

Sowing Fresh Seeds

Food, Farming and Animal Welfare post Brexit

Brexit gives us the opportunity to think about food and farming from scratch. We need food and farming that produces nutritious food and encourages healthy diets. That enables us to meet the Paris climate targets and restores water, soils and biodiversity so that they are passed in good shape to future generations. Decent livelihoods for farmers and respect for animals as sentient beings, as individuals must be core elements of our policy.

There are two important starting points. Firstly, we need to move away from the current practice of formulating policy in silos with different Government departments, or sections of departments, being responsible for agriculture, the environment, animal welfare, dietary health, climate change and agri-tech. As a result policies in this arena do not cohere and are sometimes contradictory. For example, Defra tends to press for further intensification even though this has a detrimental impact on soil quality and animal welfare. Public Health England advises people to eat less red and processed meat while Defra promotes increased meat production.

Secondly, we need to move away from industrial livestock production as this is a key driver of, or an important contributor to:

- overconsumption of meat and dairy which leads to health problems and will make it impossible to meet the Paris climate targets,
- overuse of antibiotics in farming
- pollution and overuse of water, soil degradation, biodiversity loss and air pollution
- food insecurity
- poor animal welfare (see Figure 1).

Compassion in World Farming wishes to present the following integrated plan for post Brexit food and farming in England.

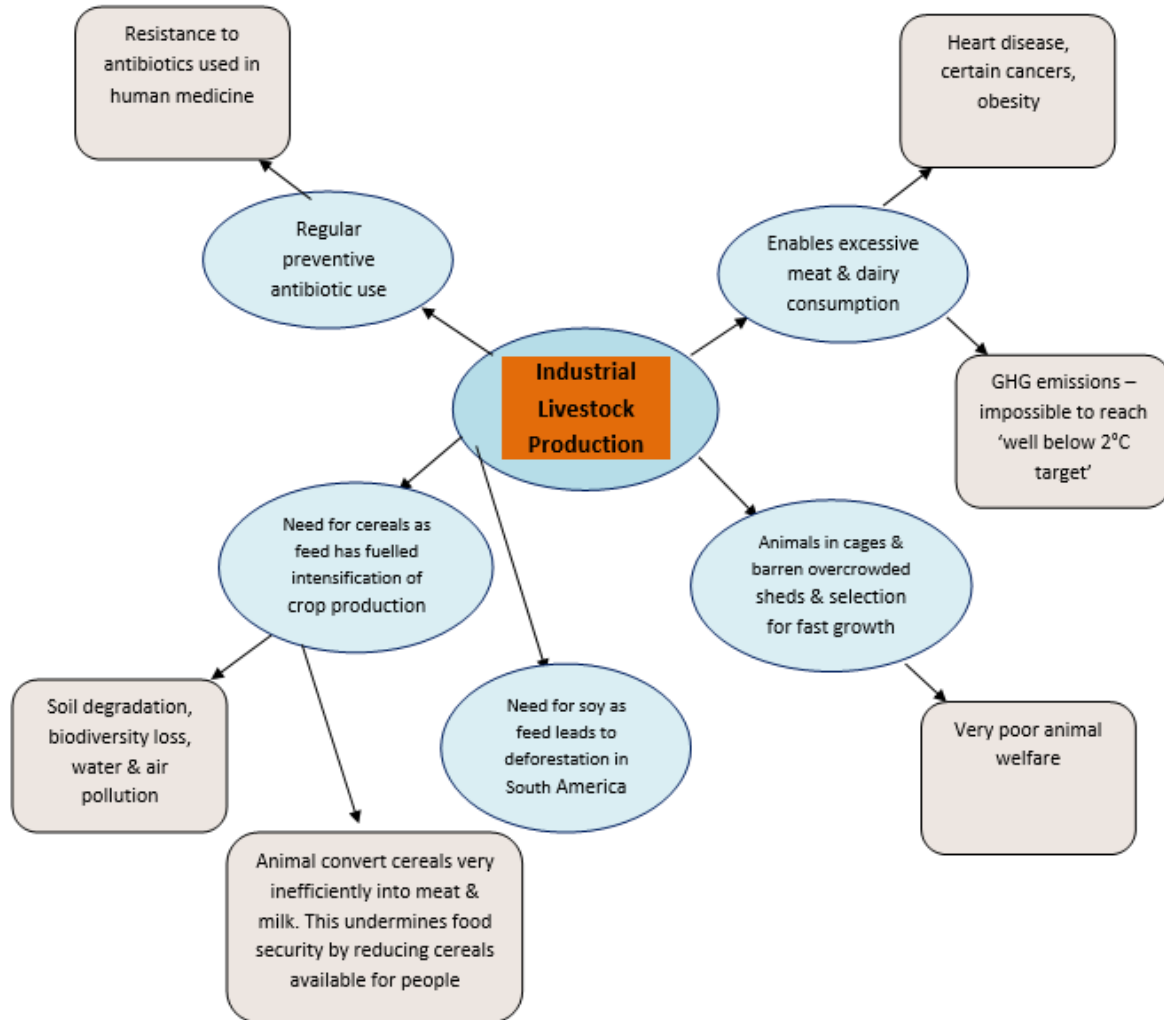
Resource inefficiency of industrial livestock production

In a world of finite resources and rising populations, resource-efficiency is crucial. And yet we have created a livestock system which, as will be seen below, experts describe as “staggeringly inefficient”, “colossally inefficient” and “a very inefficient use of land to produce food”.

The source of this inefficiency is the dependence of industrial livestock production on feeding to livestock cereals that could instead be used for direct human consumption. This matters because the nutritional value consumed by animals in eating a given quantity of cereals is much greater than that delivered for humans by the resultant meat and milk.

