints, investigated wider environmental issues facing the industry, stimulated debate across the sector and informed our knowledge transfer work—branded as the Better Returns Programme⁴—to encourage change at farm level. The result, we believe, is that we have identified key areas where large enough improvements can be made to meet targets, namely through more efficient use of fertiliser, better management of manure and improved overall livestock output.

Work completed in the first two chapters of the EBLEX roadmap project – Change in the Air, published in November 2009⁵, and Testing the Water, published in December 2010⁶—showed that the best opportunities to reduce GHG emissions were through improved breeding, efficient feeding and higher levels of farm management. Changes in all of these areas individually showed that the targets set above were technically achievable.

In terms of a benchmark, the Lifecycle Analysis (LCA) research, based on a theoretical model, carried out for beef cattle and sheep by Cranfield University and published in Change in the Air, suggested the average carbon footprint for beef production in England was 13.9kg CO₂ eq per kilogram of beef meat produced. For sheep it was 14.6kg CO₂ eq per kilogram of meat produced.

⁴ <http://www.eblex.org.uk/returns/>

⁵ http://www.eblex.org.uk/documents/content/publications/p_cp_changeintheairtheenglishbeefandsh eepproductionroadmap.pdf

⁶ http://www.eblex.org.uk/documents/content/news/p_cp_testingthewater061210.pdf

In Testing the Water, a commercially available on-farm assessment model was employed – the E-CO₂ system, endorsed by the Carbon Trust. These results, using real data from 30 beef and 30 sheep farms, showed an average emissions footprint for cattle of 11.93kg CO₂ eq, and 11.95kg CO₂ eq for sheep per kilogram of meat produced. While these figures differ slightly from the LCA calculations in the first year’s roadmap work, they reflect a real-world assessment. The range of values resulting from this relatively small data set generally follow the trends for system types (eg, lowland suckler beef, upland suckler beef, dairy beef, hill flocks, upland flocks and lowland flocks).

The on-farm carbon audit work has been used to inform EBLEX’s ongoing Better Returns Programme knowledge transfer activity, suggesting practical ways individual farmers can enhance the efficiency of production within their enterprise and, as a result, reduce their environmental footprint and help steer the industry towards the aforementioned targets.

In 2011, we repeated the on-farm data collection with a bigger sample, which showed broadly the same trends as those in 2010, adding further credence to our library of data. The results appear in the third chapter of the roadmap, Down to Earth. There is little or no change to the averages year-on-year, and the range of results remains similar. In short, the industry has paved the way to focus improvements recognising that on-farm changes filter through across several generations of animals.

Most recent figures show that across all beef units studied, the E-CO₂ carbon calculator shows an average 100-year Global Warming Potential (GWP100) of 12.65kg CO₂ eq/kg liveweight. For sheep, the work showed an average 11.86kg CO₂ eq/kg liveweight.

Table 1: Overall average of English beef production

Beef farms (131 units in total)	kg CO ₂ eq/kg lw	kg CO ₂ eq/kg dw
Average	12.65	25.30
Lowest	3.02	6.04
Highest	29.70	59.40

Section continues on next page

Table 2: Overall average of English Sheep Production

Sheep farms (57 units selling finished animals)	kg CO ₂ eq/kg liveweight	kg CO ₂ eq/kg deadweight
Average	11.86	25.79
Lowest	6.43	13.98
Highest	19.71	42.85

Encouraging change at farm level

The key to success is to maximise farm efficiency whatever the enterprise type and make best use of the available land resource. The common challenge for any producer is to find the right balance of enterprise system and management techniques to maximise the output for food production, whilst minimising impact on the environment and ensuring profitability for their business. In essence, this is sustainable intensification. To encourage farmer interaction with our message, the data, coupled with case studies of farms included in the study, have helped identify traits that typify low carbon and high carbon farms:

Low carbon farm

- Achieving optimum daily liveweight gains
- Achieving the best finishing weight as early as possible
- Feeding good quality grass or a high quality ration (with high available metabolisable energy - ME) where required and the use of co-products where suitable
- High output per breeding unit

High carbon farm

- Below average liveweight gain
- Light weight at slaughter
- High feed rate per kilogram of beef produced
- Low output per breeding unit

The road ahead

While all three chapters of the roadmap so far have included work on emissions, they have also looked at other environmental issues related to the climate change debate. These have included water usage, energy consumption, the important contribution beef and sheep production makes to the landscape, biodiversity and other significant ecosystem services, carbon sequestration, waste in the supply chain and retailer projects.

In some of these areas, we have commissioned unique research to benchmark the industry and inform debate. With water, for instance, our work revealed that the real water footprint of beef production in England is 67 litres per kg of beef produced. For sheep, it is 49 litres per kg of sheep meat produced.

In other areas, our investigations have revealed that more work needs to be done, for instance putting values on carbon sequestration in grazed grassland areas. We also have an active research and development programme looking at an additional range of issues, from feed planning tools and chicory's role in beef performance, to reduced emissions from use of high quality oats and low nitrogen levels in grass. This type of project will ensure the library of information and practical guidance will grow further to help steer the industry in the right direction towards meeting those Government targets.

In the last four years, the industry has embraced the climate change issue and established a number of ongoing activities to address elements of efficiency improvements and waste reduction. At farm level the long production cycle for beef and sheep mean change is slow to materialise, but EBLEX is committed to play its part in encouraging efficient production and it is clear the sector as a whole is working at all levels to reduce its carbon footprint.

Dairy

This section provides information on initiatives and activities specific to the dairy sector and its supply chains.

This text has been provided by the Dairy Supply Chain Forum

In 2008, the dairy industry created a Milk Roadmap concentrating on the fresh milk component of dairy, which represents 50% of total milk production. Over the last two years, this has evolved to include cheese, yoghurt, butter and milk powders in order to create a comprehensive Dairy Roadmap encompassing all aspects of dairy production⁷.

Right from the beginning of this initiative, there has been co-operation with all sectors of the dairy supply chain. Britain's dairy farmers, processors and supply chain partners have worked together to minimise their impact on the environment and deliver visible sustainability benefits.

As a result of the focus that the Dairy Roadmap has facilitated, there have been significant developments throughout the supply chain, from the use of nutrient management on-farm to increasing the use of recycled plastic in milk bottles and significantly improving the energy efficiency of dairy plants.

The UK dairy industry's 2010 Dairy Roadmap reported on progress made within the industry since the launch of its first roadmap in 2008. The report found that all the 2010 targets that were set out have been met, except for one. The report also outlines 2015 and 2020 targets.

The Dairy Roadmap steering group links with other dairy industry initiatives such as the pan-industry Dairy 2020 programme which aims to shape a sustainable vision for the industry over the next decade, and Defra's Green Food Project, which is identifying the barriers to sustainably increasing food production while reducing the environmental impact.

The Dairy Roadmap targets are under continual review to take account of improved science and better technical developments, making the Dairy Roadmap report a living document.

Below are details on the targets set for dairy processors and farmers, plus some direction on how the Dairy Roadmap is evolving with targets in a number of other areas.

