



**EXPLORING POLICY OPTIONS FOR MORE SUSTAINABLE
LIVESTOCK AND FEED PRODUCTION**

Final report for Friends of the Earth

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GLOSSARY

AES	Agri-environment scheme – targeted at environmental outcomes and delivered through Pillar II of the CAP
Article 68/69	Article 69 of Regulation 1782/2003, superseded by Article 68 of Council Regulation 73/2009 – allows up to 10 per cent of the national ceiling for Pillar I direct payments to be targeted at achieving specific outcomes, subject to certain criteria.
CAP	Common Agricultural Policy
Cross Compliance	Compulsory cross compliance was introduced in 2005 to ensure that farmers in receipt of CAP direct payments, and some rural development measures, comply with minimum baseline standards in relation to the environment, food safety, animal and plant health, and animal welfare.
DA	Disadvantaged Area (within the LFA)
Defra	Department for food, environment, and rural affairs
DG Agri	Directorate General for Agriculture and Rural Development at the European Commission.
Direct payments	Farm level payments acting as income support - historically coupled to production but mostly decoupled since 2005.
EAGF	European Agricultural Guarantee Fund (formerly EAGGF) – used to administer Pillar I expenditure
EAFRD	European Agricultural Fund for Rural Development - used to administer Pillar II expenditure
ELS/OELS	Entry Level Stewardship / Organic Entry Level Stewardship – part of Environmental Stewardship
ES	Environmental Stewardship – the main agri-environment scheme in the 2007-2013 RDP for England.
EU	European Union, currently consisting of 27 Member States
EU-15	15 Member States of the European Union prior to the accession of 10 ‘new’ Member States in 2004
EU-25	25 Member States of the European Union prior to the accession of Bulgaria and Romania in 2007
FAO	Food and Agriculture Organisation of the United Nations

GAEC	Good Agricultural and Environmental Condition - part of cross compliance, with current requirements for nationally or regionally defined standards set out in Annex III of Council Regulation 73/2009.
GHG	Greenhouse gas emissions – usually measured in CO ₂ equivalents.
HLS	Higher Level Stewardship – part of Environmental Stewardship
HNV	High Nature Value
LCA	Life Cycle Analysis
LFA	Less Favoured Area – relatively marginal areas in which some forms of agricultural production are eligible for support delivered through Pillar II of the CAP in order to compensate for natural and socio-economic handicaps.
Market interventions	Measures intended to stabilise EU commodity prices above a minimum threshold – includes export refunds, intervention storage, and milk quotas.
NVZ	Nitrate Vulnerable Zone – geographically designated areas linked to national implementation of the EU Nitrate Directive.
Pillar I	CAP support, predominantly in the form of direct payments to farmers but also including market interventions..
Pillar II	CAP support, targeted at rural development and funded through EAFRD in combination with national co-financing.
RDP	Rural Development Programme - used to administer Pillar II funds targeted at environmental, social and economic outcomes – developed and implemented at national or regional level.
SDA	Severely Disadvantaged Area (within the LFA)
SMR	Statutory Management Requirements - part of cross compliance with current requirements for standards based on EU legislation set out in Annex II of Council Regulation 73/2009.
SPS	Single Payment Scheme - used to deliver direct payments decoupled from production since 2005.
UAA	Utilised Agricultural Area
WTO	World Trade Organisation

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EXECUTIVE SUMMARY

This report has been commissioned by Friends of the Earth to provide evidence for a new campaign on the environmental and social impacts of the livestock sector, entitled 'What's feeding our food?' An overarching objective of the study is to explore the relationship between livestock and their consumption of unsustainably produced feed, principally soya imports from South America where recent expansion of production has been implicated in significant deforestation.

The main focus of this report is to establish the influence of the Common Agricultural Policy (CAP) on the intensity of livestock and feed production in the UK, with reference to the dairy, sheep, beef, pigs and poultry sectors. It explores the interaction of different types of livestock production, their consumption of feed, particularly where this involves imports of feed such as soya, and the environmental impacts of such production systems, both locally and globally. It then considers possible policy options for promoting more sustainable forms of livestock production in the UK, but also, in principle, elsewhere in order to reduce the overall environmental impact of the livestock sector globally.

IEEP has been asked to consider policy options particularly within the framework of the CAP (both in its current form and in the future). However, since the CAP must operate within the confines of global trade policy, we also provide a brief outline of WTO requirements and the implications of trade liberalisation for UK and EU livestock production. While the CAP does have a number of mechanisms that can be used, or altered, in order to promote more sustainable forms of livestock and feed production, these tend to predominantly affect the beef and sheep sectors and to a lesser extent the dairy sector. However, the CAP has not been the main driver of intensification in pig, poultry, dairy and some beef production systems, which, due to market forces, and in the absence of policy interventions, are likely to continue to dominate livestock production in the UK and EU. The need for research and development in the field of feed and livestock production is also considered. However, ultimately, in order to achieve a significant reduction in the overall global impact of livestock production, changes in consumption patterns will be needed. The report, therefore, considers options for reducing consumption of livestock products and influencing consumer behaviour.

Global, EU and UK trends in livestock production

At the global scale, livestock production is increasing, with global production of meat and milk projected to double by 2050 from 1999/2001 levels (FAO, 2006). These projections are driven by a growing world population, a general increase in income levels, changing dietary preferences towards more animal based foods (particularly in China and India), and technological changes within the agricultural sector leading to increased crop yields and productivity of livestock.

These trends have been accompanied by significant structural change within the livestock sectors leading to increased intensity and scale of production, vertical integration and geographical shifts in production. There has been significant expansion in the pig and poultry sectors worldwide and a shift towards grain or concentrate-based diets relative to low-value feed in terms of calorific content. These

trends are implicated in major environmental impacts globally including land degradation, climate change and air pollution, water shortages and water pollution and loss of biodiversity.

Shifts in diet, including increased consumption of livestock products, accompanied by reduced physical activity, are leading to rapid increases in overweight individuals and obesity, with a significant element of this occurring in the developing world, as well as the developed world. Diet-related chronic diseases, including heart disease, diabetes, hypertension and certain cancers have increased rapidly as a result of changing diets.

Within this global context, the UK, and the EU more widely, is a major producer of livestock products supplying both domestic markets and exporting livestock products abroad. This production has significant impacts on the environment, both nationally and globally, related not only to farming practices, but also in relation to the type and source of feed used. The EU imports a third of all feed consumed by EU livestock, with soya, predominantly from South America, comprising over 50 per cent of all imported feed. There are a range of different feedstocks consumed by livestock and these vary significantly between different forms of production as well as between livestock species. In general, pig and poultry production is dependent on the consumption of feed crops, whereas forage crops, principally grass, can form a much larger proportions of the dietary intake in other livestock systems, such as beef, dairy and sheep. While some protein crops are grown in the UK for livestock consumption, the use of soya, as a high energy and protein feed crop, predominates, particularly in the pig and poultry sectors, but also in the dairy and beef sectors.

In the EU, intensive livestock production is linked to problems such as the eutrophication of water bodies, soil erosion, loss of biodiversity and increased greenhouse gas emissions. The importation of soya for animal feed from South America (the major source of imported soya to Europe) also has significant environmental impacts, as a sizeable share of production is linked to the destruction of forests, as well as having negative localised impacts on biodiversity, soil and water resources.

The UK, and the EU more widely, can help to reduce the domestic and global environmental impacts of livestock production in a number of complementary ways, including:

- Reducing overall livestock production;
- Reducing dependency on imported soya and finding alternative sources of protein for animal feed;
- Reducing the intensity of livestock production and promoting more sustainable, grass-fed livestock production systems; and,
- Reducing consumption of livestock products overall, particularly consumption from intensive farming systems, whilst at the same time promoting the consumption of products sourced from more sustainable farming systems associated with relatively low environmental impacts (at a local and global level).

Reducing the intensity of livestock production may bring about local environmental benefits. However, particularly if this is not combined with a concomitant reduction in demand and consumption, overall global benefits will depend on any displacement effects that may occur due to increased production elsewhere. Public policy in Europe can play a significant role in achieving these objectives and reducing the environmental impacts of livestock production and improving public health.

The Influence of the Common Agricultural Policy on livestock production

Historically, the CAP has exerted a significant influence over the majority of EU and UK livestock producers, although this has been much more limited for the egg, poultry meat and pig sectors. As subsidies were coupled directly to the production of certain types of livestock or feed crops, or price support was given for specific agricultural commodities or products, this encouraged growth in production and surpluses of some commodities. Coupled with technological advances, this led to significant changes within the agricultural sector, with increased specialisation and mechanisation and considerable structural change. The main exceptions to this were the pigs and poultry sectors which were never direct recipients of coupled production payments but nonetheless will have indirectly benefited to a significant degree through the subsidised cost of feed linked to arable feed payments and through market interventions.

More recently, however, moves towards greater market orientation within the agriculture sector, particularly the decoupling of direct payments from production since 2005 and the corresponding reduction in expenditure on market interventions, means that the influence the CAP once had on patterns of production through production related payments and market interventions has significantly reduced and will reduce further over the coming years. The market now plays an increasingly significant role in determining what gets produced, where and how.

Despite the changing nature of support for the EU agricultural sector, the CAP continues to exert influence over the livestock and feed production sectors, due principally to the scale of expenditure. There are various mechanisms through which these continue to receive payments, the three main aspects of which include:

- a) *direct aid* through decoupled Pillar I payments (SPS and some continued coupled payments);
- b) *market interventions* through Pillar I (including export refunds and intervention storage); and
- c) *Rural development* (Pillar II) payments.

The Pillar I budget continues to dominate the CAP (€42 billion in 2007) with a budget close to four times the size of that of Pillar II when averaged across the EU-27. However, the proportion of funds allocated to Pillar II has increased significantly over the past decade, with the introduction of compulsory modulation further altering the balance between the two Pillars. When compulsory modulation and national co-financing (required for all Pillar II expenditure) are taken into account, the ration of funding between the two Pillars for the EU-27 becomes nearer 2:1.

The CAP is currently in a period of transition, with the Budget Review in 2009/10 raising fundamental questions about the purpose and nature of the support given.

Until the next CAP Reform, likely to be in 2013, there are various ways in which current mechanisms, within both Pillars, can be implemented in order to increase the sustainability of the livestock sectors. However, mechanisms within the CAP are unlikely to have a significant impact on production within the pig and poultry sectors. Increasingly production is being influenced through the market, and, therefore, the impact of such schemes in addressing the global impacts of livestock production are likely to remain limited.

Policy options for reducing the environmental impacts of livestock production

Policy options for reducing the environmental impacts of UK livestock production are considered in relation to four key areas: WTO requirements and the implications of increasing trade liberalisation; the role of the Common Agricultural Policy (CAP); consumer behaviour; and research and development.

Trade policy and the WTO

The UK, and EU, agriculture policy is bound by the terms of global trade agreements under the WTO. The current framework guiding trade negotiations under the Doha Development Round commits participants to: reductions in domestic support; increased market access; and, the elimination of export subsidies. Further trade liberalisation is likely to reduce production across all livestock sectors in the UK (to varying degrees depending on the extent of liberalisation). The environmental impacts of a reduction in production would be highly variable across the livestock sectors, be regionally differentiated and differ according to environmental attribute examined. Overall, net positive environmental impacts could be expected but concentration of livestock production and loss of extensive, grass-based livestock systems could occur and would be undesirable.

Reduced livestock production in the UK would be likely to lead to substitution by imports unless there was a corresponding reduction in consumption of livestock products. Some of these imports may come from countries with lower production standards e.g. in relation to the environment or animal welfare. The UK has limited scope to prevent or restrict the import of such products from other countries (e.g. through import tariffs), although the introduction of sustainability criteria for livestock products and feed consumed by livestock, such as soya, may be worth further consideration given recent developments with regard to biofuels. There is a clear need to develop a more global level Life Cycle Analysis (LCA) to capture the full range of direct and indirect land use change and other environmental impacts that are brought about by changes in livestock production, so that these impacts can be clearly highlighted and used to inform the global level analyses which feed into trade negotiations.

Labelling and consumer information could also be used to better effect to influence consumer purchasing behaviour towards more sustainable livestock products. Pillar II measures could have a critical role to play here too in mitigating against negative environmental trends arising from liberalisation.

Options relating to the Current CAP

Despite significant changes to the nature and design of support under the CAP since 2005, which have significantly reduced the influence of the CAP on farmers' production decisions, livestock (and other) farmers continue to receive substantial

amounts of support, mainly as income support, from the public purse. There are a number of ways, albeit limited, in which this funding could be used to support more sustainable livestock systems.

The first relates to the way in which the Single Payment Scheme (SPS) is implemented. Paying the SPS on a regionalised basis, in general, shifts support from more intensive arable and grassland areas towards more extensive, marginal farming areas (depending on the exact methods applied). In the UK, only England is currently moving towards paying the SPS entirely on a regional flat rate basis. Scotland, Wales and Northern Ireland could be encouraged to adopt this system of payment. In addition, some Member States (not the UK) chose to retain coupled payments for some sectors. They now have the opportunity to incorporate these into the SPS. France has signalled its intention to do this and make grassland aid payments. Other Member States with coupled payments could follow suit.

Secondly, the Article 68 measure can be used to shift support from intensive arable and livestock farms to extensive cattle and sheep farms and support grass-based systems. This measure could be used to introduce a High Nature Value grazing scheme targeting support towards the most environmentally important areas and to support more sustainable arable production, including production of protein crops as part of crop rotations. The UK and other Member States could be encouraged to use this option. Using Article 68, however, does have some wider implications for the CAP in that it may be used to defend the continuation of Pillar I in the longer term. Article 68 may therefore be valuable only a short-term measure to 2013.

Thirdly, the Protein Crop Scheme provides additional support to farmers growing forage peas, beans and lupins which are a substitute for soya. From 2012, this payment will no longer exist and must be incorporated into the SPS. Although the UK is likely to phase out this payment in 2010, it could be encouraged to continuing using it to 2012.

Fourthly, the role of market measures in the CAP is declining and the UK and the EU is committed to facilitating greater market access for other producing nations under current WTO trade negotiations. Removal of market support e.g. export refunds and intervention buying should remove incentives to UK and EU farmers to over-produce beyond market requirements. However, there is no scope to use market measures to reduce dependency on imported feed e.g. import tariffs on soya.

Lastly, Pillar II measures can play an important role in promoting sustainable livestock systems. There is considerable scope to use Axis 2 measures in Pillar II, especially the agri-environment measure, to support extensive grassland management, more extensive arable production (including greater use of mixed and crop rotation systems as well as conversion of some arable land to permanent grassland), and organic farming. The use of these measures should be encouraged. Axis 1 measures in Pillar II can also be used to support the modernisation of farm holdings in environmentally beneficial ways e.g. investment in manure storage and water saving, and this should be encouraged. Measures to promote the marketing and processing of products from sustainable land management are also relevant here. However, Pillar II is substantially under-funded given the demands made on it and its potential to support sustainable agriculture. A more fundamental reform of the CAP is needed to

increase funding of Pillar II type measures and switch the focus of support towards the provision of public goods.

Longer term CAP reform options

In the longer term a more far reaching reform of the CAP is likely to provide greater opportunities for making more fundamental changes to the sustainability of the livestock sector.

A key driver of CAP reform beyond 2013 is the current EU Budget Review which may result in downward pressure on agricultural spending. A number of Member States (including the UK), academics and NGOs are calling for a more fundamental reform of the CAP with some arguing for the abolition of Pillar I support and a new system of environmentally/socially focused payments designed to deliver 'public goods'. The impact that current proposals being put forward might have on different farming sectors, farm types and the environment is difficult to judge but, in broad terms, they would be expected to reduce the level of public support to intensive, environmentally damaging farming systems and increase support for more extensive and environmentally beneficial ones.

There is as yet no consensus on the future direction of the CAP but as ideas emerge, and the debate heats up, it will be critical to undertake comprehensive economic, social and environmental impact assessments in order to understand the overall likely effects to ensure that mitigating actions are taken where necessary.

Options to reduce consumption of livestock products and influence consumer behaviour

Without some kind of measures to encourage a reduction in the consumption of livestock production, increased production will continue to be needed to meet the predicted increase in demand. However, reducing the consumption of meat and other livestock products and influencing consumer behaviour to give preference to sustainably produced products is a significant challenge. There are a number of possible policy approaches to achieving this.

Firstly, the price of livestock products needs to reflect the true costs of production and the negative externalities of production could be internalised by stronger application of the 'polluter pays principle' and the use of fiscal or market measures, such as carbon taxes on inputs (e.g. fertilisers) or nitrogen trading schemes. This would make 'cheap meat' and other livestock products more expensive and sustainably produced products more competitive relative to the current situation.

Secondly, improved labelling and information campaigns for sustainably produced livestock products should be encouraged, including defining and communicating farming methods to consumers through labelling and developing new labels (e.g. for products from high nature value or mountain areas), further development of the EU market for organic produce, or encouraging private sector certification schemes to improve standards, promote sustainable production, and label products accordingly.

Thirdly, healthy eating and reduced meat consumption should be promoted as part of publicly funded nutritional and health campaigns. Better nutritional information should be provided to the public (e.g. through schools and the NHS) and the

marketing and promotion of unhealthy foods to vulnerable groups (e.g. children) should be better regulated. It may be possible to establish targets for reduced consumption of meat and dairy products and efforts to promote the Five-A-Day target for fruit and vegetables should be increased. It may also be worthwhile examining the evidence linking the nutritional content of livestock products to different types of livestock production. Where the evidence clearly suggests, for example, that certain extensively produced livestock products (e.g. from free range or relatively low input grazing systems) are healthier than equivalent intensively produced livestock products, this could be used to inform public health campaigns, assuming adequate labelling to distinguish such products could be developed. For example, Omega 3 unsaturated fatty acids are generally considered to be healthier than saturated fats, and tend to occur in greater quantities where livestock have been reared predominantly on grass, rather than cereal, based diets.

Research and development to promote sustainable livestock and feed production

Reducing reliance on imported soya and increasing the proportion of home-grown protein crops for use in animal feed is one possible option to reduce the global impact of livestock production. However, research in this field suggests there are some barriers – both technical and economic – to substituting soya with other, home-grown protein crops and further research is warranted. Research also suggests that the environmental benefits of substituting soya with home-grown protein crops may not be clear cut.

From a technological perspective, further research is needed on animal nutrition including improving efficiency in the use of dietary nutrients and feed rations and also to improve the quality and use of home-grown forages. Further work is also needed to better understand the functioning of the animal feed markets and the reasons why feed manufacturers use certain commodities such as soya versus other grain legumes in feed rations. Soya replacements need to be developed and the technical and economic barriers to using alternatives to soya need to be overcome.

In addition, the agronomic benefits of growing protein crops, such as grain legumes as an alternative to soya, should be better communicated to farmers through advice and extension work and further research is needed to better understand the global and local environmental impacts of substituting soya with other protein crops such as oilseeds and grain legumes to avoid environmental problems being shifted from one region to another.

Conclusions

Together, these efforts could make a significant contribution to promoting and supporting more sustainable livestock systems in the UK and EU, thereby reducing dependence on imported feedstocks such as soya. However, the picture is a complicated one.

Public policy in the UK and EU clearly has a role to play in incentivising more sustainable forms of livestock production through the CAP and reducing the incentives to intensive and environmentally damaging forms of production. It also has a role to play in regulating intensive livestock systems and preventing environmentally damaging activities. But the impacts of such policy on livestock

production patterns and systems and hence on the environment are difficult to judge and likely to be highly variable.

As well as influencing livestock production, public policy can also encourage reduced consumption of livestock products, as part of healthy-eating campaigns and dietary advice, and help consumers to make informed choices about the sustainability of the products they buy through labelling and information activities.

Beyond these public policy levers, markets play an increasingly influential role in determining the level of livestock production, the production methods employed and the source of feedstocks. Global consumer demand for livestock products is increasing and price is a key determinant of consumer purchasing behaviour. If consumers continue to demand and buy 'cheap' livestock products, the markets and production systems will respond accordingly. Key trends in livestock production are already ones of intensification of production, vertical integration, geographic concentration and up-scaling of production units. Emerging economies in countries such as China and India, with lower production costs, due to factors such as relatively cheap land and labour, are already responding to the increasing market demand for livestock products. Within this picture of increasing (intensive) production and consumption, the scope to reduce dependency on soya and substitute it with alternative protein crops appears limited. Soya is preferentially used for animal feed for technical reasons (i.e. its superior protein content compared to other protein sources) and for economic ones (i.e. its price and availability). Ultimately, therefore, the key to reducing dependency on soya is to achieve reductions in livestock production *and* consumption of livestock products.

The environmental and health arguments for producing and consuming fewer livestock products are overwhelming, but achieving lower and more sustainable production and reduced consumption is a significant challenge. The UK and EU can take steps now to address this challenge but efforts domestically need to be matched by efforts globally if real progress is to be made. Ultimately, this requires multi-lateral agreements on trade, climate change, the conservation of biodiversity, poverty alleviation and others, to be effective.

1 INTRODUCTION

This report has been commissioned by Friends of the Earth to provide evidence for a new campaign on the environmental and social impacts of the livestock sector, entitled 'What's feeding our food?' A key overarching objective of the study is to explore the relationship between livestock and their consumption of unsustainably produced feed, principally soya imports from South America where recent expansion of production has been implicated in significant deforestation.

Soya feed has a particularly high protein and energy content which makes it particularly suited to more intensive forms of livestock production systems with livestock. Such systems of production are intended to shorten the time it takes livestock destined for meat production to reach maturity or in the case of dairy production to increase milk yields per cow. Livestock production has been widely criticised for its high environmental footprint with estimates by the FAO (2006) linking it to around 18 per cent of global greenhouse gas emissions, measured in CO₂ equivalents. Intensive livestock and feed production systems are generally associated with greater environmental impacts relative to more extensive forms of production, when measured per hectare of agricultural land but not necessarily per unit of output (kg of meat or dairy product). Welfare issues can also be a source of concern with the most intensive forms of livestock production.

The relationship between livestock production and consumer demand for livestock products is a key determinant of the overall environmental impact. In order for this to decline significantly, then both overall production *and* consumption of livestock products will need to fall and be replaced by more sustainable alternative forms of food production. Thus extensification of livestock production without corresponding falls in consumption is unlikely to present a solution on its own.

The aim of this study is firstly to discuss the impact of current expenditure through the Common Agricultural Policy on the UK livestock and feed sectors, given that this accounts for the vast majority of support for the agricultural sector in the European Union. Following on from this, the study explores the implications of a range of policy options which, in combination, would be able to further Friends of the Earth's interlinked objectives of promoting more sustainable forms of livestock production in the UK (and in principle other parts of the EU) on the one hand and reducing dependency on unsustainably produced soya feed on the other.

Influence of the Common Agricultural Policy on livestock production

Historically, the CAP has had a significant impact on the EU and UK livestock sectors. A large proportion of this influence was due to subsidies coupled directly to the production of certain types of livestock or feed crops, or price support for specific agricultural commodities or products. The main exceptions to this were the pigs and poultry sectors which were never direct recipients of coupled production payments but nonetheless will have indirectly benefited to a significant degree through the subsidised cost of feed linked to arable feed payments. In 2005, the CAP's direct impact on production was diminished significantly due to the introduction of the decoupled Single Payment Scheme (SPS). Nonetheless, the CAP retains significant

influence on the livestock and feed production sectors, principally due to the size of its budget; the three main aspects of CAP are as follows:

- d) direct aid through decoupled Pillar I payments (SPS and some continued coupled payments);
- e) market interventions through Pillar I (including export refunds and intervention storage) as ; and
- f) Rural development (Pillar II) payments.

Following the introduction of decoupling, and the corresponding reduction in expenditure on market interventions, the market now plays an increasingly significant role in determining what gets produced, where and how. At the same time, expenditure on rural development payments, which unlike Pillar I payments are targeted at specific environmental, social and economic outcomes, has increased gradually over time, but remains substantially smaller in budgetary terms than Pillar I support. Agri-environment schemes are the main Pillar II measure with potential to extensify, and thus increase the sustainability of, UK livestock and feed production. In the UK, agri-environment schemes account for the largest proportion of Pillar II expenditure, followed by Less Favoured Areas schemes linked to extensive livestock grazing, which are also of interest to this study. However, without corresponding falls in consumption of livestock products, the impact of such schemes in addressing the global impacts of livestock production are likely to remain limited.

Policy options for more sustainable livestock and feed production

The CAP alone, although significant, will not solve the problem of unsustainable levels of livestock production and consumption of imported feeds, such as soya. As a result it will be necessary to look for other solutions which can influence the demand for livestock products as well as their supply, i.e. altering consumer behaviour.

The policy options explored within this report include an overview of measures available within the CAP in its current form as well as the potential for more radical reform. In addition, the study provides an overview of global trends in trade policy and discussion of the land use implications of reducing livestock dependency on unsustainably produced feed, including switching alternative types of feed or forage. In addition, the report discusses the importance of consumer behaviour and ways in which it might be possible for this to play a more active role in the promotion of more sustainable levels of livestock production. Finally, the report also identifies some research and development needs which collectively could increase the economic competitiveness of more sustainable livestock products relative to less sustainably products.

The report is divided into three key sections:

Chapter 1 - sets the scene for the report and explores the main production systems and trends relating to the livestock and feed sector in the UK.

Chapters 2 - 3 - explore the impact of the CAP on the livestock sector in the UK by identifying a) the type of support that exists, the aim of such polices and how these

have changed over time; and b) the level of payments that are going to the livestock sector currently.

Chapter 4 - considers policy (and other) changes that would be needed to improve the sustainability of the livestock sector with a particular focus on reducing the sector's dependency on soya. While the main focus of this section is on the CAP, other issues are also covered, albeit more briefly, including a global overview of factors driving feed consumption and implications of reducing UK dependency on soya, and possibly feed in general (if switching to alternatives such as grass), trade measures, research and development and ways of changing consumer behaviour to reduce the consumption of meat. The impacts of these changes on the livestock sector in terms of production and land use are then considered including implications that such changes might have on future public expenditure.

2 OVERVIEW OF MAIN AGRICULTURAL PRODUCTION TRENDS RELATED TO LIVESTOCK IN THE UK

2.1 Introduction

Public expenditure on the UK livestock sector occurs principally through the Common Agricultural Policy (CAP). Impacts of the CAP on the livestock sector will vary depending on the nature of the production system being operated, particularly in relation to both volume and relative intensity of production. Although the latter is intrinsically hard to quantify, one indicator of production intensity is the consumption of livestock feed, including soya, which is typically associated with more intensive production systems. Looking at recent and anticipated future trends in production can help us understand the degree to which agricultural policy continues to influence production decisions within the livestock sector, and hence the degree to which changes to the design and operation of the CAP are able to influence more sustainable livestock and feed systems within the UK and beyond.

2.1.1 *The Global Context*

Global livestock production is increasing; global production of meat is projected to more than double from 229 million tonnes in 1999/01 to 465 million tonnes in 2050, and that of milk to grow from 580 to 1,043 million tonnes (FAO, 2006). Factors driving increased global livestock production include:

- Growing world population increasing overall food demand;
- Growing incomes boosting demand for livestock products;
- Changes in dietary preferences away from plant-based diets towards foods of animal origin; and,
- Technological change including growing productivity, increased grain feeding, more productive breeds and cheaper feed grains.

FAO (2006) notes that large increases in the supply of livestock products have been facilitated by structural adjustments in the livestock sectors including increasing intensity of production, increasing scales of production, vertical integration and geographical shifts in production. The main trends in the global livestock sector are summarised as follows:

- Demand and production of livestock products are increasing rapidly in developing countries that have outpaced developed countries. A few large countries are taking centre stage. Poultry has the highest growth rate;
- This increasing demand is associated with important structural changes in countries' livestock sectors, such as intensification of production, vertical integration, geographic concentration and up-scaling of production unit; and,
- There are concomitant shifts towards poultry and pig meat relative to ruminant meat, and towards grain- or concentrate-based diets relative to low-value feed.

These trends are implicated in major environmental impacts globally including land degradation, climate change and air pollution, water shortage and water pollution and loss of biodiversity. FAO (2006) summarises some of the key environmental impacts of global livestock production, as follows:

- Expansion of livestock production is a key factor in deforestation, especially in Latin America where the greatest amount of deforestation is occurring – 70 per cent of previous forested land in the Amazon is occupied by pastures, and feed crops cover a large part of the remainder;
- The livestock sector is responsible for 18 percent of greenhouse gas emissions measured in CO₂ equivalent;
- The livestock sector is a key player in increasing water use, accounting for over 8 percent of global human water use, mostly for the irrigation of feed crops. It is probably the largest sectoral source of water pollution, contributing to eutrophication, “dead” zones in coastal areas, degradation of coral reefs, human health problems, emergence of antibiotic resistance and many others; and,
- Some 30 percent of the earth’s land surface occupied by livestock was once habitat for wildlife. The livestock sector may well be the leading player in the reduction of biodiversity, since it is the major driver of deforestation, as well as one of the leading drivers of land degradation, pollution, climate change, overfishing, sedimentation of coastal areas, and can facilitate the spread of alien invasive species.

Shifts in diet, including increased consumption of livestock products, accompanied by reduced physical activity, are leading to rapid increases in overweight individuals and obesity. A significant part of the growth in obesity is occurring in the developing world. According to FAO (2006), worldwide the number of overweight people (about 1 billion) has now surpassed the number of malnourished people (about 800 million). Diet-related chronic diseases, including heart disease, diabetes, hypertension and certain cancers have increased rapidly as a result of changing diets. Gold (2004) citing dietary recommendations made by the World Health Organisation (WHO) and Food and Agriculture Organisation (FAO) suggests there is consensus among nutrition experts that eating less saturated fat (particularly from red meat and dairy products) and increasing consumption of fruit and vegetables is beneficial to health and could lessen diet-related preventable diseases such as heart disease.

2.1.2 The Livestock Sector in the UK

The UK is a significant livestock producer within the European Union, supplying both domestic markets and exporting livestock products abroad. This production has significant impacts on the environment, both nationally and globally. National level impacts arise from the production systems and farming practices employed directly by European farmers whilst wider global environmental impacts relate, for example, to the importation of animal feed from non-EU countries and the production methods used to produce that feed.

Eurostat figures indicate that the UK cattle herd numbered around 10.1 million in 2007, the third largest in the European Union after France (19.1 million) and Germany (12.7 million). In the sheep sector, the UK had the largest flock in the EU (23.7 million) followed by Spain (22.2 million), Romania (8.5 million) and Italy (8.4 million). The UK is a less significant producer in relation to the pig sector, being the tenth largest producer, accounting for only around 3 per cent of total production in the EU-27. For comparison, UK cattle and sheep account for 11 per cent and 25 per cent

of the EU-27 total, respectively. In the poultry sector, the UK has a share of around 14 per cent of poultry meat production in the EU-27, second only to France (nearly 16 per cent).

Table 1 shows the main UK production trends in terms of total livestock numbers between 2001 and 2007. These indicate that over this period there has been an overall reduction in livestock numbers, particularly in the pig sector, but also in the size of the dairy herd, and to a lesser extent the sheep, poultry and beef sectors. However, the table does not show changes at regional level or any shifts between different types of production within a sector, for example, relative shifts in intensity of production or changes between grass-based and feed-based systems.

Table 1 Trends in UK livestock numbers (2001-2007)

Livestock numbers (1000 Head)	2001	2002	2003	2004	2005	2006	2007	% change between 2000 and 2007
Total cattle and calves (a)	10,602	10,345	10,508	10,588	10,392	10,270	10,304	-2.8%
Dairy cows (b)	2,251	2,227	2,191	2,129	2,063	2,066	1,954	-13.2%
Beef cows (b)	1,708	1,657	1,698	1,736	1,762	1,733	1,698	-0.6%
Total sheep and lambs	36,716	35,834	35,812	35,817	35,416	34,722	33,946	-7.5%
Total pigs	5,845	5,588	5,046	5,159	4,862	4,933	4,834	-17.3%
Total poultry	179,880	168,996	178,800	181,759	173,909	173,081	167,667	-6.8%

Source: Agriculture in the UK (2008). Table 3.2 accessed in February 2009. Available from:

<https://statistics.defra.gov.uk/esg/publications/auk/default.asp>

(a) Includes all bovine animals i.e. beef cows, dairy cows, calves, heifers, bulls, bullocks.

(b) Cow refers to adult female cows which have calved.

In addition to production trends it is also worthwhile noting that there are significant differences in the average farm business income between holdings engaged in different types of livestock production. There can be quite a lot of variation in average farm incomes between years. However, on average, farm business incomes¹ in the dairy, poultry and cereals sectors tend to be relatively high, ranging between £39,000 and £81,000 in 2007/08². Average farm incomes linked to pig production were actually negative in 2007/08 having plummeted from around £47,000 in 2003/04. Incomes for grazing livestock (beef and sheep) farms have been consistently lower, and in 2007/08 ranged between £8,700 and £18,800 in the lowlands, and between £5,900 and £12,500 in the more economically more marginal Less Favoured Areas. It is worth noting that direct payments acting as income support will, on average, account for a relatively large proportion of total farm income in these two sectors, particularly in the LFAs.

¹ Annual work units (AWU) (full-time equivalents) as opposed to persons employed.

² Agriculture in the UK. Table 2.3 available at: <https://statistics.defra.gov.uk/esg/publications/auk/default.asp>

Consumption patterns in the UK and globally also play a significant role in influencing production patterns in the livestock sector and its subsequent impacts on the environment. During the last 20 years, overall consumption of meat and eggs in the UK has remained fairly stable, with the exception of poultry meat, for which consumption has doubled (Garnett 2007) – although this has stabilised more recently. Table 2 shows more recent trends in consumption of livestock products between 2001 and 2007. Cyclical variations in consumption from year to year occur for most individual types of meat. For example, beef consumption fell dramatically in 2003 and 2005, possibly linked to the outbreak of animal diseases, but recovered subsequently.

Table 2 Consumption of livestock products in the UK (2001-2007)

Consumption of livestock products (1,000 tonnes)	2001	2002	2003	2004	2005	2006	2007	% change between 2001 and 2007
Meat total	4,940	5,061	4,043	5,248	4,136	5,063	4,965	0.5%
Beef	1,113	1,204	911	1,228	982	1,272	1,256	12.8%
Pig meat	1,502	1,515	950	1,519	935	1,302	1,371	-8.7%
Sheep and goat meat	339	360	321	374	340	384	388	14.4%
Poultry	1,730	1,712	1,591	1,812	1,597	1,799	1,628	-5.9%
Eggs	678	758	717	801	673	678	n/a	
Drinking milk	7,109	7,108	7,006	6,869	7,042	7,073	7,031	-1.1%
Cheese	537	523	537	549	598	629	614	14.3%
Butter	155	179	201	193	196	198	161	3.7%

Source: Eurostat. Accessed in March 2009 from:

http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136206,0_45570467&_dad=portal&_schema=PORTAL

Trends in the consumption of milk and milk products vary according to product type. Consumption of cheese and other relatively high value products such as yogurts, for example, has increased in the longer term whilst consumption of fresh milk and butter has declined slightly or remained relatively static.

2.2 Main trends in UK livestock production by sector

2.2.1 Dairy

The dairy sector is one the largest in the UK both in terms of the number of cattle and economic output of both dairy products and beef. Dairy production is one of the more intensive forms of livestock production in the UK and extensive, low input systems form a relatively small proportion of the overall number of dairy farms. Dairy production is based predominantly in the western regions of the UK where it tends to be located on more productive land. Whilst dairy production also tends to be relatively intensive in other EU Member States, examples of more extensive dairy production can be found in the some areas such as the alpine regions of France and Germany, where production is based on relatively low input livestock grazing systems linked to certain cheeses or other added value dairy products, many of which are

associated with a Protected Designation of Origin (PDO) or Protected Geographical Indication (PGI)³.

The main underlying trend in the dairy sector is of a tendency towards an increasing concentration of production on fewer, larger holdings, and with higher milk yields per cow. Until recently, the volume of milk produced in the UK had remained stable at around 14-15 million tonnes per year, due mainly to the presence of EU milk quotas⁴. However, in recent years UK milk production has dropped below quota in response to adverse market conditions (declines in milk price). ADAS & SAC (2008) predict that the number of dairy cows and heifers in milk in the UK will decline by 12 per cent between 2004 and 2015, assuming a business as usual scenario⁵. A recent study on the economic impacts of phasing out milk quotas⁶ (Institut d'Economie Industrielle, 2008) estimates that under the terms agreed under the Heath Check, UK milk production is expected to fall to about 13.6 million tonnes by 2015 a fall of from 14.6 million tonnes in 2004, although this decline may be a conservative estimate given recent trends in production.

