

Ambition for the future –
Bold proposals for agricultural land use
and food production in a Green Brexit



Farmwel is an NGO which advocates policies to enable a transition to sustainable and accountable mainstream agriculture and aquaculture.¹ Farmwel is funded by Sankalpa.²

Introduction

The United Kingdom's departure from the European Union presents an opportunity to establish a new policy framework for agricultural land use and food production. Government should aim to empower farmers to deliver future-proof agricultural systems that will be replicated around the world in decades to come: quality food, honestly priced, produced while enhancing our dividend to nature; ensuring a legacy worth inheriting for the next generations of Britain's farmers.

Sustainability must provide the foundation stone of change – not only because we are the custodians of creation, but because good business demands that we take action to protect our primary assets. Individually and together we have a duty to nurture our natural capital, so that our land performs well, and our relationship with nature becomes stronger. Our capacity to grow good food forever should be enhanced with each generation that passes on every family farm.

To achieve this government must set a clear new direction for British agriculture, but critically, it must also allow farmers the freedom to succeed or fail as they take greater control of their own businesses. While government must set and enforce high base-line standards it must also encourage farmers to organise at local and landscape level. This flexibility will be essential if farmers are to think creatively to reform the infrastructure they rely on in the fields, at the farm gate, and throughout their supply chains.

Government should also reflect on its role as citizens' champion. Taxpayer funds directed at agriculture should deliver excellent value, with genuine accountability a pre-condition for all farm payments. Farmers do not want handouts, and subsidy as a means of income support must end because this distorts the market place, promotes sloth, and reduces ambition. However, ongoing financial support for farming is critical and will be needed for at least a generation. Market distortions, established over decades, will take many years to repair, and substantial public funding will be required to fully arrest and reverse the degradation of our natural capital.

¹ <http://www.farmwel.org.uk/>

² <http://oursankalpa.org/>

Just as we need biodiversity in the hedgerow, we must protect the diversity of Britain's farm businesses, which were once the beating heart of rural England. A race to deliver sustainable agriculture could restore employment, prosperity, and wellbeing to the patchwork farmlands of our nation.

The present state of nature requires a swift transition from the current destructive model of payments. In the future, taxpayer funds should be used only to reward excellence and support the delivery of public goods, including environmental restoration and maintenance, farm animal welfare excellence, and the right to access all farm land. Landscape-scale approaches should be prioritised, and capital grants should be focussed towards precision agriculture and clean technological investment.

Funding should not only be provided by the taxpayer but through a system of economic rents on the use of non-renewable natural capital assets such as nitrogen and phosphorous. Funds from these rents should be ring-fenced and used to invest in Britain's natural legacy. Enforcement must be more proactive and effective, and should protect public interests, including the right to clean air and water and the need for natural biodiversity.

Government should also investigate medium term options to fully offset UK agriculture's environmental footprint. This could be achieved while enhancing our capacity to provide good, healthy and sustainable food for British citizens.

With strong leadership and a clear sense of purpose we believe it is possible to grasp the opportunity provided by our departure from the European Union and reform agricultural land use and food production so that it becomes a diverse, thriving, sustainable industry, competing successfully to sell quality produce at home and abroad.

Big and bold – seven key policy recommendations

We believe the following seven bold policy recommendations would go a long way to delivering rapid, viable and sustainable agricultural land use and food production.

Each item below is described in more detail later in this document.

We urge the government to take action to deliver:

1. A national approach to sustainability metrics.

Government should identify key environmental and farm animal welfare metrics and ensure they are collected nationally. A national sustainability metrics database will allow food chain stakeholders and government to analyse and drive progress. This database might in fact be a series of databases, and may be delivered by private agencies. At a macro level data must be open and available for all to access, while individual farmers must be able to access their own data to improve standards at farm level.

2. Charging for the use of non-renewable natural capital assets.

Government should introduce charging for the use of non-renewable natural capital assets. In the first instance charges should be introduced to strongly disincentivise the use of nitrogen and phosphorous because of the impact they have on our land and waterways. Funds raised should be used to fund the restoration and maintenance of renewable assets.

3. Creation of a Farmland Forest, using 5% of farmland, to restore biodiversity, manage water, improve farm animal health and welfare, enhance beauty, and offset methane emissions.