Figure 1

Intensive livestock production is at the heart of – or contributes to - many problems affecting health, food security, the environment and animal welfare



Studies show that for every 100 calories fed to animals in the form of human-edible crops, we receive on average just 17-30 calories as meat and milk.^{i ii} Indeed, the efficiency rates may be even lower for chicken, pork and beef.ⁱⁱⁱ

The UN Food and Agriculture Organisation (FAO) has said “When livestock are raised in intensive systems, they convert carbohydrates and protein that might otherwise be eaten directly by humans and use them to produce a smaller quantity of energy and protein. In these situations, livestock can be said to reduce the food balance”.^{iv} The FAO warns that further use of cereals as animal feed could threaten food security by reducing the grain available for human consumption.^v

Chatham House states that the feeding of cereals to animals is “staggeringly inefficient.”^{vi} The International Institute for Environment and Development stresses that using cropland to produce corn, soybeans and other crops for animal feed rather than to grow food for direct human consumption is “a colossally inefficient” use of resources.^{vii}

Defra data show that 46% of UK cereals are used as animal feed.^{viii} This is a wasteful use not just of these crops but of the land, water and energy used to produce them. Industrial livestock's huge need for cereals has fuelled the intensification of crop production which, with its monocultures and agri-chemicals, has led to water pollution, soil degradation^{ix x} and biodiversity loss.^{xi xii} This aspect is examined in the next section.

Natural resources

Detrimental impact of intensive farming on natural resources

Farming's environmental damage is well documented. The Natural Capital Committee points out that "farming can produce large external costs to society in the form of greenhouse gas emissions, water pollution, air pollution, habitat destruction, soil erosion and flooding. These costs are not reflected in the price of food. As a result, farming is responsible for net external costs to society that have been valued at £700m per annum."^{xiii}

Soil degradation: The damage that can arise from an ill-judged drive for increased productivity is highlighted by recent studies on soil quality. A UK study concludes that "modern agriculture, in seeking to maximize yields ... has caused loss of soil organic carbon and compaction, impairing critical regulating and supporting ecosystem services".^{xiv} It highlights "the extent to which modern agricultural practices have degraded soil natural capital". It points out that depletion of soil organic carbon "in conventional agricultural fields is now thought to be an important factor constraining productivity as many arable soils have suboptimal concentrations".

Low levels of soil organic carbon reduce fertility and soils' ability to store carbon which mitigates climate change. They also weaken soil's capacity for retaining water; this exacerbates flooding and diminishes plants' ability to withstand droughts. Insufficient organic carbon makes soils vulnerable to erosion which leads to loss of nutrients and hence to eutrophication of rivers and other aquatic ecosystems.

Another study concludes that intensive agriculture has reduced soil biodiversity in southern UK.^{xv} It stresses: "Given that the loss of soil biodiversity is ultimately linked to a loss of soil functions that underpin ecosystem services, we propose that future agricultural policies need to consider how to halt and/or reverse this loss of soil biodiversity".

A 2015 report by the Committee on Climate Change states: "Some of the most productive agricultural land in England is at risk of becoming unprofitable within a generation due to soil erosion and the loss of organic carbon."^{xvi} It adds: "Agricultural soils are being degraded by intensive farming practices in some areas".

The cost of soil degradation in England and Wales is estimated to be between £0.9 billion and £1.4 billion per year.^{xvii}

Biodiversity loss: A Defra study shows that by 2013, the UK breeding farmland bird index had fallen by 55% to a level less than half that of 1970. It adds that there has been a statistically significant on-going decline of 10% between 2007 and 2012.^{xviii} Defra's study states that many of the declines in farmland birds "have been caused by land management changes and the intensification of farming".

There has been a marked decline in pollinating insects including bees in the UK.^{xix} The Parliamentary Office for Science & Technology states that intensive farming has resulted in a significant loss of habitats with the resultant loss of food and nesting resources for pollinators –and the use of pesticides and monocultures – being a leading driver in pollinator declines.^{xx}

Air pollution: A new study reports that in the UK agriculture contributes up to 48% of the air pollution associated with premature mortality.^{xxi} This largely results from livestock and fertilisers; a substantial proportion of these are used to grow crops for animal feed.

Excess nitrogen in the environment: The use of synthetic nitrogen fertilisers is a key factor leading to environmental pollution.^{xxii} A large proportion of these fertilisers are used to grow crops for animal feed. The European Nitrogen Assessment identifies five key threats associated with excess reactive nitrogen in the environment: damage to water quality, air quality (and hence human health, in particular respiratory problems and cancers), soil quality (acidification of agricultural soils and loss of soil biodiversity), the greenhouse balance and ecosystems and biodiversity.^{xxiii}

Compassion's Plan: Objectives on Natural Resources

- Restore soil quality by increasing organic matter and soil biodiversity
- Re-establish the variety and abundance of farmland birds and pollinators
- Reduce the contribution of agriculture to poor air quality
- Reduce farming's use and pollution of water

Steps for restoring natural resources

Industrial livestock production should be brought to an end. If industrial livestock's need for cereals was much reduced, arable land could be farmed less intensively, allowing soil, water and air quality as well as biodiversity to be restored.

Soil quality could be restored – and the use of synthetic fertilisers reduced - by:

- rotations that include fallow periods and legumes which 'fix' atmospheric nitrogen into biologically available forms of reactive nitrogen
- compost, green manure and animal manure provided that the latter is applied in quantities that can be utilised by the land.

The 'last resort' principle should be applied to the use of pesticides. These should be replaced by *Integrated Pest Management* which primarily relies on nature's own processes to control pests. These include allowing the natural enemies of pest species to thrive (whereas pesticides tend to kill pests' predators), the use of resistant varieties and the development of healthy soil as this promotes strong healthy crops which are better able to withstand disease and pest attack.