Between 2003 and 2006 the average UK milk yield per cow increased from 6,805kg to 7,095kg. On the most intensively managed dairy farms, milk yields can be in excess of 10,000 kg per cow per year. For comparison, average milk yields in the EU-15 increased from 6,325kg to 6,661kg over the same period.⁷

Increased milk yields can be achieved through the breeding of specialist dairy cows, typically black and white Holsteins or Holstein-Friesian crosses⁸, and through diet. In the case of the latter, the proportion of high energy feed and forage crops, including maize silage, in the diet of a dairy cow can be expected to correlate roughly with milk

³ More information on specific EU agricultural product quality schemes is available at: <http://ec.europa.eu/agriculture/quality/>

⁴ EU Milk quotas were first introduced in 1984 in order to curb overproduction of milk and, in combination with other market support measures, to stabilise EU milk prices. Each EU Member State is allowed to produce a reference quantity of milk, which if exceeded incurs a levy, applied at farm level. In recent years, national quotas have been increased to allow greater market orientation and are set to expire in 2015 following the 2008 Health Check.

⁵ Key assumptions include: a) aspects of CAP reform agreed prior to the 2008 Health Check (including application of voluntary modulation in the UK); b) responses in management of land and inputs within agriculture to implementation of EU Directives and existing commitments under international Directives; c) continuing structural change with a tendency toward fewer larger holdings; d) increased efficiency of production, in terms of yields per unit of input, but limited production of genetically modified crops within the UK; and e) Increased global liberalisation and removal of export subsidies by 2015.

⁶ Under the 2008 CAP Health Check milk quotas will increase (i.e. be diluted) in the UK and most other Member States by 1 per cent a year from 2009/10 to 2014/15 and will then be removed in 2015-2016.

⁷ DG Agri (2007) The Agricultural Situation in the European Union. Table 4.20.0.1. Available at: http://ec.europa.eu/agriculture/publi/agrep/index_en.htm

⁸ Jersey cows are also used in the UK dairy sector but account for a much smaller proportion of the total milk production and on average production is likely to be intensive.

yields. Dairy herds with, on average, higher yielding dairy cows will need more concentrated energy inputs. Conversely, where diets have a low energy but higher roughage content (associated with a predominantly grass based diets) lower milk yields per cow can be expected. Higher yielding dairy herds are more likely to make greater use of high protein and high energy crops like soya and other oilseeds.

Linkages between the dairy and beef herds are also important. The majority of male calves and a significant proportion of female calves from the dairy herd are raised for beef production⁹, accounting for approximately 65 per cent of all calves destined for beef production (Garnett 2007). At the same time one would expect the ongoing declining dairy cow numbers, to result in a corresponding reduction in the number of dairy calves and potentially a reduction in the contribution of the dairy sector to beef production.

2.2.2 Beef

Production in the beef sector is much less homogenous than in the dairy sector. The intensity of beef production can vary significantly between high-put feed based systems, in which the animals may spend a significant proportion of time housed¹⁰, semi-intensive systems where the cattle graze outdoors but supplement their grass intake with significant amounts of feed (including cereals, protein crops, oilseeds, maize silage), and low input pasture based systems, often located in more marginal areas such as Less Favoured Areas but also in some lowland areas¹¹.

In the UK, however, there are significant variations in the distribution of the suckler cow herd. In England, 69 per cent of the suckler cow population was located in the lowlands with the remaining 31 per cent located in the Less Favoured Areas in 2005 (Defra 2006a). In Scotland, Wales and Northern Ireland a much greater proportion of the suckler herd are located in the Less Favoured Areas. Although recent trends for the UK as a whole indicate that production has remained relatively stable in recent years (see Table 1), ADAS & SAC (2008)¹² predict that the number of beef cows and other cattle in the UK will decline by 8 per cent between 2004 and 2015.

⁹ Dairy calves will be the result of a dairy cow crossed with a dairy bull or a dairy cow crossed with a beef bull. Pure bred female dairy calves may be used as dairy cow replacements or, for a small proportion of males, as bulls for breeding. Cross bred calves will be destined to be raised for beef or veal consumption along with those pure bred dairy calves not used as replacements or for breeding.

¹⁰ Cattle in many parts of the country will spend several months a year in housed accommodation, bedded in straw and fed a mixture of hay, silage and other feeds. Only in areas where soils are free draining, such as Salisbury Plain, or where stocking densities are so low as to not be commercially viable, will it be feasible (or indeed desirable) for cattle to spend the entire year in pasture (with some supplementary feed which may include hay or silage) due to the risk of poaching and water logging of soils, particularly on heavy clay ones.

¹¹ Historically, overgrazing and unsuitable supplementary feeding has been a concern in some upland areas, particularly on common land, linked to headage payments which provided an incentive to overstock. Undergrazing (loss of cattle grazing) or switch to sheep only grazing is a concern from a biodiversity perspective in some marginal areas.

¹² Assumptions outlined in section 2.2.1.

Beef animals¹³ in the UK originate from either the suckler cow herd or the dairy herd (as mentioned in the previous section). Estimates compiled by Garnett (2007) suggest that approximately 35 per cent of beef calves originate from the suckler cow¹⁴ herd, with the remaining 65 per cent originating from the dairy herd¹⁵.

It is estimated that the majority of UK beef calves originating from the suckler cow herd (over 60 per cent) are reared mainly on grass in the Less Favoured Areas (including upland and more marginal areas). The remaining 40 per cent of UK suckler cow calves are reared in the lowlands, with approximately 40 per cent of these being finished intensively on cereals and silage (Garnett 2007).

Calves from both suckler and dairy herds will often be sold from the original holding to a 'finisher' prior to slaughter or to a 'store' producer, who then sells the calf on to a finisher after 3-9 months. Management on 'finisher' holdings is typically intensive or semi-intensive according to the type of feed and forage used. Intensive diets are characterised as containing a high proportion of compound feeds and straights (e.g. cereals), whilst semi-intensive diets contain a greater proportion of silage (Garnett 2007).

Animal diseases have also had a significant impact on beef and dairy production in the UK, in particular, BSE, foot and mouth disease (FMD) and bovine tuberculosis (bTB). All three of these have resulted in trade restrictions at national level and livestock movement restrictions at farm level. Currently, bovine TB is a major issue with infected herds unable to move any cattle (infected or otherwise) on or off the holding except for slaughter¹⁶.

2.2.3 Sheep

Sheep production in the UK is in decline when measured in terms of the total number of sheep and lambs (-7.5 per cent between 2001 and 2007). Nonetheless, the UK remains the largest producer in the EU, although imports from other countries, principally New Zealand, are also significant. ADAS & SAC (2008)¹⁷ predict that the

¹³ More intensive beef systems are typically based on fast growing continental breeds, such as Charolais and Limousin, which require significant inputs of cereals and other feed crops such as grass and maize silage. Breeds native to the UK, such as Aberdeen Angus, Hereford and South Devon, tend to take longer to mature than the continental breeds but are more suited to, and economically viable when used, on grass based systems than the continental breeds dependent on feed inputs.

¹⁴ Suckler cows are cows of a beef breed which suckle their calves rather than wean them off milk at a young age, unlike dairy cows. Suckler cow production is typically based on outdoor grazing systems, although diet may be supplemented by feed to varying degrees.

¹⁵ In 2001 dairy cows accounted for 56.9 per cent of all UK adult cows, a proportion which declined to 53.5 per cent by 2007 (see Table 1). The proportion of beef calves originating from the dairy herd can thus be expected to decline over time.

¹⁶ Bovine TB is not transferable to humans and therefore does not represent a public health risk.

¹⁷ Assumptions outlined in section 2.2.1.

number of ewes (female adult sheep) and other sheep will decline by 2 per cent and 2.5 per cent respectively between 2004 and 2015.

Sheep production in the UK tends to take place on relatively marginal agricultural land both in the uplands but also in the lowlands. The majority of sheep diets are grass based, although some supplementary feeding will take place on many holdings, particularly during the winter months when forage may be scarce. Historically, overgrazing linked to coupled headage payments has been an issue in some areas. However, since the introduction of the decoupled Single Payment in 2005 (see section 3.2.1), there have been concerns about the potential for undergrazing or switch from mixed beef and sheep grazing to sheep only grazing. This is a particular issue in marginal agricultural areas where the application of appropriate grazing regimes is linked to a high biodiversity interest.

Generally speaking, mixed grazing by sheep and cattle, mainly suckler cows, is considered to be beneficial from a conservation perspective, due to the contrasting but complementary ways in which the two species graze. Production in these marginal areas (often but not exclusively located within the LFAs) can be classified as High Nature Value farming.

2.2.4 Pigs

Production in the pig sector can generally be classified as intensive, with a high dependency on feed, particularly in the housed industrial units which account for the majority of production. At the same time there will be variations in the degree of intensity and relative sustainability of the feed used, although this is very difficult to quantify.

Pig diets consist mainly of compound feed and by-products from other agricultural sectors and from the food industry, although it is not possible to quantify the total amounts of these consumed by the sector. It has been estimated, however, that around 60 per cent of the industrially produced compound feed fed to pigs consists of cereals whilst oilseeds, such as soy, and pulses (annual leguminous crops), account for around 29 per cent (Garnett 2007) by mass.

In terms of pig numbers, the UK pig sector has been in decline for a number of years, declining by over 17 per cent between 2001 and 2007. ADAS (2008)¹⁸ predict that the number of pigs in the UK will decline by 1 per cent between 2004 and 2015, although it is not clear whether such prediction have taken into account recent declines. A number of economic factors are thought to have contributed to this decline over the longer term (Garnett 2007) including:

- competition from countries such as Denmark but also the Netherlands, Germany and France;

¹⁸ Assumptions outlined in section 2.2.1.

- the introduction of relatively costly EU welfare standards in the UK earlier than in other Member States¹⁹; and
- the ban on the use of meat and bone meal (as a result of the BSE crisis), which required other more expensive sources of protein to be sourced, including protein crops such as soya.

Production in the pig sector can be either indoor or outdoor based, or a combination of the two. It has been estimated that up to 30 per cent of the UK breeding herd is reared in predominantly outdoor free range systems. Whilst such systems will be less intensive than housed systems, it would not be possible to describe the majority of outdoor systems as extensive and the pigs will still consume significant amounts of feed.

Due to the intensive nature of housed units, pig farms can have significant environmental impacts through the release of a range of pollutants farms include: ammonia, nutrients from manure, litter and slurry, effluent discharges, dust, odour, and noise. As a result, housed units are regulated under the Environmental Permitting Regulations (EPR)²⁰. Animal welfare issues are also a greater issue of concern in these sectors than other forms of livestock production.

2.2.5 Poultry

The UK is the second largest poultry producer in the EU, with most production taking place in housed industrial units associated with high levels of feed consumption. Chickens account for the majority of poultry production in the UK. In recent years, total production has declined a little, having peaked in 2004 (see Table 1). In contrast, consumption of poultry has doubled during the last 20 years. ADAS & SAC (2008) predict that the UK poultry sector will increase by 6 per cent between 2004 and 2015.

The majority of chickens raised for meat consumption (broilers) are reared intensively in large housed units (Garnett 2007) with similar issues to those raised in the previous section on pig production. Other types of poultry produced in the UK include turkeys, ducks, and geese. In 2007, turkeys, ducks, geese and all other types of poultry (except chickens) accounted for 6 per cent (10 million) of the total UK poultry flock (168 million)²¹.

¹⁹ It appears that UK consumers were either unwilling to pay a premium for these higher standards or were unable to distinguish between pork products produced to varying animal welfare standards. It should be pointed out, however, that even if standards in the UK were higher than elsewhere, production in the housed units to which the regulations applied would have remained intensive (albeit to a lesser degree).

²⁰ The Environmental Permitting Regulations (EPR) were formerly known as the Pollution Prevention and Control (PPC) Regulations in the UK based on the EU's Integrated Pollution Prevention and Control (IPCC) Directive. Intensive pig and poultry (but not dairy, beef or sheep) producers above a certain size must obtain environmental permits which regulate their pollution and waste management practices. More information available at:
<http://www.environment-agency.gov.uk/business/topics/permitting/default.aspx>

²¹ Agriculture in the United Kingdom. Table 5.16 Poultry and poultry meat. Available at:
<https://statistics.defra.gov.uk/esg/publications/auk/default.asp>

The broiler (poultry raised for meat) industry is highly integrated and centralised with processor companies often having direct control over feed production and manufacture. Similarly to compound feed produced for the pig sector, cereals, oilseeds and pulses account for the majority of feed content (89 per cent) (Garnett 2007). An indicative breakdown of this figure is as follows:

- Wheat – 45 per cent;
- Barley – 12 per cent;
- Soya – 22 per cent;
- Rape and pulses – 10 per cent.

Egg production by chickens is also important. Production systems can be characterised (Garnett 2007) as:

- Intensive production in conventional caged systems (66 per cent of production);
- Barn systems where the chickens are still housed but have greater freedom to move around (7 per cent of egg production); and
- Free range systems including organic production (27 per cent of egg production).

The issues in the previous section relating to the pig sector regarding animal welfare, Environmental Permitting Regulations and free range systems also apply to poultry production. In addition, production in the poultry and pig sectors has received very little support directly through the Common Agricultural Policy in comparison to the beef, sheep, and dairy sectors. However support is available for the production of arable crops, which form a large proportion of the feed consumed by pigs and poultry (as well other types of livestock).

2.2.6 Organic

Organic production of livestock is an alternative to more conventional forms of production. Although organic production accounts for a relatively small proportion of total livestock production in the UK, the number of livestock certified as organic has increased in recent years. The main trends in organic livestock production are shown below in Table 3. In most sectors, the number of livestock certified as organic is increasing. However, a notable exception to this can be observed in the trends for suckler and dairy cows but interestingly not in the overall trends for cattle.

In the EU-25 in 2005, Eurostat figures indicate that the organic area made up 3.9 per cent of the total utilised agricultural area. The highest share of organic area in total UAA were recorded in Austria (11.0 per cent), Italy (8.4 per cent), the Czech Republic and Greece (both 7.2 per cent) and the lowest in Malta (0.1 per cent), Poland (0.6 per cent) and Ireland (0.8 per cent). In the UK, 3.8 per cent of UAA is farmed organically. In the EU25 in 2005, 6.1 million hectares of land were used as organic areas. Italy (1.1 million hectares or 17 per cent of the EU25 total) had the largest share of total EU organic area, followed by Germany and Spain (both 0.8 million hectares or 13 per cent). The UK had 0.6 million hectares or 10 per cent of total organic area. Only 2 per cent of all holdings in the EU-25 are organic.

Table 3 Numbers of livestock certified as organic in the UK (2001-2006)

Organic livestock	2001	2002	2003	2004	2005	2006
Bovine animals (total)	70,100	91,310	216,779	200,959	214,276	244,752
Bovine animals for meat production	-	-	27,466	34,850	79,833	-
Dairy cows	-	-	90,143	83,253	58,578	-
Suckler cows	-	-	71,266	49,582	18,626	38,783
Pigs (total)	16,143	17,758	66,595	55,199	29,995	32,926
Sheep (total)	554,717	738,820	716,426	687,863	691,000	747,299
Poultry (total)	1,360,100	1,743,308	2,561,217	2,662,347	3,439,548	4,421,326
Broilers	618,431	979,606	1,059,746	1,222,355	1,840,273	2,742,374
Laying hens	703,874	708,336	1,420,555	1,337,369	1,397,517	1,573,880

Source: Eurostat. Data accessed in February 2009 from:

http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136206,0_45570467&_dad=portal&_schema=PORTAL

Eurostat (2007) indicates that the EU breeds considerable numbers of organic livestock but trends in the sector tend to be erratic. Sheep are most commonly reared organically but also cattle and pig (statistics are not provided for poultry). In Austria, some 24 per cent of sheep are organic and 17 per cent of cattle. Greece is the only country with a high proportion of organic pigs, representing 13 per cent of total pig production

Manufactured inorganic fertilisers and pesticides cannot be applied to pasture or crop land which is certified as organic. Organic holdings are also likely to have a greater degree of self-sufficiency in terms of feed production and cropping practices will include a greater use of crop rotations, fallow, and nitrogen fixing legumes (including clover, peas and beans). Organic livestock production can be expected to be free range, partly because the use of antibiotics and other pharmaceutical products, to preempt the outbreak of infections likely to occur when high concentrations of livestock are confined in close quarters, is prohibited.

Organic production is typically less intensive (but not necessarily extensive) than conventional forms of production, particularly in the pigs, poultry and dairy and feed-based lowland beef sectors where the predominant form of production will tend to be more intensive in nature. The differences between organic and conventional extensive beef and sheep production are less marked, particularly where relatively low input grassland constitutes the main source of dietary intake. Intensive (or semi-intensive) beef producers are unlikely to become organic certified as they would incur significant costs linked to feed production which their more extensive competitors would not. In the dairy sector extensive systems are rare and therefore intensive organic producers do not face competition from extensive ones.

Feed production and consumption is an area which distinguishes organic livestock production from more conventional systems. The Compendium of UK Organic Standards (Defra 2006b) set out a number of standards which organic producers must comply with including the following:

- Livestock must be fed on organically produced feed stuffs;
- At least 50 per cent of the feed shall come from the farm unit itself or in case this is not feasible, be produced in co-operation with other organic farms;
- Mammals must be fed natural milk for a minimum period - three months for cattle, 45 days for sheep and goats, and 40 days for pigs;
- At least 60 per cent of the dry matter in daily rations for cattle and sheep must consist of roughage, fresh or dried fodder, or silage²²;
- Roughage, fresh or dried fodder, or silage must be added to the daily ration for pigs and poultry - the remainder may include cereals, oilseeds, legumes, tubers, and certain other feed materials;
- Up to 40 per cent of the dry matter in daily rations for cattle and sheep can consist of cereals, oilseeds, legumes, tubers and certain other feed materials; and
- Organic certified soya (including imports) can be consumed in livestock feed but only in an unprocessed form (bean, toasted, expeller and hulls).

2.3 Feed and forage consumption within the UK livestock sector

The UK livestock sector and feed crop production sectors are inextricably linked through the production of cereals, protein crops, oilseeds, feed crops, maize, and other dietary supplements for consumption by livestock. The consumption of these varies significantly between different forms of production as well as between livestock species. Pig and poultry production will invariably be dependent on the consumption of feed crops, whilst dairy and intensive beef production will also be associated with significant consumption of feed crops. Forage and roughage, principally grass, will also form a proportion of diet for the latter two forms of production, but will constitute the majority of dietary intake for more extensive forms of beef and sheep production.

Feed production in the UK can take place on-farm or in combination with imports from local, national, EU and international markets. Garnett (2007)²³ distinguishes three types of feeds associated with livestock production:

- Compounds or blends – consisting mainly of a mixture of cereals (mainly barley and wheat), proteins (including soya, maize and rape oilseed cake) and ‘miscellaneous’ feedstuffs such as molasses cake and citrus pulp;
- Individual or ‘straight’ raw materials characterised as high energy value (cereals, cereal offals, proteins, oilseeds and other high energy feeds such as maize silage), of intermediate energy value (such as grass silage), and low energy value (such as hay); and

²² Forage and roughage are defined as: lucerne, lucerne meal, clover, clover meal, grass (obtained from forage plants), grass meal, hay, silage, straw of cereals, and root vegetables for foraging.

²³ Tara Garnett (2007) Meat and Dairy production and consumption: Exploring the livestock sector’s contribution to the UK’s greenhouse gas emissions and assessing what less greenhouse gas intensive systems of production and consumption might look like. Report for the Food Climate Research Network. Available at: <http://www.fcrn.org.uk/fcrnPubs/publications/PDFs/TG%20FCRN%20livestock%20final%2006%20Nov%20.pdf>

- Production of supplementary fodder crops, such as peas, beans, and fodder beet, either on farm or sold locally.

The amount of compound feed attributable to a particular sector varies from year to year, in response to market conditions and changes in the number of livestock. In addition the relative mixture of ingredients used in feed will also vary throughout the year as well as between years depending on the seasonal availability of crops and climatic factors which can affect the quality and volume of crop yields. In 2006, the UK consumed a total of 14.2 million tonnes of industrially produced compound feed out of a total of 140.7 tonnes consumed in the EU-25²⁴. By weight, cattle from the dairy and beef herds consumed 34 per cent of this, pigs 12 per cent, and poultry 43 per cent. Annual consumption of these products by livestock will, naturally, vary according to the relationship between price of alternative feed crops and the nutritional content of the crops consumed. Intensive, high input/high output livestock systems will, on average, be less likely to switch from feeds with high energy and protein content to competing feed stocks with lower energy and/or protein content.

The main types of feed and forage crops consumed by livestock are discussed in the following sections.

2.3.1 Grassland (forage and roughage)

Livestock production based on grassland systems accounts for a significant proportion of dietary intake in the sheep and beef sectors, and to a lesser extent in the dairy sector. Pigs and poultry and to a lesser extent the dairy sector, derive the overwhelming majority of their dietary intake from feed crops and dietary supplements, although free range systems will typically be located on grassland, as well as crop residues.

In 2007 permanent grassland²⁵, excluding rough grazing, accounted for 32 per cent (6.0 million hectares) of utilised agricultural area (UAA)²⁶, and is mainly used by grazing livestock (sheep, beef and dairy cattle) and/or to produce forage crops such as hay or grass silage. Permanent grassland can be managed to varying degrees of intensity which tend to correlate with the productive capacity of the land.

Rough grazing accounted for 6 per cent (1.2 million hectares) of UAA in 2007 and, production on this type of grassland can be characterised as low input or extensive, with grazing livestock mainly originating from the sheep and beef sectors. Rough grazing typically occurs on more marginal, less productive agricultural land, often in the uplands where moorland and common land can be found.

²⁴ France and Germany are the largest consumers of compound feed in the EU, each consuming in excess of 20 million tonnes in 2006. Source: European Feed Manufacturers' Federation (FEFAC) (2007) in 'The agricultural situation in the European Union' Table 4.13.7.3. Available at: http://ec.europa.eu/agriculture/agrista/2007/table_en/index.htm

²⁵ Defined as land under grass continuously for more than five years.

²⁶ Source: Agriculture in the UK (2008). Table 3.2 accessed in January 2009 (<https://statistics.defra.gov.uk/esg/publications/auk/default.asp>).

A further 6 per cent (1.2 million hectares) of UAA was classified as temporary grassland in the UK in 2007. Grassland is classified as temporary if the land has been used for grassland production for less than five years. Typically, land use will involve a rotation of grass with crops such as maize, cereals, or protein crops and is more likely to occur on farms where feed crops constitute a significant proportion of livestock diets in addition to forage and roughage, principally for dairy and more intensive beef production.

The intensity of grassland management will vary depending on the level of inputs and stocking density²⁷. In 2007, 66 per cent of all grassland in the UK received an application of nitrogen fertiliser (Defra 2008a). The overall application rate for grassland was 65 kg/ha in 2007²⁸. This compares to 148 kg/ha on tillage land²⁹. In general, relatively high rates of fertiliser applications (and of manures or slurries) would be expected in dairy systems as well as in intensive beef production, with lower rates likely in suckler cow and sheep production. Intensively managed pastures³⁰ typically consist of commercial rye grass species, which are not native to the UK, whereas the composition of grass species in rough grazing is more likely to include a high proportion of semi-natural vegetation³¹ than conventionally managed permanent (or temporary) grassland (moderate to high intensity or management).

2.3.2 Cereals

Cereals account for a large proportion of feed consumption in the UK, particularly in more intensive livestock systems such as pigs, poultry, dairy and more intensive beef production. It has been estimated that livestock consume over 50 per cent of the 20 million tonnes of cereals consumed in the UK annually; including over 50 per cent of wheat and 60 per cent of barley (Garnett 2008).

In 2007, land in arable production accounted for 31 per cent of the UK's UAA (5.7 million hectares). Of this area, 1.8 million hectares was in wheat production and 0.9 million hectares in barley production. Table 4 below shows the main trends in UK cereal and arable crop production between 2001 and 2007, although it should be noted that these figures do not distinguish between crops grown for human consumption and crops grown for feed production.

²⁷ Inputs include manufactured nitrate and phosphate fertilisers, manures, slurries, pesticides and herbicides.

²⁸ A decrease compared to the 2003-2007 mean overall application rate of 75 kg/ha. This continues the long term trend in declining nitrogen application rate observed on grassland since the end of the 1980s. Applications to tillage land remained stable over the same period (149 kg/ha).

²⁹ Tillage land is land which has been cultivated or tilled i.e. for crop production.

³⁰ Defined as those with relatively high inputs, which include: manufactured inorganic fertilisers (i.e. those containing nitrates, phosphates and other minerals), herbicides, pesticides, as well as slurries and manures.

³¹ List of native and commercial grass species and plants e.g. clover.

Table 4 Trends in cereal production in the United Kingdom (2001-2007)

Crop areas ('000 hectares)	2001	2002	2003	2004	2005	2006	2007	% change between 2001 and 2007
Total arable	5,741	5,879	5,705	5,864	5,794	5,673	5,691	-0.1%
Total cereals	3,014	3,245	3,057	3,130	2,919	2,861	2,871	-4.7%
Wheat	1,635	1,996	1,836	1,990	1,867	1,833	1,816	11.1%
Barley	1,245	1,101	1,076	1,007	938	881	898	-27.9%

Source: Agriculture in the UK (2008). Tables 3.1 & 3.2 accessed in March 2009 (<https://statistics.defra.gov.uk/esg/publications/auk/default.asp>).

Note: On-farm production of maize, a cereal grain originating from Mexico and Central America and sometimes referred to as 'corn', is important in some sectors, notably the dairy sector, but also more intensive beef production, and pigs and poultry. Separate figures indicating the area of land in maize production are not provided in Agriculture in the UK.

An important point to note is that cereals consumed by livestock are not necessarily produced on farms with livestock. Although many livestock farms will have land which is used to produce feed crops (including cereals and maize) to varying degrees of self-sufficiency, specialist arable farms will also sell their crops on the open market for consumption by humans, livestock, or even as a feedstock for biofuel production.

It is also worth noting that modern forms of arable production in the UK tend to involve quite high levels of fertiliser, pesticide and herbicide inputs. In addition, as cereals, like most other crops grown for feed, are annual crops, the land on which they are grown will be ploughed up regularly with negative effects on the carbon sequestration capacity of the soil and thus greenhouse gas (GHG) emissions. Manufactured fertilisers are also associated with significant levels of GHG emissions. Arable systems based on crop rotations which incorporate temporary grassland and legume crops (including clover and other leguminous crops) will on average maintain soil organic matter and nutrients better than specialised cereal systems. Cereal production based on crop rotations is often associated with higher levels of environmental benefits, compared to specialised cropping regimes.

2.3.3 Protein crops (including oilseeds)

Protein crops also form an important constituent of feed for the livestock sector as a whole. Protein crops are crops which have an above average protein content compared to other type of feed or forage³². When used as part of a mixed diet, protein crops can result in significant increases in liveweight gains (kg per head per day), although the extent to which this is the case will be determined by the species and breed of livestock kept.

Protein crops grown in the UK for livestock consumption include forage peas, field beans, and oilseed rape. In addition, UK livestock consume significant amounts of

³² All feed and forage crops will contain some protein to some degree; for example maize has a relatively low protein content balanced by a high energy content, whilst cereals have a more intermediate protein content relative to protein crops.

imported soya (722,900 tonnes in 2006), both in raw and processed form. Consumption of protein crops (and cereals) will be lowest in extensive forms of production, principally beef and sheep grazing systems, and highest in the most intensive forms of production, namely pigs, poultry, dairy and feed based beef production. Furthermore, consumption of protein crops with the highest protein (and energy) content, namely oilseeds such as soya and to a lesser extent rape, will be highest in the most intensive forms of production. Intensive high yielding livestock production systems (such as dairy herds with high milk yields per cow) are therefore likely to have a higher soya content in their diet than less intensive production systems (such as dairy herds with lower milk yields per cow). Similarly, the most intensive beef systems can be expected to include a greater proportion of soya in feed than semi-intensive, for which cereals and maize are more likely to constitute the majority of feed intake. Ultimately, decisions regarding protein crop use at farm level will be based on a combination of price and nutritional requirement considerations.

Soya

Soya is an important protein crop (and oilseed) used in livestock feed, particularly for the pigs and poultry sectors, but also for more intensive³³ dairy production and, to a lesser extent, beef production. Like most protein crops, it is a legume and thus capable of fixing nitrogen in the soil. Soya originates from East Asia and cultivation is successful in climates with hot summers³⁴ and is therefore is not commonly grown in Northern Europe.

The majority of soya used in animal feed in Europe is used for poultry and pig production (Friends of the Earth, 2008). Beef and dairy cows are ruminants and are therefore better able to digest alternative sources of protein, such as rapeseed, than pigs and poultry (Garnett 2007). Nonetheless, although this means there are more alternatives to soya for cattle than for pigs and poultry, soya has a greater energy content than rapeseed, and for this reason it will still be used in more intensive high input/high output dairy and beef production systems even where it is more expensive than rapeseed.

Soya has a higher protein content and lower fibre content than alternative crops which can readily be grown in the UK, such as rape seed (Garnett 2007). Soya accounts for the majority of high protein feed consumption in the EU-25 (55 per cent in 2005/06 – see Table 7).

The majority of worldwide soya production takes place in the USA and South America. Soya production in South America is the main source of imports to the EU, but has been implicated as a major driver of direct and indirect land use changes resulting in deforestation. Nonetheless, some soya production does take place in the EU but accounts for less than 2 per cent of total consumption. The main soya producing Member States in the EU include Italy, Romania, France, and Austria. By comparison, very little soya production takes place within the UK³⁵ (Table 5). It is

³³ More intensive is taken to mean production with relatively high milk yields per cow.

³⁴ Mean temperature range of 20 °C to 30 °C. Source: <http://en.wikipedia.org/wiki/Soybean>

³⁵ 4,000 hectares in 2006 equivalent to 0.7 per cent of the UK's arable area.

interesting to note that soya production in Spain is low despite similar climatic conditions to Italy and other Southern European countries.

Table 5 Area and harvested production of soya in the UK and selected Member States (2000-2008)

Harvested Soya bean production (1,000 tonnes)	2000	2001	2002	2003	2004	2005	2006	2007	2008
Spain	6.7	6.6	1.6	0.6	0.4	2.7	1.5	1.1	0.5
France	201.0	309.7	210.3	147.4	147.1	142.5	123.0	84.3	65.8
Italy	903.5	881.8	566.2	388.5	518.1	553.0	551.3	408.5	454.0
Austria	32.8	33.9	35.3	39.5	44.8	60.6	65.0	52.9	55.9
Romania	69.5	72.7	145.9	224.9	298.5	312.8	344.9	136.1	91.8
United Kingdom	0.0	5.0	3.5	4.1	4.1	4.0	4.0	-	-
Area of Soya bean production (1,000 ha)	2000	2001	2002	2003	2004	2005	2006	2007	2008
Spain	3.1	2.5	0.6	0.3	0.1	1.0	0.6	0.6	0.4
France	77.7	120.9	74.8	80.7	58.6	57.4	45.3	32.4	22.7
Italy	252.6	233.5	152.0	152.1	150.4	152.3	177.9	130.3	138.9
Austria	15.5	16.3	14.0	15.5	17.9	21.4	25.0	20.2	18.4
Romania	117.0	44.8	71.8	128.8	121.3	143.1	190.8	133.2	52.3
United Kingdom	0.0	2.2	1.0	1.1	1.0	1.0	1.0	-	-

Source: Eurostat. Data accessed in February 2009 from:

http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0.1136206.0_45570467&_dad=portal&_schema=PORTAL

Other protein crops consumed by livestock

The main protein crops grown in the UK are forage peas and field beans³⁶ grown for livestock production. Oilseed rape is consumed by livestock on large scale, although it also has a number of other uses, including as a feedstock for bio-diesel production. Table 6 shows the main UK production trends for these crops in terms of area and tonnes produced, between 2001 and 2007.

Excluding soya, 14.8 million tonnes of protein crops were consumed in the EU-25 in 2005/06 with over 85 per cent of these produced within the EU (see Table 7). In terms of weight, consumption of forage peas, field beans, and oil seed rape by livestock accounts for less than half of total soya consumed by livestock in the EU-25.

An overview of the main trends in UK protein crop production is shown in Table 6. Forage peas and field beans included in the table are grown specifically for livestock rather than human consumption, whilst only a proportion of oilseed rape shown will be used in livestock feed. In contrast to production of forage peas and field beans, which both declined between 2001 and 2007, oilseed rape production increased by over 80 per cent, although this increase is likely to have been driven by an increase in demand for biofuels, with the rapeseed meal produced as a by-product. The resulting

³⁶ Other protein crops grown in the EU for livestock production include sweet lupins which are mainly cultivated in Mediterranean areas.

increase in rapeseed meal production is, therefore, likely to have displaced to some extent the production of forage peas and field beans as feed for the livestock sector.

Table 6 Production of Protein Crops in the UK (2001-2007)

Thousand tonnes (unless otherwise specified)	2001	2002	2003	2004	2005	2006	2007	% change between 2001 and 2007
Peas for harvesting dry - grown for livestock consumption (a)								
Area (thousand hectares)	89	77	65	51	41	37	26	-70.8%
Volume of harvested production	314	262	254	176	156	122	80	-74.5%
Field beans - grown for livestock consumption								
Area (thousand hectares)	173	164	165	178	184	184	123	-28.9%
Volume of harvested production (a)	606	632	639	661	705	617	375	-38.1%
Oilseed rape - total production								
Area (thousand hectares)	451	432	542	554	594	575	681	51.0%
Volume of harvested production	1157	1468	1771	1607	1898	1890	2108	82.2%

Source: Agriculture in the UK (2008). Tables 5.5 and 5.8 accessed in February 2009:

<https://statistics.defra.gov.uk/esg/publications/auk/2007/excel.asp>

(a) The figures presented here cover only that part of the crop which is harvested dry (about 80 per cent to 90 per cent of total production) and largely used for stock feed. The remainder is included in UK fresh vegetables.

(b) Includes arable area payments but excludes set-aside payments; includes protein crop premium from 2004.

(c) The figures referred to here include production on arable land and set-aside land. The figures also cover all uses of oilseed rape including livestock feed, human consumption and use as a biofuel feedstock.

2.3.4 EU trade of soya and rapeseed

The EU imports a significant amount of livestock feed, 61.1 million tonnes in 2005/06 - equivalent to a third of all feed consumed by EU livestock (DG Agri, 2006). Soya accounts for over 50 per cent of all imported feed. Currently, around 85 per cent of soya imports to the EU come from South America. Import tariffs vary according to crop, however, imports of soya and rape seed are not subject to any import tariffs in order to gain access to the EU market. On the other hand, other commodities which are more widely produced in the EU, such as cereals, are subject to import tariffs.

Table 7 provides an estimate of the main agricultural products consumed by all livestock in the EU-25, including industrial compound feeds, feed produced on farm, and purchases of raw materials at farm level. The table includes a breakdown of import, exports and EU production of soya and rapeseed destined for consumption by livestock. The majority of soya consumed in the EU originates from outside the EU (>98 per cent). In contrast the majority of rapeseed consumed by EU livestock is produced in the EU (>95 per cent).

Annex 1 provides an overview of trade in oilseed rape and soya beans from selected EU Member States between 2004 and 2006, although the figures do not include trade in industrial or processed compound feeds. In the UK, the total amount of

unprocessed soya beans imported remained relatively stable at around 725,000 tonnes per year between 2004 and 2006. The majority is imported directly from outside the EU, although imports from other EU Member States rose from 29,000 to 89,000 tonnes over this period.

Table 7 Estimated consumption of key marketable products by livestock in the EU-25 (2005/06)

Key products	Import duty rate	Consumption by livestock (million tonnes)			
		EU production	EU Imports	EU Exports	Total
Wheat	T	53.2	3.5	-	56.7
Barley	T	35.4	0.1	-	35.5
Maize	T	37.0	1.5	-	38.5
Total Cereals (a)		149.5	6.0	-	155.5
Total High Energy Feeds (b)		22.3	12.3	-	34.6
Soya	0% C	0.5	32.5	2.0	31.0
Rape	0% C	4.7	1.0	0.2	5.5
Protein crops	2-5% C	3.5	1.1	-	4.6
Dried fodder and related	0-9% C	4.8	0.1	0.2	4.7
Total High Protein Feeds (c)		16.2	42.8	2.9	56.1
Key Products Total		188.0	61.1	2.9	246.1

Source: DG Agri (2006) 'The agricultural situation in the European Union'. Available at:

http://ec.europa.eu/agriculture/publi/agrep2006/agrep2006_en.pdf

T = Tariff since 01/07/1995

C = bound under GATT; % = import duty as at -1/07/1995; 0% = exempt

(a) Includes 'Other' cereals, such as durum wheat, oats, and rye.

(b) Includes Manioc, Sweet potatoes, CGF (corn gluten feed), Brans, MGC (maize germ cake), Citrus pellets, Dried sugar beet pulp, Brewing and distilling residues, Various fruit waste, Molasses, Animal and vegetable fats (added to feed).