⁷ <http://www.dairyuk.org/environmental/milk-roadmap>

Dairy Processors

The processing of raw milk into dairy products encompasses everything from the collection of milk on farm to the delivery of products to customers. In broad terms the environmental impact of the processing of milk can be attributed to the following areas:

- Transportation of raw milk & products from farm to dairies to retailers
- Emissions arising from energy use at dairies
- Water use on site
- Use of cleaning chemicals on site
- Discharge of effluent
- Packaging of dairy products
- Factory food and packaging waste

Processor targets have been set by representatives from across the industry with the targets regularly reviewed to ensure they remain challenging and fit for purpose. Progress is tracked through an annual environmental benchmarking exercise which also allows individual manufacturing sites to compare their performance against the rest of the industry.

Processor targets for 2010 were:

- Plastic milk bottles to contain a minimum of 10% of recycled plastic
- All processors to meet or beat energy or carbon reduction targets of Climate Change Agreements
- Implement an industry environmental benchmarking programme,

All of these targets were met.

Targets for 2015 and 2020 are considerably more challenging and wide-ranging in scope and include:

2015

- The removal of all HCFC refrigerants at large processors
- The continued meeting of Climate Change Agreement targets
- A 20% reduction of water brought onto site
- Plastic milk bottles to contain a minimum of 30% of recycled plastic

2020

- To send zero ex-factory waste to landfill
- A 30% reduction of water brought onto site
- 10% of non-transport energy use to come from renewable sources
- Plastic milk bottles to contain a minimum of 50% of recycled plastic

The dairy processing sector is dedicated to ensuring that their targets remain relevant and continue to drive sustainable progress in the industry. The sector is already working together to develop new target areas and with this in mind, is keen to incorporate

emissions targets for transport, packaging and food waste into the Roadmap as well as starting to look in more detail at water use, biodiversity, and investing in the environmental skills needed for the future sustainability of the industry.

Dairy Farmers

The production of over 13bn litres of milk by British dairy farmers forms the vital base upon which the entire dairy supply chain is built. The environmental footprint of milk production on dairy farms broadly involves the following areas:

- Farmland / landscape management
- Farm inputs (feed, fertiliser etc.)
- Energy (electricity)
- Water use (drinking, washing, milk cooling)
- Nutrient / resource management (slurry, manure etc.)
- Emissions (CO₂, CH₄, N₂O) and,
- Farm wastes (plastic wrap etc.)

The Dairy Roadmap, and the challenging producer targets established within it, showcase the environmental credentials of dairy farming whilst highlighting the ambition and commitment of our dairy farmers to produce quality products of high nutritive value at lower environmental impacts.

For 2010 the industry achieved a series of demanding targets which included:

- 50% of dairy managed farmland entered into Environmental Stewardship Schemes,
- 20 - 30% of dairy farmer's trialling new technologies
- 5 – 15% up-take of water use efficiency measures
- 65% of dairy farmers actively nutrient planning
- 95% of dairy farmers have a manure management plan

All 2010 targets were met, except for the target of piloting of 30 on-farm anaerobic digesters, with nine digesters being achieved.

Key targets for 2015 and 2020 include:

2015

- 65% of dairy managed farmland into Environmental Stewardship Schemes (ESS) thus fully recognising the potential implications of greening of the CAP
- 90% of farmers to have nutrient management plans
- 50% of dairy farmers trialling new technologies

2020

- 40% of energy used on dairy farms is from renewable sources
- 20-30% reductions in GHG emissions balance (CO₂ & equivalents, CH₄, N₂O etc.)
- 70% of non-natural waste is recycled or recovered (highlighting the need for infrastructure development)

In addition to the above core targets British dairy farmers are currently exploring new target areas with a view to incorporating them into the existing 2015 and 2020 targets. These new areas include farm inputs (e.g. feed, fertiliser) and on-farm renewables, along with greater energy and water use efficiency.

Pig Products

This section provides information on initiatives and activities specific to the pig products sector and its supply chains.

This text has been provided by BPEX

Improving the efficiency of resources used in the production of pork remains the major objective to secure improved sustainability of the pig industry as identified in Advancing Together – A Roadmap for the English Pig Industry⁸. The Roadmap identified three key areas of activity. Using feed more efficiently, improving productivity through the Two Tonne Sow (2TS) programme and managing slurry/waste more effectively.

Improving pig health will help to improve the efficiency of pigs and so the efficiency of resources used. BPEX is playing a leading role in the implementation of the 20:20 Pig Health and Welfare strategy launched by the Chief Veterinary Officer in August last year. Core in the early implementation is the national Pig Health Improvement Programme. The national Stage 1 plan has now been completed and the pilot Stage 2 plans have been successfully introduced in a number of regions. We are already seeing productivity measures in production beginning to improve.

The 2TS programme has become recognised throughout the industry as the main vehicle for knowledge transfer in the pig production industry. The finishing stage of production accounts for 50% of feed volume and so small gains in productivity can make a significant impact. BPEX has launched the Finisher Challenge as the next stage of the Two Tonne Sow Programme (2TS). Knowledge Transfer Managers are helping to fine tune performance, identify lost potential and improve businesses by October through competitive spirit⁹.

Managing slurries and wastes and realising their full potential is an important part of a complex and interrelated series of activities covered under the BPEX Environment Hub.¹⁰ In the summer of 2011 BPEX publicised “Improving Analysis of Solid Manures and Slurries” which came out of a Defra Link project. This helps producers analyse and maximise the nutrients contained in pig manures and slurries.

Feed remains the most important input in production and so this is the main area of our activity with the industry. Substituting imported soya with domestic sources of vegetable protein and the sustainability of soya that is imported continue to be a focus. Agricultural Industries Confederation (AIC) data shows that the industry continues to make progress. Soya inclusion rates are reported to have reduced by a half in the last decade to account for only 10% of the diet. There has been a corresponding increase in the use of home grown proteins.

The source of soya imports is reported to be mostly from Argentina (57%) with Brazil accounting for only 38% (Source AIC). At present there is little Round Table on

⁸ <http://www.bpex.org.uk/environment-hub/climate-change/PigIndustryRoadmap.aspx>

⁹ <http://www.bpex.org.uk/2TS/finishing/>

¹⁰ <http://www.bpex.org.uk/environment-hub/>

Responsible Soy¹¹ (RTRS) certified soya on the market but customer interest is increasing to the extent that the Feed Materials Assurance Scheme¹² (FEMAS) and RTRS have recently launched a joint module for responsible soya supply. The module brings together the sustainability criteria of RTRS at farm level with the existing robust supply chain certification of the FEMAS scheme without adding significantly to auditing costs. A number of suppliers are also looking at extending their existing certification sustainability schemes such as Cargill TRIPLE S.

As availability of RTRS and other certified sources of sustainable soya increases in the coming year we will be bring this to the attention of the industry. The public profile of RTRS should be increased in May when they hold their 7th International Conference near Heathrow. We will also follow with interest the recently announced partnership agreement between the Brazilian Confederation of Agriculture and Livestock (CAN) and the British Embassy in Brazil on the programme aimed at spreading the use of sustainable agricultural practices.

Results from feeding trials of finishing pigs using peas and beans (Green Pig) are being disseminated, and a total of five papers have been accepted for the British Society of Animal Science forthcoming conference. These include life cycle analysis comparing diets including home grown proteins against those containing soy (including land use change impacts). More detailed information on Green Pig can be found later in this section.