Climate change

Clearly all sectors must reduce their emissions. However, research shows that on a business-as-usual (BAU) basis globally agriculture's greenhouse gas (GHG) emissions will increase by 2050 by 77%. Even if crop yield gaps are closed its emissions will rise by 42%.^{xxiv} By 2050, on a BAU basis, agriculture alone will take us over the Paris 'well below 2°C' target leaving very little room for other sectors' emissions.^{xxv}

A Chatham House report concludes that technical mitigation measures and increased productivity will be insufficient on their own to prevent an increase in farming's GHG emissions, let alone achieve a reduction.^{xxvi} Research shows that only a 50% decrease in food waste and a shift to healthy diets with reduced meat and dairy consumption can produce a fall in agriculture's GHG emissions.^{xxvii} Two Chatham House reports stress that it is unlikely temperature rises can be kept below 2°C without a reduction in global meat and dairy consumption.^{xxviii xxix}

UK GHG emissions from agriculture have fallen from 60.5 MtCO₂e in 1990 to 49.5 MtCO₂e in 2013, a welcome fall of 18%.^{xxx} However, this fall has at present come to an end. The Committee on Climate Change's 2016 Progress Report to Parliament states emissions from agriculture increased for the second successive year in 2014, up 2% on the previous year.

Moreover, the Government's projections show that UK agriculture's emissions are only expected to fall by a further 0.7 MtCO₂e between 2015 and 2035, a decrease of just 1.4%.^{xxxi} The Climate Change Act 2008 commits the UK to reducing emissions in 2050 by at least 80% from 1990 levels. For agriculture to play its part in meeting this target, its emissions would have to be just 12.1 MtCO₂e by 2050 whereas the Government's projections show that they will still be 48.8 MtCO₂e in 2035.

UK food and farming can only contribute to meeting the targets set by the Climate Change Act and the Paris Agreement if there is a substantial reduction in meat and dairy consumption.

One of the leading researchers in this area, Dr Bojana Bajželj, has recently written that "our demand for food alone could virtually guarantee that the Paris aspirations are unachievable".^{xxxii} She stresses the need for "cutting down on consumption of intensively-produced meat and dairy. Raising livestock is a much less efficient way of producing food than growing crops. ... If we used the land growing [animal] feed to grow food, and ate only meat from pasture-fed animals, there is scope for very significant reductions in emissions."

Hilal Elver, the UN Special Rapporteur on the right to food, stresses: "The world's current consumption pattern of meat and dairy products is a major driver of climate change and climate change can only be effectively addressed if demand for these products is reduced."^{xxxiii} She adds: "developed countries should demonstrate a willingness to modify consumption behaviour and avoid food waste."

We appreciate that Governments cannot tell people what to eat. They can, however, inform people about the relationship between diets and climate change, stimulate national debate and highlight the need for action.

A recent Chatham House report states that, from the climate viewpoint, there is a "compelling case for shifting diets, and above all for addressing meat consumption. However, governments are trapped in a cycle of inertia: they fear the repercussions of intervention ... This report offers a challenge to the received wisdom that these obstacles are insuperable.... it suggests how the cycle of inertia can be broken and a positive dynamic of government and societal action created".^{xxxiv}

It argues that "although reducing meat and dairy consumption is far from straightforward, it is neither an insurmountable task nor more challenging than other climate imperatives, such as decarbonizing power, industry and transport". It stresses that "Governments must lead" and that the public "expect[s] government leadership".

Compassion's Plan: Objective on Climate Change

In order to be on track to meet the target set by the Climate Change Act for 2050, GHG emissions from UK agriculture should be reduced by around 43% between 2015 and 2035.

Steps for Realising the Objectives on Climate Change

- Mitigation techniques (such as improved manure management) can reduce emissions though care must be taken to ensure that any technique used does not harm animal welfare.
- A shift to healthier diets with reduced meat and dairy consumption. Research estimates that a change from a high meat diet (>100g/day) to a low-meat diet (<50g/day) would produce a 35% reduction in diet-related GHG emissions.¹

Measures that will be Helpful in Realising Many of the Plan's Objectives

Public information and education

The Government should develop programmes to increase public awareness of the implications of different livestock farming methods and consumption levels for human health, the environment, food security and animal welfare. Few people are aware of the relationship between meat and dairy consumption and climate change or that diet is now a bigger risk factor for disease in England than tobacco smoke.

Public procurement: taking the lead, setting the standard

Public sector bodies should, when buying meat, dairy products and eggs, use their buying power to augment the market for food produced to high nutritional, environmental and animal welfare standards. Public bodies' commitment to quality food will help change our attitude to food.

Getting prices right - internalising negative externalities

See section below '*Mending our price system*'

Creation of a new food culture

The current food culture gives great weight to factors such as low prices and convenience. There is no part of this culture that invites consumers to think about how low-cost meat, eggs and milk are produced. A new food culture must be created that attaches importance to the nutritional quality of food and values farming methods that protect the environment and animals. Like any social change, this will be a gradual process as we re-assess our values and priorities.

Empowering consumers

Consumers must be empowered to drive improvements. At present industry and Government conspire to keep consumers in the dark. Mandatory labelling of meat and dairy products as to farming method should be introduced so that consumers can make informed choices.

Health

Diets in the UK (and most of the Western world) are often of low nutritional quality. Many people consume excessive amounts of processed foods, meat and dairy as well as salt, sugar and fat. Families spend 51% of their food shopping budget on ultra-processed food.^{xxxv} A recent WHO report^{xxxvi} is the latest in a long line of studies that show that the high levels of consumption of red and processed meat that are common in Western diets increase the risk of heart disease, obesity, diabetes and certain cancers.^{xxxvii xxxviii xxxix} The WHO report classifies processed meat as carcinogenic and red meat as probably carcinogenic. Poor diet – including high red and processed meat consumption - is now the major contributor to disease in England.^{xi}

National Statistics show a marked increase in obesity in England in the last 20 years with over 50% of the population being overweight.^{xii} In addition, less than 30% of people eat five portions of fruit and vegetables per day.^{xlii}

The new *Eatwell Guide* produced by Public Health England says: “Eat less red and processed meat”.^{xliii} The Carbon Trust concludes the new *Guide* has appreciably lower environmental impact than the current UK diet, with substantially reduced GHG emissions and land use.^{xliv}

Research shows that in recent years healthy foods have been consistently more expensive than less healthy ones with a growing gap between them.^{xlv} The Faculty of Public Health states that “In the UK, the poorer people are, the worse their diet, and the more diet-related diseases they suffer from”.^{xlvi} A *Lancet* article points out that “nutrient-poor foods tend to be inexpensive, thus saturating low-income neighbourhoods with unhealthy options”.^{xlvii}

Food policy should ensure that everyone is able to access healthy food irrespective of their income. This will require a proper integration between food and social equity policies. Olivier De Schutter, former UN Special Rapporteur on the right to food, stresses that “any society where a healthy diet is more expensive than an unhealthy diet is a society that must mend its price system.”^{xlviii} Steps for mending our price system are examined below.