The Netherlands is the main importer of soya beans into the EU, accounting for over 30 per cent of total EU-25 imports from non-EU countries. Germany is also a major importer of soya beans from other EU Member States and from outside the EU. Spain is the second largest importer of soya beans from outside the EU. Other Member States which import significant amounts (>1 million tonnes in 2006) of soya beans include Italy, Portugal and Belgium.

France is notable for having a relatively low level of imports of both soya beans and oilseed rape in comparison to many EU countries, despite being the EU country with the largest herd of cattle, the second largest dairy herd, the largest poultry sector, and the fourth largest pig herd. It has a relatively high degree of self-sufficiency in terms of feed crop production due to its size, and is the EU's leading producer of cereals, maize, fodder crops, and oilseeds - second to Germany in terms of oilseed rape. In Ireland, livestock diets are predominantly based on pasture-based systems and hence it is unsurprising that imports of oilseeds and soya are relatively low.

3 SUPPORT FOR THE LIVESTOCK SECTOR IN THE UK THROUGH THE COMMON AGRICULTURAL POLICY

3.1 Overview of expenditure under the Common Agricultural Policy

The Common Agricultural Policy (CAP) is the main source of financial support for the agriculture sector in the European Union. Historically, certain types of CAP payments – particularly payments per head of livestock and price support for commodities such as beef and milk – were key drivers of livestock production patterns and practices, incentivising greater and more intensive production. Successive reforms of the CAP in 1992 and 2000 gradually reduced commodity price support and market protection and compensated farmers for loss of income through increased direct payments. The 2003 CAP reform finally broke the link between production and direct payments received by farmers through the introduction of decoupled direct payments in 2005. The intention of these reforms has been to orientate levels of production much more closely with levels of market demand, a trend which has continued following the 2008 CAP Health Check agreement.

The changes to CAP expenditure since 2005, which principally relate to the introduction of decoupled payments, have significantly reduced the influence of the CAP on farm level production decisions in relation to livestock and other forms of production. Nonetheless, the agricultural sector as a whole continues to receive substantive amounts of support, from the public purse, mainly through decoupled income support payments.

Support through the CAP can be divided into three main categories:

- *Direct payments* – income support payments for farmers paid through the decoupled Single Payment Scheme (SPS) since 2005, although some payments remain coupled to production. Prior to 2005 payments were coupled to a certain types of production on a headage or area basis. Payments are conditional on compliance with specific environmental, animal welfare and other standards under a system known as cross compliance.
- *Market interventions* – commodity price support through export subsidies, intervention purchasing and storage, quotas, amongst others.
- *Rural development measures* – a series of measures under the European Agricultural Fund for Rural Development (EAFRD) targeted at improving the competitiveness of farm businesses, the environment, and quality of life in rural areas. Some measures are subject to cross compliance.

CAP support is formally divided into two Pillars. Pillar I includes expenditure on direct payments and market interventions, whilst Pillar II relates to expenditure through national or regional Rural Development Programmes. In the UK, 2007 expenditure under Pillar I of the CAP was €3,951 million compared to a Pillar II budget allocation from EAFRD of €264 million plus national co-financing (see Table 8).

In 2007, UK expenditure on direct payments accounted for 95 per cent of the Pillar I³⁷ budget, with the remainder spent on market interventions - a proportion which will decline in the longer term. In contrast, expenditure on measures targeted at environmental, social and economic outcomes under Pillar II of the CAP is much smaller, even when both EAFRD allocations and national co-financing are taken into account. Figure 1 shows the evolution of the Pillar I and Pillar II budgets at EU level between 2002 and 2006. Pillar II expenditure has been administered through EAFRD since 2007 and thus rural development expenditure for this year is not shown.

Table 8 Overview of CAP Expenditure (€million) in the UK (2007)

Type of Expenditure	UK	EU-27
Total interventions in agricultural markets	219.01	4867.56
Direct Payments	3,832.41	37,045.83
Total Pillar I (EAGF) (a)	3,950.78	42,120.80
Total Pillar II (EAFRD) (a)	264.00	12,343.03

Source for Pillar I expenditure: 1st Financial Report - EAGF - 2007 [COM(2008) 587 final]. Annex XII. Available from: http://ec.europa.eu/agriculture/fin/finrep_en.htm and

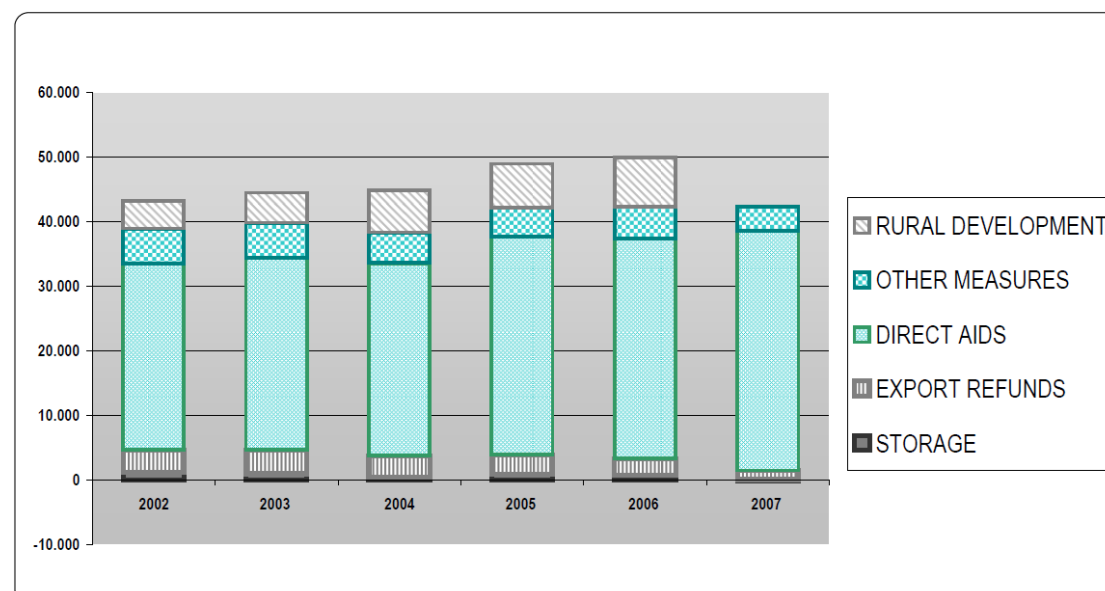
Source for Pillar II expenditure: Commission Decision of 22 October 2007 amending Decision 2006/410/EC. Available at:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:280:0027:0030:EN:PDF>

(a) EAGF expenditure includes a number of additional categories which account for a small proportion of total expenditure, such as audits.

(b) Pillar II (EAFRD) budget increases to €645 million in 2008 with a corresponding decline in the Pillar I budget due to the application of Voluntary Modulation by the UK. In addition, Pillar II receives national co-financing but rates vary between the UK countries.

Figure 1 Evolution of CAP expenditure 2002 - 2007 (in EUR million)



Source: 1st Financial Report - EAGF - 2007 [COM(2008) 587 final] Annex 20. Available at:

http://ec.europa.eu/agriculture/fin/finrep_en.htm

Note: The increase in overall budget observed in 2005 is due to the accession of 10 Member States to the EU on 1 May 2004. Bulgaria and Romania acceded to the EU on 1 January 2007.

³⁷ Since 2007 Pillar I expenditure has taken place through the European Agricultural Guarantee Fund (EAGF). Previously CAP expenditure was administered through the European Agricultural Guidance and Guarantee Fund (EAGGF).

For an overview of CAP expenditure on direct payments, other types of livestock subsidies, and rural development schemes in England, Wales, Northern Ireland and Scotland, please refer to Annex 1.

3.2 Support for livestock production through Pillar I of the Common Agricultural Policy

As previously stated, the total EU budget for Pillar I of the CAP in 2007 was €42.1 billion. This is made up primarily of direct payments (€37.0 billion), and interventions in all agricultural markets (€4.9 billion). In 2007, the UK³⁸ received a Pillar I allocation of just under €4.0 billion of which over 95 per cent was spent on direct payments and less than 5 per cent on market interventions. 2.3 per cent of the Pillar I budget was spent on market interventions specific to livestock products.

Pillar I payments are untargeted. Their purpose since the introduction of decoupling in 2005 has been predominantly to act as income support, based on a farmer's area of registered 'agricultural' land which must be kept in 'good agricultural and environmental condition' (GAEC). Producers who practice more sustainable forms of production do not receive any preferential treatment in terms of payment received.

Following the Mid-Term Review of the CAP in 2003, and more recently the 2008 Health Check, there has been a clear movement towards greater market orientation in the Common Agricultural Policy and Pillar I in particular. In practice, this has involved a movement towards direct payments which are decoupled from production and a corresponding reduction in expenditure on market interventions, such as export refunds and intervention storage (see Figure 1).

Prior to 2005, Pillar I direct payments were linked to production, which led to market distortions and the need for market interventions to stabilise prices within the EU. Decoupling means that the need for expenditure on market interventions is much less, and thus expenditure has declined over time and is set to decline further in future. A consequence of greater market orientation, however, is that EU producers are more exposed to fluctuations in world prices for agricultural commodities. As a result, expenditure on market interventions, although it will decline in the longer term, may fluctuate year on year due to the occurrence of adverse market conditions leading to low market prices. This has been seen recently in relation to the dairy sector, for example (see section 3.2.5).

Prior to 2005 and the decoupling of payments from production, Pillar I support for livestock production varied according to the production of certain types of livestock or agricultural commodities. The nature of this support can be summarised as follows:

- Beef production – mainly through coupled headage payments until 2005 but also through market interventions, to a lesser extent, and BSE measures;

³⁸ For comparison, in 2007 the UK received less than half the €9.2 billion of Pillar I funds received by France whilst Germany was allocated €5.6 billion.

- Sheep production - mainly through coupled headage payments until 2005 but also through market interventions;
- Dairy production – significant support through market interventions (mainly export refunds and storage of various non-perishable dairy products) but switching to direct payments from 2004 onwards with the introduction of the area based Dairy Premium and then fully decoupled direct payments in 2005;
- Pigs and poultry production – no coupled direct payments but some expenditure on market interventions (much less than dairy and to a less extent beef and sheep interventions);
- Arable production – mainly through area based arable payments until 2005 but also through market interventions. Any crops produced on land in receipt of direct payments (decoupled or coupled) and then consumed by livestock will indirectly have supported livestock production, principally, poultry, pigs, dairy and feed based beef production.

Coupled payments were subject to budgetary limits and, in some cases, quotas limiting the number of payments a farmer could claim. Table 9 below provides a summary of the main coupled payment schemes which existed prior to decoupling, their payment rates, eligibility criteria and comments on their potential effects.

Table 10 shows the transition from coupled direct payments in 2001 to mainly decoupled payments from 2005 until 2007. In 2004, the last year in which direct payments were paid to farmers on a coupled basis, direct payments in the UK were distributed as follows:

- Beef production - £690 million;
- Sheep production - £262 million;
- Dairy production - £100 million;
- Extensification payments for beef and sheep production - £159 million;
- Compensation schemes linked to BSE (beef and dairy production) and other animal diseases - £222 million; and
- Arable production - £1,042 million.

Prior to 2005, there was no direct support linked to pigs and poultry production, unless they owned land on which they claimed support for other commodities, such as arable crops. The sectors would also have received some limited support (relative to other sectors) through market intervention measures, such as export refunds and intervention storage linked to pig meat and poultry products. In principle, all registered agricultural land, subject to certain criteria, and excluding land on which housed units are located, will have been eligible for some decoupled direct payments since 2005.

Table 9 Summary of coupled payment schemes in the UK until 2005

Coupled payment	Payment rate and eligibility criteria	Comments
Beef Special Premium Scheme (BSPS)	€150 per steer/bullock up to 2 times in the animal's lifetime and €10 per bull once	Significant proportion of claimants likely to be lowland 'finisher' and 'store' producers, although less intensive producers on grass based systems are not excluded from the payment.
Extensification Payment Scheme	Annual €80 per eligible livestock unit (a) on beef and sheep holdings with livestock densities below 1.4 livestock units per hectare; €40 per eligible animals for livestock densities between 1.4 and 1.8 livestock units	In principle, an example of a coupled payment potentially capable of delivering environmental benefits. However, stocking densities were not particularly low and did not take account of local circumstances (i.e. carrying capacity of different types of land). In practice, the scheme did not have a significant impact in terms of lowering intensity of production.
Slaughter Premium Scheme	€50 per calf and €80 per adult cow slaughtered at an approved abattoir.	Available to all producers, although, similarly to the BSPS, more likely to be claimed by relatively intensive lowland 'finisher' and 'store' producers.
Suckler Cow Premium Scheme (SCPS)	Annual €200 per adult beef breed female cow plus beef national envelope payments.	Likely to be claimed by producers with breeding beef herds in the uplands and lowlands. Less likely to be claimed by 'finisher' and 'store' producers. Linked to Extensification Payment Scheme.
Sheep Annual Premium Scheme	Annual €20 per adult ewe plus supplementary payment per animal in Less favoured Areas	Likely to be claimed by sheep producers in lowland and uplands. Net payments received likely to be less than those available for beef and suckler cow production.
Dairy Premium and Additional Payments	Payment to dairy producers introduced in 2004 based on milk quota held during a reference period. Dairy producers received €8.15 per tonnes of reference period quota in 2004.	Budget (historic envelope) integrated into Single Payment Scheme in 2005 on basis of €16.31 per tonne of quota held in reference period (€4.49 per tonne from 2006 onwards). Accompanied by significant cuts in expenditure on market interventions for dairy products.
Arable Area Payments Scheme (b)	€71.07 per hectare for cereals (including sweetcorn and maize), oilseeds (rapeseed, sunflower seed and soya), linseed, flax and hemp	A significant proportion of crop production linked to these payments would have been consumed by livestock in the poultry, pig, dairy and feed-based beef production systems.
	€27.03 per hectare for protein crops (i.e. peas, beans and lupins)	The majority of these crops would have been consumed by livestock.
	€71.07 for set-aside	All arable producers (food and feed) received this payment on 10 per cent of their IACS registered arable land.
	€38.90 per hectare supplement for durum wheat	Durum wheat is not commonly grown in the UK and thus this supplementary payment would not have been widely claimed in the UK.

Source: Payment rates are standard rates in Euros provided in the English scheme literature which is available on the Rural Payment Agency website: <http://www.rpa.gov.uk>

(a) Adult ewe = 0.15 Livestock units, adult male and female cows = 1.0 livestock units, male and female cows between 6 and 24 months old = 0.6 livestock units.

(b) Rates for 2002 (and later years) in England. Payment rates were set by the EU in Euros (€) per tonne and converted to a rate per hectare by applying the historic average cereal yields in the region

Table 10 Direct payments and levies to farmers in the United Kingdom (2001-2007)

Payments and levies linked to the production of agricultural products (£ million)	2001	2002	2003	2004	2005	2006	2007
Crop subsidies	1,010	1,020	1,105	1,042	12	13	14
Arable area payments	827	875	925	900	..	..	..
Arable area payments set-aside	180	143	177	129	..	..	..
Other crop subsidies (a)	3	2	3	13	12	13	14
Livestock subsidies	1,051	1,225	1,218	1,433	215	84	67
Beef special premium	216	236	238	267	..	..	..
Suckler cow premium	195	203	208	229	..	..	..
Slaughter premium	76	133	136	157	..	..	..
Over Thirty Month Scheme/Older Cattle Disposal Scheme	158	237	199	203	178	50	28
Beef national envelope	19	34	34	37	..	..	..
Scottish beef calf scheme (b)	..	..	..	..	19	18	19
Animal disease compensation.	13	24	25	19	19	16	20
Extensification schemes	118	137	145	159	..	..	..
Sheep annual premium	105	211	223	244	..	..	..
Sheep national envelope	..	10	10	18	..	..	..
Other livestock subsidies	72	..	..	..	..	..	..
Dairy subsidies	79	..	..	108	..	..	..
Milk superlevy	..	..	..	- 8	- 1	..	..
Single Payment Scheme	..	..	..	..	2,349	2,354	2,292
Total coupled and decoupled direct payments to livestock and crops sectors	2,061	2,245	2,323	2,475	2,576	2,451	2,373

Source: Agriculture in the UK (2008). Table 11.1 accessed in January 2009 (<https://statistics.defra.gov.uk/esg/publications/auk/default.asp>).

(a) CAP hops and herbage seeds support; hemp and flax aid; oilseed rape and linseed support; Potato Marketing Board compensation payments; protein crop premium; area aid for nuts; energy crops aid.

(b) The Scottish beef calf scheme is currently financed through Article 69 of Council Regulation 1782/2003.

3.2.1 *The Single Payment Scheme (SPS)*

Since 2005, direct payments for different commodities have been brought together into one overall income support payment known as the Single Payment Scheme (SPS). Under current CAP rules, farmers in receipt of SPS are under no obligation to produce any commodity from the land which has SPS entitlements but must comply with certain conditions under a system known as cross compliance³⁹. This means that, decisions about whether to produce livestock and how (management systems, stocking densities, feed requirements etc) are now much more firmly driven by market factors (input prices, consumer demand, market prices etc) than they were previously, and the influence of the CAP on production decisions has been substantially reduced.

The rules for the introduction of the SPS, allowed for a number of different payment models for the SPS⁴⁰, as follows:

- SPS historical – each farmer is granted an entitlement based on the amount received previously in a reference period and the number of hectares being farmed in that reference period and on which direct payments were claimed.
- SPS regional – each farmer receives a flat rate payment per hectare (calculated based on previous regional amounts and total hectares farmed) for every hectare declared in the year of SPS introduction
- SPS static hybrid – each farmer receives payments calculated partly on an historic basis and partly on a regional basis and payments are fixed
- SPS dynamic hybrid – each farmer receives payments calculated partly on an historic basis and partly on a regional basis in the year of introduction but over time the payment shifts progressively towards a regional payment until eventually the regional model applies.

Under the historic model, farmers essentially receive the same amount of payment as previously but instead of receiving payments related to different types of production, they receive it as one single payment. Hence, a farmer who received, for example, £5,000 by claiming Suckler Cow Premium and £5,000 claimed as Sheep Annual Premium during the reference period (2000-2002) would receive a total payment in

³⁹ Compulsory cross compliance was introduced in 2005 under Council Regulation (EC) No 1782/2003 to ensure that farmers in receipt of CAP direct payments, and some rural development measures, comply with minimum baseline standards in relation to the environment, food safety, animal and plant health, and animal welfare. Farmers must comply with 18 Statutory Management Requirements (SMRs) based on EU legislation and a number of nationally or regionally (i.e. England, Northern Ireland, Scotland and Wales) designated standards of good agricultural and environmental condition (GAEC). Requirements have been slightly changed as a result of the 2008 CAP Health Check. The current set of requirements is set out in Annexes II & III of Council Regulation 73/2009.

⁴⁰ The 12 Member States which have acceded to the EU since 2004 have had the option of administering direct payments through the simplified Single Area Payment Scheme (SAPS) as an alternative to the SPS.

2005 (and subsequent years) under the SPS of £10,000. If the total area on which the SCP and SAP were claimed was 100 hectare, the farmers SPS payment per hectare would be £100. In contrast, an arable farmer who farmed 100 hectares but received, for illustrative purposes, £20,000 through the Arable Area Payments Scheme, would have an SPS payment of £200 per hectare and a total payment of £20,000.

Under the regional model, all payments previously made in a region (Member State or region thereof) are added together and then divided by the total number of hectares farmed to give a figure for the SPS payment per hectare e.g. £120. A farmer can then claim this amount for each eligible hectare he/she was farming when the new system was introduced. So, the livestock farmer with 100 hectares would be eligible to receive £12,000 each year as would the arable farmer. Under this model, farmers whose payments previously averaged more than £120 per hectare will receive less money in future and those whose payments averaged less than £120 will gain. Hence, under this model the livestock farmer is £2,000 better off each year and the arable farmer is £8,000 worse off each year. The hybrid models are essentially that – hybrids of the historical and regional models.

In the UK, direct payments accounted for €3.8 billion of Pillar I expenditure in 2007 of which 98.5 per cent of funds were decoupled from production. A few coupled schemes still remain, however, where the UK has, thus far, not had the option to integrate them into the Single Payment Scheme⁴¹. These include the Protein Crop Premium (€5.57 per hectare), and the Area Payment for Nuts (€120.75 per hectare up to a maximum of 100 hectares in the UK). However, these payments will be phased out by 2012 at the latest following the 2008 CAP Health Check.

The SPS budget for the UK as a whole is distributed between England, Wales, Northern Ireland and Scotland according to a fixed percentage of the total budget, as set out in Table 11 below.

Table 11 Distribution of Direct Payments in the UK

UK Country	% share direct payments
England	65.6 %
Wales	8.9 %
Scotland	16.4 %
Northern Ireland	9.1 %

Source: Communication to the European Commission by the United Kingdom Government concerning voluntary modulation. Available at: <http://www.defra.gov.uk/rural/rdpe/pdf/vmia.pdf>

Each of the UK regions has chosen different approaches to determine the basis on which the Single Payment is calculated (see Table 12).

⁴¹ Single Payment Scheme Handbook in England (2009). Available at: [http://www.rpa.gov.uk/rpa/index.nsf/0/a2d43af914629f118025756800341dae/\\$FILE/SPS%20Handbook%20&%20Guidance%20-%20202009.pdf](http://www.rpa.gov.uk/rpa/index.nsf/0/a2d43af914629f118025756800341dae/$FILE/SPS%20Handbook%20&%20Guidance%20-%20202009.pdf)

Thus far Scotland⁴² and Wales have chosen to calculate the Single Payment on a historic only basis. In practice, this means that each farmer is paid at a different per hectare rate based on past production. Those farmers, who, in the past, claimed the largest amount of coupled payments per hectare, will thus receive the highest Single Payment rates per hectare, irrespective of current production levels. Calculation of the Single Payment in this way limits the redistribution of direct payments between different types of producers i.e. from those who have historically been more intensive to those who have historically been more extensive.

In England and Northern Ireland, the Single Payment is calculated on both a historic and flat rate area basis. In England, a dynamic hybrid model has been used which means that each year the relative importance of the historic element of the Single Payment will decline (see Table 13). By 2012, all farmers will receive the same regional flat rate payment. In practice, this means that there will be some redistribution between individual farmers and between different farm types i.e. from those farmers who claimed above average amounts of coupled payments in the reference period (typically the most intensive producers or farm types in receipt of coupled payments during the reference period) to those who claimed below average amounts of direct payments in the reference period (typically farmers or farm types with, on average, more extensive forms of production). However, this effect is mitigated by the fact that England introduced three different payment regions – England normal, England moorland and England SDA non-moorland – thus limiting redistribution of direct payments from arable and lowland regions to the more severely disadvantaged land of the LFA.

In Northern Ireland, the Single Payment is calculated on the basis of a fixed historic element (80 per cent) and a fixed flat rate area element payment (20 per cent). These proportions will not change over time. Thus, some redistribution will occur but this will be limited due to the relatively small flat rate area element of Single Payment calculations.

Table 12 Implementation of Single Payment Scheme within the UK

UK Country	Regional implementation	Basis for Single Payment Scheme
England	a) Lowland (all land including the former DAs but excluding the SDAs) b) Moorland SDA c) SDA land (excluding moorland)	Dynamic hybrid moving from historic to flat rate (or area) payment by 2012
Wales		Historic
Scotland		Historic
Northern Ireland		Static hybrid: 20% on area basis, 80% on historic basis

Source: Defra (2007a) Agricultural Change and Environment Observatory Research Report No. 07: 'Distribution of payments and payment rates for the 2005 Single Payment Scheme'. Available at: <https://statistics.defra.gov.uk/esg/ace/research/pdf/observatory07.pdf>

⁴² Under the terms of the 2008 Health Check, Member States or devolved administrations have an opportunity to switch the basis of calculating the Single Payment from a historic to a regional flat rate one. The Scottish Minister of Agriculture has been quoted as saying that flat rate will apply by 2013 (Agra Europe 9/1/09 *Scottish Minister backs Pillar 1 support*) and consultation on this is in process.

Note: SDA stands for Severely Disadvantaged Area, which is used to define those parts of the Less Favoured Areas that have the greatest level of natural handicap, usually located in the uplands. Until recently (2008), DAs or Disadvantaged Areas also constituted part of the LFA in England but are no longer eligible for LFA support (except in Scotland, Wales and Northern Ireland).

Table 13 Transition from historic to area based payments within England

Basis of payment	2005	2006	2007	2008	2009	2010	2011	2012
Flat Rate (%)	10	15	30	45	60	75	90	100
Historic (%)	90	85	70	55	40	25	10	0

Source: Defra (2007a) Agricultural Change and Environment Observatory Research Report No. 07: 'Distribution of payments and payment rates for the 2005 Single Payment Scheme'. Available at: <https://statistics.defra.gov.uk/esg/ace/research/pdf/observatory07.pdf>

3.2.2 Distribution of the Single Payment by farm type in England

A consequence of the transition from historic to area based payments is that some redistribution of direct payments will occur. However, as three SPS regions have been introduced in England, no redistribution can occur between the lowlands (and former DAs) and the uplands (SDAs). The exact impacts of this redistribution at farm level will vary according to farm type and, specifically, the historic receipt of coupled payments by individual farms. Table 14 shows the average payments per hectare received by farmers in the lowland (and former DAs), SDAs (moorland and non-moorland combined) and for England as a whole for 2005 and projected rates for 2012 (not taking into account modulation and other factors) scaled up from the flat rate elements of the Single Payment in 2005.

Table 14 Single Payment Scheme rates in England, 2005 and estimated rate in 2012

Regional payment (€Euro)	Average SPS payment rates per hectare (90% historic and 10% flat rate) (2005) (a)	Flat rate per hectare element (10%) of the SPS (2005) (a)	Estimated SPS payment rate (100% flat rate) (2012) (b)
Lowland/DA (i.e. not SDA or moorland)	€282	€28.20	€282
Moorland SDA (uplands)	€155	€3.36	€34
Non-moorland SDA (uplands)		€23.59	€236
Average payment in England (overall)	€268	€26.83	€268

Source: RPA (2005) in Defra (2007a) Agricultural Change and Environment Observatory Research Report No. 07: 'Distribution of payments and payment rates for the 2005 Single Payment Scheme'. Available at: <https://statistics.defra.gov.uk/esg/ace/research/pdf/observatory07.pdf>

(a) Figures taken from Defra (2007) and converted to Euros at a €£ conversion rate of 0.68195; the value of the Euro on 30 September 2005.

(b) Own calculations scaled up from the 10 per cent flat rate element of the SPS in 2005.

Note: All of the figures in this table include national reserve deductions at rates applied in 2005 but exclude deductions for modulation (compulsory and voluntary).

In 2005, Single Payment 'entitlements' in England were registered on approximately 97 per cent of all eligible land. 99 per cent of these entitlements were activated (i.e.

the Single Payment was claimed), on an area covering over 8.3 million hectares (Defra 2007b). Rates of both registering entitlements and activating them were lower for some farm types, particularly pigs, poultry and horticulture, as the historic element of the SPS linked specifically to these forms of production will be zero. Such farms may nonetheless have some historic entitlements, if, for example, they had previously received arable area or beef and sheep headage payments, held milk quota prior to decoupling, or were able to successfully make a claim to the national reserve⁴³.

The nature of decoupling makes it very difficult to determine the exact amount of funds paid through the SPS to a particular type of farming. This is because until 2012 a proportion, albeit declining, of the Single Payment will be calculated based on the type of production a farmer undertook before decoupling. Current production, relative to production in the reference period, can, in principle, have intensified, extensified, remained stable or switched to a different type of production. However, in all cases the payment per hectare received by an individual farmer will be identical. Nonetheless, by 2012, all agricultural land, within each of the three defined SPS regions, will receive the same rate per hectare. Calculations made by Defra (2007a) do provide, however, an insight into the distribution of Single Payment between different farm types in England. These are presented for 2005 in Table 15.

Table 15 Average English subsidy payments by farm type in 2005 derived from SPS payment and field data

Farm type	Payment (€m) (a)	Area activated ('000 ha)	Payment rate (€/ha) (a)	% of SPS receipts
Cereals	830	2,688	309	37.1%
General cropping	324	1,252	260	14.5%
Pigs, poultry & horticulture	28	130	220	1.2%
Dairy	279	1,011	274	12.5%
LFA grazing livestock	172	880	195	7.7%
Lowland grazing livestock	220	749	293	9.8%
Mixed	273	855	320	12.2%
Other	54	402	136	2.4%
England (link to June data)	2,181	7,968	274	97.6%
No main holding number	1	3	186	0.0%
No link to June dataset	54	342	158	2.4%
England (overall)	2,235	8,313	268	100%

Source: Defra (2007a) Agricultural Change and Environment Observatory Research Report No. 07: 'Distribution of payments and payment rates for the 2005 Single Payment Scheme'. Available at: <https://statistics.defra.gov.uk/esg/ace/research/pdf/observatory07.pdf>

(a) Figures taken from Defra (2007) and converted to Euros at a €£ conversion rate of 0.68195; the value of the Euro on 30 September 2005.

Note: Definitions for each farm type are based on those used in the Defra June Agricultural Census and can be found in ANNEX 1 of this report. These definitions are based on economic output of agricultural

⁴³ The national reserve is principally made up of the small amount of direct payments for which entitlements have not activated.

holdings based on Standard Gross Margin (SGM). With the exception of 'mixed' and 'other', a minimum of 2/3 of a holding's SGM will stem from the sector listed. Up to a maximum of 1/3 of a holding's SGM may be due to other agricultural activities, such as feed or different types of livestock production. The historic element of SPS payments to pigs, poultry & horticulture will be linked to such activities as these forms of production will not be directly eligible for any historic entitlements.

Cereal producers received the largest proportion of the Single Payment in 2005 (37 per cent) and, on average, the second highest payment per hectare (€309/ha), after holdings classified as 'mixed' livestock and arable holdings (€320/ha). Lowland grazing livestock (beef and sheep) received the next highest payments per hectare (€293/ha) followed by dairy (€274/ha). With the exception of 'other' holdings, LFA grazing livestock (beef and sheep) received the lowest payment per hectare (€195/ha). This is due mainly to the prevalence of relatively extensive production systems which, on average, have had lower stocking densities, and thus lower historic entitlements per hectare, than those located in the lowlands. Holdings classified as pigs, poultry & horticulture combined (data are not presented separately) also have a relatively low payment per hectare (€220/ha) compared to the average for England as a whole (€268/ha). Such payments will be based on the standard flat rate area element with the historic element linked to past production of agricultural commodities which were eligible for coupled payments before decoupling. Holdings consisting of housed pig and poultry units with little or no agricultural land attached to them will almost certainly not claim the Single Payment and thus will not be included in the figures.

Table 16 below gives an approximate indication of the levels of redistribution which will occur between different farm types as the basis for calculating the Single Payment moves from a predominantly historic one in 2005 to a flat rate in 2012. It should be noted that the per hectare payment rates in the table do not take into account deductions due to modulation and are dependent on a number of assumptions which are outlined below the table. Most significantly these figures are not able to take account of any land use change since 2005. However, taking into account these factors, it is possible to broadly identify those farm types are likely to 'lose' and those which are likely to 'gain' in terms of overall levels of support in the transition towards the three regional flat rates. Thus, relative 'winners' in the redistribution of the Single Payment by farm type (but not necessarily individual farms within these farm types) include dairy, pigs, poultry and horticulture, and general cropping. Relative 'losers' include cereals, mixed, and lowland grazing livestock, whilst LFA grazing livestock experience the largest decline in Single Payment receipts. Anecdotal evidence suggests that this decline has been disproportionately felt by beef rather than sheep producers, due to the higher historic entitlements linked to beef production.

Table 17 provides an indicative breakdown of the total budget attributed to each farm type and how this might change over time as the flat rate payment is phased in. The figures in the table do not take into account deductions due to modulation and are figures are dependent on the same assumptions as described for the per hectare payments levels by farm type. The figures show that although some redistribution between farm types is expected to take place between 2005 and 2015, in most cases this is quite small as a percentage of the total SPS budget.

Table 16 Estimated variation in Single Payment rates in England by farm type between 2005 and 2012 (€/ha)

Sector	Basis of payment	2005	2006	2007	2008	2009	2010	2011	2012	% change 2005-2012
Cereals	historic	€281	€266	€219	€172	€125	€78	€31	€0	
	flat rate	€28	€42	€85	€127	€169	€211	€254	€282	
	Total	€309	€308	€303	€299	€294	€290	€285	€282	-8.9%
General cropping	historic	€231	€218	€180	€141	€103	€64	€26	€0	
	flat rate	€28	€42	€85	€127	€169	€211	€254	€282	
	Total	€260	€261	€265	€268	€272	€276	€279	€282	8.6%
Pigs, poultry & horticulture	historic	€192	€181	€149	€117	€85	€53	€21	€0	
	flat rate	€28	€42	€85	€127	€169	€211	€254	€282	
	Total	€220	€223	€234	€244	€254	€265	€275	€282	28.2%
Dairy	historic	€246	€232	€191	€150	€109	€68	€27	€0	
	flat rate	€28	€42	€85	€127	€169	€211	€254	€282	
	Total	€274	€275	€276	€277	€279	€280	€281	€282	2.8%
LFA grazing livestock (SDA moorland and non-moorland)	historic	€179	€170	€140	€110	€80	€50	€20	€0	
	flat rate	€16	€23	€47	€70	€93	€117	€140	€155	
	Total	€195	€193	€186	€180	€173	€166	€160	€155	-20.3%
Lowland grazing livestock	historic	€265	€250	€206	€162	€118	€74	€29	€0	
	flat rate	€28	€42	€85	€127	€169	€211	€254	€282	
	Total	€293	€293	€291	€289	€287	€285	€283	€282	-3.9%
Mixed	historic	€291	€275	€227	€178	€130	€81	€32	€0	
	flat rate	€28	€42	€85	€127	€169	€211	€254	€282	
	Total	€320	€318	€311	€305	€299	€292	€286	€282	-11.8%
England (overall) average	historic	€242	€228	€188	€148	€107	€67	€27	€0	
	flat rate	€27	€40	€81	€121	€161	€201	€242	€268	
	Total	€268	€268	€268	€268	€268	€268	€268	€268	0.0%

Note: Own calculations scaled up from 2005 figures in Defra (2007a) Agricultural Change and Environment Observatory Research Report No. 07: 'Distribution of payments and payment rates for the 2005 Single Payment Scheme'. Data provided in Table 13, Table 14 and Table 15 above.

The key assumptions are outlined below:

1. Land use changes between different farm types are not taken into account. It is therefore assumed that the area of land in receipt of the Single Payment remains stable by farm type (and overall) between 2005 and 2012 at the values shown in Table 15. In practice, this is unlikely, although net changes in area of land linked to each farm type

may not be large (but are unknown). Comparable data for different years are not publically available. Given that the historic element of the Single Payment received per hectare relates to agricultural production in the reference period (2000-2002, or the Dairy Premium in the case of dairy production) not current production and that the flat rate element has no link to production levels at all, the payments received per hectare provide no indication of the intensity of production and whether this is increasing, decreasing or has remained stable over time. At individual farm level all three possibilities will occur, no doubt to varying degrees within each farm type. Based on available information it is not possible, therefore, to determine the extent to which the Single Payment supports relatively intensive and extensive forms of production and whether this changes over time.

2. All of the figures in this table include National Reserve deductions at rates applied in 2005 (although in reality annual variations can be expected) but exclude deductions for modulation (compulsory and voluntary). A rate of compulsory modulation for all Member States was introduced in 2005 set at 3 per cent increasing to 5 per cent by 2007. Following the CAP Health Check in 2008, the basic rate of compulsory modulation will increase to 10 per cent by 2012, with those farmers in receipt of more than €300,000 through the SPS liable for an additional 4 per cent on payments above this threshold. The first €5,000 a farmer receives is exempt from compulsory modulation via a 'franchise'. In addition to compulsory modulation, the UK has also chosen to apply voluntary modulation without a franchise. In England, the rate of voluntary modulation was set at 12 per cent in 2007 increasing to 14 per cent by 2009, with lower rates set elsewhere in the UK. However, a consequence of the Health Check agreement is that increases in the rate of compulsory modulation will have to be offset by reductions in the rate of Voluntary Modulation. Nonetheless, it can be assumed that a rate of modulation close to 19 per cent will apply in England from 2009 until 2012, a reduction which will apply to the Euro value of the total Single Payment received by individual farmers. Thus, in practice, the average per hectare payment for England (overall) between 2009 and 2012 can be expected to be much closer to €17/ha than €68/ha.