We are aware of some commercial producers including beans in pig diets. Experience from one such farm which is milling and mixing its own feed is that including home grown beans at a rate of about 7% can be done without a detrimental impact on pigs performance. However, it is not without its challenges. Beans are not that economical to grow due to variable yields but they are a useful break crop for this particular system. The higher inclusion level of beans in the ration, the higher the need for supplementary amino acids as beans have a lower amino acid content than soya. Also, higher bean inclusion can make the feed more dusty resulting in more oil in the ration which can adversely affect grading.

Despite there being no UK supply of wheat dried distillers grains with solubles (DDGS) at the present time, two feed mills are understood to be using French sourced product in pig rations. Experience with this and ENSUS's products is indicating that DDGS can be included successfully in finisher pig feed. Further studies are in the planning stages so we can understand the full nutritional characteristics of this product (the Environmental and Nutritional Benefits of Bio-ethanol Co-products).

The EcoPig project has successfully proved the benefits of feeding outdoor pigs in long troughs as opposed to the conventional floor method. Reduced feed and fuel use, carbon footprint, nitrate leaching and improved soil management are all positive outcomes. Results have given BQP the confidence to invest over £1M in roll trough feeding across all their outdoor production sites (around of 25% outdoor sows). Other production companies have visited the site and are looking to implement changes in their businesses.

¹¹ <http://www.responsiblesoy.org/>

¹² <http://www.agindustries.org.uk/content.output/95/95/Trade%20Assurance/Trade%20Assurance%20Schemes/FEMAS.msp>

The BPEX website¹³ has been refreshed and improved to make our services more accessible to users. New material has been added including a case study featuring a £300k investment in solar PV technology on a midlands farm. We are also working with producers seeking to claim renewable heat incentive (RHI) payments from the use of biomass fuel to understand the system and assist others take advantage of this. We have started to use webinars as another means of building engagement in the industry.

¹³ www.bpex.org

BPEX Farm Case Study



Farm Case Study

30

NUTRITION

Green Pig Project Update



Sustainable Farming

Farm facts

Name: Midland Pig Producers

Location: Staffordshire

Farm size and enterprise: 450 sows selling all progeny at 7kg and finishing pigs as part of the Green Pig trial

Background

Midland Pig Producers are hosting commercial scale trials as part of the Green Pig Project. The Green Pig Project is a collaborative project between research and industrial partners and is sponsored by Defra through the Sustainable Livestock Production LINK Programme. The aim of the project is to assess the potential of using home-grown legumes (peas and beans) in growing/finishing pig diets as a means of reducing environmental burden and soyabean meal (SBM) dependency in UK pig production.

Benefits

- Reduce dependency on imported SBM
- Improve farm sustainability with home-grown pulses (peas and beans)
- Reduce environmental impact of farm
- If SBM prices continue to rise or availability is reduced, pig producers can be confident in using pulse crops as replacements.

The trial

Three different diet formulations were fed to batches of pigs 35-110kg. Parallel treatments were carried out on slatted and straw-based housing.

The trial commenced with the first set of three diets (Finisher 1) introduced when the batches of pigs reached approximately 35kg in weight. At approximately 60kg, a second set of three rations was introduced with a reduced total protein and energy level (Finisher 2). The pigs were removed from the trial and taken to slaughter once they reached 110kg.

The following diets were used:

- Control diet (SBM)
- Pea diet (30% peas, no SBM)
- Bean diet (30% beans, no SBM)

“The Green Pig Project feed trial has gone very well, no adverse effects seen with any of the diets, all pigs grew and graded well.”
Trevor Digby, Production Director

The maximum currently accepted level of pulses is around 15%, typical inclusion rates are 5-11%. The Green Pig diets were formulated to be nutritionally balanced through use of pure amino acids.



A Green Pig ration containing a 30% pulse inclusion level

Results

Test diets resulted in similar pig body weight gain (BWG; Fig. 1) and feed conversion ratio (FCR; Fig. 2) indicating no detrimental effect of using 30% peas and faba beans in pig diets in the absence of SBM. Also back fat depth (P2; Fig. 3) measured at slaughter were similar, and mean P2 values obtained were below the 12mm upper limit for premium carcass payment.

The slaughter data has been analysed using QBox (Fig. 4) to give a commercial overview of how many pigs from each treatment met the required contract slaughter specification. The graphs show the distribution of pig carcass weight and back fat (probe). The majority of pigs fell within the desired specification (dark shaded area) and therefore full contract payment. Deductions are applied to pigs which fall outside of the dark shaded areas.



Sustainable Farming

Figure 1 The body weight gain (BWG) (g/pig/day) of pigs (35-110kg) fed control, bean and pea diets housed on a slatted or straw system

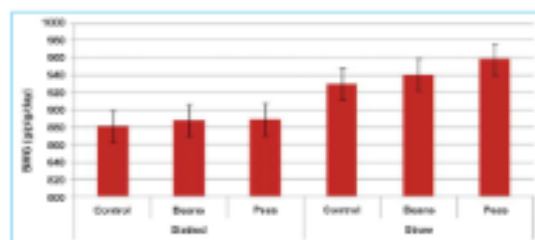


Figure 2 FCR of pigs (35kg-110kg) fed control, bean and pea diets housed on a slatted or straw system

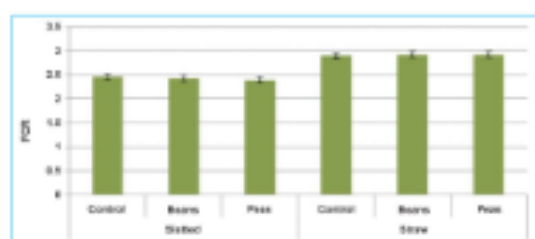
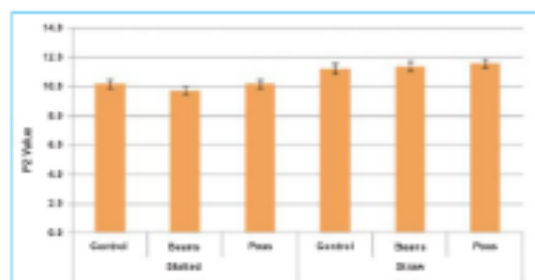


Figure 3 Fat depth at the P2 position of pigs fed control, bean and pea diets housed on a slatted or straw system



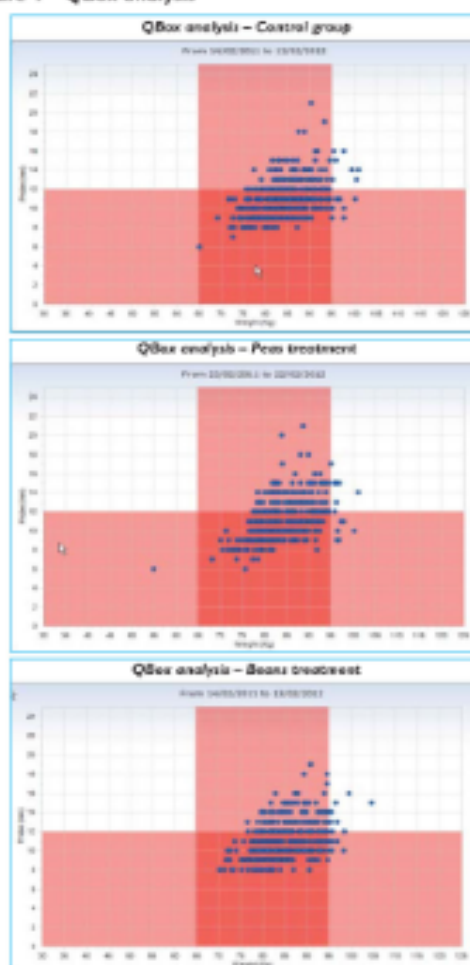
Conclusion

The project has shown that higher levels of peas and beans than are currently used in the UK can be included in rations for grower and finisher pigs without significant penalties on growth performance or slaughter measures. Furthermore, there is no difference between pea and faba bean based diets suggesting farmers can choose the pulse which best suits them. Thus, peas and faba beans are a viable home-grown alternative to SBM in grower and finisher pig diets.