Free-range animals – that consume fresh forage and have higher activity levels – often provide meat of higher nutritional quality than animals that are reared industrially. Meat from free-range chickens contains substantially less fat and generally a higher proportion of the beneficial omega-3 fatty acids than meat from chickens reared industrially.^{xlix} Similarly, pasture-fed beef has less fat and higher proportions of omega-3 fatty acids than grain-fed beef.

Compassion's Plan: Objectives on Health

By 2030

- A very high proportion of people eat healthy diets with reduced levels of salt, sugar, red meat, processed meat and saturated fat and increased levels of fruit, vegetables and whole grains.
- The consumption of red and processed meat is reduced by around 50%; currently average consumption of red meat in the UK is around 30kg per person per year; this is almost twice as high as the maximum of 15.6kg recommended by the World Cancer Research Fund²
- The diets of poorer members of society are as nutritious as those of wealthier people
- The contribution of diet to non-communicable diseases is reduced by 75%

Steps for Realising the Objectives on Health

- See earlier section on '*Public information and education*' and later section on '*Mending our price system*'
- Provide information regarding the options for healthy eating on a low income

Routine preventive use of antimicrobials in intensive livestock sector

The over-use of antimicrobials in human medicine is the main driver of antimicrobial resistance. However, both the European Medicines Agency and the World Health Organisation stress that the regular prophylactic use of antimicrobials in farming contributes to the transfer of resistant bacteria to people.ⁱ The O'Neill *Review on Antimicrobial Resistance* established by the UK Government reports a clear link in the scientific literature between antimicrobial consumption in farm animals and resistance in humans. It calls for a substantial reduction in antimicrobial use in farming.ⁱⁱ

The therapeutic treatment of individual sick animals with antimicrobials is often essential. However, antimicrobials are frequently routinely given to whole herds or flocks of intensively farmed animals to prevent the diseases that are inevitable when large numbers of animals are kept in crowded, stressful conditions. The O'Neill report *Antimicrobials in Agriculture and the Environment* states that prophylactic use is "particularly prevalent in intensive agriculture, where animals are kept in confined conditions".ⁱⁱⁱ The link between intensive farming and high levels of antimicrobials use is highlighted by the fact that the Veterinary Medicines Directorate's data show that around 90% of all UK farm antibiotic sales are for pigs and poultry, the two most intensively farmed species.^{iv}

The routine preventive (prophylactic and metaphylactic) use of antimicrobials should be brought to an end.

Developing health-orientated systems for rearing of animals

The *Lancet Infectious Diseases Commission* has stressed that instead of relying on routine use of antimicrobials, we need to develop "health-orientated systems for rearing of animals".^{iv} In such systems good health would be integral to the system rather than being propped up by

routine use of antimicrobials. This approach would build good health and strong immunity by (see Figure 2):

avoiding overcrowding: research shows that high densities are a risk factor for the spread and development of infectious disease; such densities can allow rapid selection and amplification of pathogens;^{lvi lvii lviii}

reducing stress: stress tends to impair immune competence, making animals more susceptible to disease;

enabling animals to perform natural behaviours: inability to engage in natural behaviours is a major source of stress in intensive systems;

ending the early weaning of pigs: this is stressful due to premature removal from the sow, change in diets, mixing with unfamiliar pigs and being moved to a new environment. Pigs should not be weaned until they have gained immunological and nutritional independence from the sow. Danish Ministry of Agriculture data show that antimicrobial use is 20 times greater in intensive pigs than in organic pigs which are weaned at a substantially older age;^{lix}

avoiding excessive group size: The O' Neill Review states: "large numbers of animals living in close proximity ... can act as a reservoir of resistance and accelerate its spread. There are often many opportunities in intensive farming environments for drug-resistant bacteria to be transferred between, for example, thousands of chickens being reared in the same indoor enclosure";^{lx}

minimising mixing: Mixing is stressful and can result in the introduction of disease;

maintaining good air quality: poor air quality is a risk factor for respiratory disease;

encouraging a move away from genetic selection for high production levels: these appear to involve an increased risk of immunological problems and pathologies.^{lxi}