3. Flat rate payments for all farm types, except LFA grazing livestock, are scaled up from 10 per cent of the 2005 Single Payment (averaged across all farm types except LFA grazing livestock) received by farmers based in the lowlands and the former Disadvantaged Areas (DAs). For example, the average 2005 payment per hectare in the lowlands and former DAs was €282/ha. 10 per cent of this, the flat rate paid to all recipients of the Single Payment in 2005, is €28.20/ha. Thus, in 2012, when the Single Payment will be calculated purely on a flat rate basis, all farmers in receipt of the Single Payment in the lowlands and DAs will receive the same payment per hectare i.e. €282/ha which, unlike in 2005, will not be an average figure.

4. Flat rate payments for LFA grazing livestock are scaled up from 10 per cent of the average 2005 Single Payment received by farmers based in the Severely Disadvantaged Areas (SDAs) including all eligible moorland and non-moorland. An average rate is used although in practice moorland and/or common land will receive a lower payment rate than other agricultural land within the SDA. Separate figures to allow the separate calculation of the average historic element of moorland SDA and non-moorland SDA are not publically available. The figure provided for 2012 is therefore an average figure based on the assumption that the area of moorland and non-moorland SDA in receipt of the Single Payment will be the same as in 2005.

5. A further assumption is that all payments attributed to the farm type 'LFA grazing livestock' are linked to production in the SDAs and not the DAs (phased out in England at the end of 2007). In addition, it is assumed that the only production which takes place in the SDAs is livestock grazing (beef and sheep), but excludes dairy, pigs and poultry which are much more likely to be located in the lowlands (or even the former DAs).

6. The historic element of coupled payments linked to dairy production is based on the Dairy Premium. The budgetary envelope for the Dairy Premium (within the SPS) increased between 2004 and 2006, as support for the dairy sector through market intervention measures was decreased. Thus the historic dairy element (increase) and total area payments attributed to all farmers (slight increase) can be expected it be higher in 2006 and subsequent years than that shown in the table (taking into account point 2).

7. Payments rates are shown in their original Euro values, having been calculated back from the Sterling figures using an exchange rate of 0.68195, the value of the Euro on 30 September 2005. The reason for doing this is that the value of the Single Payment in Euros will remain relatively stable over time, whilst the value of the payment rate in Sterling is subject to considerable fluctuations. At the time of writing, the €£ exchange rate was 0.90, which would increase the payment rate in Sterling by 32 per cent compared to the 2005 Sterling rate. Making comparisons over time in Sterling would be extremely complex and would make it difficult to observe the redistributive effects between farm types as the Single Payment switches from a historic to a flat rate area basis. Annual Euro exchange rates for the SPS are published on the RPA website.

Table 17 Estimated distribution of the Single Payment in England by farm type between 2005 and 2012 (€)

Sector	2005	2006	2007	2008	2009	2010	2011	2012	% of total in 2005	% of total in 2012
Cereals	€831,685,607	€827,590,684	€815,305,912	€803,021,140	€790,736,369	€778,451,597	€766,166,826	€757,976,978	37.1%	34.0%
General cropping	€324,956,375	€326,516,900	€331,198,475	€335,880,050	€340,561,625	€345,243,200	€349,924,775	€353,045,824	14.5%	15.8%
Pigs, poultry & horticulture	€28,594,472	€29,042,452	€30,386,392	€31,730,332	€33,074,272	€34,418,212	€35,762,153	€36,658,113	1.2%	1.6%
Dairy	€277,230,002	€277,666,520	€278,976,074	€280,285,627	€281,595,180	€282,904,734	€284,214,287	€285,087,323	12.5%	12.8%
LFA grazing livestock	€171,625,486	€169,689,860	€163,882,983	€158,076,105	€152,269,228	€146,462,351	€140,655,473	€136,784,222	7.7%	6.1%
Lowland grazing livestock	€219,664,198	€219,194,361	€217,784,849	€216,375,337	€214,965,825	€213,556,313	€212,146,801	€211,207,127	9.8%	9.5%
Mixed	€273,319,158	€271,529,071	€266,158,809	€260,788,548	€255,418,286	€250,048,024	€244,677,762	€241,097,588	12.2%	10.8%
Miscellaneous*	€103,702,617	€109,548,069	€127,084,423	€144,620,777	€162,157,131	€179,693,485	€197,229,839	€208,920,742	4.9%	9.4%
England (overall)	€2,230,777,916	€2,230,777,916	€2,230,777,916	€2,230,777,916	€2,230,777,916	€2,230,777,916	€2,230,777,916	€2,230,777,916	100%	100%

Note: Own calculations scaled up from 2005 figures in Defra (2007a) Agricultural Change and Environment Observatory Research Report No. 07: 'Distribution of payments and payment rates for the 2005 Single Payment Scheme'.

A key point to note is that the figures in this table do not take into account voluntary and compulsory modulation. As mentioned previously, a combined modulation rate of approximately 19 per cent can be expected to apply to the SPS in England between 2009 and 2012, resulting in an English SPS budget of around €1.807. Figures for expenditure quoted from this table should either factor modulation in or note that it has not been taken account.

Note: The figures in this table have been calculated by multiplying the annual total payment rate for each farm type shown in Table 16 by the number of hectares included in Table 15. As a result the same underlying assumptions apply as in the previous table. In addition there is also a small discrepancy (0.002 per cent) between the figure calculated for total budget for the SPS in England in 2005 based on the above calculations and the figure provided by Defra (to 4 decimal places) for this year in Table 15, €2.235 billion.

* Miscellaneous refers to the remaining categories of farm types included in Annex 2, namely: 'Other', 'No main holding number' and 'No link to June dataset' which in 2005 accounted for 747,000 hectares of land in receipt of the Single Payment. As it is not clear whether this land is located within the lowland/DA, or SDA, the figures have been calculated by subtracting the sum of all the other farm types in the table and then subtracting this total from the total SPS budget for 2005, which is assumed to remain stable until 2012 (for the purposes of this calculation).

3.2.3 Article 68/69

As part of the 2003 Mid-Term Review of the CAP, Member States were allowed to divert up to 10 per cent of the national ceiling under Article 69 of Council Regulation (EC) No 1782/2003 into national envelopes to be targeted at ‘specific types of farming which are important for the protection or enhancement of the environment or for improving the quality and marketing of agricultural products’. Expenditure had to be focused on the sector from which it was taken⁴⁴ and thus no redistribution between sectors was possible.

In 2005, Scotland chose to make use of Article 69 and introduced support, targeted primarily at small beef producers on a headage basis through the Scottish Beef Calf Scheme⁴⁵. The scheme has a budget of £18-19 million per year and pays beef farmers a maximum of £70 for each of the first 10 beef bred calves and £35 for all other beef bred calves. The differentiation in payments rates is intended to allow the schemes to target small beef producers, which, on average, may be more likely to be located in more marginal areas. No other parts of the UK have chosen to implement Article 69, which has since been revised and renumbered as Article 68 of Council Regulation (EC) No 73/2009 following the 2008 Health Check agreement. Annex 6 of this report provides a summary of Article 69 schemes which have been implemented in the livestock or arable sectors of other EU Member States.

A number of the changes have been made to Article 68, compared to the previous Article 69, following the CAP Health Check agreement reached in November 2008. Member States will continue to be allowed to retain up to 10 per cent of their national ceilings for direct payments to provide support to specific sectors and environmentally sensitive regions. However, redistribution of Pillar I expenditure between sectors and towards economically vulnerable regions is now possible. The five purposes for which the funds can now be used are:

- protecting the environment, improving the quality and marketing of products (as permitted under Article 69) or for animal welfare support;
- payments for disadvantages faced by specific sectors (dairy, beef, sheep and goats, and rice) in economically vulnerable or environmentally sensitive areas;
- top-ups to existing entitlements in areas where land abandonment is a threat;
- support for risk assurance in the form of contributions to crop insurance premia; and
- contributions to mutual funds for animal and plant diseases.

Coupled supports for types of farming important for the protection of the environment, support to address specific disadvantages, and support for mutual funds

⁴⁴ National ceilings are linked to the historic budgetary ceilings for coupled payments which existed before 2005.

⁴⁵ £70 per first 10 beef bred calves and £35 all other beef bred calves, depending on number of applications.

are not seen to clearly meet WTO Green Box conditions⁴⁶, and for this reason the amount of direct payments that can be used for these purposes is limited to 3.5 per cent of national ceilings.

A notable exception to the 3.5 per cent limit is support for ‘specific agricultural activities entailing additional agri-environment benefits’⁴⁷, as long as such support is not coupled to a particular product. Thus, in principle, a Member State could divert up to 10 per cent of its total Single Payment ceiling for this purpose. For example, given that the UK budget for the Single Payment as a whole in 2007 was €3,756 million, Article 68 could potentially be used to raise a maximum of €76 million per year if all four regional administrations decided to apply Article 68 in this way.

New Article 68 schemes can be implemented from 2010 onwards and Member States must submit proposals outlining how they propose to use the measure by August of the preceding year.

3.2.4 Protein Crop Premium Scheme

The Protein Crop Premium was introduced in 2004 as a result of the 2003 CAP Mid Term Review in order to ‘strengthen the role of protein-rich crops and to provide an incentive to increase the production of these crops’⁴⁸ in anticipation of decoupling and the introduction of the Single Payment in 2005.

The Protein Crop Premium may be paid to EU farmers who grow certain crops (not including oilseeds). In principle, a farmer can claim the Protein Crop Premium on land not in receipt of the Single Payment, although this is unlikely to happen in practice. The crops which may be supported by the Protein Crop Premium are forage peas; field beans; and sweet lupins.

In principle, farmers who meet the requirements of the scheme receive €55.57 per hectare of protein crops harvested. The maximum area, on which this payment applied for the EU-27 in 2008, was 1,648,000 hectares⁴⁹, with individual budgetary reference levels set for each Member State. If the area on which the premium is claimed exceeds the reference level, then the payment is reduced proportionately across all claimants for that Member State.

⁴⁶ In order to be Green Box compatible, agricultural subsidies must not distort trade, or at most cause minimal distortion. Green Box subsidies must not involve (direct) price support, tend not to be targeted at particular products, but include direct income supports for farmers that are not related to (i.e. are ‘decoupled’ from) current production levels or prices. Other examples of Green Box compatible support include environmental protection and regional development programmes. More information is available at: http://www.wto.org/english/tratop_e/agric_e/agboxes_e.htm

⁴⁷ Defined under Article 68(a)(v) of Council Regulation (EC) No 73/2009. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:030:0016:0099:EN:PDF>

⁴⁸ Council Regulation (EC) No 1782/2003 of 29 September 2003. Available at: http://eur-lex.europa.eu/pri/en/oj/dat/2003/l_270/l_27020031021en00010069.pdf

⁴⁹ This suggests an EU budget of €1.5 billion in 2008 assuming a flat rate per hectare rate of €55.57. The budget may have been less than this due to the phasing in of direct payments in New Member States.

Figures collected by Defra (see Table 18) indicate that, in 2007, the total area of crops eligible for the Protein Crop Premium and intended for livestock, rather than human consumption, was 149,000 hectares with total expenditure of £7 million. As noted in section 2.3.3, the figures indicate that the area of land on which these crops eligible for the Protein Crop Premium has declined significantly in recent years.

Table 18 UK production of crops eligible for the Protein Crop Premium (2001-2007)

Protein crop	2001	2002	2003	2004	2005	2006	2007
Peas for harvesting dry (a)							
Area (thousand hectares)	89	77	65	51	41	37	26
Subsidies (£ million) (b)	22	19	17	15	2	1	1
Field beans							
Area (thousand hectares)	173	164	165	178	184	184	123
Subsidies (£ million) (b)	42	42	48	50	7	6	6

Source: Agriculture in the UK (2008). Table 5.8 accessed in February 2009:

<https://statistics.defra.gov.uk/esg/publications/auk/default.asp>

(a) The figures presented here cover only that part of the crop which is harvested dry (about 80 per cent to 90 per cent of total production) and largely used for stock feed. The remainder is included in UK fresh vegetables.

(b) Includes arable area payments but excludes set-aside payments until 2004; includes Protein Crop Premium from 2004 onwards, but not the Single Payment.

Following the CAP Health Check, it has been decided to integrate the Protein Crop Premium into the Single Payment Scheme by 2012 at the latest. Member States have until August 2009 to decide whether they wish to integrate the Protein Crop Premium budgetary reference levels into the Single Payment Scheme earlier (i.e. in 2010 or 2011). Member State budgetary reference levels from 2010 onwards are shown in Annex XII of Council Regulation of (EC) No 73/2009. France is allocated €17,635,000 per year followed by Spain €10,905,000, the UK €10,500,000⁵⁰, Germany €7,231,000 and Italy €5,009,000. The Protein Crop Premium scheme requirements for the UK are set out in the Single Payment handbook, based directly on the EU legislation.

3.2.5 Interventions in Agricultural Markets

Interventions in agricultural markets, such as export refunds and expenditure on intervention storage, have historically played a significant role in supporting EU agriculture. The principal objective of all market interventions is to stabilise EU agricultural commodity prices above a minimum threshold. Although expenditure on market interventions is typically paid to commodity traders and processors, it can be expected to have a positive effect on commodity prices at farm level – with the scale of this effect linked to the level of expenditure.

⁵⁰ Equivalent to 188,951 hectares, assuming a per hectare rate of €55.57.

Decoupling of direct payments is intended to increase market orientation of production and thus prevent overproduction. As a consequence of this the need for market interventions such as export refunds and storage can be expected to decline over time. Historically, market interventions in combination with coupled direct payments have resulted in the overproduction (relative to market demand) of some supported commodities and products. Such overproduction has a deflationary impact on EU market prices which triggers expenditure on export refunds and intervention storage when the EU price falls below a certain threshold set at EU level. When market prices rise above this threshold, then expenditure on market interventions is either reduced or withdrawn.

In the dairy sector, price support through market interventions in combination with milk quotas (introduced in 1984) has been particularly significant and was one of the principal contributory factors to the infamous butter mountains in the 1980s. The 2003 Mid Term Review led to a significant reduction in the budget ceilings allocated for expenditure on market interventions in subsequent years, a process continued by the 2008 Health Check. From 2004 onwards, significant cuts in market interventions in the dairy sector took place with expenditure being shifted to the Dairy Premium (a coupled farm level payment linked to tonnes of milk quota held during a reference period) and then integrated into the decoupled SPS.

In 2007, total expenditure on market interventions in the UK accounted for around 5 per cent of the Pillar I budget. Interventions specific to the UK livestock sector in 2007 amounted to €4 million, equivalent to 2.3 per cent of the total Pillar I budget. The overwhelming majority of this figure is due to market interventions in 'milk and milk products' (€11 million) and in 'beef and veal' (€2 million linked to BSE measures). Total interventions for pig meat, eggs & poultry, bee-keeping & other animal products combined was €1.3 million. Of the remaining €124 million spent on UK market interventions in 2007, the majority of funds went to the sugar (€75 million) and fruit and vegetable (€33 million) sectors. Whilst these payments are significant in absolute terms, they are small in comparison to the total expenditure on UK direct payments to farmers in 2007 (€3,832 million) and are declining in the longer term.

The current EU legislation underlying interventions in agricultural markets is set out in Council Regulation (EC) 1234/2007⁵¹ with some amendments in Council Regulation (EC) No 72/2009 following the Health Check. Pillar I of the CAP includes provisions for a range of interventions in agricultural markets, in combination with direct payments, quotas and trade measures, principally:

- Export refunds for certain non-perishable agricultural products or commodities;
- Public and private storage of certain non-perishable agricultural products or commodities; and

⁵¹ Council Regulation (EC) No 1234/2007 of 22 October 2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation). Available at:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:299:0001:0149:EN:PDF>

- Other specific measures in the dairy sector and in response to animal diseases (e.g. BSE).

Export refunds

Depending on market conditions, agricultural commodity traders wishing to export certain agricultural products or commodities out of the European Union can apply for export refunds. Export refunds relevant to the livestock sector include those for:

- Beef and veal;
- Cereals;
- Eggs;
- Fruit and vegetables;
- Milk and milk products (butter, cheese and skimmed milk powders but not fresh milk due to its perishability);
- Pig meat; and
- Poultry.

Export refund rates and budgets are set at EU level by the Commission with a specialist committee. A very detailed and specific nomenclature is used to describe the different products and payment levels vary between them per kilogram of agricultural commodity or product. In the UK, export refunds are administered by the Rural Payments Agency (RPA). Details of current and historic export refund rates by product type can be accessed on their website⁵².

Intervention storage

Intervention storage (both public and private) supports the market price by the purchase, at times of low prices, of eligible surplus products, for example butter and skimmed milk powder, into intervention storage. Products may be sold out of intervention by the European Commission for specified end uses when prices are high and/or there is a shortage of the product in question on the open market. Traders offer to sell products into, or buy products out of intervention at a price related to an intervention price⁵³. In principle, public intervention is possible for the following livestock related products:

- Beef (not currently in operation);
- Butter;
- Skimmed milk powder (SMP);
- Cereals;

⁵² Information on export refunds rates available at:

<http://www.rpa.gov.uk/rpa/index.nsf/UIMenu/0B829F3E3E4B12CE80256F72003D7E55?Opendocument>

⁵³ Information on intervention storage schemes available at:

<http://www.rpa.gov.uk/rpa/index.nsf/UIMenu/916F2D78F31CEDE280256F72003DB233?Opendocument>

Based on the market situation, the European Commission will decide whether or not it is appropriate to open a Private Storage Aid scheme. Schemes can be opened using either fixed aid in advance or a tendering procedure⁵⁴. Private Storage Aid may be made available for the following agricultural products:

- Butter (Unsalted or Salted)
- Cheese (Grana Padano, Parmigiano Reggiano, Provolone, Long keeping cheeses, Pecorino Romano, Kefalotyri & Kasseri)
- White Sugar
- Olive Oil
- Beef
- Pig meat
- Sheep meat or Goat meat

Other market intervention measures

A number of schemes providing aid of one kind or another with relatively small budgets, related to the marketing and production of dairy products⁵⁵ exist, or have existed, at EU and UK level, including:

- Butter for manufacture (scheme suspended and rate currently set at zero);
- Butter for non-profit-making organisations;
- Casein production (rate set to zero since 2006);
- Concentrated butter for direct consumption (scheme suspended and rate currently set at zero);
- Control of casein in cheese making (only 3 out of 200 cheese makers registered with the RPA are authorised to use caseinates in cheese).
- School milk subsidy;
- Skimmed milk powder for animal feed (rate set to zero since 2006).

An important aspect of market interventions in the livestock sector relates to expenditure on animal disease compensation and prevention. These schemes are particularly important in the UK due to the Bovine Spongiform Encephalopathy (BSE) crisis which began in the 1990s. Under the Over Thirty Months Scheme (OTMS) which ran from 1996 until January 2006, beef and dairy farmers received compensation for slaughtered cattle over thirty months of age, as such cattle were not allowed to enter the food chain. In 2006 the ban on human consumption of cattle older than 30 months, but born after 1 August 1996, was lifted whilst export restrictions on UK cattle (including veal calves) and beef products were also relaxed. At the same time, the Older Cattle Disposal Scheme (OCDS) was introduced, before expiring on 31 December 2008. Under the scheme no cattle aged over thirty months were allowed

⁵⁴ Information on Private Storage Aid Schemes available at:
<http://www.rpa.gov.uk/rpa/index.nsf/UIMenu/6420CC5625DB8E3580256F72003DC50D?Opendocument>

⁵⁵ Information on Dairy Schemes available at:
<http://www.rpa.gov.uk/rpa/index.nsf/UIMenu/6A9D28DC87F9B78880256F72003D4FE4?Opendocument>

to enter the human food chain. 70 per cent of the payment costs for both schemes were funded from the CAP budget, whilst the cost of slaughtering and destruction of the carcasses was paid by the UK Treasury.

Expenditure on market interventions

Table 19 below shows Pillar I expenditure on UK market interventions by sector. The table also includes expenditure on direct payments for comparison. In 2004 and 2005⁵⁶, expenditure on coupled beef and sheep payments and BSE measures is included within the expenditure on market interventions attributed to these sectors. A large percentage, if not all, of beef and veal expenditure in 2006 and 2007 is due to BSE measures.

Table 19 Expenditure on Pillar I market interventions and direct payments in the UK (2004-2007)

Type of Intervention	UK			
	2004	2005	2006	2007
Total interventions in agricultural markets	-	-	536.1	219.01
Interventions in livestock markets (a)	-	-	209.1	94.38
Cereals	0.7	5.2	2.2	-0.52
Milk and milk products (b)	190.9	267.9	70.7	41.19
Beef and veal (c)	1,411.4	1,508.2	134.6	51.92
Sheep meat and goat meat (d)	426.2	477.7	0	0
Pig meat, eggs & poultry, bee-keeping & other animal products	1.5	1.5	1.6	1.27
Direct Aids	-	-	3,520.6	3,832.41
Decoupled direct aids	-	-	3,459.8	3,756.28
Other direct aids (e)	-	-	53.8	51.7
Arable area payments	1,631.4	1,555.4	0	0
TOTAL PILLAR I EXPENDITURE	3,986.6	4,215.0	4,287.2	3,950.78

Source: http://ec.europa.eu/agriculture/fin/finrep_en.htm

Note: expenditure in the EU budget is accounted for in the year after expenditure is the payments are claimed. For example, Arable Area payments shown in 2005 relate to area in production in 2004. The high figures for milk and milk products in 2005 probably include the Dairy Premium paid to farmers for production in 2004 and then integrated into the SPS (decoupled direct aids) in 2005.

(a) Sum of interventions in milk and milk products, beef and veal, sheep meat and goat meat, pig meat, eggs and poultry.

(b) Includes export refunds, intervention storage and various dairy schemes & dairy premium.

(c) Includes export refunds, intervention, coupled headage payments in 2004 & 2005, and BSE measures. In 2007 expenditure on the Over Thirty Months Scheme (OTMS) – introduced in 1996 - and the Older Cattle Disposal Scheme (OCDS), amounted to €1.9 million. Expenditure for previous years is assumed to be similar as no specific information is provided in the data source. The schemes have been expired now so future expenditure on this will be zero.

(d) Includes export refunds, intervention storage and coupled headage payments in 2004 & 2005.

(e) Includes the Protein Crop Premium, the Energy Crop Premium and the Scottish Beef Calf Scheme.

⁵⁶ All figures are taken from the official Financial Report for Pillar I of the CAP undertaken for the CAP. It appears that expenditure is accounted for in the subsequent year to which the payment is linked. So, for example, coupled payments for beef and veal, sheep and goats, and arable are accounted for in the 2005 financial year even though these payments will be linked to production in 2004. Decoupled area payments (i.e. SPS) are linked to claims made for 2005 not 2006.

The dramatic reduction in market interventions in the dairy sector between 2005 and 2006 largely can be attributed to a switch in policy away from intervention and the introduction of the Dairy Premium and its subsequent integration into the SPS. Market interventions in support of the cereal and pig and poultry sectors were consistently low during this period, reflecting the relatively low budgetary ceilings attributed to these sectors and higher prices. In the case of cereals, favourable market conditions in 2007 meant that the sale of cereals out of intervention storage actually made a profit of €0.52 million.

Although UK figures for overall expenditure on market interventions by sector are available, separate figures for each type of intervention are not available. However, these figures are available at EU level (see Annex 7 of this report)

Although the overarching trend for expenditure on export refunds is in decline, in the short term, expenditure can fluctuate on an annual basis in response to market conditions. For example, in 2008 export refunds for all milk products were set to zero⁵⁷ due to relatively favourable market conditions. However, in January 2009 export refunds were reintroduced⁵⁸, subject to a limit on overall expenditure, due to deterioration in market conditions. Even more recently, it has been reported⁵⁹ that the annual EU ceiling of 30,000 tonnes of butter which can be put into intervention storage looks set to be reached within days of the start of the buying-in period (2 March 2009).

⁵⁷ Commission Regulation (EC) No 620/2008 of 27 June 2008 correcting Regulation (EC) No 386/2008 fixing the export refunds on milk and milk products.

⁵⁸ Commission Regulation (EC) No 57/2009 of 22 January 2009 fixing the export refunds on milk and milk products.

⁵⁹ *Agra Europe (06/03/09) Butter intervention swiftly reaches limit.*

3.3 Impact of Pillar II (Rural Development) expenditure on the UK livestock and feed sectors

3.3.1 Overview of Rural Development policy

Pillar II expenditure on Rural Development Programmes (RDPs) has become increasingly significant in the UK, particularly as rates of compulsory and voluntary modulation have increased, although the level of expenditure on Pillar II remains substantially below that of Pillar I (see Table 8). Actions funded through Member States' Rural Development Programmes (RDPs) can have a significant influence on increasing the sustainability of the livestock sector. One of the key differences between Pillar I and Pillar II expenditure is that Pillar II payments, unlike the majority of Pillar I expenditure⁶⁰, are targeted at specific social, economic and environmental outcomes.

Pillar II of the CAP was first formally established in 1999 through the Rural Development Regulation⁶¹. Member States and/or regions must draw up RDPs which run for a seven year programming period and are designed to meet the strategic priorities set out within the Community strategic guidelines for rural development⁶² as well as national and local needs. The current programming period runs from 1 January 2007 to 31 December 2012 and expenditure at EU level is administered through the European Agricultural Fund for Rural Development (EAFRD), introduced in 2005 through Council Regulation 1698/2005. The EAFRD is divided into four axes, with the following objectives:

- Axis 1: Improving the competitiveness of the agricultural and forestry sector through measures targeted at knowledge transfer, farm modernisation, innovation, quality in the food chain.
- Axis 2: Improving the environment and the countryside through measures targeted at biodiversity, high nature value farming and forestry systems, and traditional agricultural landscapes.
- Axis 3: Measures aimed at improving the quality of life in rural areas and diversification of the rural economy.
- Axis 4: Building local capacity for employment and diversification (Leader) linked to all the objectives of the other three Axes.

Each axis contains a range of measures focused on the delivery of specific outcomes. In the first two axes, measures are targeted at the agricultural and, to a lesser extent, forestry sectors. As a result these two Axes are most of interest in terms of targeting expenditure at social and environmental objectives related to livestock and feed production. A number of measures are relevant to encouraging more extensive forms

⁶⁰ Article 68/69 is a possible exception to this depending on how it is implemented.

⁶¹ Council Regulation 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF).

⁶² Council Decision 2006/144/EC on the Community strategic guidelines for rural development (programming period 2007 to 2013), amended by Council Decision 2009/61/EC following the 2008 CAP Health Check.

of livestock production, in particular the agri-environment measure and, to a lesser extent, Natural Handicaps measures (delivered through Less Favoured Area schemes). Measures which provide advice and support to land managers and those which promote the production of added value / quality products may also be of interest.

A minimum proportion of funds from EAFRD must be allocated between the RDP Axes as follows:

- Axis 1 (competitiveness) - 10 per cent;
- Axis 2 (environment) - 25 per cent;
- Axis 3 (quality of life) - 10 per cent; and
- Axis 4 (Leader) - 5 per cent (within the other three Axes).

It is compulsory for all RDPs to include agri-environment measures within Axis 2, whilst the implementation of all others measures are discretionary and linked to national and regional priorities. In addition, and unlike Pillar I expenditure, Member States must co-finance RDPs. Rates of national co-financing vary but must be approved by the European Commission.

All RDPs are subject to approval by the European Commission through a rigorous process of monitoring and evaluation. This is based on a Common Monitoring and Evaluation Framework (CMEF) which includes a suite of baseline, result and impact indicators intended to monitor the impact of RDPS and individual measures within them. Following the 2008 Health Check, Member States and devolved administrations need to demonstrate that RDPs address Community priorities⁶³ related to climate change mitigation and adaption, renewable energies, water management, biodiversity and dairy restructuring, the so-called ‘new challenges’.

3.3.2 Rural development financing through modulation

The Rural Development budget is significantly less than Pillar I budget, at both EU and UK level. The UK has, historically, received a relatively low share of rural development funds from EAFRD and its predecessor. In 2007 the UK received only 2.1 per cent of the total Pillar II (EAFRD) budget compared to 9.4 per cent of the EU Pillar I budget. In order to reduce these disparities, a mechanism called ‘modulation’ has been applied to move funds from the Pillar I national ceiling, which relates to total expenditure on direct payments, to Pillar II of the CAP (rural development).

Compulsory modulation is applied by all EU-15 Member States. Compulsory modulation was introduced in 2005, set at 3 per cent increasing to 5 per cent by 2007. Following the CAP Health Check in 2008, the basic rate of compulsory modulation will increase to 10 per cent by 2012, with those farmers in receipt of more than €300,000 through the SPS liable for an additional 4 per cent on payments above this threshold. The first €5,000 a farmer receives is exempt from compulsory modulation, known as a ‘franchise’. Funds raised through compulsory modulation are redistributed across Member States according to set of objective criteria, however all Member

⁶³ Linked to implementation of the Water Framework Directive, the Kyoto Protocol, and commitments to reverse biodiversity decline by 2010.

States are guaranteed to receive back at least 80 per cent of the sums raised within their country. This does not apply to the additional rates agreed as part of the Health Check.

In addition to compulsory modulation, the UK is one of two Member States to have chosen to apply voluntary modulation for the 2007-2013 RDP programming period⁶⁴. In England, the rate of voluntary modulation was set at 12 per cent in 2007 increasing to 14 per cent by 2009 (and subsequent years), with lower rates set elsewhere in the UK. However, a consequence of the Health Check agreement is that any future increases in the rate of compulsory modulation will have to be offset by corresponding reductions in the rate at which voluntary modulation is applied. It is unlikely, therefore, that the UK will receive any additional rural development funds to address the 'new challenges' resulting from the Health Check.

During the 2007-2013 approximately €1.4 billion⁶⁵ will be deducted from the total Pillar I national ceiling for the UK due to the application of compulsory modulation rates set prior to 2008 Health Check. However, only 80 per cent of this amount (i.e. €1.1 billion) will be added to UK's Pillar II EAFRD allocation, due to redistribution of 20 per cent of funds raised through compulsory modulation in the UK to other Member States. Over the same period, pre-Health Check voluntary modulation was anticipated to result in the deduction of €2.7 billion from Pillar I with a corresponding increase in the Pillar II EAFRD budget⁶⁶. Although modulation increases the Pillar II budget substantially over this period, the Pillar I budget remains substantially larger. Thus, taking into account compulsory *and* voluntary modulation, indicative budgets for 2007-2013 can be expected as follows: Pillar I direct payments, €23.8 billion; and Pillar II EAFRD allocation, €6.0 billion (plus national co-financing)⁶⁷.

3.3.3 Implementation of Rural Development Policy in the UK

Rural development allocations to the UK are distributed between the four devolved administrations in similar proportions to those used to allocate direct payments, namely: England 66 per cent; Wales 9 per cent; Scotland 16 per cent; and Northern Ireland 9 per cent. The majority of funds in all four countries are linked to expenditure

⁶⁴ The UK also applied voluntary modulation, at lower rates, during the previous programming period.

⁶⁵ This figure has been calculated based on the difference in Pillar I national ceilings calculated by Defra in their communication to the Commission on the application of voluntary modulation (€26.4 billion) and the national ceilings for the same period published in Council Regulation (EC) No 73/2009 and Council Regulation (EC) No 1782/2003 (amended 1.1.07). The figure calculated by Defra takes into account deductions due to compulsory modulation (pre-Health Check) but the figure in the Regulations does not.

⁶⁶ Funds raised through voluntary modulation are not redistributed between Member States.

⁶⁷ Own calculations based on figures provided in: Communication to the Commission by the United Kingdom government on the application of voluntary modulation (€26.4 billion); Council Regulation (EC) No 73/2009; Council Regulation (EC) No 1782/2003 (amended 1.1.07); Commission Decision (2007/680/EC) of 22 October 2007; Commission Decision (2006/636/EC) of 12 September 2006; Council Regulation (EC) No 73/2009 of 19 January 2009; Council Regulation (EC) No 1782/2003 of 29 September 2003 (consolidated version 1 January 2007).

on Axis 2 schemes targeted at improving the environment and the countryside, principally agri-environment schemes and Less Favoured Area (LFA) support.

Table 20 Allocation of total EAFRD contributions for 2007-2013 RDPs

UK region	Axis 1	Axis 2	Axis 3	Axis 4	Technical assistance
England	10.7%	75.9%	8.4%	5.0%	0.0%
Northern Ireland	10.4%	60.4%	-	29.2%	-
Scotland	14.3%	68.5%	11.5%	5.6%	0.1%
Wales	18.3%	59.9%	14.0%	6.8%	1.0%

Source: 2007-2013 RDPs for England, Wales, Scotland, and Northern Ireland. Calculations take into account contribution from voluntary modulation with the exception of the Northern Ireland RDP for which VM contributions have not been published yet.

Note: Axis 4 funds relate to expenditure under the first three Axes. Hence, England and Northern Ireland are in compliance with the 10 per cent minimum allocation required for Axis 3.

Table 21 shows indicative figures for total public expenditure on rural development in the UK for the programming period 2007-2013 taking into account EAFRD allocations including compulsory modulation, voluntary modulation (except Northern Ireland), and national co-financing.

Table 21 Estimated total public expenditure on UK RDPs (2007-2013)

UK region	Total Public expenditure	Total EAFRD amount
England	€5,187,145,008	€3,217,464,635
Northern Ireland	€22,898,005	€170,824,060
Scotland	€2,133,281,340	€676,342,944
Wales	€1,169,903,996	€401,296,730

Source: 2007-2013 RDPs for England, Wales, Scotland, and Northern Ireland. Calculations take into account contribution from voluntary modulation with the exception of the Northern Ireland RDP for which VM contributions have not been published yet.

3.3.4 Axis 1 (competitiveness)

Rural development expenditure on Axis 1 type measures accounts for a relatively small proportion of total Pillar II budget in the UK (see Table 21 above). However, a number of schemes are potentially relevant to the livestock sector and an overview of these is shown below in Table 23. It should be noted though that only a proportion of the indicative total public expenditure shown for each measure will be targeted at the livestock sector. A detailed breakdown of expected expenditure related to the livestock sector is not available, however, in England it is possible to make some assumptions in this regard based on funds raised through voluntary modulation. It is estimated that approximately £100 million (subject to £/€ exchange rates) of Axis 1 funds will be targeted specifically at the livestock sector between 2007 and 2013 on the basis of economic difficulties linked to adverse market conditions and the impact of animal diseases, such as foot and mouth disease (FMD), Bovine Spongiform Encephalopathy (BSE) and bovine tuberculosis (bTB). These funds are likely to be linked primarily to the beef, dairy and sheep sectors. It is anticipated, however, that

funds raised through voluntary modulation and targeted at the livestock sector in England (Pers. Com. RDAs⁶⁸) will be used to support measures intended to:

- improve the competitiveness of the sector (~40 per cent);
- enhance on-farm management of nutrients (~40 per cent); and
- provide specific support for measures to improve animal health and welfare (~20 per cent).

⁶⁸ The Regional Development Agencies (RDAs) (<http://www.englishrdas.com/>) are responsible for administering the majority of Axis 1 and Axis 3 expenditure in England. Each region will have its own programme. An example outlining how the funds will be spent in Cumbria can be accessed at: <http://www.nwda.co.uk/news--events/press-releases/200901/programme-helps-cumbrias-farm.aspx>

Table 22 Rural Development schemes linked to the livestock sector under Axis 1 (competitiveness) for (2007-2013)

UK Region	AXIS 1: Improving the competitiveness of the agricultural and forestry sector	Total indicative public expenditure for 2007-2013 (€ (a))	Type of scheme/ activities supported in livestock sector
England	Vocational training and information actions (111)	126,172,312	- animal health and welfare - resource use, including waste reduction, waste management, water use (including diffuse water pollution), energy efficiency
	Modernisation of agricultural holdings (121)	203,585,294	- alternative agriculture (including niche and novel crops and livestock) - improving on farm nutrient management (capital investment in systems and management equipment)
	Adding value to agricultural and forestry products (123)	183,188,366	- processing and marketing of products
	Cooperation for development of new products, processes and technologies (124)	108,994,471	- development of new products, processes and technologies
Northern Ireland	Modernisation of agricultural holdings (121)	359,600	Includes support for: - Investments to introduce new technologies and innovation e.g. electronic livestock identification readers; - Investments to improve animal health and welfare e.g. automatic animal feeding systems, rubber matting - Investments for positive environmental impact e.g. automatic slurry scrapers
	Adding Value to Agricultural and Forestry Products and Improving Marketing Capability (123)	31,440,716	Types of products supported under the Agricultural and Forestry Processing and Marketing Grant Scheme include: livestock, eggs, and milk and milk products.
Scotland	Use of advisory services by farmers and forest holders (114)	4,000,740	- Nutrient management plan - Soil and water management programme
	Modernisation of agricultural holdings (121)	98,110,644	Manure/slurry storage and treatment
	Supporting farmers who participate in food quality schemes (132)	4,674,193	Membership of food quality assurance schemes
Wales	Adding value to agricultural and forestry products (123)	49,781,769	Processing and Marketing Grant Scheme includes support for activities in relation to: livestock, eggs, and milk and milk products.