Green Pig Life Cycle Assessment (LCA)

The environmental benefits of using pea and faba bean based diets are being assessed in the Green Pig project through LCA modelling. The LCA has shown that such an approach will contribute to reduce environmental burdens arising from pig production, especially when otherwise used SBM is associated with recent land use change (eg deforestation). This positive answer could lead to an increased demand for pulses being generated from the animal feed industry. Provided that this increased demand can be met, as a whole, the UK pig industry is given an opportunity to become increasingly more sustainable, with reduced reliance on imported protein sources whilst also complying with policies that aim to reduce its environmental footprint.

Figure 4 QBox analysis



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Poultry

This section provides information on initiatives and activities specific to the poultry sector and its supply chains.

This text has been provided by the British Poultry Council

Industry Structure

The British poultry industry recognises that sustainable development is in the best long term interest of our consumers and the individual companies within the industry. Sustainable development balances economic growth, protection of the environment and recognition of social needs and values. The industry has been working together to improve its sustainability through various mechanisms.

Within the UK farming sector the UK poultry meat industry is uniquely structured and organised with relatively few producing and even fewer slaughter and processing operations with a high degree of vertical integration. This structure makes it easier for policies to be developed and taken up across the industry. The comparatively very short breeding and production cycle, the short and direct production chain, and the lack of CAP subsidies makes the poultry meat industry very responsive to consumers' needs and to citizens' values and aspirations. This is reflected in our tiered welfare systems, where we can supply standard product right through to more niche organic and free range products.

Activities that are improving the sustainability of the poultry meat industry are summarised below.

Breeding and environment

Advances in the process of selective breeding, mainly of chickens, have been made possible by advances in the science of breeding programmes and in the capacity of computing power available. More than 40 different traits are selected for in chickens including health and welfare, and environmental resource efficiency, as well as productivity traits. Modern breeding programmes balance the characteristics needed for efficient parent breeders with the different characteristics required in their meat-producing offspring, and are underpinned by robust bird health and welfare characteristics.

The balanced breeding programme has resulted in a long term and continuing increase in the number of hatching eggs produced per breeder hen and in the ratio of chicks hatched from eggs placed in hatcheries. Hatching eggs per hen have increased by around 23% over the last four decades.

At the same time, the meat (broiler) chicken has become more efficient with respect to the amount of feed required to grow to its target weight. The feed conversion ratio has improved by over 26% and continues to improve. FCR is now around 1.7kg of feed for 1 kg of live-weight for chickens. The result is that on average a chicken now requires less

than three quarters the amount of feed and water it did four decades ago. These improvements have gone hand in hand with health and welfare improvements.

This is roughly equivalent to a reduction in land requirement of 67,000 hectares for wheat production alone for 850 million chickens reared annually.

Feed and land use requirements are further reduced when the greater productivity of the parent breeding stock is taken into account. While much of this environmental gain is due to improved breeding programmes it is also due to investments in enhanced house environment, disease reduction and control measures, and to diets more exactly specified to the birds' nutritional needs in the different stages of their growth. This better feed specification has reduced the nitrogen and phosphorous excretions in the litter.

The predominance of indoor rearing systems means litter disposal and other emissions are able to be controlled and the impact on the environment minimised. Around 75% of chicken and turkey litter is used as a renewable resource to generate electricity.

Wood shavings for litter are increasingly being sourced from recycled wooden pallets.

Energy and farming

Heat exchangers are being installed in poultry houses, reducing energy use for heating and ventilation. A computer controlled environment within the poultry house that maintains temperature to within 1°C rather than the previously wider 4°C is giving greater energy efficiency. Low energy lighting and low energy fans have been installed and new builds have improved insulation ratings. EV panels are being installed on poultry house roofs whose pitch suits the optimum placement angle.

The overall energy consumption on farms within the BPC Climate Change Agreement with DECC reduced by 26% over period of the Agreement, and the energy efficiency per unit of output improved by 27% over the period.

Sustainable feed

Feed is the largest single input in the production of poultry meat. While there are different feed specifications for different stages of the bird's life, generally feed consists of around 60-65% wheat and 20-30% soy protein. Some barley may be included and other ingredients provide the essential minerals and amino acids needed for the birds' healthy development.

Most UK retailers specify non-GM soy for all UK poultry (whether organic or not) and supplying poultry companies have little option but to source soy from reducing areas of non-GM production in Brazil. Increasing plantings of GM soy varieties in Brazil follow the move to almost 100% GM plantings in the other main producing and exporting countries of USA and Argentina.

The most important concern with regard to soy, whether non-GM or GM, is that it is responsibly and sustainably grown without contributing to deforestation. A sustainable

sourcing policy for soy needs to take account of changing social and environmental priorities.

Unlike other livestock, the scope for substitution of soy with other protein crops in poultry feed is limited because of the limited protein content of other protein meals, limiting amino acids and anti-nutritional factors in alternative protein crops. A 2010 study for Friends of the Earth on the potential for replacing imported soy with alternative home grown protein feeds for UK livestock showed that for broiler chickens alternatives to soy could replace at best only 9% of the current soy content of broiler feed i.e. around 2% of the diet.

The study did not consider the benefits of incorporating processed animal proteins (PAPs) in pig or poultry feed. A current EU proposal to permit the controlled re-incorporation of PAPs in pig, poultry and fish feed offers the technical potential for sustainable substitution of some soy in poultry diets. Research on dried distillers grains with solubles (DDGS) may succeed in making this a viable raw material for poultry feeds and allow limited substitution for wheat in the future.

Soy is the most sustainable source of protein for supplying the nutritional needs of poultry. It has a very good amino acid balance which cannot be matched by any other plant protein source. It will continue to be the major protein source for broiler feeds with only part substitution being possible.

Sustainable sourcing of all feed ingredients is of paramount importance to the long term future of the poultry industry. The industry adheres to the AIC Feed Materials Assurance Scheme (FEMAS) as a requirement of the Red Tractor poultry assurance schemes. FEMAS is accredited by the Round Table on Responsible Soy (RTRS) for distribution chain certification post-harvest under RTRS. The FEMAS scheme for non-GM soy ensures that it has not been grown on land deforested since 2006 under the terms of the Soy Moratorium. The industry is monitoring the development of RTRS and other certification schemes as possible vehicles for the migration from the current constrained sourcing policy for soy to a broader and more sustainable policy platform. Many issues have to be overcome before such schemes become the norm.

Processing

Processing plants are highly mechanised and when companies are investing in the continuous round of equipment upgrades or replacement, energy efficiency and efficient use of resources such as water per unit of output have considerable weighting on the investment decision. Packaging plays an important role in preserving food safety and in the poultry meat industry the bulk of production is for retailers' own label. Working with retailers poultry processing companies have down-gauged plastic packaging making it lighter weight and using less material. Corrugated card used is from recycled materials.