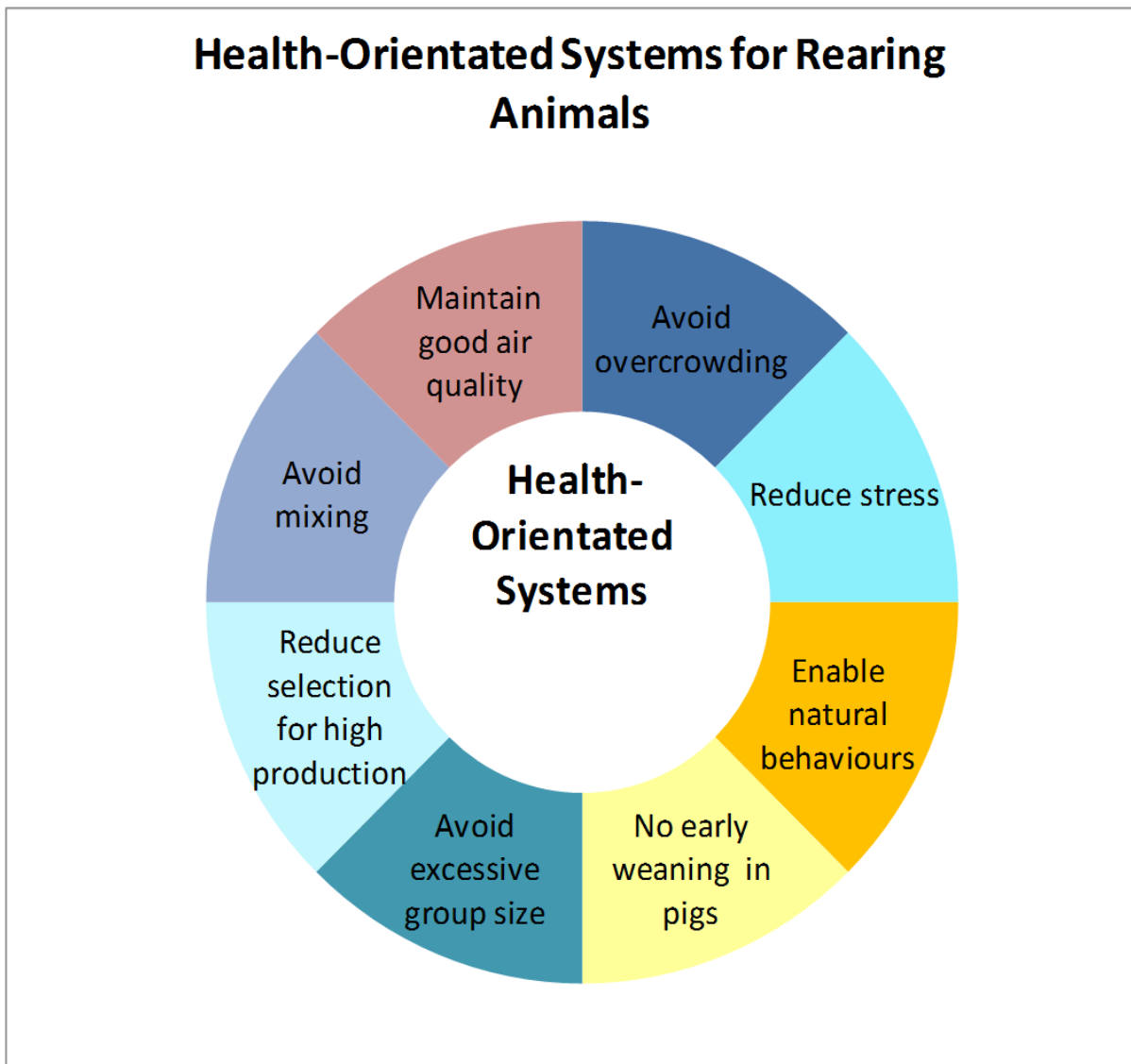
Compassion's Plan: Objective on Antimicrobials

The routine preventive use of antimicrobials should be replaced by health-orientated systems for rearing animals. These would bring the additional benefit of having much greater potential for delivering good welfare outcomes than industrial systems.

Steps for Realising the Objective on Antimicrobials

- Legislation to prohibit routine prophylactic and metaphylactic use of antimicrobials in farming
- Dissemination of information on how to rear animals without routine use of antimicrobials.

Figure 2



Redefining the role of livestock

Research funded by the FAO (two of the authors of the resultant paper work for the FAO) argues that the role of livestock should be transformed. Rather than being fed on human-edible grain, their role should be “to use resources that cannot be otherwise used for food production”.^{lxii}

This research shows that the environmental pressures from livestock production could be reduced by focusing on grassland-based ruminant production and by reducing the amount of cereals fed to farm animals; this would entail a move away from intensive pig and poultry production and grain-based cattle. This would allow arable land to be farmed less intensively thereby enabling soils and biodiversity to be restored.

A 2014 paper takes a similar approach. It identifies grazing on pasture and use of crop residues and processing co-products as efficient forms of feed. It says that “together these support about 30% of current [global] livestock production; the remaining 70% has to be seen as a very inefficient use of land to produce food”.^{lxiii}

The great strength of extensively reared cattle and sheep is that they convert grass into food that we can eat and are able to use land that is generally not suitable for other forms of food production. Extensive pastures can support biodiversity; they provide a diverse environment, rich in plants and invertebrates and beneficial to a variety of birds. In addition, they store carbon and can reduce the use of nitrogen fertilisers by the incorporation into pasture of legumes (e.g. clover) which fix atmospheric nitrogen in the soil.

The belief has grown up that even outdoor cattle and sheep need a proportion of cereals in their diet. However, members of the *Pasture-Fed Livestock Association* have shown that producing beef and lamb on 100% pasture and forage crops is feasible and profitable.^{lxiv} By avoiding cereals they have lower input costs which is a crucial element of their business.

Rotational integrated crop-livestock farming is also highly efficient. Such systems are in line with circular economy principles. The waste products of one component serve as a resource for the other: animals are fed on crop residues and their manure, rather than being a pollutant, fertilises the land.

Compassion's Plan: Objectives on the Role of Livestock and Animal Feed

- A 33% reduction by 2025 – and a 50% reduction by 2035 – in the use of human-edible crops to feed farm animals
- The role of livestock is transformed by 2035. They are no longer used primarily to convert human-edible crops into meat and milk as this is profoundly inefficient. Their proper role is now recognised as being the conversion of materials that humans cannot eat into meat and milk
- With its plentiful pastures the UK becomes a world leader in pasture-fed livestock and the skilful management of such systems
- 50% of cattle and sheep are fed on pasture and forage crops alone by 2025; that figure has increased to 80% by 2035
- Due to the reliance on grain of today's pig and poultry systems, these sectors are likely to contract. By 2030 most pigs and poultry are kept outdoors on pasture or in agro-forestry systems with at least 15% of their feed coming from foraging and 25% from by-products and unavoidable food waste such as cull vegetables and bakery waste.

The multiple benefits of reducing meat and dairy consumption

Defra's thinking tends to focus almost exclusively on production. However, an integrated policy will consider the symbiotic relationship between production and consumption. Reduced consumption of meat and dairy production would not only benefit people's health and enable climate change targets to be met. It would also allow production pressures to be eased. Fewer livestock would be needed; animals could be farmed extensively to high welfare standards. Fewer cereals would be required for animal feed; arable land could be farmed less intensively. Monocultures could be replaced by rotations; fertiliser and pesticide use could be reduced; soil quality and biodiversity could be restored.