Source: 2007-2013 RDPs for England, Wales, Scotland and North Ireland approved by the European Commission. Available on the devolved administration websites.

(a) Includes EU allocation from EAFRD (including voluntary modulation contributions - except in Northern Ireland) and national co-financing.

3.3.5 Axis 2 (*environment*)

The majority of rural development expenditure in the UK has been allocated to Axis 2 measures linked to land management practices intended to benefit the environment and the countryside. The two most significant measures within UK RDPs, in terms of expenditure and area covered, are agri-environment schemes (including organic) and, less favoured area (LFA) schemes. Both of these schemes are relevant to livestock production and, in the case of agri-environment schemes, feed production. Table 25 below provides an overview of these schemes and the types of activities they fund which relate to livestock and arable production. In the case of LFA schemes, all of the figures for expenditure are linked to the maintenance of beef and sheep grazing systems. Agri-environment schemes on the other hand can provide support for a range of management practices intended to result in environmental and social benefits and are not restricted to a particular type of agricultural production.

Agri-Environment Schemes

Agri-environment expenditure is the principle source of support in the UK specifically targeted at supporting land management practices associated with extensive and relatively low input systems of agricultural production. For example, agri-environment measures can be used to support the extensification of grassland and arable production systems, but also management, restoration or establishment of non-productive features such as hedgerows, protection of watercourses and on-farm wildlife habitats. Payments are made in addition to any Pillar I direct payments received and management requirements must go beyond the legislative and cross compliance baseline. Payment rates are calculated on the basis of income foregone and costs incurred averaged across a Member State or region and are not intended to act as income support.

Agri-environment schemes were first introduced in England in 1985 through the geographically delimited Environmentally Sensitive Areas (ESAs), located mainly in the uplands, and then through the Countryside Stewardship Scheme (CSS), introduced in 1991, which allowed expenditure to be targeted at specific environmental priorities outside of the ESAs. In 2005, Environmental Stewardship (ES) was introduced based on a combination of the best elements of the previous schemes, and applications to the previous schemes were closed. Equivalent schemes have been established in other parts of the UK and current schemes are referred to in Table 25.

In England, agri-environment schemes account for 83 per cent of the Axis 2 budget and 67 per cent of Pillar II expenditure for the period 2007-2013. However, although large in absolute terms (€3.5 billion), the budget will still be dwarfed by Pillar I expenditure over the same period (approximately €15.7 billion in England taking into account compulsory and voluntary modulation).

Environmental Stewardship

Environmental Stewardship provides funding to farmers and other land managers in England who deliver effective environmental management on their land⁶⁹. The scheme has five primary objectives:

- wildlife conservation (biodiversity);
- maintenance and enhancement of landscapes;
- protection of the historic environment;
- promotion of public access;
- natural resource protection (soils, air, water)

ES also has two secondary objectives linked to genetic conservation (including rare breeds) and flood management. The scheme consists of three elements: Entry Level Stewardship, Organic Entry Level Stewardship⁷⁰, and Higher Level Stewardship. A summary of the main differences between these schemes is tabulated below.

Table 23 Summary of Environmental Stewardship in practice

Entry Level Stewardship (including Organic ELS)	Higher Level Stewardship (HLS)
'Whole-farm scheme' open to all land managers	Targeted at high priority areas
5 year agreement	10 year agreement
Fixed payment per hectare (£30/ha for ELS, £8/ha for moorland, £60/ha for OELS)	No fixed payment per hectare (>> than ELS/OELS)
Non-competitive - 'broad and shallow'	Discretionary and competitive
Suited to maintenance of existing land management practices (although changes in management are possible)	Capable of much more complex, site-specific forms of management (including capital works).

In terms of area covered, total agri-environment scheme uptake in England accounted for 6 million hectares of agricultural land delivered through 57,400 agreements in January 2009 (Natural England 2009), approximately 65 per cent of total UAA. The majority of this land is in ELS and OELS agreements (4.7 million hectares and 0.3 million hectares respectively). The remaining one million hectares, plus some overlap with ELS, is in HLS agreements, as well as ESA and CSS agreements which began before 2005.

In terms of uptake by farm type (Pers. Com. Natural England) the largest number of holdings in agri-environment schemes are those farms classified as lowland grazing livestock (beef and sheep), followed by cereals, then LFA grazing livestock and dairy, followed by mixed (see farm type definitions in Annex 2). However, whilst grazing livestock farms in the lowlands have the largest number of holdings in an agri-environment scheme, as percentage of total holdings by farm type, a much higher

⁶⁹ Further information on the Environmental Stewardship scheme is available at: <http://www.naturalengland.org.uk/ourwork/farming/funding/es/default.aspx>

⁷⁰ In addition to OELS farmers, financial support under the agri-environment measure is available for those farmers in the process of converting to organic production. More information available at: <http://www.defra.gov.uk/farm/organic/funding/index.htm>

proportion of LFA grazing livestock are enrolled in schemes, approximately 38 per cent compared to 17 per cent.

Table 24 below provides an overview of the types of options available in Environmental Stewardship which can support management practices linked to more extensive livestock and feed production. The schemes work on a points systems with each type of management being allocated a different number of points. For ELS and OELS farmers must average at least 30 points per hectare of land enrolled in the scheme. There is no specific points target for land enrolled in HLS.

Table 24 Selected agri-environment management options linked to livestock and feed production systems

Type of option	Type of management
Options for Arable land	Management of field corners
	Wild bird seed and nectar flower mixtures
	Over wintered stubbles
	Beetle banks
	Skylark plots
	Unfertilised or uncropped areas
Options for buffer strips and field margins	Various options on cultivated land and intensively managed grassland
Options to encourage a range of crops types	Wild bird seed and nectar flower mixtures on grassland
	Cereals for whole-crop silage followed by overwintered stubbles
Options for grassland (upland and lowland)	Permanent pasture with low inputs or very low inputs.
	Mixed beef and sheep stocking
	Management of semi natural pastures

Source: Environmental Stewardship handbooks (2008). Available at: <http://www.naturalengland.org.uk/ourwork/farming/funding/es/default.aspx>

As part of the on-going monitoring and evaluation of Environmental Stewardship (ES), Defra and Natural England published a ‘Review of Progress’ in 2008. The general conclusion of the report is that *‘ES is making good progress and that the combination of a “broad and shallow” Entry Level strand (ELS) open to all, with a more demanding and selective Higher Level strand (HLS), is achieving the scale of coverage and degree of targeting required to deliver across the range of ES objectives, many of which are complementary.’* At the same time, the report makes a number of recommendations⁷¹ intended to improve the effectiveness of the scheme. These include a specific recommendation that climate change adaptation and mitigation should become an over-arching theme of Environmental Stewardship. A number of recommendations relate to the need to improve the ‘geographic literacy’ of Environmental Stewardship, namely to improve the focus and appropriateness of management options taken up by farmers in regard to local environmental priorities. In November 2008(b), Defra announced a review of some agri-environment payment rates in England as recommended in the Review of Progress, with amendments due to be introduced in 2010.

⁷¹ About 20 new options are recommended for development and introduction, while 2 options are recommended for removal.

At UK level, a recent review of environmental benefits supplied by agri-environmental schemes by Boatman et al (2008) was published by the Land Use Policy Group (LUPG). The report found that UK agri-environment schemes have been made a positive contribution to achieving environmental benefits in relation to:

- meeting UK Biodiversity Action Plan (BAP) targets for certain habitats and species;
- maintenance of semi-natural grassland and widespread establishment of grass margins and buffer strips;
- maintenance of landscape character;
- helping the UK to meet its target for halting the decline of farmland birds through the Public Service Agreement (PSA); and
- protection of soil and water natural resources by reducing inputs (hard to quantify though).

The report notes that, where agri-environment schemes have been targeted at specific environmental issues, outstanding results have been recorded. At the same time, the report highlights the intrinsic need for on-going monitoring and evaluation, so that such results can be achieved on a broader scale; for example, through improvements to targeting, scheme coverage (area and farm type), applicability of management options to certain farm types, and to targeting particular habitats and/or species.

Less Favoured Area Schemes

Less Favoured Areas (LFA) Schemes also account for a significant proportion of Pillar II expenditure in UK. In Scotland, the LFA measure receives the largest allocation of RDP funds. Payments under these schemes are made to beef or sheep farmers, typically located in relatively marginal agricultural areas, such as the uplands. Payments are intended to compensate for natural and, to a lesser extent, economic handicaps associated with farming in these areas.

LFAs in the UK can be subdivided into Severely Disadvantaged Areas (SDAs) and Disadvantaged Areas (DAs). Both of these categories of LFA can be found within the UK, although in England beef and sheep farmers located within the DAs have not been eligible for LFA payments since 2008⁷². Production within the LFAs is amongst the most extensive in the UK, although examples of more intensive production systems can be found, particularly in the DAs.

LFA payments are primarily targeted at the maintenance of production systems, which are associated with the provision of environmental and socio-economic benefits. Unlike agri-environment schemes they are not directly targeted at environmental benefits. However, the UK schemes⁷³ do provide incentives for environmentally beneficial management linked to cross compliance and Good

⁷² Farmers located within the DAs receive, on average, a higher Single Payment per hectare than those located within the SDAs though.

⁷³ Tir Mynydd in Wales, Less Favoured Area Compensatory Allowance Scheme in Northern Ireland, Less Favoured Areas Support Scheme in Scotland and Hill Farm Allowance (HFA) in England. In 2010, Defra intends to replace HFA with an Upland Entry Level Stewardship (UELS) scheme.

Farming Practice. For example, farmers claiming the payments must comply with minimum stocking levels to avoid undergrazing, which can have a detrimental effect on natural and semi-natural pastures and moorland. Farmers must also avoid overgrazing or unsuitable supplementary, and payments usually include incentives for environmentally beneficial mixed grazing.

In England, 1,627,037 hectares have been designated as SDA (including non agricultural land and land ineligible for LFA payments) including moorland which accounts for 798,896 hectares. The former DAs in England covered around 586,654 hectares. In Scotland, once common grazing land is excluded 84 per cent (4.6 million hectares) of agricultural land is classified as LFA, and 98 per cent of this is classified as SDA. In Wales over 77 per cent of agricultural land is designated as LFA. Approximately 52 per cent of Welsh agricultural land is designated as SDA and 26 per cent as DA. In Northern Ireland 65 per cent of agricultural land is designated as LFA, 40 per cent SDA and 25 per cent DA.

Table 25 Rural Development schemes linked to the livestock sector under Axis 2 (environment) for (2007-2013)

UK Region	AXIS 2: Improving the environment and the countryside	Total indicative public expenditure for 2007-2013 (€)	Type of scheme/activities supported in livestock sector
England	Less Favoured Area payments	237,956,204	Hill Farm Allowance (HFA) per hectare support to extensive livestock (excluding dairy) in Less favoured Areas. Prior to 2008 divided into Severely Disadvantaged and Disadvantaged Areas. From 2008 payments focused only on SDAs. Due to be replaced by Uplands Entry Level Scheme in 2010.
	Agri-environment payments	3,454,261,359	Environmental Stewardship introduced in 2005 to replace previous schemes: - Entry Level Stewardship (£30/ha) options available for livestock and arable production. - Organic Entry Level Stewardship (£60/ha) options available for livestock and arable production. - Higher Level Stewardship (more targeted payments/more complex management) options available for livestock and arable production.
	Support for non-productive investments	426,009,417	Restoration of unproductive habitats through Environmental Stewardship e.g. hedges, fencing, re-introduction of grazing.
Northern Ireland	Less favoured Area payments	50,626,682	Less Favoured Areas Compensatory Allowances Scheme (LFACAS) per hectare support to extensive livestock (excluding dairy)
	Agri-environment payments	134,670,471	Northern Ireland Countryside Management Scheme (NICMS) The Organic Farming Scheme (OFS)
Scotland	Less favoured Area payments	623,441,661	Less Favoured Area Support Scheme (LFASS) per hectare support to extensive livestock (excluding dairy except in Scottish Islands).
	Agri-Environment payments	371,143,510	- Support for the conversion to and maintenance of organic farming - Agri-environment payments currently delivered through Rural Development Contracts (and predecessor schemes)
	Animal welfare Payments	8,569,730	- Animal Health and Welfare Programme
	Support for non-productive investments	97,490,317	- Habitat grazing management - Livestock tracks, gates and river crossings - impacts on diffuse pollution
Wales	Less favoured Area payments	161,453,192	Tir Mynydd Scheme - per hectare support to extensive livestock (excluding dairy)
	Agri-Environment payments	404,971,245	Tir Cynnal – entry level agri-environment scheme Tir Gofal – higher level tier agri-environment scheme Organic Farming Scheme
	Support for non-productive investments (216)	112,083,335	Conservation of natural resources such as water and soils from damage or pollution by livestock e.g. Gates, culverts, bridges, etc.

Source: 2007-2013 RDPs for England, Wales, Scotland and North Ireland approved by the European Commission. Available on the devolved administration websites.

(a) Includes EU allocation from EAFRD (including voluntary modulation contributions except in Northern Ireland) and national co-financing.

4 DISTRIBUTION OF CAP PAYMENT IN THE UK

4.1 CAP payments to different types of livestock and feed production in the UK

Annual CAP expenditure in the EU accounts for around €42 billion under Pillar I and €12 billion in EAFRD contributions through Pillar II. Given the scale of this expenditure, it would clearly be desirable to be able determine the extent to which such payments support different types of farming systems, distinguishing between intensive and extensive production methods. However, in practice, it is very difficult to make such estimates within reasonable confidence limits.

Prior to decoupling, it was simple to identify at which sectors support was focused, as payments were linked to production. However, even in these circumstances, it was difficult to disentangle the extent to which payments for a particular sector were going to the more intensive or more extensive producers. It was possible, however to make some generalisations, and evidence showed that, for example, headage payments both in the UK and elsewhere in Europe, tended to incentivise higher stocking densities, than otherwise would have been the case, and this resulted in negative impacts where this resulted in overstocking beyond the environmental carrying capacity of the land⁷⁴.

Since 2005, however, payments are no longer linked to particular types of production. Under the decoupled SPS, farmers are free to maintain production, intensify, extensify, switch to a different form of production, or cease production altogether as long as the land is maintained in good agricultural and environmental condition. In all cases the payment received will be the same. In addition, information submitted in order to claim the Single Payment includes only minimal information about land use. For example in England⁷⁵, farmers must declare if they have ‘pigs, goats or sheep’ or ‘cattle’ (but no further details), if they have any land which they do not intend to put into agricultural production, if they plan to convert any permanent pasture to an alternative agricultural (i.e. arable) or non-agricultural land use. Only farmers in the Less Favoured Areas wishing to claim the Hill Farm Allowance must submit information about the number of eligible cattle and/or sheep on their holding.

It is also important to remember that the sustainability of a particular livestock system is determined by a complex interaction of factors, particularly when the global impacts of feed production are taken into account, and caution should be exercised in making generalisations, and labelling intensive or extensive⁷⁶ production systems as

⁷⁴ Namely, where high stocking densities increasing the risk of soil erosion, or pollution associated with concentrations with the storage and applications of manures and slurries. High inputs to grassland and arable land with potential for nutrient runoff may also be needed to increase forage and feed production.

⁷⁵ SPS 2009 application form. Available at:
[http://www.rpa.gov.uk/rpa/index.nsf/0/a2d43af914629f118025756800341dae/\\$FILE/Sample%20\(SP5\)%20form%20-%202009.pdf](http://www.rpa.gov.uk/rpa/index.nsf/0/a2d43af914629f118025756800341dae/$FILE/Sample%20(SP5)%20form%20-%202009.pdf)

⁷⁶ Extensive is taken to refer to low input, low output systems, relative to each hectare of UAA. Extensive systems in the UK are typically associated with grazing livestock on grassland with low fertiliser inputs. Intensive systems, conversely, are associated with relatively high fertiliser, pesticide,

either 'sustainable' or 'unsustainable'. So whilst it is possible to be reasonably confident that the majority of UK production in the dairy, pigs, poultry and arable farm types will be relatively intensive in absolute terms, some forms of production will be more sustainable than others. For example, organic production in these sectors might be expected to be more 'sustainable'⁷⁷, than the average form of production in a given farm type, even though it may not be possible to describe production as 'extensive' in absolute terms. In the beef sector, the situation is complicated by the variety of different production systems.

In general, feed based systems of production can be considered to be relatively intensive, in comparison to low input pasture based systems. However, if sustainability is judged in relation to the type of feed consumed, then there will be significant variations in the 'sustainability' between individual holdings which will be very difficult to identify. For example, a relatively intensive beef or dairy producer on one farm may feed their livestock large amounts of cereals, maize and oilseed rape, whilst another relatively intensive producer may substitute the latter for soya. Identifying such variations in management and then linking these to the receipt of CAP payments is not possible based on existing published information, and has therefore not been possible within the remit of this study.

A further complication relates to whether environmental impact is calculated in terms of quantity of product or area of land in agricultural production. So, for example, extensive production systems will typically be associated with lower greenhouse gas emissions per hectare of land compared to intensive production systems. However, if the GHG emissions are judged in relation to kilo of meat or milk produced then the reverse may be true. In practice, this may not be clear cut though, given that Garnett (2008) notes that current methods of Life Cycle Analysis (LCA) for estimating GHG emissions 'do not accurately capture the second order land use impacts of certain forms of food production or of mitigation approaches', deforestation linked to the cultivation of arable crops, such as soya, being the most obvious example of this. Another example, which could relate directly to the UK, is the impact, in terms of GHG emissions, of converting previously unploughed grassland to land in arable cultivation.

Nonetheless, it is possible to make some very rough estimates of the CAP payments currently being used to support livestock and feed production more generally in the UK.

CAP support for feed production

Garnett (2007) estimates that over 50 per cent of cereals produced in the UK are consumed by livestock. Figures calculated by Defra (see Table 14) suggest that in

and herbicide inputs. Intensive livestock holdings will have relatively high stocking densities resulting in higher outputs per hectare of UAA. Feed crops are likely to account for significant proportion of dietary intake, whilst intensively managed pastures will receive a relatively high level of inputs compared to grazed pasture.

⁷⁷ In terms of feed production and consumption, nutrient management, pesticide and herbicide applications, animal welfare, crop rotations, etc

2005 cereals holdings received €416 million through the SPS. Calculations shown in Table 17 suggest that, all things being equal, this will have declined to €395 million by 2009 (excluding modulation). It is not possible to judge, based on available information, the extent to which such expenditure will have supported 'sustainable' or 'unsustainable' production. In any case, it should be noted that the role of market forces is becoming increasingly important as a driver of intensification (or conversely extensification and marginalisation).

CAP support for intensive beef production

Estimating CAP support for intensive beef production is more problematic. Firstly, the figures provided in Garnett (2007) for proportion of beef calves raised in the lowlands and uplands relate to the UK and differ from the distribution in England. However, estimates of CAP expenditure linked to lowland and upland beef production are only available in England. In addition, the budget figures refer to lowland and LFA grazing livestock and do not distinguish beef and sheep production (and the payments attributed to these individual farm types). Nonetheless, one might expect the support for LFA grazing stock in England, specifically within the SDA, estimated at €171,625,486 in 2005 and declining to €152,269,228 in 2009 (excluding modulation), to be linked to extensive production (see Table 17). In the lowlands, if one assumes that 40 per cent of beef calves raised in the English lowlands are finished intensively on cereals and silage (not necessarily soya) then, one could extrapolate that approximately €87,865,679 in 2005 and €85,986,330 in 2009 (excluding modulation) supported intensive and semi-intensive beef production out of a total of €219,664,198 and €214,965,825 (excluding modulation) respectively.

Any support for feed production or support for beef production which takes place on holdings not classified as 'cereals' or 'grazing livestock' (see list of farm types in Annex 2) will not be included in these figures. A key assumption of all of these calculations is that no land use change will have taken place between 2005 and 2009.

4.2 Identification of CAP recipients (Pillar I and Pillar II)

In accordance with Commission Regulation (EC) No 259/2008⁷⁸ Member States must publish details of beneficiaries of all CAP schemes, including the Single Payment Scheme, from 30 April 2009 relating to expenditure between 16 October 2007 and 15 October 2008 (updated annually). Member States already have an obligation to publish details of the beneficiaries of rural development schemes during the period 1 January 2007 to 15 October 2007.

Data on Pillar I expenditure for direct payments is publically available in Scotland, Wales and Northern Ireland but not currently in England. Details of Rural Development recipients in 2007 are available in all 4 countries. The top 10 payment recipients in Scotland, Northern Ireland and Wales are shown below. For the reasons

⁷⁸ Commission Regulation (EC) No 259/2008 of 18 March 2008 laying down detailed rules for the application of Council Regulation (EC) No 1290/2005 as regards the publication of information on the beneficiaries of funds deriving from the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD). Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:076:0028:0030:EN:PDF>

outlined in section 4.1, it is important to note that, based on the information available, it is very difficult to make any judgements about whether such CAP payments are supporting relatively 'sustainable' or 'unsustainable' forms of agriculture.

Table 26 Top 10 Scottish recipients of CAP payments in 2007 (£)

FARM BUSINESS NAME	Single payment	Energy Crop Scheme	Protein Crop Premium	Scottish beef Calf Scheme	Land management Contracts (AES)	Less Favoured Areas	Grand Total
G Barbour & Co	783,843	0	0	60,037	0	91,582	935,461
Ross Bros	809,256	0	0	13,367	4,318	21,052	847,993
William Hamilton And Son (No 2)	711,488	0	1,907	0	3,795	0	717,190
J & T F Macfarlane Ltd	558,615	0	0	31,151	4,387	62,078	656,231
Genoch Mains Farms	479,222	0	0	51,164	4,438	95,840	630,663
Moray Estates Development Co.	571,421	1,309	1,742	307	4,330	24,142	603,251
Kevan Forsyth	503,744	0	0	20,243	0	57,021	581,008
Glenmore Properties Ltd	574,338	0	0	0	4,606	0	578,944
J R Graham Ltd	464,646	0	0	0	3,963	914	469,523
John C McIntosh	419,422	1,073	1,179	13,444	0	14,270	449,388

Source: Scottish agricultural subsidy payment information available from:

<http://www.scotland.gov.uk/Topics/Agriculture/grants/LatestPayments/Introduction>

Table 27 Top 10 Northern Irish recipients of CAP payments in 2007 (£)

Farm Business Name	Amount (£)	Basis of Pillar I and Pillar II payments see (explanatory note)
D CONLON	264,265	a, d, g
M SAWYERS	244,118	a, g, i, l
PERS REPS OF W H SHERIDAN	228,600	a, b, c, d, e, g, n
BLAKISTON HOUSTON ESTATE COMPANY	202,392	a, k, o
W CORRIE	183,718	a, l
FARM DIRECTOR CAFRE (DARD)	179,515	a, g
J CONNON	169,154	a, i, l, n
C TWEED	156,109	a, g, s
DUNLEATH ESTATES LTD	141,309	a
E & W CARSON	140,776	a, g, i, o

Northern Ireland CAP subsidy information available at:

<http://www.dardni.gov.uk/index/grants-and-funding/single-farm-payment-and-pre-2005-subsidy-schemes/release-of-cap-subsidy-information.htm>

Note: All Pillar I payments are calculated on the basis of flat rate element (20 per cent) and a historic element (80 per cent). Pillar I schemes which were phased at the end of 2004 are shown and indicate the coupled payments that each producer claimed during the reference period, but do not necessarily indicate the type of production undertaken in 2007.

- a Single Farm Payment Scheme (Pillar I – flat rate calculations)
- b Beef Special Premium Scheme (Pillar I – historic element calculations)
- c Suckler Cow Premium Scheme (Pillar I – historic element calculations)
- d Slaughter Premium Scheme (Pillar I – historic element calculations)
- e Extensification Payment (Pillar I – historic element calculations)
- g Less Favoured Area Compensatory Allowance Scheme (Pillar II)
- i Countryside Management Scheme (Pillar II)
- l Farm Nutrient Management Scheme (Pillar II)
- o Forestry-Farm Woodland Annual Premium/Farm Woodland Premium Scheme/Woodland (Pillar II)
- s Beef Quality Initiative Training Scheme (Pillar II)

Table 28 Top 10 Welsh recipients of Pillar I payments in 2007 (£)

Customer Name	Total (£)
THE CNEWR ESTATE LTD	261,977
LYN JONES & SONS LTD	250,602
TL HARRIS	236,321
D T JONES AND SON	204,926
WELSH WATER ELAN TRUST	204,621
WYNNE FINCH FARMS	201,630
M AND R PRITCHARD & SONS	200,968
MD JAMES AND SONS	195,637
RHUG FARM	184,764
MS RAYMOND BROS	174,976

Source: Welsh Single Payment Scheme data available at:

<http://new.wales.gov.uk/topics/environmentcountryside/farmingandcountryside/farming/singlepayment/scheme/spspayments/?lang=en>

Note: Figures are for ‘Sterling customers only’. Additional data available for ‘Euro customers’ who claimed agri-environment and less favoured area payments in addition to the Single Payment.

Protein Crop Premium

Thus far, specific information on the receipt has only been made publically available in Scotland. Information on CAP direct payments for the UK is due to be published from 30 April 2009 on Defra’s CAP Payments website⁷⁹. A list of the top 10 Scottish recipients of the Protein Crop Premium is shown below. The amount of SPS payment received by each farm business is shown for comparison.

⁷⁹ <http://cap-payments.defra.gov.uk>

**Table 29 Top 10 recipients of the protein crop premium in Scotland (2007)
(£)**

BUSINESS NAME	Single Payment Scheme (£)	Protein Crop Premium (£)
Culfargie Estates Ltd	191,168	4,316
Balmano Farms Ltd	105,769	4,183
New Ladykirk Farm	151,690	2,950
James Millar (Kilduff) Ltd	80,643	2,420
Charterhall Farm	128,119	2,408
Ayton Castle Farm Partnership	68,766	2,327
J M Menzies Farm Partnership	105,819	2,166
P R & D E Tench	42,306	2,128
Wakefield Partners	61,258	2,125
A M & A Calder Farms Ltd	179,145	2,099

Source: Scottish agricultural subsidy payment information available from:

<http://www.scotland.gov.uk/Topics/Agriculture/grants/LatestPayments/Introduction>

Rural Development

Table 30 below shows the top 10 recipients of rural development funds in each of the four devolved UK administrations. The majority of rural development expenditure in the UK is targeted at agri-environment schemes followed by less favoured area payments. A number of the recipients appear likely to be associated with extensive grazing on common land. A number of charitable organisations also appear in the list of recipients including the RSPB, the National Trust and the Soil Association. It is likely that management on holdings owned by these organisations will be relatively extensive and/or organic. Some of the payments will be linked to livestock production but a significant proportion will also be associated with other forms of production such as arable. The large sums attributed to Dartmoor probably relate to an agri-environment agreement covering the entire area of common land with payments spread amongst a number of farmers and land owners.

Table 30 Top 10 recipients of Rural Development expenditure in the four UK countries (2007)

England		Northern Ireland		Scotland		Wales	
Beneficiary Name	Total Payment (EUR)	Beneficiary Name	Total Payment (GBP)	Beneficiary Name	Total Payment (GBP)	Beneficiary Name	Total Payment (EUR)
Forest of Dartmoor Commoners Association (a)	1,608,488	FANE VALLEY CO-OP SOCIETY	91,663	RSPB	114,214	THE CNEW ESTATE LTD	397,071
RSPB	770,024	THE NATIONAL TRUST	84,269	C E I Harding	74,506	SEVERN TRENT WATER LIMITED	260,600
RMR WINGFIELD	747,117	MR GORDON BURLEIGH	61,737	THE TRUSTEES OF THE WJ WESTON	61,151	WELSH WATER ELAN TRUST	258,125
Allendale & Hexhamshire Commons Assn	636,532	MR TREVOR THOMPSON	60,758	C & E Tawse	46,762	DT OWEN AND SONS	206,054
Cropwell Bishop Creamery Limited	576,124	MESSRS EDWARD & WM CARSON	54,444	James Gillanders (A Firm)	41,159	T C EDWARDS AND CO	170,426
FARMCARE LIMITED	514,416	MR THOMAS BLACK	54,366	Riddell Farms	39,502	ES BAILEY AND SONS	159,533
CONSERVATORS OF ASHDOWN FOREST	487,482	MR GAVIN WINTERS	44,135	CHAPEL PARK FARMS	37,834	GM ROBERTS AND SON	150,686
HEMCORE LTD	435,004	C PHAIR & D A ARMSTRONG & J L COOPER	43,089	Pitgaveny Farms	37,377	ADAS PWLLPEIRAN	128,157
THE NATIONAL TRUST	398,866	MR JAMES ALEXANDER STEELE	41,703	Shinness Common Grazings	36,000	W E JONES	126,440
THE WOODLAND TRUST	357,594	MR NORMAN D MCBURNEY	38,601	R H Harris	35,936	WCR PUGH AND CO	123,689

Source: Defra's CAP Payments website available at: <http://cap-payments.defra.gov.uk>

Receipt of Pillar I payments in 2004 before decoupling

Finally, data showing the top 10 UK recipients of CAP payments in 2004/05, the final year before the introduction of the Single Payment Scheme can be seen below in Table 31. The figures in the table are differentiated between those payments received by farm businesses and those received by non-farm businesses. The farm payments section includes data on Pillar I subsidies for England as well as other parts of the UK. It is notable that the non-farm payments are very large. These payments will be linked to interventions in agricultural markets, such as export refunds and intervention storage. Unlike direct payments received by farm businesses since 2005, market interventions are not made on a historic basis.

In many cases, these payments will not be linked to livestock production. For example, the top two recipients are probably linked to export subsidies for sugar. Dairies also feature prominently on the list which is perhaps not surprising given that historically (i.e. until 2004), support for the dairy sector had been primarily through market interventions. Figures for subsequent years have not been made publically available. However, total UK expenditure on market interventions has declined significantly since 2004 in line with the general movement of the CAP towards greater liberalisation and increased market orientation of production.

Table 31 Top 20 Farm and non-farm CAP recipients in the UK (2004/05)

UK Farm Payments 2004/05		UK Non Farm Payments 2004/05	
Name	Payment (GBP)	Name	Payment (GBP)
FARMCARE LIMITED	£2,358,947	TATE & LYLE EUROPE	£124,052,519
STRUTT & PARKER (FARMS) LTD	£1,382,510	C CZARNIKOW SUGAR LTD	£39,396,794
LILBURN ESTATES FARMING PARTNERSHIP	£1,234,083	FAYREFIELD FOODS IRELAND LTD	£18,368,851
AGRESERVES LTD	£1,208,685	PHILPOT DAIRY PRODUCTS LTD	£13,229,777
ALBANWISE LTD	£1,159,496	MEADOW FOODS LTD	£12,471,426
PARKERS OF LEICESTER LTD,	£1,104,587	DALE FARM INGREDIENTS LTD	£9,854,735
BLANKNEY ESTATES LTD	£920,012	MILK SUPPLIES LTD	£9,775,832
SIR RICHARD SUTTONS SETTLED ESTATES	£917,650	NESTLE UK LTD	£5,374,988
THURLOW ESTATE FARMS	£847,198	MEADOW FOODS LTD	£4,909,609
WARTER PRIORY FARMS	£827,119	G'S GROWERS LTD	£4,593,443

Source: <http://farmsubsidy.org/>

4.3 Estimates of per capita expenditure

Table 32 below includes some statistics relating to CAP expenditure in the UK. Per capita calculations are based on 2007 population estimates provided by Office for National Statistics.

Table 32 CAP expenditure statistics in the United Kingdom

Type of expenditure	Total expenditure	Per capita expenditure
Total Pillar I expenditure in the UK (2007)	€3,950,780,000	€65 per year*
Total expenditure on Pillar direct payments in the UK (2007)	€3,832,410,000	€63 per year
Average SPS payment per hectare of farmland in England (2005)		€74 per hectare per year
Total expenditure on Pillar I market interventions in the UK (2007)	€219,010,000	€4 per year
Total expenditure on Pillar I livestock market interventions in the UK (2007)	€94,380,000	€2 per year
Pillar II EAFRD expenditure in the UK (2007)	€264,000,000	€4 per year
Total public expenditure on Pillar II in England (2007-2013)	€5,187,145,008	€102 (average of €15 per year)
Total public expenditure on Pillar II in Northern Ireland (excluding voluntary modulation) (2007-2013)	€322,898,005	€184 (average of €26 per year)
Total public expenditure on Pillar II in Scotland (2007-2013)	€2,133,281,340	€415 (average of €59 per year)
Total public expenditure on Pillar II in Wales (2007-2013)	€1,169,903,996	€393 (average of €56 per year)
Total public expenditure on agri-environment schemes in England expenditure (2007-2013)	€3,454,261,359	€68 (average of €10 per year)

Source: Own calculations.

Note: 'Total public expenditure' of Pillar II funds includes indicative allocations from EAFRD and all nationally financed rural development funds.

* This figure is less than the sum of expenditure on direct payments and market interventions combined due to the return of €100.16 million by the UK to the EAGF due to administrative failures in the distribution of SPS direct payments.

5 POLICY OPTIONS FOR PROMOTING MORE SUSTAINABLE LIVESTOCK PRODUCTION IN THE UK AND EU

5.1 Introduction

As set out in section 2.1.1, global livestock production is increasing, with the global production of meat and milk projected to double by 2050, due to factors including world population growth and a concomitant increase in demand for food; growing incomes boosting demand for livestock products; changes in dietary preferences; and technological change including growing productivity, increased grain feeding, more productive breeds and cheaper feed grains.

These trends are implicated in major environmental impacts globally including land degradation, climate change and air pollution, water shortage and water pollution and loss of biodiversity. In addition, shifts in diet, including increased consumption of livestock products, accompanied by reduced physical activity, are leading to rapid increases in overweight individuals and obesity, with a significant part of the growth in obesity occurring in the developing world. According to FAO (2006), worldwide the number of overweight people (about 1 billion) has now surpassed the number of malnourished people (about 800 million). Diet-related chronic diseases, including heart disease, diabetes, hypertension and certain cancers have increased rapidly as a result of changing diets. Gold (2004) citing dietary recommendations made by the World Health Organisation (WHO) and Food and Agriculture Organisation (FAO) suggests there is consensus among nutrition experts that eating less saturated fat (particularly from red meat and dairy products) and increasing consumption of fruit and vegetables is beneficial to health and could lessen diet-related preventable diseases such as heart disease.

The UK, and the EU more widely, is a major producer of livestock products supplying both domestic markets and exporting livestock products abroad. This production has significant impacts on the environment, both nationally and globally. In the EU, intensive livestock production is linked to problems such as the eutrophication of water bodies, soil erosion, loss of biodiversity and increased greenhouse gas emissions. The importation of soya for animal feed from countries such as Brazil and Argentina, where production is linked to the destruction of forests and has negative localised impacts on biodiversity, soil and water resources, is also of particular concern.

Reducing production and consumption of livestock products and shifting production to more sustainable methods would have significant environmental and health benefits globally. The UK, and the EU more widely, can help to reduce the domestic and global environmental impacts of livestock production in a number of complementary ways, including:

- Reducing overall livestock production in the UK and EU;
- Reducing dependency on imported soya and finding alternative sources of protein for animal feed in the UK and EU;
- Reducing the intensity of livestock production and promoting more sustainable, grass-fed livestock production systems in the UK and EU; and

- Reducing consumption of livestock products overall, particularly consumption from intensive farming systems, and promoting consumption of products from UK and EU sustainable farming systems.

Public policy in the UK has a critical role to play in achieving these objectives and reducing the environmental impacts of livestock production and improving public health. The following sections review some key policy options to achieve these objectives. The main focus is on policy options within the framework of the CAP (both current options and future options under a reformed CAP). However, since the CAP must operate within the confines of global trade policy, we begin with an analysis of WTO requirements and the implications of trade liberalisation for UK and EU livestock production. The analysis then considers options for reducing consumption of livestock products and influencing consumer behaviour. Finally, the need for research and development in the field of feed and livestock production is considered.

5.2 Global trade policy, the WTO and land use implications of reducing livestock dependency on traded feed

5.2.1 Implications of recent and current trade policy reforms

Agriculture is one of the few remaining sectors to be protected from world market forces. But over the past twenty years there has been growing political acceptance of the need for, and movement towards, liberalisation of world markets for agricultural commodities. The Uruguay Round trade talks that began in 1986 were the first to focus on agriculture and the subsequent Uruguay Round Agriculture Agreement (URAA), concluded in 1993, established the agenda for reform that continues today. This reform agenda has three core components:

- Reductions in domestic support;
- Increased market access; and
- The elimination of export subsidies.