Under the Climate Change Agreement with DECC the poultry meat processing companies increased their overall energy efficiency per unit of output by 13%. In the same period production output grew by 32% in the participating companies.

All inputs and emissions in poultry rearing and processing are subject to controls imposed by the Industrial Emissions Directive (previously IPPC) which require permitting and regular inspections by the Environment Agency.

Water

Water is becoming a scarce resource. Rainwater harvesting systems are being installed in some farms cutting water losses and costs. The technology captures all rainwater from the site, storing it in either a lake or tanks. Water from this reservoir is then treated on demand to make it fit for consumption. Water recycling within processing plants is practiced where possible.

Society and community

From a social perspective the poultry industry is sensitive to the potential impact of noise and odour on neighbouring communities and individuals and considerable effort is put into minimising such impacts through working practices and mitigation actions to be good neighbours. Poultry farmers work with their local communities and with the Environment Agency in this respect.

The poultry industry is heeding new scientific evidence and society's concerns on animal health and welfare. It views good health and welfare as integral to sustainable development of the industry and takes a proactive role in working with Defra and NGOs to develop and implement indicators of on-farm chicken welfare which are measured at the processing plant for every flock. Flocks that exceed agreed thresholds are reported to the farmer and to the AHVLA for corrective action. This is the only welfare outcomes based approach to animal welfare currently being operated officially in the UK.

Like all livestock sectors and the human population, poultry flocks sometimes require medication. Poultry veterinarians need to prescribe antibiotics for certain poultry diseases and conditions. The industry has a proactive approach to responsible antimicrobial stewardship with special attention to categories of antibiotics considered of critical importance to human medicine. Antibiotic use in flocks is subject to rigorous risk assessment before prescription.

People and skills for the future

Sustainable development requires planning and providing for the people, skills and professional qualifications that will be needed by companies to produce poultry meat sustainably in the future. The poultry meat industry, through BPC, has a proactive programme of education and training to attract new entrants with the right mix of skills into the industry and of continued skills development for training and retention of those already in the industry. The industry runs its own scholarship and apprenticeship programmes, along with a commitment to minimum standards through its Poultry Passport scheme.

Overview

This section provides information on initiatives and activities by industry and Government of interest to all livestock sectors and stakeholders generally.

Foresight Global Food and Farming Futures Report¹⁴

The Government Chief Scientist's Foresight report was the culmination of over two years work, involving over 400 experts and stakeholders from around 35 different countries - a truly international report. It was published in January 2011.

The report identifies factors increasing pressure on the globe's finite resources which include climate change, demographic shifts, changing patterns of work, and habitation, all of which will create major challenges and intensify the demands we make on our land and seas.

The report emphasises the need to work towards the sustainable intensification of our global food supply chain, and stresses that without change, the global food system will continue to degrade the environment, compromise the world's capacity to produce food in the future, and contribute to climate change and the destruction of biodiversity.

The Foresight report identifies the most important challenges and choices for policy makers to balance the competing pressure and demands on the global food system. These include:-

- balancing future demand and supply sustainably – to ensure that food supplies are affordable
- ensuring that there is adequate stability in food supplies – and protecting the most vulnerable from the volatility that does occur
- achieving global access to food and ending hunger
- managing the contribution of the food system to the mitigation of climate change, and
- maintaining biodiversity and ecosystem services while feeding the world.

As an immediate response to the report, Defra have signed up to a Foresight Action Plan which will include:-

¹⁴ <http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf>

- working with other governments and international institutions to ensure work on global food security makes links with climate change, poverty biodiversity, energy and other policies
- pressing for integration of agricultural greenhouse gases (GHGs) into the United Nations Framework Convention on Climate Change (UNFCCC) process
- taking forward work begun at Negoya on international biodiversity
- promoting the importance of sustainable intensification
- pressing for trade liberalisation and CAP/CFP reform
- showcasing what can be achieved on food waste reduction within the UK and the sharing of best practice, and
- increasing the productivity and competitiveness of UK food and farming and ensure that agriculture and the food sector can contribute fully to the green economy.

The Natural Environment White Paper¹⁵

We need a competitive farming and food industry which contributes towards global food security. However, we also need to manage the impacts that food production has on the natural environment. In the long-term, food security depends on tackling the environmental impacts of production.

The Government recognises that potential tensions exist between improving the environment and increasing food production, and we see farmers and land managers as key to resolving this. The White Paper on the Natural Environment commits the Government to working with industry and environmental partners to reconcile the goals of improving the environment and increasing food production.

To deliver this, the Government will:-

- work with the farming industry to reconcile the goals of improving the environment and increasing food production
- improve the way government bodies work together so they provide more coherent advice and are easier to work with
- carry out a full review of how we provide both advice and incentives for farmers and land managers, to create an approach that is clearer, more joined-up; and yields better environmental results
- work with farmers and land managers to develop a new approach to Environmental Stewardship that increases the focus on results, including the possibility of allowing greater flexibility within agreements
- establish a task force bringing together representatives from across the supply chain to advise on how best to overcome the barriers to reducing peat use, and

¹⁵ <http://www.defra.gov.uk/environment/natural/whitepaper/>

- continue to call for ambitious reform of the Common Agricultural Policy, which should promote a strong industry better placed to deliver.

The Green Food Project

The Green Food Project is a joint initiative between the Government, environmental and consumer organisations, and the food and farming industry. It is looking at the challenge of how we can increase food production in England, whilst simultaneously enhancing the environment, and how we might reconcile any tensions that this challenge raises. A Natural Environment White Paper commitment, the Government wants to use the project to shape its policy work on food and farming, and the way in which we contribute to the global debate on food security.

Key to the project is the Government's priority to enhance growth and productivity in the agri-food sector. This sits alongside the environmental commitments we have made in the Natural Environment White Paper and elsewhere and the need to find ways of reconciling the tensions between these objectives.

If we are to use our finite rural land to increase food production, generate energy and protect our valuable natural assets, the need for smart, innovative and more efficient approaches to food and farming are required. The leadership demonstrated through the Green Food Project and other initiatives is helping to ensure that the UK continues to be seen as a major contributor to global food security and environmental improvement.

Advice and Incentives

The current system for delivering advice and incentives to farmers and land managers can, at times, be time consuming and complex and not optimally targeted at improving environmental outcomes. Farmers and land managers need a clear and coherent system that can deliver advice and incentives in a manner which helps improve their competitiveness in the most cost effective way.

A review arising from a commitment in last year's Natural Environment White Paper to examine current advice and incentives for farmers and land managers to create a more integrated, streamlined and efficient approach that is clearer and yields better environment results is now underway. This review is being taken forward in the context of securing environmental benefits, but we recognise that competitiveness is often a necessary condition for achieving these.

So far, five high level principles for good advice have been developed and mapped to the current landscape of advice and incentives. The review is also looking to evaluate that landscape and work with key stakeholders to develop and build consensus on what sort of

advice and incentives framework might be required in the future, and who might be best placed to deliver it.

The final product of the review will be a Transition Plan which will set out a strategy for improving the delivery of advice and incentives and will be published this December.

Common Agricultural Policy (CAP)

The CAP is revised every seven years and the European Commission published its proposals for the post-2013 CAP in October 2011. The proposals will be negotiated and agreed with the European Parliament and are due to enter into force on 1 January 2014.