Studies show that a substantial reduction in meat and dairy consumption would provide important environmental benefits. These include reduced GHG and nitrogen emissions, a decrease in the use and pollution of surface- and ground-water, reduced use of cropland and

a drop in the import of soybean for animal feed which would reduce deforestation in South America.^{lxv lxxvi lxxvii lxxviii}

The Chinese Government has recently announced plans to reduce meat consumption by 50% in the interests of dietary health and reducing GHG emissions.^{lxxix}

Compassion's Plan: Objectives regarding meat and dairy consumption

A 33% reduction in meat and dairy consumption by 2025 – and a 50% reduction by 2035

Steps for encouraging a reduction in meat and dairy consumption

When this subject is raised, policy makers often respond: 'We cannot tell people what to eat'. No-one is suggesting that people be told what to eat. However, Government could take the lead in informing consumers of the benefits entailed in reducing meat and dairy consumption.

A recent Chatham House report stresses that focus groups conducted in four countries - the UK, the US, China and Brazil - "all demonstrated a general belief that it is the role of government to spearhead efforts to address unsustainable consumption of meat". It concludes that "Governments overestimate the risk of public backlash".³

Livestock farmers must be able to earn decent livelihoods

The three most intensive livestock sectors – pigs, broilers and dairy – are those that most regularly experience poor prices with very low margins or even losses stemming from a failure to cover production costs. Clearly intensive livestock production is not working for either the farmers or the animals.

This problem stems from a range of factors including cheaper imports that in some cases are produced to lower animal welfare standards and the fact that farmers receive a very low share of the value generated by the food chain. Government data show that livestock farmers generally receive half or less of the retail price paid for their products.^{lxxx} For eggs and milk they receive just 32% and 38% respectively while for chicken and pork they get 40%. In the case of chicken, pork, beef and lamb, the share farmers receive has declined substantially in the last 27 years.

The problem is compounded by the fact that farmers have been swamped by other parts of the food chain. In 2014, the UK agri-food sector contributed £108 billion to the economy. Within this, manufacturing, retailing and catering accounted for around one quarter each. Food wholesaling produced 11% of the sector's value and agriculture made the smallest contribution at 9%.^{lxxxi}

Compassion's Plan: Objectives regarding livestock farmers

Farmers should obtain a greater proportion of the retail price for their products. They should receive a proper price for their food that provides them with a decent living, enables them to invest in their business and achieve good environmental and animal welfare standards.

Steps for securing a decent living for livestock farmers

- Unfettered market economics are producing damaging undesired results in undermining farmers' livelihoods, natural resources and animal welfare. Government must encourage food businesses to pay farmers prices that are commensurate with their production costs and allow farmers to provide good environmental and animal welfare standards. If encouragement proves to be insufficient, Government should introduce regulatory measures.
- Short, simple supply chains must be encouraged as this will enable farmers to obtain a greater share of the income generated by the food chain.
- When negotiating future trade deals, the Government must insist on the inclusion of a clause that allows the UK to require imports to meet UK animal welfare standards.

Animal welfare

Defra states that the UK has the highest standards of animal welfare in the world. This is not the case but even if it were it would not detract from the fact that UK welfare standards do need to be improved. Some farmers achieve high standards, but others fail to do so. 51% of UK laying hens are kept in enriched cages; these have a low potential for delivering good welfare outcomes.^{lxxii} Most UK broiler chickens are farmed intensively; such systems involve a range of serious welfare problems.^{lxxiii} A proportion of UK pig farmers flout the legislation that bans routine tail docking and requires enrichment materials to be given to pigs.

The UK dairy sector is rapidly industrialising with cows being moved off fields into zero-grazing operations. Reports by the European Food Safety Authority and a new review of the literature show that pasture based cows have lower levels of lameness, hoof pathologies, hock lesions, mastitis, uterine disease and mortality than zero-grazed cows.^{lxxiv lxxv} Pasture access also results in improved lying/resting times and lower levels of aggression. When given the choice between pasture and indoor housing, cows show an overall preference for pasture.^{lxxvi}

Now, more than ever, machines: It is just over fifty years since Ruth Harrison published *Animal Machines*. But now the transformation of animals into machines has gone much further. They are fine-tuned for maximum productivity, minimum emissions and utmost efficiency in converting feed into meat or milk. Technicians pore over their blueprints trying to find a further gram of growth or an extra piglet per litter. And now new technologies – cloning, genetic engineering, gene editing and agri-tech - are poised to usher in a ruthless new generation of factory farming.

Live exports: The UK exports sheep for slaughter to the Netherlands, Germany, Belgium and France. Recent investigations by the French organisation L214 reveal cruel and illegal slaughter conditions in French abattoirs. Animals should be slaughtered in the UK near to the farm of rearing with our exports being in meat form. The UK exports calves to France and Spain though scientific research shows high rates of sickness and mortalities amongst calves during and following long distance transport.^{lxxvii} Calves are simply not able to cope

with the stresses of long distance transport; they have a poorly developed system for providing immunity, dealing with stress and controlling body temperature.

Compassion's Plan: Objectives regarding Animal Welfare

By 2025:

- All farm animals are either kept in well-designed and well-managed free range systems or, if they are indoors, they are housed in large well-ventilated barns with ample space, plenty of straw as well as natural light;
- Husbandry systems enable animals to express their natural behaviours;
- Genetic selection for fast growth or high yields is avoided where this results in compromised welfare such as ill-health, pain or limits on behavioural expression;
- Systems that require routine mutilations are not used;
- Cloning, genetic engineering and gene editing of farm animals have been prohibited;
- High standards of animal welfare have become a core part of the post Brexit UK's international brand.

Live exports for slaughter or fattening should be banned as a matter of urgency.

Agri-tech is at present being primarily used to entrench industrial livestock production which generally has a detrimental impact on animal welfare. Innovate UK, a public body, provides funding for agri-tech. Innovate UK should not provide funding for agri-tech in the livestock sector except when there is clear evidence that the project concerned will not harm animal welfare and is not likely to shore up industrial systems with inherently poor welfare standards.