The EU, and hence UK, is bound by global trade agreements to which the EU is a signatory as a member of the WTO. Successive reforms of the CAP, particularly the 1992 MacSharry reforms and Agenda 2000, were driven, at least in part, by the requirements of the URAA. Further pressure to reduce EU market support and to liberalise agricultural markets has been applied through WTO negotiations under the Doha Development Round which began in 2001. Trade negotiations broke down in 2008 due to lack of agreement between key countries and are yet to be resumed. However, the Framework Agreement reached in 2004⁸⁰, which is guiding negotiations, committed participants to eliminate export subsidies and progressively reduce tariffs and domestic support 'by a credible end date' although much of the detail remained to be agreed.

⁸⁰ WTO 2nd August 2004 Doha Work Programme: Decision adopted by the General Council. Annex A Framework for Establishing Modalities in Agriculture.
http://www.wto.org/english/tratop_e/dda_e/ddadraft_31jul04_e.pdf

The EU's own internal position on trade liberalisation is not without disagreement. Whilst the official EU position is one of having made commitments to reduce export subsidies and trade distorting farm support, and the recent CAP Health Check having made some further progress in this direction, there are EU Member States such as France that favour 'Community Preference' and maintaining levels of protection for EU farmers. In some respects, further trade liberalisation is likely to favour more intensive livestock producers as such producers are better placed to take advantage of economies of scale and to compete with other producers in global markets. Extensive livestock producers, that are already vulnerable and struggle to compete for market share, are likely to come under further pressure to intensify production (where feasible) or exit the industry. Overall, livestock production in the UK and EU might be anticipated to fall with greater liberalisation. However, where there are environmental or social justifications to maintain such farming systems e.g. to maintain biodiversity and landscapes or to maintain the social fabric of disadvantaged rural areas, alternative and non-trade distorting measures need to be applied to provide adequate levels of support. It is for exactly these reasons that the EU has introduced measures under Pillar I, such as Article 68, and provides support under Pillar II of the CAP (see sections 3.2.3 and 3.3 for discussion of these measures).

If an agreement on the WTO Doha Development Round can be reached in the near future, and it is not clear that one will be reached, the role of market measures in the CAP looks set to continue to decrease. European farmers will be increasingly exposed to market forces and will need to structure their businesses accordingly. However, the continuation of income support under the SPS will continue to provide some degree of protection from the full force of global markets (assuming the WTO accepts the SPS constitutes a non-trade distorting 'Green Box' payment). The removal of the SPS would expose UK farmers even more to market forces.

5.2.2 Potential impacts of trade liberalisation on UK agriculture

The impact of further liberalisation in the agriculture sector has been examined in a number of studies (Renwick et al, 2005, ADAS & SAC, 2008). ADAS & SAC examine the impacts on production and on the environment in England of various scenarios for Pillar I reform. These scenarios provide some useful insights into the likely production responses to removal of the SPS and market measures. Four scenarios are examined: A - Business as usual (baseline); B - removal of decoupled support; C - removal of tariff barriers and other trade restrictions; and, D - a combination of B and C. Table 33 below shows the changes in crop area and stock numbers by scenario in 2015.

Scenarios B-D show significant reductions in livestock production. For dairy and pigs, the removal of tariff barriers and other trade restrictions (Scenario C) has a greater effect than removal of the SPS since these sectors are least reliant on direct payments. In contrast, the beef and sheep sectors are affected more severely by removal of the SPS given their low relative profitability and reliance on income support. When reductions in SPS are combined with the removal of tariff barriers, these sectors are expected to show substantive reductions in production level. The study also modelled the area of land expected to be taken out of production and concluded that under Scenario A, 1 per cent of land would be taken out of production,

under Scenario B, 9 per cent, under Scenario C, 5 per cent and under Scenario D, 15 per cent. The expected environmental impacts of these changes are highly variable across the sectors, are regionally differentiated and differ according to the environmental attribute examined.

Table 33 Forecast changes in crop areas/stock numbers in the UK, by policy option scenario in 2015

Enterprise	Scenario A Business as Usual (Baseline)	Scenario B Removal of decoupled support	Scenario C Removal of tariff barriers and trade restrictions	Scenario D Combination of B and C
	Per cent from 2004	Per cent change from Scenario A		
Wheat	+13.0	-9.8	-4.5	-26.2
Barley	+0.0	-21.5	-8.2	-63.1
Oilseed rape	+19.0	-3.7	+38.1	+28.5
Potatoes	-5.0	-7.0	-25.4	-21.0
Dairy cows and heifers in milk	-12.0	-3.1	-22.5	-19.7
Beef cows	-8.0	-19.6	-0.3	-25.4
Other cattle	-8.0	-8.8	-11.0	-14.7
Ewes	-2.0	-15.1	-16.2	-20.1
Other sheep	-2.5	-28.5	-1.8	-35.6
Pigs	-1.0	-5.7	-18.3	-18.3
Poultry	+6.0	-3.8	-3.8	-3.8

Source: ADAS & SAC (2008)

The study concludes:

'In overview, there are net positive impacts for resource protection impacts such as water quality, soils, GHG and ammonia emissions and flood risk and net negative impacts for landscape. This can be expected to some extent as it reflects an overall reduction in the scale of agriculture in England. For biodiversity, the net impact is largely neutral (Scenario B) or modestly positive (Scenarios C and D)... The policy response to these impacts through Pillar II environmental stewardship measures will be critical. There may also be new opportunities for non-agricultural land use; these have the capacity to be environmentally positive or negative.'

Scenario C – removal of tariff barriers and other trade restriction - is of particular interest in the context of this work since it impacts most on the intensive livestock sectors and has less negative impacts on biodiversity and landscapes than Scenario B or D. The pig and dairy sectors could each potentially decline by almost one fifth although no scenario has a significant impact on poultry production, reflecting the dominance of the market in driving this sector. Such a reduction in pig and dairy production would be expected to have knock-on effects, lowering EU animal feed production and reducing demand for imported feed such as soya. However, one consequence of trade reforms of this nature might be to promote further concentration of livestock production onto fewer, larger farms and the loss of more extensive, and economically marginal, livestock systems which are beneficial for the environment. As the study highlights, policy responses through Pillar II type measures become

critical in this regard. It should also be noted that this is only one country study, based on modelling, and the exact responses of EU farmers to reduced subsidy levels are difficult to assess. The results of this study do however correspond with other studies on the likely impacts of trade liberalisation on EU agriculture (e.g. OEF, 2005) which suggest an overall reduction in the size of the sector.

5.2.3 Options to influence livestock production in non-EU countries

Reduced livestock production in the UK, or EU as a whole, is not without wider consequences, and is likely to result in increased imports of livestock products (in the absence of trade restrictions) unless matched by a corresponding reduction in consumption. Imports are likely to come from countries which are equally dependent on soya for feed e.g. Brazil, Argentina and Thailand and potentially from some countries where other production standards e.g. relating to animal welfare, may be lower and less acceptable to EU consumers. The exception to imports would be fresh milk since this is mostly consumed close to the point of production. The EU is a major milk producer and the consumer implications of a significant reduction in fresh milk production are largely unknown. More generally, studies on the impacts of liberalisation (e.g. OECD, 2004a) suggest that unilateral reform by the EU would reduce internal prices of dairy products by 16.5 per cent or by 10 per cent under a multilateral global reform scenario which, in turn, is likely to stimulate consumption and consumer demand for dairy products.

Assuming import substitution for most livestock commodities, and without a corresponding decline in consumption, the question then is whether the UK or EU can do anything by way of ‘flanking measures’ in response to environmental problems that might arise from production in non-EU countries. This question was examined by IEEP (2005) in a study of the environmental impacts of trade liberalisation covering a number of sectors including dairy and poultry. The study concluded that the UK has little scope or jurisdiction to influence production methods and their impacts outside its border. These are largely a matter for national authorities although multilateral environmental agreements e.g. the Convention on Biological Diversity are important global responses to problems such as habitat loss due to agricultural expansion. International climate change agreements may also act as a driver for countries to take action to reduce GHG emissions from the livestock sector⁸¹. Rather, the study suggests, that:

⁸¹ FAO (2006) highlights the role of the Clean Development Mechanism (CDM) whereby developed countries can reduce net carbon emissions by promoting renewable energy, energy efficiency or carbon sequestration projects in developing countries, receiving Certified Emissions Reductions (CERs) in return, in order to meet obligations under the Kyoto Protocol. Projects in the livestock sector currently only focus on the industrial production sector e.g. GHG mitigation from improved animal waste management. Afforestation or reforestation initiatives are the only land-use change projects that are currently eligible. These can help to mitigate livestock’s footprint on climate change by returning marginal, or degraded pastures, back to forest. Other potential methods that could significantly reduce emissions, but do not yet qualify for eligibility include: forms of pasture improvement, such as silvo-pastoral land use, reduced grazing pasture and technical improvements.

'Exploring the potential to harmonise environmental and animal welfare standards for imports with those faced by domestic producers and introducing requirements for labelling and providing consumer information are possible approaches to this issue. It should be noted however that developing trade policies attempting to distinguish between products based on their methods of production is a contentious issue within the WTO and may fall foul of rules relating to 'process and production methods' (PPMs). The 'shrimp-turtle' ruling of the WTO is a case in point. The WTO ruled (November 1998) against the US in its attempts to prevent imports of shrimp from India, Pakistan, Malaysia and Thailand caught without turtle excluder devices on the basis not of the environmental restrictions but on discrimination against these countries.'

This means that under current WTO rules, the UK could not seek to restrict imports of livestock products from non-EU countries on the grounds of unsustainable production methods as this would be discriminatory against producers in those countries. There is also little scope for the UK or EU to restrict imports of soya by imposing import tariffs since soya is currently tariff free and there is a general move towards reductions in tariffs. However, since this ruling, there has been an agreement that sustainability criteria should be developed in relation to biofuel feedstock production. Although unlikely, it could be worth considering the possibility of introducing sustainability criteria to other products, such as soya.

Whilst it appears therefore that further trade liberalisation could be beneficial in reducing overall livestock production within the UK and EU, albeit with many unknown and potentially undesirable affects, without a corresponding reduction in consumption of livestock products or changes in purchasing behaviour, the impact on soya production is likely to be limited. The extent to which the UK is able to influence consumption patterns and consumer behaviour is considered in section 5.4

5.2.4 Land use implications of reducing livestock dependency on traded feed

Current livestock production in the EU is heavily dependent on imported feed stocks, particularly soya. In 2005/6, the EU imported 61.1 million tonnes of feed, equivalent to a third of all the feed consumed by livestock. Soya accounted for over half of all imported feed. Soya produced in the EU, as a proportion of that consumed by EU livestock, accounts for less than 2 per cent of the total consumed by livestock. In addition to soya, livestock in the EU are fed crops such as wheat, oilseed rape, maize, peas and beans but the EU is less dependent on imports of these crops and produces a greater proportion domestically.

The potential to increase EU/UK production of livestock feed (both soya and other protein sources) deserves consideration. In 2005/6, livestock in the EU consumed 246.1 million tonnes of feed including cereals, high energy feeds (such as bran, sugar beet pulp and brewers grains) and high protein feeds (including soya, rape and protein crops). Of this, 32.5 million tonnes was imported soya (both soya beans and processed soya meal). Replacing 100 per cent if this imported soya with soya produced within the EU (assuming this were technically feasible given soya requires specific climatic

conditions) would require 17.8 million hectares of land⁸². Table 34 shows the area required for soya production assuming different levels of dependency on imports.

Table 34 Area of EU-25 soya production required to replace all imported soya consumed by livestock

Implications of reducing soya imports and replacing them with EU production of soya	Soya imports (Tonnes)	EU-25 average Yield of soya tonnes /ha	Area needed to replace 100% imported soya EU production (hectares)	Area needed to replace 75% imported soya EU production (hectares)	Area needed to replace 50% imported soya EU production (hectares)	Area needed to replace 25% imported soya EU production (hectares)
EU-25 production	500,000	1.83	273,224	204,918	136,612	68,306
EU-25 imports	32,500,000	1.83	17,759,563	13,319,672	8,879,781	4,439,891
EU-25 exports	2,000,000	1.83	1,092,896	819,672	546,448	273,224
Total consumption of soya by EU-25 livestock	31,000,000	1.83	16,939,891	12,704,918	8,469,945	4,234,973

Note: Source: DG Agri (2006) 'The agricultural situation in the European Union'. Contradicts this and states that EU livestock consumed 31 million tonnes of soya in 2005/06. Available at:

http://ec.europa.eu/agriculture/publi/agrep2006/agrep2006_en.pdf

Source for average yield of soya produced in the EU-25 is DG Agri Table 4.4.1.1 in 'The agricultural situation in the European Union (2007)'

Such production would require reductions in the production of other crops such as cereals (which would then need to be imported from elsewhere assuming feed demand remained stable) or the expansion of arable production into previously uncropped areas i.e. the ploughing of grassland. The reduced availability of grass, that would occur as a result, may drive further intensification of livestock production with greater reliance on housed livestock systems. This would be likely to have a range of negative environmental impacts with possible implications for soil erosion, water pollution, biodiversity and landscapes. Arable expansion into more marginal grassland areas would be likely to be particularly detrimental from an environmental perspective. The situation if soya were substituted with alternative, domestically produced protein crops such as oilseed rape, peas or beans is less clear since a straight substitution cannot be assumed; the protein value of 1 tonne of oilseed rape meal or peas is not equivalent to that of 1 tonne of soya. The crude protein content of soya meal is 48-50 per cent whilst that of rape meal is 32 per cent and peas and beans have a protein content of 23 per cent⁸³. Hence, significantly larger areas of oil seed rape or peas and beans would therefore need to be grown domestically to provide the same crude protein content supplied by imported soya. In addition, it is not only the protein content that is important in nutritional terms but also the composition in essential amino acids as well as the digestibility of the protein by different species. Ruminants are less demanding regarding the quality and digestibility of the protein source and

⁸² For context, the entire area of agricultural land in the UK covers around 18.6 million hectares.

⁸³ SEC (2001) 431 Commission Staff Working Paper: Supply and demand of protein-rich crops in the EU following the BSE crisis. Brussels 16.3.2001.

can be more easily fed alternatives than monogastric species such as pigs and poultry. In 2006, the area of cereal production in the EU was 56.8 million hectares with 7.7 million hectares of oilseeds and 1.4 million hectares of peas, beans and lupins. The area of oilseed and grain legume production would need to expand significantly, at the expense of cereal production or by arable expansion, to replace the loss of imported soya.

This analysis suggests that substituting imported soya for domestically produced soya or by alternative protein crops would, without reduced EU demand for livestock feed, have significant land use implications and the potential for a range of negative environmental impacts. Effort therefore needs to be focused on reducing EU livestock production overall, switching to more sustainable production methods and reducing consumption of livestock products. These issues are considered next.

5.3 Using CAP funds to support more sustainable livestock production and associated feed production in the UK and EU

The CAP is currently in a period of transition. Historically, certain types of CAP payments – particularly payments per head of livestock and price support for commodities such as beef and milk – were key drivers of livestock production patterns and practices, incentivising greater and more intensive production. Successive reforms of the CAP in 1992 and 2000 gradually reduced commodity price support and market protection and compensated farmers for loss of income through direct payments, and the 2003 CAP reform finally broke the link between CAP payments and production with the introduction of decoupled direct payments (see Section 3.2 for details).

Despite the changes to the nature and design of support under the CAP in 2005, which have significantly reduced the influence of the CAP on production decision, livestock (and other) farmers in the UK continue to receive substantive amounts of support, mainly as income support, from the public purse.

In the future, further changes are anticipated, which may result in reductions in the budget available for Pillar 1 direct payments and could lead to a more significant restructuring of the CAP and a reorientation of the budget towards a revised set of objectives. However, as it currently stands, there are three key types of CAP intervention that exist:

- *Direct payments* – income support payments for farmers paid through the SPS. The majority of payments are decoupled from production but some coupled payments remain. The receipt of payments is conditional on compliance with specific environmental, animal welfare and other standards under a system known as cross compliance.
- *Market interventions* – including tariffs, export subsidies and intervention purchasing, amongst others
- *Rural development measures* – a series of measures under the European Agricultural Fund for Rural Development (EAFRD) to help improve the

competitiveness of farm businesses, the environment and the quality of life in rural areas. Some measures are subject to cross compliance.

The way in which these funds are applied could have a significant impact on UK crop and livestock production and their subsequent environmental impacts. The SPS, even though decoupled from production, is particularly important given the size of the budget. As highlighted as section 3.2, direct payments now represent the largest share of support to UK farmers. Currently there is no environmental rationale for the allocation of the SPS and no preferential treatment of farmers that operate more sustainable farming systems. Because of the way that payments are calculated, intensive livestock farms that previously received high levels of subsidy (based on production levels) are more likely to receive high levels of subsidy per hectare today under the CAP than more extensive farms, although in England this bias lessens every year as the historic basis for calculating payments decreases in favour of a flat rate area payment.

Options for how the current CAP might be used in the UK (and elsewhere in the EU) to promote more sustainable livestock farming systems and/or reduce reliance on imported soya for feed are considered in the following section. Longer term options for CAP reform are considered in section 5.3.3. It should be noted that these options are not likely to directly affect the pigs and poultry sector to the same extent as other livestock sectors, given that historically this sector did not receive production support via the CAP, although they may affect the production of feed used.

Current CAP options for supporting sustainable livestock and feed production

The following section considers options for supporting sustainable livestock and feed production under both Pillars of the CAP. Options considered are as follows:

Pillar I options	Pillar II options
Options for direct payments (SPS): <ul style="list-style-type: none"> • Cross compliance • Regionalised payments • Article 63 • Article 68 	Axis 1 measures e.g. investment in sustainable technology
Options for direct payments (other): <ul style="list-style-type: none"> • Protein Crop Premium 	Axis 2 measures: <ul style="list-style-type: none"> • Agri-environment • Less Favoured Areas
Market intervention measures	

5.3.1 Pillar I options for supporting sustainable livestock production

Of the two Pillar I components - direct payments (SPS) and market measures (export refunds, storage expenditure etc) - the SPS is most significant in budgetary terms. What types of farms receive direct payments, and on what basis, has a significant bearing on the overall impact of these payments.

Options for Direct Payments (SPS) - Cross Compliance

All farmers in receipt of direct aids under the SPS must comply with specific farm level standards or face sanctions in the form of payment reductions, or, in the case of wilful or extreme infringements, withdrawal of support. This means that all livestock farmers are bound by the legislation as it relates to them. However, given that pig and poultry farmers are generally minor recipients of the SPS, cross compliance sanctions mainly apply only to the dairy, beef and sheep sectors (within livestock production) and to arable farmers (who produce feed for the livestock sector).

One of the key Directives in the SMRs in relation to livestock production is the Nitrates Directive which, amongst other requirements, limits the application of manure and fertilisers in order to reduce water pollution. Stringent enforcement of this Directive should, in theory, reduce the level of inputs used by sectors such as dairying. The Water Framework Directive is not included in SMRs but it too has significant implications for intensive farming systems and could, potentially be included in cross compliance requirements⁸⁴.

GAEC is potentially more interesting in terms of promoting certain farming practices that are of benefit to the environment and that go beyond existing legal baseline requirements. Most GAEC standards, however, relate to the management of soils and are not directly relevant to livestock production per se. However, the standard for 'crop rotations' in order to maintain soil organic matter is potentially of interest as a means of encouraging arable farmers to maintain more diverse cropping patterns and grow animal feed crops that could substitute for soya. Such a requirement could be used to promote the use of break crops such as peas and beans, if sufficiently specified.

Prior to the CAP Health Check, it was not clear whether all GAEC standards were mandatory for Member States to implement and, as a result, many Member States applied only certain standards. In 2007, only eight Member States had implemented a GAEC standard relating to crop rotations. France included a standard for maintaining crop diversity and Denmark requires crop rotations. In Greece, the crop rotation farmers' obligation initially required all farmers to cultivate grain legumes on 20 per cent of the holding's arable land. These were to be incorporated into soils to maintain organic matter rather than grown for feedstocks, but the principle of encouraging more diverse cropping was established. This standard was subsequently withdrawn in Greece as it was considered as imposing 'unjust' costs on farmers, and has not been re-introduced. Whilst unlikely to have significant impacts, these examples demonstrate the potential to attach conditions to the SPS that could encourage the production of certain crops such as grain legumes (peas, beans and lupins) that can be used for animal feed.

More directly relevant to livestock production are standards developed under the GAEC issue of 'Minimum Level of Maintenance' and relating to 'Minimum livestock

⁸⁴ Other legislation not included in cross compliance but relevant to intensive pig and poultry production is the Integrated Pollution Prevention and Control (IPPC) Directive which requires operators of installations for the intensive rearing of pigs and poultry over certain size limits to apply for permits.

stocking rates or/and appropriate regimes’ and ‘Maintenance of permanent pasture’ According to Alliance Environnement (2007),

‘11 Member States have developed farmers’ obligations which require farmers to maintain pasture by grazing or appropriate mowing regimes (EL, ES, FR, IE, LT, LU, LV, PL, SE, SK, UK). Spain and Greece have set national minimum stocking levels with regional variations possible, although appropriate mowing regimes are also possible. In France, stocking density criteria are set at local level. In Ireland, specified stocking levels are only set in targeted areas including commonages. In Luxembourg, abandonment of agricultural land is prohibited. In the UK, there are farmers’ obligations for overgrazing, undergrazing and unsuitable supplementary feeding but no stocking densities are specified.’

Many Member States also apply obligations to maintain permanent pasture. In the UK, there are measures in place to prevent the ploughing up of ecologically valuable natural and semi-natural permanent pasture (under the Environmental Impact Assessment Directive). Together, these standards help to maintain appropriate grazing regimes and prevent certain practices associated with more intensive livestock systems e.g. overgrazing. In itself, cross compliance does not therefore actively incentivise more sustainable livestock systems but it can be argued that such standards indirectly encourage such systems.

The way in which cross compliance has been implemented by Member States is highly variable and has been criticised by the EU Court of Auditors. During the period of the CAP Health Check negotiations, some NGOs such as BirdLife International called for a strengthening of cross compliance requirements to improve their environmental impact. However, farmers’ organisations and some Member States called for a ‘simplification’ of cross compliance to reduce the number of requirements for farmers and lessen the administrative burden for authorities. The final Health Check agreement resulted in a number of changes to cross compliance. Most significantly, some of the existing standards in GAEC have become optional for Member States to implement. Included are the standards for crop rotations and the application of minimum livestock stocking rates or/and appropriate regimes discussed above. If Member States already have standards under these now optional standards they must continue to apply them, but for other Member States there is no longer any requirement to apply such standards. This potentially weakens cross compliance and reduces the ‘environmental leverage’ on the SPS. Strengthening cross compliance and enhancing the range of environmental conditions attached to the SPS would have been a more positive step towards supporting sustainable farming systems in both the arable and livestock sectors⁸⁵.

In summary, cross compliance appears to have a number of limitations as an instrument to promote more sustainable farming systems at EU level, given that it acts as a baseline set of standards. It appears that the level of cross compliance standards introduced (particularly GAEC), increasingly relies on the level of Member State

⁸⁵ Two new standards were added to cross compliance – a requirement to establish buffer strips alongside water courses to improve water quality and an optional standard for the establishment and/or retention of habitats to help mitigate the loss of set aside. These are welcome but will not directly address the issue of sustainable livestock and animal feed production.

commitment to the environment. Of all Member States, the UK (particularly England) has taken one of the most rigorous approaches to cross compliance, using GAEC in particular to enforce both newly established and previously existing standards in both the livestock and arable sectors. Following the abolition of set-aside, Defra is now also considering using the two new standards for buffer strips and establishment/retention of habitats to recapture the environmental benefits provided by set-aside. Overall however, there does not appear to be significant scope to add new cross compliance standards that would encourage more sustainable livestock or crop production in the UK.

Options for Direct Payments (SPS) – regionalised payments

The 2003 CAP reform required Member States to introduce the SPS, bringing together previously existing direct payments into one overall payment. The rules allowed for a number of different payment models for the SPS, as set out in Section 3.2.1.

The payment model applied has implications for the distribution of direct payments and hence levels of support for extensive livestock farming systems. The regional model is the most significant of these and implies a shift in funding from intensive arable and grassland areas towards more extensive, marginal farming areas. In other words, extensive farming systems are likely to have gained, in theory, from the introduction of the regional model or where countries have adopted a dynamic hybrid model moving, over time, to regional payments.

Where the historic model has been adopted, past patterns of direct payment distribution are fixed with those areas that historically received high levels of subsidy in the past – mainly intensive, arable areas and intensive grassland – continuing to receive the highest payments now. It is perhaps significant that of the EU-15, 10 Member States (or regions thereof) adopted the historical model, thereby avoiding a re-distribution of direct payments, with the remainder (Denmark, Germany, Finland and UK (England)) mostly adopting a dynamic hybrid model or, in the case of Sweden, Luxembourg and UK (N Ireland) a static hybrid model.

England is an interesting case in that while the dynamic hybrid model was adopted, implying some redistribution of support, three different sub-regions were identified – England normal, England moorland and England SDA non-moorland – with the specific purpose of limiting re-distribution. Without these steps, payments would have shifted from arable and lowland regions to the more disadvantaged land of the LFA where extensive, grass-based farming systems are likely to be more prevalent.

The CAP Health Check now allows Member States to change the basis of SPS payments and shift from historic to regionalised payments. In the UK, Scotland, Wales and Northern Ireland could be encouraged to introduce regionalised payments in order to shift support towards more extensive livestock systems.

Options for Direct Payments (SPS) – Article 63

Following the 2003 CAP reform, a number of Member States chose to continue to pay a proportion of direct payments as coupled payments rather than integrate them into

the SPS. The rules allowed Member States to retain up to 25 per cent of arable support as coupled payments, 50 per cent of sheep and goat payments, 100 per cent of suckler cow payments, 100 per cent of special male bovine payments and 100 per cent of slaughter premium. Coupled payments were also allowed for other commodities such as seeds and hops. France and Spain both chose to retain the maximum amounts possible as coupled payments for the main sectors described above. Other Member States such as Belgium, Denmark, Austria and Portugal also retained a proportion of coupled payments, particularly for suckler cows. The UK chose to fully decouple payments from production, apart from Scotland which decoupled schemes in existence prior to 2005 but introduced new payments coupled to beef production through the Scottish Beef Calf Scheme (under Article 69).

Following the CAP Health Check, Member States must now bring previously coupled support (or a proportion of it) into the SPS (under Article 63 of Council Regulation 73/2009) from 2010. France has signalled its intention to use this Article to create a new fund to make a grassland aid payment⁸⁶. Some €700 million of aid will be allocated on the basis of a maximum stocking density of 0.8 Livestock Units per hectare up to 50 hectares, and 0.5 LU/ha thereafter. A working group is being established to determine the detail of this scheme. The impact of this measure will be to re-distribute support from the more intensive arable and beef sectors and support more extensive, grass-based livestock systems, a key objective of the French Agriculture Minister, according to a recent statement⁸⁷.

Since the UK had already fully decoupled support from production prior to the CAP Health Check, Article 63 is not applicable. Other Member States that have coupled payments may, in due course, decide to use this option. Member States must notify the European Commission of their intentions by 1 August 2009.

Options for Direct Payments (SPS) - Article 68

Section 3.2.3 identifies the potential for the new Article 68 of Council Regulation 73/2009 to be used to protect the environment or support certain types of farming or farms in environmentally sensitive areas. This section considers the ways in which Article 68 could be used in the UK to support sustainable livestock production – primarily for the beef and sheep sectors - and/or to promote protein crop production as an alternative to soya.

Promoting sustainable livestock production

Two recent reports consider the potential for the Article 68 measure to be used in the UK to support High Nature Value (HNV) farming systems. HNV farming systems were first described and defined by Baldock et al (1993), as follows:

⁸⁶ AgraFacts No. 15-09 25-02-09

⁸⁷ Michel Barnier announced proposals for implementation of the CAP Health Check at a meeting on Monday 25 February of the Conseil d'orientation de l'économie agricole et alimentaire (CSO). See <http://agriculture.gouv.fr/sections/presse/discours/michel-barnier-devant>

“High Nature Value (HNV) farming systems are predominantly low intensity systems which often involve a relatively complex interrelationship with the natural environment. They maintain important habitats both on the cultivated or grazed area (for example, cereals steppes and semi-natural grasslands) and in features such as hedgerows, ponds and trees, which historically were integrated with the farming systems’

In the UK such systems are typically extensive grazing systems (mainly beef cattle and sheep) which rely primarily on semi-natural vegetation as the main feedstock. Improving CAP support to such farming systems would be a direct way to support more sustainable farming systems. IEEP (2008a) considers alternative options for the use of Article 68 and identifies HNV grazing systems as a viable option. Swales et al (2008) review policy options for supporting HNV farming and crofting systems in Scotland and identify Article 68 as a measure with some potential, alongside measures such as Less Favoured Areas (LFAs) and agri-environment. Both studies highlight the potential to use Article 68 in the UK to re-distribute Pillar I support from more intensive farming systems such as arable and dairy systems to more extensive, cattle and sheep systems. This would effectively shift support from lowland to upland areas and within upland areas from the less agriculturally disadvantaged to the more disadvantaged areas.

IEEP (2008a) suggest that an HNV grazing measure funded under Article 68 would:

‘...be focused on the retention of grazing, at a stocking density that is attuned to the ecological carrying capacity of the system, on holdings where there is also a significant proportion of semi-natural vegetation, and structural diversity of the cropping system.’

The percentage of SPS that could be applied to such a measure would depend on how such a scheme was drawn up and the extent to which payments were deemed to be coupled to production or not. If payments were considered to be coupled to production because, for example, farmers were required to keep specific types of livestock, a limit of 3.5 per cent of the national ceiling for direct payments would apply. However, if the measure was drawn up in such a way that it provided support for ‘specific agricultural activities entailing additional agri-environment benefits’ then up to 10 per cent of the total national ceiling could be used. A 10 per cent cut in SPS in England would, according to IEEP (2008a) result in an amount approximately equal to the current budget for the Entry Level Stewardship Scheme being available for such purposes, and in Scotland would give an amount greater than the current total agri-environment expenditure. These are significant levels of funding, which unlike agri-environment expenditure, do not have to be co-financed by the Member State, which may be attractive to some countries. The wider policy implications of using Article 68 to fund an ‘agri-environment type’ measure are discussed further below.

Promoting protein crop production

Article 68 could also be used in the arable sector to support environmentally sustainable production including greater use of crop rotations. This could help indirectly to promote the production of protein and other crops for animal feed as

alternatives to imported soya. There has been limited use of this mechanism in the arable sector to date (under Article 69). Only Finland and Italy have offered such payments to arable producers, in the former to reduce nutrient leaching by maintaining a winter crop cover and in the latter to promote quality production and crop rotations that improve soil fertility. IEEP (2008) review an Article 68 option to encourage environmental management of arable and fallow land, primarily to improve water quality and to benefit biodiversity. In addition to prescribed management practices such as leaving uncultivated margins and winter stubbles, IEEP suggests that:

‘...there could be a requirement on the holding to ensure a mixed crop rotation, whereby at least 25 per cent of the cropped area must be a second crop type (i.e. other than winter wheat), for example forage, oilseeds, legumes or spring crops to improve crop heterogeneity and counteract the increasing trend towards simplified arable systems where the predominant crop tends to be winter wheat.’

In this way, farmers could be indirectly encouraged to grow protein crops which could be sold for animal feed or used for on-farm feed where livestock are also reared. Specifying that certain crops must be grown would effectively constitute a coupled payment and the proportion of the total national ceiling that could be used in this way would therefore be limited to 3.5 per cent.

Wider policy implications and impacts of using Article 68

Using Article 68 in this way raises some important policy questions about the longer term direction of the CAP beyond 2013. Whilst the idea of using Pillar I money to finance sustainable production or agri-environment type measures appears initially attractive, given current constraints on Pillar II budgets, such an approach could have the effect of providing greater justification for Pillar I in the long term. This is likely to be of concern to those Member States such as the UK, Sweden and Denmark that support a radical reform of the CAP and phasing out Pillar I payments as well as to NGOs such as BirdLife International which argue for a new CAP predicated on Pillar II type support. However, some Member States and possibly farmers’ organisations are likely to find the idea of justifying Pillar I on environmental grounds attractive and a means of securing on-going funding. The use of Article 68 therefore needs to be considered in the context of longer term objectives for the CAP (see section 5.3.3 for further discussion).

While the UK Government supports more substantive reform of the CAP in the longer term, the position of the four UK devolved countries on the use of Article 68 in the short term is not entirely clear. Scotland is the only country to have used the previous Article 69 in the form of the Scottish Beef Calf Scheme. However, an evaluation of the scheme carried out by the Scottish Agricultural college (SAC(2008a)) highlighted that this scheme provided limited support to beef producers and was not sufficiently targeted to support the more extensive and environmentally beneficial production systems. Scotland may continue to use Article 68 to support the beef sector but the scheme would need to be substantially revised if it is to target more sustainable production. The position of the administrations in England, Wales and Northern Ireland regarding the use of Article 68 is not yet known, although any significant use would seem unlikely given it has not been used to date. The intentions of other

Member States in relation to Article 68 are also not clear, although France's Agriculture Minister has recently announced his intention⁸⁸ to use the measure to support various activities and sectors including the sheep and goat sector, milk producers in mountain areas, vegetable protein crops and organic production. A total of €385 million will be made available by reducing direct payments under the SPS. A working group is to be established to define the exact criteria for allocation of the aid and the first draft regulations are anticipated in March 2009 with the work of the group being completed no later than September or October.

The overall farm level and environmental impacts of using Article 68 are difficult to judge at this stage. Article 68 essentially results in a redistribution of support from one group or type of farms to another resulting in 'winners and losers' in financial terms and uncertain environmental impacts. An Article 68 HNV type measure, for example, would provide additional support to economically vulnerable, extensive livestock producers, and is likely to help such farms remain in business. The Royal Society of Edinburgh (2008) and SAC (2008b) both highlight the precarious economic position of extensive beef and sheep farming in Scotland, especially in the more disadvantaged regions, and the declining trend in livestock numbers. This is a situation mirrored elsewhere in the more agriculturally disadvantaged regions of the UK e.g. upland areas in the south-west, north-west and north-east of England, parts of Wales and Northern Ireland. Shifting financial support from more intensive arable and livestock producers to such farmers could therefore make a significant contribution to supporting more sustainable livestock systems, important for retaining biodiversity, landscape and other local environmental benefits.

However, the impact of this on the more intensive producers is less clear. Given strong market drivers, there is no evidence to suggest that incentivising extensive production methods in this way will necessarily reduce overall levels or intensity of production within the UK livestock sector. Indeed, such redistribution of payments would be likely to lead to further re-structuring within the arable, dairy and intensive beef sectors, resulting in fewer, larger farms. The intensive livestock sectors are unlikely to significantly change production methods and will continue to rely on imported feed stocks such as soya, perhaps more so, as they will be increasingly exposed to market forces and highly price sensitive in relation to inputs. Under such a scenario, consumer choice of livestock products becomes an important factor. If consumers can be persuaded to purchase meat and dairy products from more sustainable sources, for example through information, labelling and educational campaigns, this would further help to support extensive livestock producers. This issue is discussed further in section 5.4.

Options for Direct Payments (other) – Protein Crop Scheme

Opportunities under Pillar I to directly increase protein crop production in the UK and EU are somewhat limited. Successive reforms of the CAP have gradually reduced crop specific support, including for protein crops such as oilseed rape, and shifted towards decoupled payments under the SPS. Farmers are increasingly free to choose what crops to grow in line with market demands. There currently remains a Protein

⁸⁸ Michel Barnier's speech to the Conseil d'orientation de l'économie agricole et alimentaire (CSO), *op cit.*

Crop Premium Scheme for peas, beans and lupins which may act as an incentive to some farmers to grow such crops. France is allocated the highest budgetary amount for this Premium, presumably reflecting past production levels. However, these payments are to be integrated into the SPS from 2012 or earlier if a Member State so chooses. Given the UK's position on decoupling, it seems likely that this Premium will be phased out in 2010 although a case could potentially be made for continuing it on environmental grounds until 2012.

Market measures

Historically, the CAP has provided substantive support to European farmers through market measures such as export refunds, import tariffs and intervention buying. Successive reforms of the CAP have sought to introduce a more market orientated policy, reducing the level of market support to farmers and compensating loss of income through direct payments. Today, income support measures in the form of the SPS far outweigh market measures in budgetary terms. The recent Health Check has further reduced market measures by ending intervention buying for most commodities including pig meat and reducing limits for intervention for butter and skimmed milk powder. This should reduce the incentive for all livestock producers, but particularly the more intensive producers, to produce at levels beyond market requirements.