While the Government believes the Commission identified the right challenges in its proposals: the need to increase food production to feed a growing global population, while, at the same time, reducing environmental impact, we are disappointed at its lack of ambition. We do not believe the proposals for Pillar 1 will do enough to benefit the environment nor the long-term competitiveness of the industry.

The Government wants a very substantial reduction in the size of the CAP budget with a higher proportion of CAP funds used for cost-effective delivery of public goods, such as protection of the natural environment and climate mitigation. In short, we want a fair deal for UK farmers and taxpayers within a smaller CAP budget.

Pillar 2 is the best way to deliver meaningful environmental outcomes through multi-annual agreements such as agri-environment schemes which can be tailored to local conditions. It also plays a pivotal role in improving competitiveness and supporting rural vitality across the EU.

Under new 'greening' proposals, 30% of Pillar 1 funds will be payable on the basis of farmers undertaking crop diversification, retention of permanent grassland, and maintaining 7% of land per farm business in 'ecological focus areas'. The Government believes that these proposals for greening Pillar 1 are only acceptable where they will deliver meaningful environmental outcomes across the EU and strengthen Pillar 2 outcomes without undue administrative burden.

The EU has a huge opportunity to agree the genuine reforms needed to meet the long-term demands of the 21st Century. It is not too late to deliver that, but it will require a lot of hard work. The Government and Ministers of the devolved administrations are considering the Commission's proposals, and have started discussions at European level. We are working constructively with Member States, the Commission and – for the first time on CAP Reform – with the European Parliament, to deliver the ambitious reform we believe is necessary.

Greenhouse Gas Mitigation

Under the Climate Change Act 2008, the Government is legally required to achieve an overall 80% reduction in greenhouse gas (GHG) emissions from 1990 levels across the UK economy by 2050. The agriculture sector needs to play its part in contributing to meeting this target.

A Greenhouse Gas Action Plan (GHGAP) has been developed by representatives of the agriculture industry, and is the principal specific mechanism for delivering their commitment to abatement. Given scientific uncertainties about agricultural emissions, it is difficult to be precise about the level of reductions the Greenhouse Gas Action Plan will generate. However, current industry estimates suggest that it will deliver in the region of 3 Mt CO₂e (CO₂ equivalent gases) on 1990 levels by the third carbon budget period (2018 – 2022), and until better evidence is available through the research the Government is currently sponsoring, we will continue to use this as an indicative figure.

The objectives of the GHGAP are to:

- Establish a robust partnership that will stimulate and deliver the voluntary approach thereby reducing the need for regulation.
- Improve awareness amongst farmers and growers of GHG emissions and of the particular farm practices that will improve efficiency and business performance, whilst simultaneously reducing emissions.
- Drive the implementation of on-farm practices that reduce GHG emissions per unit of production in a manner that promotes animal health and welfare and environmental protection by
 - improving the use of science to continuously update technical advice and decision making tools;
 - Developing innovative, effective means of delivering business and technical advice to farmers and growers that motivates and enables them to adopt improved practices;
 - Enhancing partnerships and networks to improve penetration of awareness in each sector and stimulate uptake and adoption of innovative and beneficial practices.
- To work effectively with the GHG Platform funded by Government to share information and data that will enable progress in reducing GHG emissions in the agriculture sector to be measured over time.

Progress made by the industry led GHGAP and livestock sector road maps in enabling the agricultural industry to reduce greenhouse gas emissions will form part of a review Defra is undertaking to assess the effectiveness of the Government's current approach to achieving Greenhouse Gas (GHG) emissions reductions from agriculture. The review's findings will be published later in 2012.

In order to tackle the scientific uncertainties that accompany greenhouse gas emissions from agriculture, Defra and the devolved administrations have committed to investments

totalling £12.6 m. into research to improve understanding of factors affecting GHG emissions from livestock and soil. This work by UK scientists is now underway, and the Government is also collaborating with its partners in the Global Research Alliance of 30 countries on research into emissions from all agricultural sectors.

Collaborative Research

LINK and Technology Strategy Board projects bring business interests together with scientific researchers to deliver projects with defined commercial and scientific deliverables. Government support can be as much as 50% of eligible costs, and the criteria ensures that LINK supports research which would not ordinarily have taken place without this support.

This co-funded research is providing evidence to underpin sustainable livestock systems by improving our knowledge base of what works. Current examples of these partnerships in action include:-

- Green Pig (LK0682). This project has shown that soya bean meal can be replaced entirely by peas or beans in nutrient-balanced pig diets.
- Low protein diets for pigs (LK0689). This project has shown that the total concentration of crude protein can be reduced in nutrient-balanced pig diets with little impact on performance, reduced loss of nitrogen in manure and less environmental pollution.
- New grass and clover varieties are being developed for improved use of phosphorus (LK0685). This project is developing new varieties with reduced requirement for phosphate so that water pollution from fertiliser phosphate is reduced.
- New grass and clover varieties are being bred with improved use of fertiliser nitrogen (LK0686) and increased efficiency of nitrogen use in the rumen (LK0687) to increase overall nitrogen use efficiency and reduce losses of nitrogen to the environment.
- New grass and clover varieties are being produced with improved efficiency of water use (LK0688) and tolerance of drought. Work in this project will enhance the sustainability of livestock production in future years when decreased annual rainfall and increased risk of droughts are expected to occur.
- Environmental consequences of husbandry changes in UK poultry production (LK0693). This project is looking at the effects of changes in diet, genetics and housing on environmental efficiency and is being supported enthusiastically by the poultry industry.

- Wheat distillers dried grains with solubles (WDDGS) from bio-ethanol production (LK0697). This project is looking at the potential of UK-produced WDDGS to replace soya bean meal with in diets for dairy cows, pigs and poultry.
- Further information about collaborative research activities can be found at the BBRSC website¹⁶.

Sustainable Palm Oil

On 22 February 2012 Defra brought together representatives of all the major users of palm oil and derivatives, including refiners and the animal feed sector to discuss a shared government/supply chain approach to achieving 100% sourcing of sustainable palm oil by 2015. As a first step to this end, a Joint National Statement on sustainable palm oil was proposed to include actions by industry to enhance levels of sustainable sourcing. Such a statement would send a positive message to palm oil producing nations (encouraging them to continue to move towards sustainable production) and to palm oil consumer nations (encouraging them to move more rapidly to sustainable sourcing). It would also be a means to publicise existing business and Government commitments, and to encourage further action.

We are at a relatively early stage in this initiative, but sector organisations are now considering the Government's request and consulting their members. We expect the organisations concerned to prepare and submit sector statements to Defra, and then to attend a second round table meeting in late summer to agree the main statement. We hope to publish the proposed National Statement in November 2012, just before the main meeting of the international Roundtable on Sustainable Palm Oil (RSPO).

Meanwhile, the Government is engaging in a number of areas in support of the move towards more sustainable sourcing of palm oil:

The Government is seeking the support of the livestock sector to help the UK achieve the objective of sustainable sourcing of palm oil by 2015. For example, if users of oil or kernel-based feeds were to ask their suppliers if they could confirm the source of the product, or to support suppliers who are committed to sustainable sourcing, this would help to move the supply chain forward.