Steps for Improving Animal Welfare

- Legislation together with industry voluntary initiatives will be needed.
- **Mandatory labelling as to farming method:** Mandatory labelling of meat, milk and dairy products as to farming method should be introduced so that consumers can make informed choices. Consumers are largely unable to play a part in determining the future direction of UK dairying as most milk is pooled together making it impossible to distinguish intensive and pasture-based milk. Defra should work with industry to explore ways in which pasture-based milk and dairy products can be labelled as such rather than being mixed with milk and dairy products from intensive herds.
- CAP payments, which are primarily a subsidy for land ownership, should be replaced post Brexit by payments for ecosystem services and high animal welfare standards. Farmers will be encouraged to move to enhanced welfare standards by the combination of higher prices from the market and support from public funding.
- In negotiating any future trade deals with the EU, the UK must insist on the inclusion of a clause permitting the UK to ban live exports.
- It is widely recognised that animal welfare entails more than avoiding suffering. Good welfare involves enabling animals to have positive experiences such as pleasure, confidence and a sense of control

Horticulture

The UK produces just 11% and 55% respectively of the fruit and vegetables that we consume.^{lxxviii} Imports of fruit and vegetables are the largest item in our food import bill.^{lxxix} We devote 3.1 million hectares to cereal production^{lxxx}, 46% of which is fed to animals.^{lxxxi}

However, just 168,000 hectares are used to grow fruit and vegetables.^{lxxxii} Just halving the use of cereals as animal feed would provide enough land for the UK to grow the fruit and vegetables it imports (apart from those for which our climate is not suited). This would produce healthier food and contribute to lowering the UK's food trade gap.

Compassion's Plan: Objective regarding Horticulture

A 33% expansion in horticulture production by 2025 – and a 50% expansion by 2035

Mending our price system

Olivier De Schutter, former UN Special Rapporteur on the right to food, stresses that “any society where a healthy diet is more expensive than an unhealthy diet is a society that must mend its price system.”^{lxxxiii} This applies equally to a society, such as our own, where environmentally damaging, low animal welfare food is cheaper than food that respects natural resources and animals' well-being.

“In many countries there is a worrying disconnect between the retail price of food and the true cost of its production. As a consequence, food produced at great environmental cost in the form of greenhouse gas emissions, water pollution, air pollution, and habitat destruction, can appear to be cheaper than more sustainably produced alternatives”.

FAO Report, 2015: Natural Capital Impacts in Agriculture

At the heart of our inefficient price system is its failure to take certain costs into account i.e. farming's negative externalities such as its damaging impact on health, natural resources and animal welfare. This results in market failure, in particular in the production of unwanted outcomes, mainly in the public sphere. It also leads to private gains being viewed as more important than public losses.

The costs associated with farming's negative externalities are borne by third parties or society as a whole, for example taxpayers funding the NHS costs of treating diet-related ill-health. In some cases the costs are borne by no-one and key resources such as soil and biodiversity are allowed to deteriorate undermining the ability of future generations to feed themselves.

The Foresight report stressed: “There needs to be much greater realisation that market failures exist in the food system that, if not corrected, will lead to irreversible environmental damage and long term threats to the viability of the food system. Moves to internalise the costs of these negative environmental externalities are critical to provide incentives for their reduction.”^{lxxxiv} Government has failed to act on the Foresight report's recommendation.

Compassion's Plan: Objectives regarding mending our price system

Food that is healthy and respects natural resources and animals' well-being should be cheaper than unhealthy, poor quality food

Steps for mending our price system

A wide range of mechanisms will be needed to mend our price system. These include much better public information about the consequences of today's farming, mandatory labelling as to farming method, supportive public procurement (these are all detailed elsewhere in this paper). Fiscal measures will be of particular importance. Once the CAP no longer applies to the UK, public funds should be used to support positive externalities i.e. as payments for environmental services and high standards of animal welfare.

Taxation should entail two intertwined approaches. Taxes can be levied equal to a particular negative externality; this will very precisely internalise them. Taxes should also be used to positively lower the cost of quality food and farming for both farmers and consumers. Farmers adopting high standards could be given generous capital allowances and an extra tranche of tax-free income.

The cost of high quality food could be reduced for consumers in two ways. Income generated by taxes levied to internalise negative externalities could be used to subsidise quality food such as meat raised to high welfare standards, fruit and vegetables. UK policy on charging VAT on food is inconsistent. However, where VAT is charged, a zero rate should be placed on healthy food that respects the environment and animal welfare.