Further pressure to reduce EU market support e.g. through export refunds and to liberalise agricultural markets is being applied through WTO negotiations under the Doha Development Round, as discussed at section 5.2. Given the reduced emphasis on market measures within the CAP, and the broad commitments by the EU and other trading nations to reduce market intervention in agriculture, there appears to be limited value in focusing on market measures as a means of achieving more sustainable livestock production in the UK or EU more widely. In addition, as already discussed, there is little scope for the UK/EU to impose import tariffs on soya as, unlike some other commodities, soya is already deemed tariff free under existing WTO agreements.

5.3.2 *Pillar II options for supporting sustainable livestock production*

As highlighted in section 3.3, there are a number of measures within Pillar II of the CAP linked to the livestock sector including the LFA and agri-environment measures in Axis 2 and measures to promote, more generally, the competitiveness of agriculture in Axis 1. Agri-environment measures include support for organic farming; this is one of the few measures to support a whole farming system as opposed to requiring farmers to undertake specific activities designed to yield environmental benefits. This is a key point since most Pillar II measures are not targeted at supporting specific sectors or production systems but rather focus on achieving specific environmental outcomes. Production systems and environmental outcomes are, of course, related and one cannot be achieved without the other, but the rationale for environmental schemes is one of compensating farmers for undertaking specific environmental commitments beyond mandatory requirements, and not to support types of farming per se.

The extent to which Pillar II measures will benefit sustainable livestock production over the 2007-2013 programming period is determined by:

- The overall budgetary allocation to the different Axes;
- The objectives of the different measures applied; and
- The detailed implementation of different measures including eligibility criteria, management activities required and payment rates.

A full assessment of the likely impacts of Pillar II on livestock production and its potential to support sustainable production would require detailed analysis of individual Rural Development Programmes which is beyond the scope of this study. The following sections therefore offer a broad analysis, based on past studies, of how different Pillar II measures might be expected to support sustainable livestock production and to what extent.

Axis 1 measures

Axis 1 includes a number of measures to help improve the competitiveness of the agricultural sector including: support for advice and training; aiding restructuring and developing the potential of businesses; adding value to agricultural products; and, improving the quality of agricultural production and products. IEEP (2008b) indicates that for the 2007-2013 rural development programming period, Member States intend to allocate the greatest proportion of Axis 1 funding to two measures: the modernisation of agricultural holdings and adding value to agricultural and forest products. Expenditure levels across the different Member States are however highly variable with some Member States allocating a relatively low proportion of their budgets to Axis 1 measures e.g. Finland, UK and Austria (c. 10 per cent) and some Member States allocating a large proportion of their budgets e.g. Portugal, Spain and Belgium (c. 45-60 per cent). England has specifically indicated that it will use funds from voluntary modulation⁸⁹ to help support the livestock sector through a range of Axis 1 measures in the wake of problems such as Foot and Mouth Disease, BSE and bovine TB.

There is considerable potential for Axis 1 funding to be used to support more sustainable farming systems. WWF et al (2005) suggest that the modernisation of agricultural holdings measure could be used to support investment in water saving technologies and in infrastructure such as slurry storage and pesticide handling facilities, thereby helping to improve the sustainability of the livestock sector. They suggest that the adding value to agricultural products measure could be used to help process and market products derived from sustainable land management and to develop food quality schemes based on environmental criteria e.g. for products from conservation grazing. Axis 1 measures could therefore be applied in such ways as to support and promote sustainable livestock production.

Axis 2 measures

Key measures in Axis 2 that can help to support sustainable livestock production include the LFA and agri-environment measures. In the UK, these two measures are most significant in terms of rural development expenditure and area covered.

⁸⁹ ~£100 million, depending on €£ exchange rate, over the period from 2007 until 2013.

LFA measure

LFA policy is traditionally socio-economic in nature, designed to maintain farming through supporting farm incomes in areas where farming is disadvantaged by climate, topography, geology and remoteness from markets. More recent iterations of the policy have added specific environmental components reflecting the requirements of certain Community environmental legislation. Livestock farmers are the main recipients of LFA support but the extent to which these payments support low input, extensive farming systems across the EU is variable. IEEP (2006) undertook a full evaluation of the LFA measure in 25 Member States and concluded that:

- ‘The LFA measure is helping to maintain farming but with variable results at the more specific land management level. The focus on livestock farms has helped to address the key environmental issue of continued grazing on farms where profitability tends to be low, and this has made a major contribution to meeting nature conservation and landscape goals over a significant area. Other habitat types have benefited less from the LFA measure and intensive production is a concern in some areas.
- Achieving environmental objectives through the LFA measure requires its application – in terms of eligibility criteria, payment conditions and rates – to be done in such a way as to incentivise behaviour that leads to environmental protection and to target those recipients best able to contribute to achieving such objectives. This implies a more precise targeting on farms where the threat of land abandonment is greatest, and on low intensity systems, with irrigated land generally excluded.
- In environmental terms, there have been synergies with other CAP measures with respect to maintaining land management. The LFA measure complements rather than competes with agri-environmental schemes.’

The LFA measure appears to have an important role to play in providing support for farms falling within its boundaries but much could be done to improve the effectiveness and efficiency of the measure in achieving environmental outcomes and, in particular, to target support at sustainable livestock systems. The measure is currently under review at EU level and this may result in changes to the policy which could improve targeting.

It is also worth noting that the measure is not compulsory within Pillar II and Member States do not need to operate an LFA scheme. In England, Defra has already taken the decision to end the LFA scheme and use the agri-environment measure from 2010 in order to provide more targeted environmental support in upland areas. In Scotland, however, the measure remains a central component of Pillar II. For the 2007-2013 rural development programming period, the LFA measure will receive the largest share of Pillar II expenditure (23 per cent) followed by the agri-environment measure (14 per cent). The likely impact of ending the LFA scheme and using the money to fund agri-environment measures in upland areas is to re-distribute support from more intensive (although still relatively marginal compared to lowland livestock production) LFA farms to more extensive, environmentally beneficial farming systems. This is therefore an option that might be promoted more widely in order to support more sustainable livestock production. However, the impact on farm incomes and production responses needs to be considered carefully. The loss of income by some farmers could encourage further intensification, which is clearly not desirable

and there are concerns that, because of the way agri-environment payments are calculated, such schemes cannot fully compensate for the loss of LFA payments.

Agri-environment measure

The agri-environment measure is a key measure capable of providing direct support for sustainable livestock systems (and the management practices that underpin them). Member States, including the UK, already use this measure to maintain and encourage sustainable farming practices on both livestock and arable farms. A study of measures agri-environment measures (CRER et al, 2002) found that measures involving extensification of grassland (including conversion from arable land) or the extensification of arable land were widely available in Member States and many schemes were targeted at upland areas where extensive livestock farming systems already prevailed. Agri-environment measures were therefore being used to maintain such extensive systems in the face of pressures to abandon land on the one hand or intensify on the other. Most Member States have further developed schemes since 2000 but an emphasis on grassland measures and maintaining extensive systems remains a priority for many schemes. France is notable in operating an agri-environment grassland premium, the so-called Prime Herbagère Agro-Environnementale (PHAE). It has recently indicated its intention to increase funding to this measure by €84 million, by shifting funds from Pillar I to Pillar II via modulation, following the CAP Health Check reforms.

From the perspective of supporting sustainable livestock production, agri-environment measures are needed which encourage, amongst other activities:

- The maintenance of appropriate stocking densities and grazing regimes on semi-natural vegetation
- Restrictions on input use on in-bye pasture and meadows
- Restrictions on timing of certain operations e.g. mowing
- Moorland management e.g. by burning
- Grip blocking
- The use of traditional breeds of livestock for grazing
- Management and/or restoration of specific habitats

Whilst many agri-environment schemes already target and support extensive farming systems, they appear less effective in targeting intensive farms. Oréade-Brèche (2005) in an evaluation of agri-environmental measures for the European Commission concluded that:

‘...the attractiveness of the measures for intensive farms must be improved, as they remain, at the present time, mostly outside the schemes, even though they are often the most problematical ones from an environmental point of view. As the contexts vary in the different MS, the solutions to this problem must be found at the individual level of each country.’

Greater effort would therefore appear to be required to make schemes appropriate to, for example, dairy farming systems and to encourage farmers to enter such schemes.

The agri-environment measure can also be used to support organic farming systems. All Member States use the agri-environment measure in this way, although levels of support vary. Supporting organic farming is one of the most direct ways to support more sustainable farming systems, as opposed to encouraging specific management practices. Organic production has increased in recent years in the EU encouraged by agri-environment payments supporting conversion to and the maintenance of organic farming methods. The main advantages of organic farming (see section 2.2.6) are considered to be:

- Higher market prices
- Less intensive use of land and better protection of the environment (although some forms of organic production can still be relatively intensive e.g. dairy production)
- Achieving a better balance between supply of, and demand for, agricultural products

The European Action Plan for Organic Food and Farming sets out ‘... 21 initiatives to achieve the objectives of developing the market for organic food and improving standards by increasing efficacy, transparency and consumer confidence. The plan aims to achieve measures such as improving information about organic farming, streamlining public support via rural development, improving production standards or strengthening research.’⁹⁰

The Action Plan ‘strongly recommends’ that Member States make full use of their rural development programmes to support organic farming, including providing support for conversion, advice and training and to facilitate the distribution and marketing of produce. In particular, it suggests that organic farming should be the preferred management option in environmentally sensitive areas.

Further expansion of organic farming could be a key means of switching from more to less intensive livestock systems and reducing the reliance on imported feedstocks such as soya beans. However, it should be noted that organic farmers can still use imported soya in feed as long as it is organically produced although the organic standards require that at least 60 per cent of dietary intake for grazing livestock (dairy, beef and sheep) must consist of forage and roughage.

Future prospects for Pillar II and funding issues

This brief analysis indicates that there is considerable potential to use Pillar II measures to encourage and support more sustainable farming practices in the arable and livestock sectors and to promote sustainable farming systems such as organic farming. Within the framework of EAFRD, Member States can determine rural development priorities at national and regional level and choose how to allocate budgets accordingly. Priorities, budgetary allocations and measures selected are therefore highly variable across the Member States and to greater and lesser extents promote more sustainable farming methods. Member States have opportunities to revise their RDPS throughout the programming period and, in many cases, greater

⁹⁰ http://ec.europa.eu/agriculture/organic/eu-policy/action-plan_en

emphasis could be given to Axis 2 measures and to using them to encourage extensive grazed livestock systems and diversified arable systems. Greater emphasis could also be given to designing measures for intensive farming systems such as dairying. The pig and poultry sectors (which are dominated by indoor production systems), however, do not lend themselves to the application of agri-environment measures.

The overall level of funding for Pillar II – and hence its ability to support sustainable agriculture - remains a key issue with the CAP budget still heavily dominated by Pillar I support. The recent CAP Health Check has increased the rate of modulation – the mechanism by which funding is switched from Pillar I to Pillar II – but Pillar II remains substantially underfunded in comparison to the demands made on it. In the longer term, a more substantive reform of the CAP that phased out Pillar I support and increased Pillar II type funding would do much to shift the balance of support away from more intensive production systems to less intensive ones that achieve sustainable land management. The forthcoming EU Budget Review will be the next opportunity to consider such a reform of the CAP beyond 2013 (see section 5.3.3 for further discussion).

Summary of current CAP options to support sustainable livestock and feed production

The preceding sections have reviewed a range of current CAP options that could be used in the UK, and EU more widely, to support sustainable livestock and feed production and thereby reduce reliance on imported soya for livestock feed. The options and their potential benefits/impacts are summarised in Table 35.

Table 35 Summary of current CAP options to promote more sustainable livestock and feed production in the UK

CAP Measure	Use of measure	Benefits/impacts
Pillar I measures:		
SPS - Cross compliance	Enforcement of legislative requirements and GAEC standards to prevent environmental damage from intensive arable and livestock systems	Potential to reduce diffuse pollution, prevent overgrazing, promote crop rotations etc and encourage environmental protection rather than enhancement
SPS - Regionalised payments	Shift SPS from historic/static hybrid to area payments in Scotland, Wales and Northern Ireland	Re-distributes support from intensive arable and livestock producers to more extensive producers (generally from lowland to upland areas)
SPS - Article 63	Not applicable in UK but possible for those Member States with coupled payments	Allows support to be re-distributed from more intensive to less intensive systems or specific types of production e.g. grass-based livestock
SPS - Article 68	Applies cuts to SPS payments and allows funds to be used to support types of production important for environment or agri-environment type measures	Re-distributes support from more intensive to less intensive arable and livestock systems and encourages sustainable farming practices of benefit to environment
Protein Crop Premium Scheme	Provides support to producers of peas, beans and lupins but only available until 2012 when payments must be incorporated into SPS	Incentivises production of protein crops which can be used for animal feed and may reduce dependency on imported soya
Market measures	Measures such as export refunds and intervention buying indirectly support production of certain commodities. Recent reforms have further reduced use of these measures at EU level.	Ending market intervention reduces incentives for production and encourages more market orientated agriculture. Likely to have greatest impact on most intensive producers, especially dairy and pig farmers.
Pillar II measures:		
Axis 1	Can be used to support investment in infrastructure such as water saving technology and waste storage and handling	Potential to improve water quality, reduce diffuse pollution and improve on-farm energy efficiency etc and thereby reduce negative environmental impacts of more intensive livestock systems
Axis 2: LFA measure	Income support measure for farmers in agriculturally disadvantaged areas. Payments could be better targeted to support low intensity and environmentally beneficial farming systems	Potential to support extensive, grass-based livestock systems in areas of environmental importance
Axis 2: Agri-environment measure	Payments for undertaking specific environmentally beneficial farming practices and to support organic farming	Potential to support extensive, grass-based livestock production linked to environmental land management and encourage more sustainable arable farming systems including crop rotations

5.3.3 Longer term CAP reform options for supporting sustainable livestock and feed production

Whilst much can be done within the current framework of the CAP, between now and 2013, to promote more sustainable livestock farming in the UK and reduce dependency on imported soya, there are strong economic, social and environmental arguments building for a more fundamental reform of the CAP. A key driver of future CAP reform is likely to be the EU Budget Review which was initiated in September 2007. The outcomes of this Review will determine the next EU Financial Framework for 2014 onwards. CAP expenditure is likely to face significant challenges, with competing demands for funds for research, innovation, job creation and competitiveness exerting downward pressure on agricultural spending.

Prompted by the Budget Review, discussions about the future of the CAP beyond 2013 have already begun amongst Member States, academics, NGOs and other key commentators including farmers' representatives. IEEP (2009) reviews the state of the CAP reform debate to date and highlights the different positions and arguments put forward for future support to EU agriculture. IEEP notes that:

'The documents published to date variously justify future public expenditure on agriculture through the use of terms such as 'public goods', 'environmental services', 'public services' and 'socially desirable values'.'

A number of organisations, primarily environmental ones, present ideas for the possible future structure of a European agricultural policy which they justify on the basis of the provision of public goods. IEEP (2009) offers a technical definition of this term and their own interpretation of how it might apply to farmland biodiversity, as follows:

Public Goods and Agriculture

One of the most widely used technical definitions of a public good is one which is defined by the attributes of non-rivalry and non-excludability. In other words, if a public good is consumed by one person, others cannot be excluded from consuming it (non-excludability) and in consuming it, the supply is not depleted (non-rivalry). In practice, there are few pure public goods (in the strictest sense), and many are 'quasi public goods' since, for example, there may be a practical limit to the number who can consumer them (e.g. overcrowding at a viewpoint of an attractive agricultural landscape).

In the farming context, this could mean that the rare flora and fauna provided by certain farming systems are a public good. There is no limit to their consumption (interpreted here in terms of the numbers who can view the flora and fauna or gain enjoyment from knowing of their existence) and no one can be excluded from their consumption (for example, you do not have to pay a fee to specifically view these species). However, the lack of a market to provide these public goods creates a case for public policy intervention and an associated spending programme in order to support the farming systems with which rare flora and fauna are associated.

Several organisations promoting a reformed CAP advocate a ‘tiered’ approach to a new system of payments for farmers in order to deliver public goods. WCL (2008, cited in IEEP, 2009) advocate a lower level of support for meeting cross compliance requirements, a higher level of support for resource protection and environmental enhancements and the greatest level of support for environmental enhancement in target areas. Notre Europe (2008, cited in IEEP, 2009) suggest a three tier ‘Contractual Payments Scheme’, as follows:

- Tier 1 – a basic husbandry payment, available to all farmers, paid at a flat rate on all farmland maintained to basic environmental standards
- Tier 2 – a natural handicap payment coupled to farming activity that produces ‘environmental services’, paid in defined areas with natural handicaps
- Tier 3 – a green points payment, based on costs incurred and the value provided to society, and paid for the provision of ‘designated environmental services of higher value’

WWF (2008) proposes a similar tiered structure of payments as follows:

- Legislative baseline (no payments) for environmental protection – applicable to all farmers in receipt of public payments or not;
- Level 1 – basic area based payments for environmental maintenance + specific rural development assistance; and
- Level 2 – targeted payments (including special areas e.g. Natura 2000) for environmental enhancement.

In addition, WWF suggests public funds would be used to provide advice and training for farmers and all farmers receiving payments would be required to complete a management plan for the land to be entered into agreement.

There is, as yet, no consensus on what a reformed CAP should look like, the rationale for public payments or what kind of payments should be made to farmers. The debate is very much open and new ideas are likely to emerge in the coming months. What is clear is that a number of Member States, particularly the UK, Sweden, the Netherlands and Denmark, and some environmental organisations and academics are advocating radical reform of the CAP, with a phasing out of the current two Pillar structure and a shift towards a new system of environmentally/socially focused payments.

The impact of such proposals on different farming sectors, farm types and the environment is very difficult to judge although, in broad terms, they would be expected to reduce the level of public support to intensive, environmentally damaging land-based farming systems and increase support for more extensive and environmentally beneficial ones. Sustainable livestock farming systems – particularly beef, sheep and dairy - might be expected to benefit financially under such proposals and their future be more secure. The impact on, and response of, currently intensive livestock systems to such reforms is more difficult to anticipate. The removal of Pillar I support might, on the one hand, result in further specialisation and concentration of production in the beef, sheep and dairy sectors as some farmers become more market orientated. Other farmers may choose to extensify production in order to qualify for the public payments on offer and enter land into environmental agreements. The pig

and poultry sectors, particularly intensive, housed production systems, are likely to be relatively unaffected by such CAP reforms as they are currently minor recipients of CAP support and unlikely to be attracted to or eligible for environmental payments. Market factors will continue to have a much greater influence on how such systems develop in future.

It is feasible that overall levels of livestock production in the UK, and EU more generally, could decline as a result of such reforms. This could be beneficial in terms of reducing greenhouse gas emissions from the livestock sector and may reduce demand for imported soya for feed, although impacts on feed demand would depend on where the contraction in production occurred. Loss of livestock from upland and more marginal farming areas i.e. predominantly grass based systems, would have limited impact on current feed demand and would have negative impacts on the environment in terms of biodiversity and landscape, which is clearly not desirable. Concentration of livestock production into fewer but larger and intensively managed farms is likely to have a range of environmental impacts, both positive and negative, and may not help to reduce overall demand for imported feedstocks. Even if intensive producers responded by extensifying production, this would not necessarily reduce demand for imported feedstocks such as soya, particularly for those sectors who use a greater proportion of high energy proteins within their feed, such as the poultry sector. In these cases extensification of production may simply serve to extend the number of days needed to produce the necessary growth, and may lead to greater feed requirements per unit of output (kg of meat, eggs or dairy product) than within more intensive systems. However, in combination with a reduction in consumption of livestock products, extensification has the potential to reduce overall environmental impacts – less so if overall production and consumption of livestock products remain static or even increase.

As noted in section 5.2, studies on the impacts of trade liberalisation are helpful in understanding the potential impacts on farming of removing various types of trade distorting and income subsidies, but tend not to consider the impacts of providing alternative support through payments for public goods or environmental services. In other words, they only provide half of the picture that a reformed CAP would deliver. What this suggests is that possible CAP reform options, such as those highlighted above, need to be accompanied by comprehensive economic, social and environmental impact assessments to understand the likely overall effects. At this stage however, most proponents of CAP reform are focusing on advancing principles and ‘broad-brush’ ideas designed to build support for reform rather than advancing concrete and costed proposals. As more of a consensus about the future direction of the CAP builds, more work on the latter might be anticipated.

5.4 Promoting reduced consumption of livestock products/influencing consumer behaviour

World demand for livestock products is set to grow as population increases and greater consumer affluence allows many people to shift away from plant-based diets. FAO (2006) show that much of the increased production needed to meet this demand is likely to come from intensive production systems. Given the negative impacts of intensive livestock production on the earth’s natural resources and the growing body

of evidence of the impacts of excessive consumption of livestock products on health, reduced consumption could yield a number of benefits.

But the idea of reducing meat consumption is, in today's society, something of anathema both culturally and economically. As Jonathan Porritt argues in the foreword to Gold (2004), eating meat retains a certain 'cachet' even in our more affluent society and politicians appear unwilling to challenge the food and farming systems that produce it. Reducing the consumption of meat and other livestock products and influencing consumer behaviour to give preference to sustainably produced products is a significant challenge. Possible policy approaches to achieving this include:

- Internalising the costs of production and make 'cheap meat' more expensive and sustainably produced products relatively more competitive;
- Promoting sustainably produced food to consumers through appropriate labelling and information campaigns, enabling consumers to make more informed choices; and
- Running educational campaigns on healthy diets and informing the public of the benefits of eating less meat.

5.4.1 Internalising the costs of production

The first step towards more sustainable production is to re-balance market supply and demand by removing all market and trade distorting subsidies, as discussed earlier in this report. At the same time, CAP measures such as Article 68 and Pillar II measures can be used to support extensive, grass based livestock systems that rely less on imported feed and are more environmentally sustainable. But even if this were to be achieved, intensive pig, poultry, dairy and beef systems are likely to continue and, arguably, dominate the livestock sector in the UK and EU. This raises the question as to whether other policy tools or measures can be applied to such intensive systems to prevent negative environmental impacts or shift such systems towards more sustainable farming practices.

It is often argued that intensive livestock systems that give rise to environmental problems such as soil erosion, water pollution and loss of biodiversity, are viable because the costs of dealing with these problems are passed on to taxpayers and consumers, for example through charges made by water companies, rather than being borne by the producer. Internalising such costs into the cost of production through more effective enforcement of the 'polluter pays principle' could be a partial solution to deal with this issue. The price of consumer products such as meat and milk would be likely to rise under such a scenario, as producers are likely to pass on production costs to consumers, but prices would better reflect the true costs of production. The higher prices that would arise for more intensively produced commodities would then be more comparable to prices for sustainably produce commodities which tend to already reflect the higher costs of production, organic produce being the best example of this currently. This may not be a politically attractive solution, but higher prices might result in changes in consumer purchasing, with meat and other products consumed less frequently.

Such a solution would require more stringent application and enforcement of environmental legislation – and possibly new legislation - in the livestock sector. The Nitrates Directive, Water Framework Directive (WFD) and Integrated Pollution Prevention and Control (IPPC) Directive already have significant implications for livestock producers in the UK and EU, placing restrictions on waste management and disposal to reduce nutrient leaching into ground and surface water bodies. In the case of the WFD, Member States have until 2015 to achieve good ecological status for all water bodies in their territories. They must identify River Basin Districts and operationalise management plans to achieve the objectives of the Directive. The EU is also in the process of bringing forward a Framework Directive for Soil which may have implications for livestock producers. Effective enforcement of such legislation has a critical role to play in ensuring application of the polluter pays principle, and as long as Pillar I direct payments continue, cross compliance has an important role to play in enforcing compliance with key environmental legislation.

Dealing with such problems is not confined to the EU. Many of its competitor countries also face environmental problems arising from intensive livestock production. The OECD (2004b) notes that all OECD countries, including the US, Canada and New Zealand, impose regulatory requirements to address the negative impacts of agriculture on the environment, ranging from outright prohibitions to standards and resource use requirements. The Nutrient Management Act in Ontario and the Water Protection Plan in Manitoba, which set targets for N and P levels and regulate some activities such as the timing of manure spreading to land, are two examples of regulatory approaches applied at Provincial level in Canada to control water pollution from intensive livestock operations. In the US, the Clean Water Act requires Concentrated Animal Feed Operations (CAFOs) to have pollution permits and implement nutrient management plans. In New Zealand, water protection is driven by the Resource Management Act; farmers themselves remain responsible for resource management and authorities charge farmers in order to recover the costs associated with programmes and applications. Nutrient flows from agriculture into Lake Taupo were such that in 2004 national and local governments agreed to fund a total package of nearly NZD 82 (USD 54) million to limit nutrient flows through restrictions on land use and allowing nitrogen trading to occur. Economic instruments such as input taxes e.g. on nitrogen and phosphorus in fertiliser and feed concentrates, are also possible means of internalising the externalities of agriculture (Helming, 1998).

The greater use of regulatory and fiscal approaches to combat problems such as water pollution arising from intensive livestock systems could be further explored as a means of internalising the external effects of intensive production and influencing consumer behaviour through price signals.

5.4.2 Labelling and information campaigns

As recent TV campaigns about poultry production, by celebrity chefs such as Jamie Oliver and Hugh Fearnley-Whittingstall, demonstrate, many consumers are unaware of the conditions under which livestock are often reared, or confused about the differences between, for example, poultry production systems such as battery, barn reared and organic. Providing consumers with greater information about types of production and farming methods, enabling them to make informed choices about the

products they buy, could be another key step towards supporting more sustainable livestock products.

The European Commission recently issued a Green Paper on agricultural product quality⁹¹ consulting on the role of EU policy in protecting and promoting the quality of agricultural products. As the Paper notes, EU farmers already have to adhere to a range of farming requirements, defined by legislation, in relation to matters such as food safety and hygiene, animal welfare and protecting the environment. EU marketing requirements also lay down *'...definitions of products, minimum product standards, product categories, and labelling requirements to inform consumers for a significant number of agricultural products and some processed foods'*. These products include beef and veal, eggs, poultry and pig meat, milk and milk products. Obligatory elements of marketing standards include: product identities; farming requirements; and, quality and size classifications. Optional, reserved terms can also be applied to products which correspond to defined farming methods or product characteristics. For example, poultry meat can be marketed with terms such as 'fed with...', 'extensive indoors', 'free-range' or 'traditional free-range'. The Green Paper raises some interesting questions such as whether reserved terms describing farming methods in particular sectors, such as 'mountain product', 'farmhouse' and 'low carbon' should be laid down by the EU to avoid consumer confusion.

The EU also has a system of 'geographical indication' describing products or foodstuffs that owe their characteristics or reputation to the geographical area from which they originate. Two categories exist: Protected Designation of Origin (PDO) and Protected Geographical Indications (PGI). A key question posed by the Commission of relevance to this study is whether specific sustainability criteria should be included as part of the specification, whether or not they are intrinsically linked to origin? The Green Paper also highlights that there are a number of candidates for further EU schemes including product of high nature value or mountain areas, welfare quality, an EU origin label and extension of the Ecolabel scheme to processed agricultural products. It notes that any new scheme would need to reflect EU needs, and cites the challenges of climate change, conservation of biodiversity and water use. The concept of a high nature value or extensive production scheme is of particular interest in the context of this study, given arguments made earlier for the use of Article 68 to support extensive, HNV grazing systems.

The Paper also notes the importance of organic certification and the growth in demand for organic produce exceeding supply. It highlights that whilst all organic food in the EU must be produced according to common EU standards, the market for organic food is fragmented along national lines with national supermarkets tending to stock products certified by national certifiers. The Commission suggests that the challenge for the EU is to *'...create a functioning internal market for organically produced products without losing or diluting the reputation and credibility of the organic label'* and asks how the market might be made to work better. This recognition of the importance of organically produced food is helpful and when allied with Pillar II aid to support conversion to and the maintenance of organic farming (as

⁹¹ COM (2008) 641 final. Green Paper on agricultural product quality: products standards, farming requirements and quality schemes

discussed earlier), is a positive step towards supporting more sustainable farming methods. Gold (2004) suggests that: *‘An inevitable consequence of a switch to organic methods would also be a reduction in the livestock population and meat consumption, since limitations on stocking densities are part of the organic ethos. It would simply be impossible to conform to the environmental and animal welfare standards demanded by organic standards and to keep anything approaching the current population of farm animals.’*

At this stage, the Commission is only consulting on these issues and there is likely to be a wide range of views among EU stakeholders as to the appropriateness of some of the suggestions put forward. The Green Paper indicates however that there is considerable potential to use marketing and labelling standards for EU livestock products to promote those produced according to more sustainable farming methods. Labelling could potentially be used to denote ‘soya free’ or ‘grass-fed’ products, whilst standards could be applied to prescribe the conditions under which certain products are produced. Defining relevant criteria and production systems such as ‘HNV farming systems’ or ‘soya free’ is not without difficulties however, and finding ways to easily communicate these to consumers through labelling is likely to be challenging. This is potentially an area that warrants further consideration.

There are limitations however to the use of farming and marketing standards for imported produce. The Paper notes that whilst the EU *‘...can and does insist that imported foods meet minimum product standards, especially concerning hygiene and safety, the checking of the farming methods used in the production of imported agricultural products and foods is a matter for legislation in the country of production.’* The EU is therefore unable to specify farming standards, protection of the environment, animal welfare, and worker safety in relation to production in other countries. The development of an EU origin label, alongside other sustainability labels, could be one means of helping consumers choose products produced, in many cases, to the higher standards of the EU.

In addition to public sector requirements, there has been a proliferation in recent years of privately established certification and food assurance schemes in the UK, EU and globally. Many of these schemes are led by the farming, food manufacturing and retail industries as a means of communicating food standards or quality attributes to consumers. The Green Paper covers this topic and identifies a number of drivers behind the development of such schemes including:

- A desire for consumers to reconnect with agriculture and give preference to local and seasonal products from farming systems that sustain both nature and society;
- The environmental concerns of combating climate change, managing natural resources such as water and soil more efficiently, and preserving biodiversity;
- Promotion of nutritional qualities of foodstuffs;
- Societal concerns: the Fair Trade label is an example of such a scheme; and
- Animal welfare: private schemes promoted by animal welfare groups and farmers working with retailers and the scientific community, generally certifying that higher than minimum requirements are met.

The Commission notes that, ‘...the proliferation of schemes and labels in recent years has given rise to concerns about the transparency of schemes’ requirements, the credibility of claims made and their possible effects on equitable commercial relations.’ The main private scheme in the UK is that owned by Assured Food Standards (AFS), which markets produce with the Little Red Tractor logo. Sector schemes under the umbrella of AFS cover all the main agricultural sectors and the logo is now used on £6.4 billion of produce and supported by all the main retailers. The standards applied by AFS are largely ‘baseline’ regulatory standards. Criticism of the scheme by environmental NGOs, such as the RSPB, for overstating its environmental credentials led to a study examining the scope for improving relevant standards. The AFS Board subsequently rejected most of the proposals put forward on the grounds that they would impose significant additional costs on producers. AFS has since downplayed the benefits to the environment of the scheme in its promotional material, but given its dominance in the assurance sector, renewed efforts to persuade AFS to improve standards could be beneficial. More generally, there may be scope to address the issue of environmental standards in all of the main assurance schemes throughout the EU; however, given their proliferation, this is likely to be a mammoth task and one that requires engagement with hundreds, if not thousands, of different actors in the food sector. The Green Paper indicates that the Commission is not minded to further regulate certification schemes beyond existing legislation, for example on competition law and labelling requirements, but might consider the need for a set of guidelines to ‘assist scheme-owners in developing and improving schemes.’

5.4.3 Promoting healthy eating and reduced meat consumption

The WHO and FAO (2002) concluded that changes in diet during the second half of the 20th century have seen ‘...traditional, more plant-based diets... swiftly replaced by high-fat, energy-dense diets with a substantial content of animal foods’ and that this has contributed to the increase in diet related preventable diseases. Their dietary recommendation is to reduce consumption of saturated fats (particularly from red meat and dairy foods) and increase consumption of fruit and vegetables to at least 400 grams per day – an amount currently eaten by ‘...only a small/negligible minority of the world’s population’.

Whilst the case for eating less meat and dairy products on health grounds is relatively uncontested, convincing UK consumers to do so is rather more of a battlefield. Lang (2004) suggests that the ‘...shape of consumption is formed in the ‘holy triangle’ of food policy, the relationship between the Food Supply Chain (companies/labour/capital), the State (Governance) and Civil Society (consumers, NGOs, culture etc)’ and that this is contested ground. Whilst dietary guidelines might champion reduced meat consumption, private companies marketing meat products and food cultures themselves may send conflicting messages to consumers.

The State clearly has a role to play in promoting healthy eating and providing dietary information, including recommendations to eat less meat and more fruit and vegetables.

Several commentators (Lang et al, 2002 and Gold 2004) have argued that the achievement of a healthy and sustainable food policy requires a multi-departmental

approach with collaboration between the Department of Health (DH), the Food Standards Agency (FSA) and Defra. Lang suggested the need for a Food Policy Council to advise on an overall view of farming and food policy and help such co-ordination. Some progress has been made recently on this issue with the establishment of a Council of Food Policy Advisors in October 2008. Part of the role of this body is to advise the Secretary of State on how to achieve the four objectives for food policy set out in an earlier published Cabinet Office Strategy Unit report (2008). These more recent developments come against a backdrop of earlier criticisms about Government's poor response to health concerns and healthy eating. Gold argued that the DH was '*...almost exclusively concerned with NHS costs, yet one of the most significant ways of producing a less expensive and more efficient health service is to prevent disease successfully*' and cited the Wanlass report of 2002 as having made this case to the Chancellor of the Exchequer. The Cabinet Office now state that diet related ill health cost the NHS approximately £6 billion each year and that 70,000 fewer people would die prematurely each year if diets matched nutritional guidelines.

The Cabinet Office report makes a number of commitments in relation to bodies such as the FSA including the expansion of its current advice to provide a one-stop-shop for consumers looking for information and advice on nutrition, food and sustainability and food safety. The Government will also adopt targets for increasing fruit and vegetable consumption in low income families and work with retailers and manufacturers to identify barriers to achieving the Five-A-Day target for fruit and vegetables. To date however, the Government has shied away from actively promoting reduced consumption of meat and dairy products. But it has made a number of commitments to reducing obesity set out in a Cross-Government Strategy for England: 'Healthy Weight, Healthy Lives (2008). These include commitments, among others, to: making cooking a compulsory part of the national curriculum by 2011 for all 11-14 year olds; finalising a Healthy Food Code of Good Practice, in partnership with the food and drink industry, and other stakeholders challenging the industry to adopt practices to reduce consumption of saturated fat, sugar and salt among other measures; asking Ofcom to bring forward its review of restrictions on the advertising of unhealthy foods to children; and, seeking to develop the NHS Choices website to give highly personalised advice to all on their diet and activity levels, with clear and consistent information on how to maintain a healthy weight. Whilst most of these commitments relate to England it is notable that the Scottish Government is also in the process of developing a National Food and Drink Policy which may address some similar issues.

Together, these steps suggest that diet related health is being taken far more seriously by Government today than previously and some, albeit limited, efforts are being made to move towards joined up policy in relation to food, health and the environment. However, this is clearly an issue that cannot be addressed by Government alone; multiple stakeholders from food producers and retailers through to civil society NGOs can play a significant role in influencing consumption habits. But ultimately, it is up to each and every one of us to decide on our diet. There are some indications that health messages are reaching consumers. Germany's federal environment agency recently issued an advisory⁹² suggesting people eat less meat and model their diet on

⁹² <http://www.guardian.co.uk/world/2009/jan/23/german-diet-meat-environment>

that of Mediterranean countries. According to Destatis, the federal statistics agency, meat consumption has already fallen in Germany from an annual 64kg a head in 1991 to 58.7kg today, mainly due to health reasons, although this level of consumption is still relatively high.

In summary, governments have a significant role to play in promoting healthy eating to the public, including eating less meat and dairy products, and can operate across a wide sphere from directly providing nutritional advice and information to regulating the advertisement of unhealthy foods to certain groups such as children. Recent developments in relation to food policy in the UK suggest greater effort is now being made to address concerns about food, health and the environment. Progress in relation to commitments made clearly needs to be monitored, and the links between meat consumption, health and the impacts on the environment more clearly made.

5.5 Research and development to promote sustainable livestock and feed production

Soya, mainly imported from non-EU countries, increasingly forms a large proportion of the feed fed to pigs, poultry and dairy cattle. Reducing reliance on imported soya and increasing the proportion of home-grown protein crops for use in animal feed is one possible option to reduce the global impact of livestock production. However, research in this field suggests there are some barriers – both technical and economic – to substituting soya with other, home-grown protein crops and further research is warranted. Research also suggests that the environmental benefits of substituting soya with home-grown protein crops may not be clear cut.