¹⁶ <http://www.bbsrc.ac.uk/business/collaborative-research/link/stand-alone-link.aspx>

Food Waste

Food waste is an environmental and a financial issue. UK householders spend £12bn every year on food that could have been eaten but ends up being thrown away. Waste in the UK food industry is estimated at £5bn per year¹⁷. Preventing food waste is environmentally better than any treatment, and can offer financial benefits for businesses and households. For food waste that does arise, treatment by anaerobic digestion or in-vessel composting is more sustainable than landfill, which creates powerful greenhouse gasses.

EU drivers of food waste policy include the Landfill Directive's targets to reduce biodegradable waste going to landfill, and the revised Waste Framework Directive's requirements to manage waste according to the Waste Hierarchy, recycle 50% of household waste by 2020, and ensure biodegradable waste is treated sustainably.

The Government has worked with businesses via the Courtauld Commitment¹⁸, a responsibility deal on reducing food and packaging waste, and has engaged consumers directly via WRAP's 'Love Food Hate Waste' initiative¹⁹, providing ideas and information to help them waste less.

The Waste Review published in June 2011²⁰ outlines our commitment to move food waste up the waste hierarchy, away from landfill, with waste prevention a priority, followed by reuse, recycling and recovery.

The Waste Review makes the following commitments on food waste:-

- The Government will continue to develop the evidence base on food waste
- The public sector will lead by example. We will look to raise Government Buying Standards as the evidence base develops
- The Government will explore further the role of incentives in both reducing food waste and ensuring it is managed in the most sustainable way possible
- The Government will encourage local authorities to sustainably manage their food waste, providing technical support on treatment options that meet local needs

¹⁷[http://www.wrap.org.uk/downloads/Household Food and Drink Waste in the UK Nov 2011.54f67c83.8048.pdf](http://www.wrap.org.uk/downloads/Household_Food_and_Drink_Waste_in_the_UK_Nov_2011.54f67c83.8048.pdf) and http://www.wrap.org.uk/downloads/CC2_First_Year_Progress_Report_05_Dec_11_final.fa227157.11547.pdf

¹⁸http://www.wrap.org.uk/retail_supply_chain/voluntary_agreements/courtauld_commitment/phase_1/targets_and_signator.html

¹⁹ <http://www.lovefoodhatewaste.com/>

²⁰ <http://www.defra.gov.uk/publications/files/pb13540-waste-policy-review110614.pdf>

- The Government will develop a new Responsibility Deal with businesses in the hospitality and food service sector, to reduce food waste and ensure that unavoidable food waste is managed sustainably
- The Government will establish the potential for a successor to Courtauld 2, and
- The Government will continue to make it easier for business and consumers to reduce and sustainably manage their food waste (e.g. by sharing best practice, improving product design, engaging consumers and encouraging innovative partnership approaches to food waste prevention).

Food Waste as Animal Feed

In order to protect public and animal health there are limited opportunities for feeding waste food of animal origin to livestock under the EU Animal by-products Regulation. However, it is permitted to feed some former foodstuffs (waste food no longer intended for human consumption originating from food manufacturers and retailers) to livestock. This includes surplus bread, cakes, confectionery (not containing gelatine of ruminant origin), vegetables and fruit, provided they originate from premises with established separation procedures for preventing any contact with raw meat, fish and other animal by-products. Defra has been working with some of the larger supermarkets to substantially increase the supply of waste food no longer intended for human consumption for animal feed purposes in line with these requirements.

Following the foot and mouth disease outbreak in the UK in 2001, the same regulations ban the use of catering waste in livestock feed. However, recognising that feeding to livestock has the potential to provide a more sustainable use for catering waste if it can be done safely, Defra has commissioned a research project. This project is reviewing the current situation regarding disposal and recycling of food and catering waste and exploring the feeding of food and catering waste to farmed animals as a future option. It is due to report in summer 2012.

Government Buying Standards

Government Buying Standards (GBS) recognise the significant quality benefits of British food's high standards of production and, in particular, the importance we attach as a nation to animal welfare. To reflect the Government's commitment, the standards, which were published on 16 June 2011 and came into effect on 16 September, cover resource efficiency standards for the catering and provision of food served in central Government departments.²¹ Under GBS the Government has committed to ensuring that food procured by central Government departments meets British or equivalent standards of

²¹ <http://sd.defra.gov.uk/advice/public/buying/products/food/>

production, wherever this can be achieved without increasing overall costs. Additionally, there is a requirement that 10% of food and drink procured under GBS is produced to a certified or assured higher level environmental standard, such as organic or LEAF.

The Government is committed to leading by example in the way that we manage our operations and procurement, and hopes to see GBS adopted as a minimum standard across the public sector.

Promoting Sustainable Agriculture Abroad

International Climate Fund (ICF)

The Government has established the ICF of £2.9 billion over 2011- 2015 to help developing countries tackle climate change, reduce poverty, and enhance biodiversity and ecosystems.

The ICF focuses on the three core priorities below. Promoting sustainable agriculture, which supports both climate change mitigation and adaptation, cuts across all these priorities:-

- a. **Low carbon development:** helping poor countries develop in ways that avoid or reduce harmful greenhouse gas emissions and enabling millions of people benefit from clean energy.
- b. **Forestry:** protecting the world's forests and the livelihoods of people who depend on them.
- c. **Climate change adaptation:** helping the poorest people adapt to the effects of climate change on their lives and livelihood.

The ICF aims to achieve these priorities by:

- d. **Building evidence of what works.** Funding and learning from programmes which demonstrate that low carbon and climate resilient development is affordable and achievable.
- e. **Being innovative.** Working with the private sector to drive and make best use of innovative approaches.
- f. **Sharing knowledge.** Contributing to and sharing knowledge globally on how to best tackle climate change whilst reducing poverty.
- g. **Ensuring the UK aid budget is “climate smart”.** Designing all aid programmes so that they achieve value for money by withstanding the impacts of a changing climate.
- h. **Achieving value for money.** Rigorously monitoring and evaluating the impact of the ICF to maximise value for money for the British taxpayer.

Low carbon development

In recent decades global economic growth has lifted significant numbers of people out of poverty. But economic growth has come with increasing greenhouse gas emissions, which has the potential to undermine this success through its effects on climate change. In order to stay within two degrees of pre-industrial levels to avoid the worst impacts of climate

change, along with a legally binding international climate change deal, we need new ways of raising money to invest in low carbon growth. This includes investment in agriculture which sustainably increases productivity, improves resilience, and reduces and removes greenhouse gases.

Example: Low carbon interventions in agriculture in Colombia

The UK and the Colombian government are working together on a project to support low carbon agricultural development in Colombia, using funding from the ICF. This will help Colombia meet its ambitious carbon reduction and growth objectives.

Agriculture is the largest source of Colombia's greenhouse gas emissions (38%), primarily from methane and nitrous oxide from livestock and cultivation. Around a third of Colombia's territory of 39m hectares is used for livestock production. However, the sector is highly inefficient and only contributes 3.5% to Colombia's GDP while accounting for almost a third of rural employment. Securing land for ranching is also a major driver of deforestation in Colombia.

The UK-supported project will aid farmers to convert land currently used for open, extensive pasture to a "sivlopastoral system" (SPS). This is mixed use cultivation, including pastureland, high-density fodder shrub and more mature woody species for direct cattle browsing. It will also incentivise farmers to plant connectivity corridors to connect fragments of natural ecosystems with networks of tree and shrub-like vegetation. The project will reduce greenhouse gas emissions from areas converted to SPS, enhance biodiversity, and improve land and water quality.