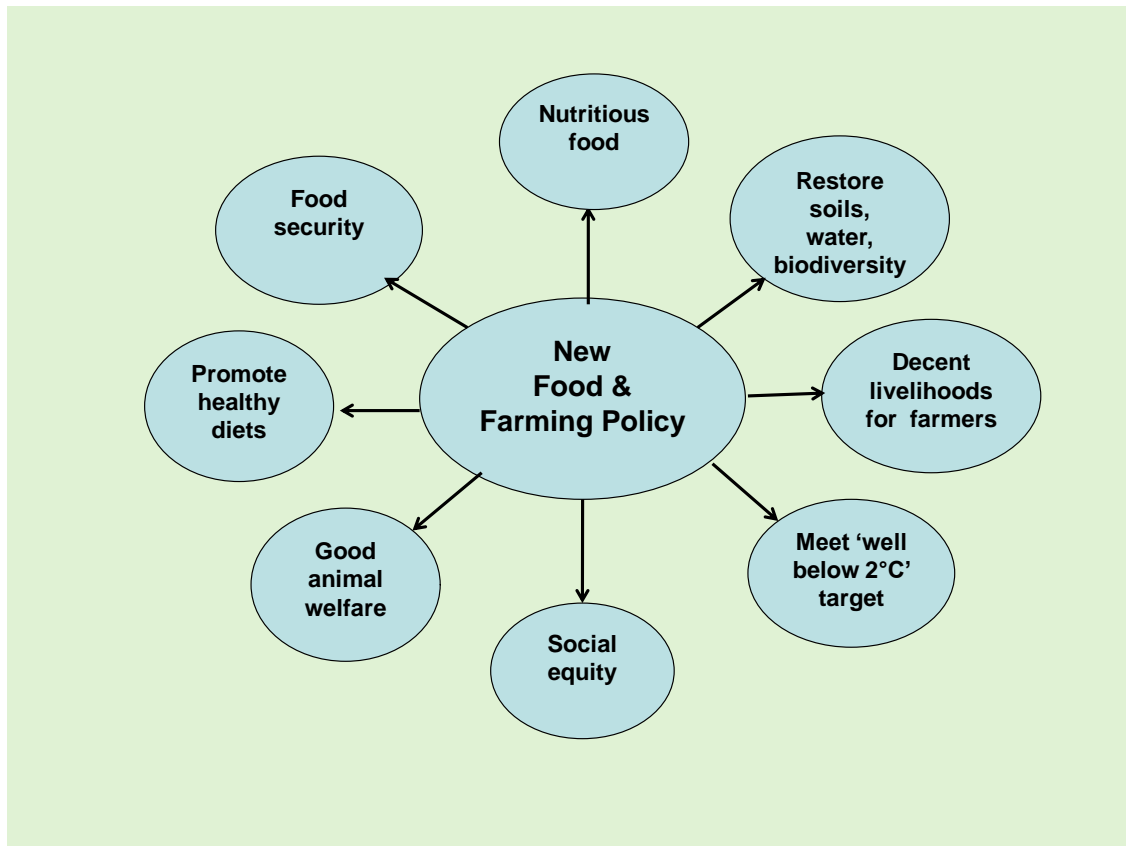
Need for plurality of indicators

Governments tend to measure the success of agriculture by levels of production and productivity. This entrenches a narrow, quantitative view of what constitutes a good food and farming system. Many other indicators are published in documents such as the Defra annual publication *Agriculture in the UK* and in a range of scientific studies. However, policy-makers tend to give relatively little weight to non production-related indicators.

Policy makers should use a much broader range of indicators to measure success. These should include: the contribution of diet to non-communicable diseases; the ability of the poorest sections of society to access healthy food; the contribution of food and farming to GHG emissions; the use of antimicrobials in farming; the state of natural resources; animal welfare indicators; farmers' margins; farmers' share of the retail price and of the agri-food sector's contribution to the economy. Only if such a wide range of indicators is used can we ascertain that all of the intermeshed objectives of a good food and farming policy are being met (see Figure3).

Figure 3

Key Objectives of a Sustainable, Healthy and Humane Food and Farming Policy



Compassion’s plan: Summary of Recommendations

Starting afresh

We must take the opportunity provided by the UK’s decision to leave the EU to reformulate food and farming policy so that its core objectives are to provide nutritious food produced to high environmental and animal welfare standards and to encourage diets that are healthy and enable the Paris climate targets to be met.

Reduce grain-reliant livestock feeding

We should aim for a 33% reduction by 2025 – and a 50% reduction by 2035 – in the use of human-edible crops to feed farm animals as this is an inefficient, environmentally damaging way of feeding people. This should be coupled with keeping farm animals on the land in efficient and environmentally friendly forms of husbandry such as pasture-based and mixed rotational farming.

Restoring natural resources

Industrial livestock production should be brought to an end. If industrial livestock’s need for cereals as animal feed was much reduced, arable land could be farmed less intensively, allowing soil, water and air quality as well as biodiversity to be restored.

Redefine the role of livestock

The function of livestock should be to convert materials we cannot eat – pasture, crop residues, by-products, unavoidable food waste – into food that we can consume.

Eat less but better meat and dairy products

This would give us healthier lives, reduce greenhouse gas emissions, help restore the environment, make it easier to feed the growing world population and increase the scope for animals to be farmed extensively using higher welfare standards. As a guide we should aim for a 33% reduction in meat and dairy consumption by 2025 and a 50% reduction by 2035 with livestock products consumed coming from land-based farming systems which provide better animal welfare and nutritional and environmental benefits.

Reduce antibiotics use

End the routine preventive use of antibiotics most of which takes place in intensive farming. Health-orientated systems for rearing animals should be developed that are not reliant on antibiotics.

Farmers must be able to earn a decent living

Farmers should obtain a greater proportion of the retail price for their products. Government must encourage food businesses to pay farmers prices that properly reflect their production costs and provide them with a decent living while also enabling them to achieve good environmental and animal welfare standards.

Animal welfare

Live exports for slaughter or fattening should be banned as a matter of urgency.

By 2025:

- All farm animals are either kept in well-designed and well-managed free range systems or, if they are indoors, they are housed in large well-ventilated barns with ample space, plenty of straw as well as natural light;
- Husbandry systems enable animals to express their natural behaviours;
- Genetic selection for fast growth or high yields is avoided where this results in compromised welfare such as ill-health, pain or limits on behavioural expression;
- Systems that require routine mutilations are not used;
- Cloning, genetic engineering and gene editing of farm animals have been prohibited;
- High standards of animal welfare have become a core part of the post Brexit UK's international brand.

To protect UK farmers from low welfare imports, when negotiating future trade deals the UK must insist on a clause permitting the UK to require imports to meet UK welfare standards.

Labelling as to farming method

Meat and dairy products must be labelled as to farming method to enable consumers to make informed choices.

Mending our price system

Once the UK is no longer subject to the CAP, a new approach to subsidies should be developed. Public funding should primarily be used to support positive externalities i.e. as payments for environmental services and high standards of animal welfare.

Farming's negative externalities must be internalised. Taxes can be levied to reflect a particular negative externality. Taxes should also be used to positively lower the cost of quality food and farming for both farmers and consumers. Farmers adopting high standards could be given generous capital allowances and an extra tranche of tax-free income.

The cost of high quality food could be reduced for consumers in two ways. Income generated by taxes levied to internalise negative externalities could be used to subsidise quality food such as meat raised to high welfare standards, fruit and vegetables. UK policy

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