Alternative sources of protein to soya include: grain legumes such as peas, beans and lupins; forage legumes such as lucerne and clover which are fed whole to animals either by grazing the crop or cutting it for hay or silage; and, oilcrops such as rapeseed, sunflower and flax which are grown primarily for their oils but the meal left over from oil extraction, which is rich in protein and fibre, is used in animal feed. A study of the feasibility of increasing grain legumes in the EU (GLIP, 2008), highlights that the EU is only 30 per cent self-sufficient in plant proteins. The situation varies from country to country; the Netherlands imports 96 per cent of the plant protein needed for feed, Spain 80 per cent, Germany 70 per cent and France only 45 per cent. Imported proteins are predominantly soya beans, in the form of meal or seed. The reasons for a high level of inclusion of soya beans are both technical and economic. Technical reasons include the need for high energy feed rations in order to achieve the higher liveweight gains or yields demanded by intensive systems. Most high energy feeds such as wheat, barley, maize and cassava have relatively low protein content and need to be complemented by protein rich materials. Soya is commonly used because of its high protein content compared to other protein crops however other crops such as peas and beans can be used as alternative sources of protein. Economic reasons can include the greater competitiveness of soya bean meal compared to other protein sources, especially in areas near to ports like Le Havre, Hamburg and Rotterdam.

According to GLIP (2008), the type of feed and production systems is also important when considering the source of protein, with opportunities to substitute soybean meal more numerous in pig or cattle feed than in poultry feed. Peas are a possible source of

protein for pig feed and GLIP cites one study that suggests the use of peas could save as much as 60 per cent of imported soya bean meal. Opportunities to substitute soya beans in poultry diets are less common. Current intensive systems demand high protein and energy levels with soya beans the most frequently used source. The rearing period for chickens ranges from 35 to 80 days depending on the type of poultry and production system. The longer the rearing duration and the lower the protein and energy requirements of feed. GLIP suggests that the consequence of a longer rearing duration could be a lower inclusion of soya bean meal and an increase in the use of peas in diets. However, currently in France, 16 per cent of chickens are slaughtered at 80 days, 8 per cent at 56 days and the rest at 40 days. In the UK, less than 5 per cent of chickens are slaughtered at more than 56 days. For dairy cows, high milk yields require high protein diets and soya bean meal is frequently used. It can be substituted however by rapeseed meal and this is frequently the case in countries such as Germany, France and the UK. The switch in some countries such as western France, Belgium and the Netherlands from grass based dairy systems to those reliant on maize may be a factor in increasing reliance on soya beans since maize has a lower protein content than grass and requires complementary protein sources. Policy measures that support less intensive livestock production and grass-based systems (with longer rearing duration), as discussed at section 5.3 should therefore help to reduce dependency on soya based feeds.

Farmers also need to be encouraged to grow more protein crops. But the economic benefits of growing protein crops such as grain legumes appear to be poorly understood by farmers according to the results of a Concerted Action research project, GL-Pro supported by the EU⁹³. A survey of 500 farmers in several EU counties found that whilst farmers appreciated the agronomic benefits of grain legumes in crop rotations (higher yields in following crop) and their feed value, they saw them as less profitable than other crops such as rapeseed and wheat. The same study however found that including grain legumes in rotations resulted in higher gross margins, when calculated across the rotation, than simplified rotations of mainly winter cereals and oilseed rape. The payment of the protein crop premium was included in the calculations. The study also found that the more diversified cropping helped to use labour and machinery more efficiently, avoiding a labour peak in autumn associated with tillage, seedbed preparation and sowing of winter crops. These findings suggest that improved communication – through advice and extension work - of the agronomic benefits of growing crops such as grain legumes could be beneficial.

Whilst the above results suggest farmers in the UK and EU should be encouraged to grow more protein crops, other research suggests that increasing the proportion of home-grown protein crops would not necessarily result in the greater use of such crops in compound feed rations or would yield overall environmental benefits. GLIP (2008) assessed the likelihood of soya bean meal being substituted by peas in compound feeds produced by manufacturers. The limited availability of peas in the countries examined (Germany, Denmark, Spain, Netherlands, Belgium, UK and Czech Republic) was currently a constraint for feed producers. The researchers found that the use of peas could, in theory, be much higher if they were available in greater

⁹³ European extension network for the development of grain legume production in the EU (QLK-CT-2002-02418)

amounts: a fourfold increase or more in the use of peas in feed could be possible, increasing total production from 1 million to 4.1 million tonnes. The greatest potential for increasing the use of peas was found in Spain (+1.6 Mt), Germany (+0.54 Mt), Denmark (+0.34 Mt) and the Netherlands (+0.29 Mt). Apart from Germany, all these countries are pea importers and/or small pea producers. However, the likelihood of peas being used was dependent on the prices and the energy values of different raw materials in compound feeds. Feed manufacturers use linear programming models to define the composition of the compound feeds they produce and effectively buy raw materials but pay for nutrients. As prices of raw materials fluctuate, manufacturers substitute one material for another in order to achieve the overall nutritional requirements. The method of calculating nutrition can however influence the results. For example, assessing digestible energy (DE), metabolised energy (ME) or net energy (NE) gives different results. Using the NE system to formulate rations gives peas an advantage compared with soya bean meal. Even so, the easy substitution of peas by other materials suggest it is not a given that manufacturers will use them. The researchers suggest that further work is needed to better understand the functioning of the pulse feed market.

The same study also examined the environmental impacts (using Life Cycle Assessments) of increasing grain legume production compared to importing soya bean meal. The results of five case studies on meat, egg and milk production revealed that replacing soya bean meal with grain legumes did not necessarily lead to an overall environmental improvement. Researchers concluded that:

‘Clear benefits could only be found regarding the resource use-driven impacts due to less transport, reduced incorporation of energy rich feeds and absence of land transformation. There was little effect on nutrient-driven impacts, as the positive effects of the reduced soya bean meal and energy rich feeds were often (over) compensated by the negative effects of cultivation of the grain legumes themselves or the accompanying protein rich feeds, especially sunflower and rapeseed meal. For the pollutant-driven impacts, the production of grain legumes in feedstuffs tended to be negative. Again, the reasons lie in the crop production, where the feed ingredients replacing the soya bean meal involve using particularly harmful pesticides. However, these results should be checked with improved ecotoxicity assessment methods, as in some case studies they vary considerably depending on different methodologies. It must be underlined that replacing soya bean meal by grain legumes changes the whole composition of the feed formulas not only the protein rich feeds. Consequently, the results are more determined by the whole composition of feed formulas than by the replacement of soya bean meal by grain legumes. The diverging results across the different environmental aspects highlight the importance of a holistic approach to the evaluation of the integration of European grain legumes in animal feed, enabling shifts to be detected from one environmental problem to another.’

The research suggests therefore that reducing reliance on soya bean meal and increasing grain legume production in the EU generally yields environmental benefits for the soya producing countries and reduces transport emissions but is largely neutral or has negative environmental effects in the EU. Effort would be needed to ensure that the production of grain legumes or other protein substitutes such as rapeseed in the UK and EU is undertaken sustainably if these crops are to be promoted as substitutes for soya. The danger is that environmental problems are shifted from one

region to another; this suggests great care needs to be taken in advocating any one solution to the problems of soya production. Further research in this area would appear to be warranted.

In addition to finding viable alternative protein crops to soya, research into improved animal nutrition could also help to reduce dependency on soya. For example, Defra's current scientific research programme includes a Nutritional Efficiency Programme which funds research to:

- explore the use of breeding programmes to select animals that capture dietary nutrients more efficiently
- increase the quality and use of home-grown forages
- design rationing systems that enhance the efficient use of nutrients

Research of this nature may be beneficial in supporting more sustainable livestock and feed production in future.

6 CONCLUSIONS

Most of the main commentators argue that, over the next 50 years, world demand for livestock products is set to grow as population increases and greater consumer affluence allows many people to shift away from plant-based diets. Work by the FAO (2006) shows that much of the increased production needed to meet this demand is likely to come from intensive production systems. However this is likely to have negative impacts not only on the earth's natural resources, but also on many people's health.

The focus of this report has been on the influence of the CAP on production within the livestock sector, including its impacts on feed production both within Europe and globally. It is clear, that livestock production systems, particularly those that are intensive in nature, are associated with significant negative environmental impacts. For example, in the EU, intensive livestock production is linked to problems such as the eutrophication of water bodies, soil erosion, loss of biodiversity and increased greenhouse gas emissions. The importation of soya for animal feed from South America also has significant environment impacts, since some of its production is linked to the destruction of forests as well as having negative localised impacts on biodiversity, soil and water resources.

The report has sought to consider policy options particularly within the framework of the CAP (both in its current form and in the future) to influence the increased sustainability of livestock production systems both locally and globally. However, it is clear, that moves towards greater market orientation of the CAP, mean that the influence it once had on specific patterns of production through production related payments and market interventions has significantly reduced and will reduce further over the coming years. Although significant funds are still available to livestock producers within the EU, most of these payments are no longer related to particular types of production, and as a result the market now plays an increasingly significant role in determining what gets produced, where and how.

The report outlines a number of policy options under the CAP and other measures that could be used to advance four key objectives:

- To reduce overall livestock production in the UK and EU;
- To reduce dependency on imported soya and find alternative sources of protein for animal feed;
- To reduce the intensity of livestock production and promote more sustainable, grass-fed livestock production systems; and,
- To reduce consumption of livestock products overall, particularly consumption from intensive farming systems, and promote consumption of products from sustainable farming systems in the UK and more widely in Europe.

These relate to four key areas: WTO requirements and the implications of increasing trade liberalisation; the role of the Common Agricultural Policy (CAP); consumer behaviour; and research and development.

The first step towards more sustainable production is to re-balance market supply and demand by removing all market and trade distorting subsidies. The EU has limited scope to prevent or restrict the import of products which are not produced sustainably from other countries, for example through import tariffs, and the UK cannot do so unilaterally. However, seeking to introduce European sustainability criteria to animal feed production such as soya may be worth further consideration given recent developments with regard to biofuels. There is also a clear need to develop a more authoritative global level Life Cycle Analysis (LCA) to capture the full range of direct and indirect land use change and other environmental impacts that are brought about by changes in livestock and feed production. These impacts need to be clearly highlighted and used to inform the global analyses which feed into trade negotiations.

In relation to the CAP, there are some policies, such as the targeted form of support known as 'Article 68' and rural development measures, particularly the LFA and agri-environment measures that can be used to support extensive, grass based livestock systems and organic systems that rely less on imported feed and are more environmentally sustainable. However, these tend to predominantly affect the beef and sheep sectors, rather than impacting significantly upon the more intensive systems, including pigs, poultry and dairy, which, due to market forces, seem likely to continue to dominate the livestock sector in the UK and EU. More specifically, the pig and poultry sectors, particularly intensive, housed production systems, are likely to continue to be relatively unaffected CAP mechanisms, as they are currently minor recipients of CAP support and unlikely to be attracted to or eligible for environmental payments. Market factors will continue to have a much greater influence on how such systems develop in future.

Reducing reliance on imported soya and increasing the proportion of home-grown protein crops for use in animal feed is one possible option to reduce the global impact of livestock production. However, research in this field suggests there are some barriers – both technical and economic – to substituting soya with other, home-grown protein crops. Further research is needed to find high energy protein replacements for soya, as well as to better understand the global and local environmental impacts of substituting soya with other protein crops such as oilseeds and grain legumes to avoid environmental problems being shifted from one region to another.

While reducing the intensity of livestock production may bring about local environmental benefits, any global impacts will depend on any displacement effects that may occur due to increased production elsewhere, especially if demand for livestock products continues to grow. This suggests that other solutions are also needed, to influence the demand for, and consumption of livestock products.

Without some kind of measures to encourage a reduction in the consumption of livestock production, increased production will continue to be needed to meet the predicted increase in demand. However, reducing the consumption of meat and other livestock products and influencing consumer behaviour to give preference to sustainably produced products is a significant challenge. Possible options include improved labelling and information campaigns for sustainably produced livestock products alongside the promotion of healthy eating and reduced meat consumption as part of publicly funded nutritional and health campaigns.

Together, these efforts could make a significant contribution to promoting and supporting more sustainable livestock systems in the UK and EU, thereby reducing dependence on imported feedstocks such as soya. However, the picture is a complicated one.

Public policy clearly has a role to play in incentivising changes in livestock production through the CAP and reducing strong market incentives for intensive and environmentally damaging forms of production. It also has a role to play in regulating intensive livestock systems and preventing environmentally damaging activities. But the impacts of the more readily available and currently credible policies on livestock production patterns and systems and hence on the environment are difficult to judge and likely to be highly variable. Key questions include:

- ‘if an overall decline in livestock production occurred where might this take place and on what scale?’;
- ‘what would be the precise environmental impacts given the multiplicity of market adjustments that would take place?’; and,
- ‘to what extent would reduced production or more sustainable production reduce demand for imported soya in the UK?’

These questions are difficult to answer without a more ambitious study and, while some indications have been given in the analysis, they warrant further consideration. As well as influencing livestock production, public policy can also encourage reduced consumption of livestock products, as part of healthy-eating campaigns and dietary advice, and help consumers to make informed choices about the sustainability of the products they buy through labelling and information activities.

Beyond these public policy levers, markets play an increasingly influential role in determining the level of livestock production, the production methods employed and the source of feedstocks. Global consumer demand for livestock products is increasing and price is a key determinant of consumer purchasing behaviour. If consumers continue to demand and buy ‘cheap’ livestock products, the markets and production systems will respond accordingly. Key trends in livestock production are already ones of intensification of production, vertical integration, geographic concentration and up-scaling of production units. Emerging economies in countries such as China and India, with lower production costs due to factors such as cheap land and labour, are already responding to the increasing market demand for livestock products. Within this picture of increasing production and consumption, the scope to reduce dependency on soya and substitute it with alternative protein crops appears limited without very strong interventions. Soya is preferentially used for animal feed for technical reasons i.e. its superior protein content compared to other protein sources and for economic ones i.e. its price and availability. The key to reducing dependency on soya is therefore to achieve reductions in both livestock production and consumption of livestock products.

In this context, efforts within Europe, ideally at EU level, but with some scope for national action as well, need to be matched by efforts globally if real progress is to be made. Ultimately, this requires multi-lateral action and agreements on trade, climate

change, the conservation of biodiversity, poverty alleviation and others to shift global patterns of production.

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8 ANNEXES

Annex 1 UK CAP subsidies and other payments by country in 2006

Payments linked to the production of agricultural products (£ million)	England	Wales	Scotland	Northern Ireland	United Kingdom
Total Pillar I (direct payments)	1602	236	448	249	2533
<i>Crop subsidies</i>					
Protein crop premium; area aid for nuts; energy crops aid.	13	-	1	-	13
<i>Livestock subsidies</i>					
Over Thirty Month Scheme / Older Cattle Disposal Scheme	25	6	11	8	50
Scottish Beef Calf Scheme	..	..	18	..	18
Animal disease compensation	6	4	-	7	16
<i>Total coupled payments</i>	38	6	30	8	82
<i>Single Payment Scheme</i>	1,520	220	388	226	2,354
Pillar II (Rural Development - Axis 2 environment)	565	113	218	51	947
<i>Less Favoured Areas support schemes (a)</i>	27	35	100	21	183
<i>Agri-environment schemes (b)</i>	269	39	59	15	382
Environmental Stewardship / Countryside Stewardship Schemes	192	..	..	..	192
Countryside Premium / Rural Stewardship / Land Management Contracts Schemes	..	..	47	..	47
Tir Cymen / Tir Gofal / Tir Cynnal	..	31	..	..	31
Countryside Management Scheme	..	..	..	10	10
Organic Aid & Organic Farming Schemes	3	3	3	-	9
Environmentally Sensitive Areas Schemes	64	4	6	5	79
Sites and Areas of Special Scientific Interest	10	1	3	-	14

Source: Agriculture in the UK (2008). Table 11.2. Available at:

<https://statistics.defra.gov.uk/esg/publications/auk/2007/excel.asp>

(a) Tir Mynydd in Wales, Less Favoured Area Compensatory Allowance Scheme in Northern Ireland, Less Favoured Areas Support Scheme in Scotland and Hill Farm Allowance in England.

(b) It is important to note that the UK is one of two EU Member States (along with Portugal) which have chosen to implement voluntary modulation. Modulation is the transfer of funds from Pillar I (direct payments and market intervention) of the CAP to Pillar II (Rural Development). In 2007 a rate of 12 per cent was applied in England with 80 per cent of funds raised being spent on agri-environment measures. Annual expenditure on agri-environment will therefore be significantly larger during the period 2007-2013. Further details available at:

<http://www.defra.gov.uk/farm/singlepay/furtherinfo/modulation.htm>

Annex 2 Definition of farm types

Farm type	Definition
Cereals	Holdings on which cereals and other crops generally found in cereal rotations (e.g. oilseeds, peas and beans harvested dry and land set-aside) account for more than two thirds of the total SGM of the holding.
General cropping	Holdings on which arable crops (including field scale vegetables) account for more than two thirds of the total SGM. Also holdings with a mixture of arable and horticultural crops which again account for more than two thirds of the total SGM.
Pigs	Holdings on which pigs account for more than two thirds of their total SGM
Poultry	Holdings on which Poultry account for more than two thirds of their total SGM.
Horticulture	Holdings on which fruit (including vineyards), hardy nursery stock, specialist mushrooms, glasshouse flowers and vegetables, market-garden-scale vegetables and outdoor bulbs and flowers account for more than two thirds of the total SGM.
Dairy	Holdings on which dairy cows and followers account for more than two thirds of the total holding SGM.
LFA grazing livestock	Holdings on which grazing livestock account for more than two thirds of the total SGM (excludes holdings classified as dairy). A holding is classified as a Less Favoured Area (LFA) holding if 50 per cent or more of its total area is in the LFA. A holding is classified as lowland if less than 50 per cent of its total area is in the LFA.
Lowland grazing livestock	Holdings on which grazing livestock account for more than two thirds of the total SGM (excludes holdings classified as dairy). A holding is classified as lowland if less than 50 per cent of its total area is in the LFA.
Mixed	Holdings on which crops account for one third, but less than two thirds of the total SGM and livestock account for one third, but less than two thirds of the total SGM. This category also includes holdings with mixtures of cattle and sheep on the one hand and pigs and poultry on the other and holdings where one or other of these two groups is dominant, but does not account for more than two thirds of the total SGM.
Other	These are holdings which either do not fit well with mainstream agriculture, such as specialist horses, or which are of limited economic importance, such as specialist set-aside, specialist grass and forage and non classifiable holdings. Specialist grass and forage holdings consisting only of fodder crops, or only of grass or rough grazing and having no livestock. Non classifiable holdings are holdings consisting of fallow or buildings and other areas only, for which no SGM coefficients are calculated.

Source: Defra June Agricultural Survey. Accessed in March 2009 at:

[http://www.defra.gov.uk/esg/work_htm/publications/cs/farmstats_web/1 ABOUT THE SURVEY/FAQs ABOUT THE DATA AND SURVEY/Introduction.htm](http://www.defra.gov.uk/esg/work_htm/publications/cs/farmstats_web/1_ABOUT_THE_SURVEY/FAQs_ABOUT_THE_DATA_AND_SURVEY/Introduction.htm)

Note: SGM = Standard Gross Margin. All holdings in the Defra June Agricultural Survey are allocated a holding type which is based on predominant activity (which is measured using the SGM of the holding). SGM is used by Eurostat to classify agricultural holdings by farm type.⁹⁴

Holdings classified as pigs, poultry, dairy, LFA and Lowland grazing livestock, and mixed must by definition undertake some form of livestock production directly on the holding. When taken as a whole (but not necessarily on individual farms), some of the crops produced by holdings classified as cereals, general cropping, mixed, and, to a lesser extent, horticulture, will be used as livestock feed, although the proportion used as livestock feed is not fixed and subject to annual variations according to yields and market conditions. Such holdings can, in principle, undertake on-farm livestock production too (but may not with the exception of 'mixed'), as long as this accounts for less than one third of the total SGM of the holding in question (between one third and two thirds for 'mixed').

⁹⁴ http://en.wikipedia.org/wiki/Standard_Gross_Margin

Annex 3 Trade of Rapeseed and soya beans in selected EU Member States (2004-2006)

Member State	Year	Rapeseed (1,000 tonnes)			Soya beans (1,000 tonnes)		
		Intra-EU trade (a)	EU Imports from non-EU countries	EU Exports to non-EU countries	Intra-EU trade (a)	EU Imports from non-EU countries	EU Exports to non-EU countries
EU-25	2004	2,311.4	853.7	325.1	2,169.6	13,806.9	37.1
	2005	2,891.5	153.4	182	2,129.0	14,448.8	11.4
	2006	3,243.7	744.9	78.4	2,022.8	14,078.9	16.3
Germany	2004	1,075.5	334.8	127.6	1,595.1	2,124.2	9.7
	2005	1,424.2	36.7	50.8	1,509.7	2,374.7	0.1
	2006	1,591.0	240	5.2	1,267.0	2,269.0	0.1
Ireland	2004	0.5	0	0	35.3	18.5	0
	2005	0.8	0	:	12.8	35.8	:
	2006	1.2	0	:	25.8	30.5	0
France	2004	23.6	11.2	16.4	62.1	420.2	1.1
	2005	32.1	:	70.5	51.6	457.6	5.2
	2006	65.4	20.3	52.3	48.8	310.1	7.0
Netherlands	2004	74.3	30	0.4	38.3	4,742.8	10.0
	2005	55.3	10.3	0.2	89.3	4,714.8	0.1
	2006	102.1	23.9	1	145.1	4,306.0	0.1
Spain	2004	43.7	0.1	0.1	37.8	2424.6	0.0
	2005	33.4	0.0	0.2	62.8	2524.4	0.0
	2006	23.7	42.6	0.1	58.6	2100.7	0.0
United Kingdom	2004	181.5	16.6	2.6	26.9	704.6	0.4
	2005	47.4	0.2	4.4	33.5	743.3	0.1
	2006	132.1	0	14.8	89.3	633.6	0.1

Source: Eurostat (2007) in 'The agricultural situation in the European Union' Table 4.4.3.1. Available at: http://ec.europa.eu/agriculture/agrista/2007/table_en/index.htm

(a) Based on quantities entering (i.e. imports from EU Member States).

Annex 4 Expenditure (€million) for Direct Aids to producers by measure – 2007 Financial Year (UK & EU-27 total)

Heading	GB	Total (EU-27)
SPS (single payment scheme)	3,756.28	28,119.30
Decoupled direct aids	3,756.28	30,369.10
Suckler-cow premium	0.10	1,179.10
Additional suckler-cow premium	0.01	56.00
Beef special premium	0.35	99.10
Beef slaughter premium	0.00	126.50
Beef slaughter premium	0.37	235.90
Beef extensification premium	0.57	12.20
Additional payments to beef producers	0.07	4.30
Sheep and goat premium	0.14	251.70
Sheep and goat supplementary premium	0.04	78.20
Additional payments in the sheep and goat sector	0.01	0.10
Dairy premium	-	438.20
Additional payments for milk producers	-	198.90
Protein crop premium	13.10	58.20
Payments for specific types of farming and quality production	28.54	419.60
TOTAL DIRECT AIDS of EAGF 2007 EXPENDITURE	3,832.41	37,045.80

Source: 1st Financial Report - EAGF - 2007 [COM(2008) 587 final]. Annex 13. Available from: http://ec.europa.eu/agriculture/fin/finrep_en.htm

Annex 5 National budgetary ceilings for the Protein crop premium in the EU-27 (2010-2015)

(EUR 1 000)

Member State	2010	2011	2012	2013	2014	2015	2016 and subsequent years
Belgium	84	84	84	84	84	84	84
Denmark	843	843	843	843	843	843	843
Germany	7 231	7 231	7 231	7 231	7 231	7 231	7 231
Ireland	216	216	216	216	216	216	216
Greece	242	242	242	242	242	242	242
Spain	10 905	10 905	10 905	10 905	10 905	10 905	10 905
France	17 635	17 635	17 635	17 635	17 635	17 635	17 635
Italy	5 009	5 009	5 009	5 009	5 009	5 009	5 009
Luxembourg	21	21	21	21	21	21	21
Netherlands	67	67	67	67	67	67	67
Austria	2 051	2 051	2 051	2 051	2 051	2 051	2 051
Portugal	214	214	214	214	214	214	214
Finland	303	303	303	303	303	303	303
Sweden	2 147	2 147	2 147	2 147	2 147	2 147	2 147
United Kingdom	10 500	10 500	10 500	10 500	10 500	10 500	10 500
Bulgaria	160	201	241	281	321	361	401
Czech Republic	1 858	2 123	2 389	2 654	2 654	2 654	2 654
Estonia	169	194	218	242	242	242	242
Cyprus	17	19	22	24	24	24	24
Latvia	109	124	140	155	155	155	155
Lithuania	1 486	1 698	1 911	2 123	2 123	2 123	2 123
Hungary	1 369	1 565	1 760	1 956	1 956	1 956	1 956
Poland	1 723	1 970	2 216	2 462	2 462	2 462	2 462
Romania	911	1 139	1 367	1 595	1 822	2 050	2 278
Slovenia	63	72	81	90	90	90	90
Slovakia	1 003	1 146	1 290	1 433	1 433	1 433	1 433

Source: COUNCIL REGULATION (EC) No.../2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003. Annex XII: Integration of coupled support into the single payment scheme as referred to in Article 64 in the Health Check Regulation. Available from:

<http://register.consilium.europa.eu/pdf/en/08/st16/st16765.en08.pdf>

Annex 6 Implementation of Article 69 of Regulation 1782/2003 in relation to the livestock sector

Member State	Part of the ceiling	Objective	Measures	Amount of aid (a)
Greece	1) 10% arable crops,	Quality	1) cultivation of durum wheat and maize, hybrid varieties, non GMO, certified seed	1) 120 EUR/ha
	2) 10% beef sector,	Quality	2) carcass classification at least R3, minimum 20 animals on the holding, weight 1 year 240 kg, 2 nd year 280 kg.	2) 200 EUR/animal
	3) 5% sheep and goat sector	Environment, quality	3) production of milk in less favoured areas and intensive production of quality milk (total viable content), min 10 t of sheep and goat milk per year, (LFA: 8t), farm register, retention period for a number of female animals >1 year, minimum ratio between animals kept and quantity of milk delivered.	3) 4 EUR/animal
Spain	1) 7% of beef sector (54.96 MEUR)	Environment, quality	1a) suckler cow premia top up , livestock density less than 1.5 LU/ha forage area, modulation of the aid according to the number of animals, max. 100 animals per holding 1b) payments to beef producers participating in recognised quality schemes (origin, integrated or organic farming, voluntary labelling systems)	
	2) 10% dairy payments	Quality	2) participation in a code of a good hygiene practice established by the quality systems or regional authorities, payment for max 500000 kg per holding	
Italy	1) 8% arable sector	Environment, quality	1) cultivation of certain varieties of durum wheat , wheat, maize or application of 2 year crop rotation or more minimum use of certified seed, GMO-free, product grown until full agronomic maturity,	1) max 180 EUR/ha
	2) 7% bovine sector	Environment	2) -suckler cows of meat breeds , retention period of 6 months -extensive livestock keeping (cows and other bovine animals with obligation of minimum grazing, max 1.4 LSU/ha of fodder UAA (animals older than 6 months taken into account), retention period 6 pr 7 months,	2) max 180 EUR/head

Member State	Part of the ceiling	Objective	Measures	Amount of aid (a)
			cows of a certain breeds, age requirements, -slaughter premia if compliance with PGI , organic farming, voluntary labelling, retention period of 7 months, slaughtered between 12 and 26 months	
	3) 5% ovine sector	Environment	3) ewe and goats , more than 50 heads, minimum grazing period 120 days	3) max 15 EUR/head
Portugal	1) 1% arable crops, rice	Marketing, environment	1) marketing of entire production via a producer group (if not authorisation of producer groups for marketing to third party provided), higher aid for organic production	1) a) organic farm produce : 8.2 EUR/t (max. 13.0 EUR/t) arable crops, 5.8 EUR/t (max. 9.2 EUR/t) rice b) other farms: 6.7 EUR/t (max. 10.6 EUR/t) arable crops, 4.8 EUR/t (max. 7.5 EUR/t) rice
	2) 1% bovine sector, ovine sector 2a) bovine ovine sector	Marketing, environment, maintaining of purebred indigenous breed	2) marketing of entire production via a producer group , higher aid for organic production 2a) female purebred animals entered in the register of adult animals by 1 June, animals participating in agri-environment measure not eligible, aid for using domestic breeds	2) = organic farm produce: 24 EUR/slaughtered bovine animal, 5 EUR/lamb or kid slaughtered = other farms: produce 20 EUR/slaughtered bovine animal, 4 EUR/lamb or kid slaughtered 2b) supplement to suckler cow premia and ewe and goat premia for domestic breeds: 103 EUR per female bovine and 9 EUR per ewe and goat (aid may be increased if ceiling not used)
Slovenia	10% of beef and veal sector	Environment	Specific types of farming contributing to environmental protection (suckler cows)	Additional payment
Finland	1) 2.1 % arable crops (5.8 million EUR)	1) environment, increase of diversification of farming, improvement of soil structure to prevent erosion	1) aid for cultivation of winter cereals on at least 10% of the arable area, max. percentage of the individual crop: 50%, cereal crops sown in spring are not eligible, areas used to fulfil 30% minimum area for plant cover requirement (agri-environmental measure) is excluded from aid	1) max. 50 EUR/ha,
	2) 10 % bovine sector (10.1 million EUR)	2) promoting high quality beef	2) aid to raise suckler cows of certain beef breeds (suckler cows and heifers with at least 50% of beef breed over 8 months(breed listed), animal must be eligible for 365 days, support paid in proportion to eligible days, number of eligible heifers max 40% of total annual number of eligible suckler cows/heifers of the farm aid for heavy slaughtered male bovines and	2) max 200 EUR/suckler cow/heifers, max 80 EUR/heavy slaughter animal

Member State	Part of the ceiling	Objective	Measures	Amount of aid (a)
			heifers , male bovines > 330 kg, heifers > 210 kg	
Sweden	0.45% of the total envelope	quality	1) participation in accredited quality certification schemes in primary production aiming at developing high quality products, aid should contribute to cover certification costs	1) flat rate 2000 SEK, 20 SEK/ha
		quality, marketing	2) quality and marketing measures to enhance the quality of food and agricultural products (development production methods or new products)	2) 75% of the costs, max. 50 000 SEK/year
		marketing	3) participation in agricultural fairs and food exhibitions within the European union, costs of preparation and participation (double funding with rural development excluded by data base cross checks, priority to applications that cover more than one applicant)	3) 75% of the costs, max. 50 000 SEK/year
United Kingdom (only Scotland)	1) 10% of beef sector	1) environment, quality	1) production of beef bred calves , calves born on the farm and reached age of four months	1) £70/ first 10 beef bred calves and £35 all other beef bred calves, depending on number of applications

Source: DG Agri (2007) Overview of the implementation of Article 69 of Regulation 1782/2003 in MS. Available at:

http://ec.europa.eu/agriculture/markets/sfp/pdf/2007_12_art69.pdf

(a) Amount of aid: All Member States applying Article 69 of Regulation (EC) No 1782/2003 have indicated that they will adapt the amount of aid depending on the number of applications.

Annex 7 Evolution of Pillar I expenditure in the EU livestock sector 2001-2007

Type of expenditure (€)	2001	2002	2003	2004	2005	2006	2007	% change between 2001 & 2006	% change between 2001 & 2007
TOTAL PILLAR I EXPENDITURE	42,083.3	43,214.2	44,461.2	44,760.5	48,928.2	49,865.2	42,120.9	18.5%	0.1%
TOTAL DIRECT AIDS							37,044.7		
Decoupled Direct aids							30,369.1		
- Single Payment Scheme (SPS)						14,542.0	28,119.3		
- Single Area Payment Scheme (SAPS)					1,449.2	1,721.3	2,083.0		
Other Direct aids							6,259.6		
INTERVENTION IN AGRICULTURAL MARKETS (e)	36,272.0	37,793.2	38,901.5	36,587.8	40,210.7	25,203.8	4,206.5	-30.5%	-88.4%
INTERVENTION IN LIVESTOCK MARKETS	9,545.0	10,091.5	13,140.6	11,412.1	12,692.3	7,065.6	910.3	-26.0%	-90.5%
CEREALS	17,466.2	18,590.1	16,809.4	17,296.6	17,769.8	8,737.1	-133.3	-50.0%	-100.8%
Export refunds	259.8	99.3	175.9	72.4	124.3	127.7	41.8	-50.8%	-83.9%
Storage	184.9	219.2	267.5	44.7	441.6	337.9	-225.8	82.7%	-222.1%
Area Aids	15,198.5	16,137.9	16,331.7	16,974.6	17,145.9				
Direct Aids						8,174.4			
Others	1,814.5	1,893.0	34.3	204.9	58.0	97.2	50.7	-94.6%	-97.2%
MILK AND MILK PRODUCTS	1,906.6	2,360.0	2,796.2	1,993.4	2,547.5	2,463.4	638.2	29.2%	-66.5%
Export refunds	1,106.5	1,159.6	1,595.3	1,494.9	1,140.8	724.9	513.4	-34.5%	-53.6%
Interventions	800.1	1,200.4	1,200.8	498.5	1,406.7	0.1	-36.2	-100.0%	-104.5%
- Skimmed milk aids	480.1	446.0	584.2	591.4	283.4				
- Skimmed milk storage	-13.5	85.8	60.8	-11.5	-59.7				
- Butter storage	-33.1	300.0	158.8	-18.2	-56.1				
- Cheese storage	-	-	-	-	31.4				
- Butter ecoulement	460.1	458.9	444.4	401.5	283.0				
- Financial contribution of milk p.	-148.3	150.4	-91.9	-490.1	-447.0				
- Direct Aids						1,453.8			
Others					1,371.7	284.6	161.0		
BEEF AND VEAL	6,054.0	7,071.9	8,090.9	7,776.0	8,176.0	3,550.7	98.3	-41.3%	-98.4%

Type of expenditure (€)	2001	2002	2003	2004	2005	2006	2007	% change between 2001 & 2006	% change between 2001 & 2007
- Export refunds	362.6	386.7	295.5	250.8	212.0	118.4	46.3	-67.3%	-87.2%
- Interventions	5,691.3	6,685.2	7,795.4	7,525.2	7,964.1				
- Public and Private storage	325.8	104.1	3.0	-8.4	-0.1	0.0			
- Suckler cow premium	1,776.9	1,888.3	2,151.5	2,015.3	2,149.2				
- Special premiums	1,530.0	1,748.4	1,946.0	1,928.5	2,122.2				
- "BSE" measures	518.8	1,024.8	-	-	-				
- Direct Aids						3,297.8			
- Others	-	-	-	-	-	134.5	52.0		
SHEEPMEAT AND GOATMEAT	1,447.3	552.4	2,082.1	1,469.5	1,837.3	950.4	0.0	-34.3%	-100.0%
PIGMEAT, EGGS AND POULTRY	137.1	107.2	171.4	173.2	131.5	101.1	173.8	-26.3%	26.8%
- Export refunds	115.7	104.4	116.0	130.6	106.2	80.6	111.2	-30.3%	-3.9%
- Pig meat	55.2	27.3	17.3	42.2	19.1	-			
- Eggs	8.6	5.9	4.7	3.3	7.1	-			
- Poultry	51.9	71.1	94.1	85.2	80.0	-			
- Storage							0.0		
- Interventions Pig meat	4.9	2.7	35.3	30.0	4.2	-			
- Exceptional measures for Pig meat	9.6	0.1	10.4	0.0	0.0	-			
- Exceptional measures for Poultry	-	-	-	0.0	3.8	-			
- Others	-	-	-	-	17.3	20.4	62.7		

(a) Coupled direct aids currently include the Energy Crop Premium (to be phased out at the end of 2009), the Protein Crop Premium plus coupled aids where these have been (partially) retained by Member States (e.g. Suckler Cow Premium and Sheep and Goat Premium but not in the UK) or where Article 69 has been introduced (only in Scotland for the UK). For details, refer to: http://ec.europa.eu/agriculture/markets/sfp/pdf/2008_01_dp_capFVrev.pdf

(b) 2001-2006 expenditure through the EAGGF (European Agricultural Guidance and Guarantee Fund). 2007-2013 expenditure through the EAGF (European Agricultural Guarantee Fund).

(c) Sum of interventions in: milk and milk products; beef and veal; sheep meat and goat meat; and Pig meat eggs and poultry. Cereal interventions are not included. In 2007 coupled livestock payments (where these have been retained or introduced) are not included.

(d) Includes market interventions in the following sectors: cereals, sugar, olive oil, flax and hemp, cotton, fruits and vegetables, wine, tobacco, rice, other products (not defined), milk and milk products, beef and veal, sheep meat and goat meat, pig meat eggs and poultry, and fish. For the period 2001-2006 the following additional sectors are explicitly included in the total: dried fodder & grain legumes, textile plants and silkworms, and other plant products (seeds, hops, rice).