Forestry

Forests are crucial in reducing greenhouse gas emissions, preserving livelihoods, and supporting biodiversity and ecosystems. Deforestation deprives the poorest people of their livelihoods, harms ecosystems and biodiversity, as well as generating almost a fifth of carbon emissions. It is the largest source of greenhouse gas emissions – larger than the entire transport sector. Deforestation is largely driven by land use change for agriculture. In recent years the impact of commercial agriculture has risen relative to other drivers of deforestation.

The UK's vision, and the EU's target, is to help support global efforts towards a 50 percent reduction in global deforestation by 2020.

Example: Reducing Deforestation in the Brazilian Cerrado

The UK and Brazilian governments are working together to reduce deforestation in the Brazilian Cerrado. The Cerrado biome, located in central Brazil, is home to 5% of the planet's biodiversity and is one of the most biodiverse savannas in the world.

Despite the importance of this biome, deforestation is intense in the Cerrado, driven by agriculture (soya and cattle-raising), as well as the demand for charcoal. The Cerrado had

lost about 48% of its forest cover by 2009. In the last decade, land use change resulted in the clearing of 92,710 km², 4.5% of the original vegetation cover, from 2002 to 2009. Agriculture is one of the main sectors behind Brazil's economic growth, but this growth will not be environmentally or socially sustainable if it significantly damages the natural resource base and associated ecosystem services, on which the rural poor depend. Improved natural resources management is crucial for sustainable economic growth and poverty reduction.

The UK Cerrado project will:

- Support the registration of land ownership of farm holdings and increase compliance with the Brazilian government's Forest Code. Farmers who register will be provided with technical assistance to help with the restoration of vegetation on illegally cleared land.
- Support measures to prevent and deal with forest fires. This includes the improvement of the Brazilian Early Warning Fire system and support to emergency assistance services to increase local capacity to deal with forest fires.

As a result, the project will contribute to a reduced rate of biodiversity loss, poverty reduction and significantly reduce greenhouse gas emissions in the Cerrado biome through the restoration of natural forest, reducing pressure on the remaining natural vegetation and supporting measures to support fire prevention and control of burning.

A Perspective from Friends of the Earth

This text has been provided by Friends of the Earth

There is growing consensus that addressing the environmental impacts of livestock production and consumption is crucial to a sustainable food and farming future. These include the overseas impacts of feed production particularly how production of soy for animal feeds is driving deforestation in South America—although most attention is paid to greenhouse gas emissions. Friends of the Earth has been campaigning since 2008 to highlight these issues and has been working with stakeholders to develop solutions.

Below we summarise progress by government, industry and others since the Sustainable Livestock Symposium²² in March 2011, convened by Friends of the Earth, and at which the Minister for Agriculture promised that Defra would ‘play its part’. Friends of the Earth will separately be publishing a full assessment of progress obtained through commissioning an analysis of available data and through stakeholder surveys.

1. The Government has made progress in one key area, but, overall, as a key funder and with the opportunity to both encourage industry action and to drive policy change here and in Europe, has shown too little leadership or coordination on the issues highlighted in the symposium and has missed key opportunities presented during the year to begin the process of change needed. On the positive side:

- There is a specific and relatively substantial programme of **new research** on livestock and alternative feeds, with multiple partnerships in the supply chain and supporting research that could significantly address soy substitution. The multi-million pound Technology Strategy Board project and others could deliver some very useful outcomes if these are delivered in practical and accessible ways to farmers and the feed industry.
- **Projects** have been initiated, such as the Green Food project, which may look at livestock and feed issues. But these are at an early stage and so far the terms of reference and the tight schedule suggest that they will be focused on a small number of high profile issues. Whether they will adequately address UK or global biodiversity impacts and GHG emissions associated with food and feed imports is unclear.

But progress in other areas has been limited or regressive:

²² Actions identified at the Symposium included:

- * Taking a leading role in CAP reform to ensure sustainable livestock production and home grown proteins get the support they need
- * Research into viable alternatives to soy and ensuring that practical advice is passed to farmers
- * Investigating the potential for waste products to be better utilised in animal feeds
- * Ensuring that environmental impacts overseas including GHG emissions are measured and taken into account in climate change and farming policy
- * Support, advice and funding to help farmers to sell direct to customers
- * Clear information and advice to the public on a healthy and sustainable diet.

- The position taken by the government on CAP reform so far will do little to drive reform that favours more sustainable livestock production, despite clear opportunities available do so. Alarming, some of the positions taken by the Government could further drive intensification of the livestock sector, with no evidence that this would be 'sustainable'. The Government made no apparent effort to support moves that would enhance domestic feed production and sustainable livestock goals for example by supporting mandatory crop rotations under greening of Pillar1. The focus on export lead growth for the UK meat and dairy sector rather than growth based on high quality, sustainable local markets will continue the trend towards UK factory farms.
- There has been no attention paid to the use of processed food waste as feed which would be a quick win as safe and suitable processed food waste is already available.
- Efforts to promote sustainable diets which would reduce the impacts of meat and dairy consumption are lacking.
- There was clear opportunity missed in promoting a more sustainable livestock message and outcome in the new government food procurement standards – the Government Buying Standards.
- The issue of costs of UK protein feed (relative to soy) and how farmers are able to deal with a highly concentrated buyers' market has not been addressed. As one academic respondent put it: "*scientifically sound and valid information on opportunities to reduce reliance on soya will find their place amongst the many stakeholders involved. Uptake, however, is largely an economic matter, and is difficult to foresee.*" There seems little effort to ensure UK domestic feed production or grass based systems are more profitable. The introduction of the supermarket Ombudsman may have indicated some willingness to act but this has so far been delayed.

2. The Farming industry has made some progress. Several industry bodies and farmers are involved in new research projects which could be valuable to the development of soy alternatives. The development of the Pasture Fed Livestock Association is a positive one as are EBLEX and BPEX initiatives to look at feed issues. Farmers have also been working on industry roadmaps and developing these further to deliver mainly GHG emission reductions. The GHG Action plan for Agriculture does refer to some useful areas of work on feeds but with no specific objectives to reduce the global impact of UK livestock supply chains. How far the industry can act without adequate support from both government and the food industry is open to question.

3. On retailer progress, without a full survey, it is difficult to assess progress by the retailers overall. Clearly some, notably Marks and Spencer, are investing in research on alternative feeds and have some commitment to the issues highlighted in the symposium.

4. Other initiatives: The WWF Livewell project is notable in delivering a real and practical approach to the problem of meat and dairy consumption by promoting a diet which brings together health and sustainability goals.

One key gap in terms of progress or evidence of progress is in the poultry sector. As this is the sector with both a significant use of soy and also considerable barriers to progress (in terms of the financial state of the sector and in the use of alternatives in feed) it is regrettable that little attention appears to have been paid this year to addressing these barriers.

We have not been able to assess progress by the Devolved administrations and stakeholders. This is a significant gap and we hope it will be addressed elsewhere.

In summary, we welcome some progress made against the goals and proposals made at the March Symposium in the area of Defra supported research into livestock and soy feed alternatives and farming and industry work to promote more sustainable, lower GHG farming. However, against the considerable needs and outcomes identified, the progress has been inadequate and significant opportunities have been missed over the past year to encourage and promote more sustainable livestock production and consumption. It is also not easy to assess at this stage whether steps being taken are making a difference in terms of measurable outcomes on GHG emissions, biodiversity or resource use.