A new permanent Farmland Forest, using 5% of farmland, should be established to strengthen biodiversity, improve hedgerows, manage water, enrich farm animal environments, improve animal health outcomes, and enhance beauty. This woodland would also sequester the equivalent of UK agriculture's total methane emissions.

4. Accountability for citizens.

- a) *Farm contracts should be published on-line*
- b) *The public should have a right of access to all farmland*
- c) *Citizen science and reporting capacity should be enhanced*
- d) *Method of production labelling should be introduced for all meat and dairy products*
- e) *Method of slaughter labelling should be introduced for all meat products*

5. Net carbon negative agriculture by 2030.

All farms should be generating clean energy by 2030, for own use and for export to the grid. Government should support a full range of clean energy options. Each proposal should be considered on a case-by-case basis but a planning presumption in favour of renewables development should be established. Community-based schemes should be welcomed.

6. A rapid transition, with metrics collection required from day one as a condition of continued Basic Farm Payments (BFP).

We seek a rapid transition, over no more than five years, with some sustainability metrics collection required from day one as a condition of continued basic farm payments (BFP).

7. A national quality brand, similar to Origin Green, based on environmental and farm animal welfare excellence.

Government should consider investing in a national food brand similar to Ireland's Origin Green. This would help to focus an approach to metrics, and could be used to promote British environmental and welfare quality at home and around the world. We recommend a brand built on all-round sustainability, which champions high environmental standards (climate and biodiversity) and excellent farm animal welfare.

Contents

Our vision	Page 5
Key principles	Page 5
1. A national approach to metrics	Page 7
2. Charging for non-renewable assets	Page 14
3. Creation of a permanent Farmland Forest	Page 16
4. Accountability for citizens	Page 18
5. Net carbon negative agriculture by 2030	Page 25
6. A rapid transition, with metrics required from day one	Page 26
7. The creation of a national quality brand	Page 27
Appendix One – Farm animal welfare metrics (indicative)	Page 29
Appendix Two – Environment metrics (indicative)	Page 35
Appendix Three – Welfare metrics change map (examples)	Page 36
Appendix Four – Environmental metrics change map (examples)	Page 50
Appendix Five – Genetics and a transition to more robust breeds	Page 58
Appendix Six – Iceberg outcome measures approach to payments	Page 59

Our vision

- A prosperous, innovative, and resilient food industry
- Restoring and balancing natural capital, so that our farm land continues to provide good food forever
- High quality sustainable food, standards, and technologies that we can export proudly around the world

Key principles

The International Panel of Experts on Sustainable Food Systems (IPES) report in 2016 identified that today's food and farming systems are contributing to the 'widespread degradation of land, water and ecosystems; high greenhouse gas emissions; biodiversity losses; persistent hunger and micro-nutrient deficiencies alongside the rapid rise of obesity and diet-related diseases; and livelihood stresses for farmers around the world.'

The report explains that many of these problems are linked specifically to what they call 'industrial agriculture'. 'The uniformity at the heart of these systems, and their reliance on chemical fertilizers, pesticides and preventive use of antibiotics, leads systematically to negative outcomes and vulnerabilities.' The report concludes that, 'What is required is a fundamentally different model of agriculture based on diversifying farms and farming landscapes, replacing chemical inputs, optimizing biodiversity and stimulating interactions between different species, as part of holistic strategies to build long-term fertility, healthy agro-ecosystems and secure livelihoods.'

In short, we are facing a crisis of natural capital. Food production is driving severe degradation of soil quality and biodiversity. Water and air quality are under intense pressure. Climate volatility is increasing.

In our view there are four key principles which together should underpin each and every decision in terms of future agricultural land use and food production policy.

1. Mitigating greenhouse gas pollution

Food systems account for up to 29% of global greenhouse gas emissions, within which agriculture accounts for up to 86%. There is an urgent need for a managed transition to systems and technologies that swiftly reduce the impact of food production on global warming by reducing carbon, methane and nitrogen emissions. We should take action to increase carbon sequestration through effective soil management and tree planting, to increase renewable energy production from farm land, and to implement new technologies that reduce our reliance on oil-hungry farm machinery.

2. Integration with biodiversity

Biodiversity boosts productivity. It includes the microbial life forms that improve soil health, as well as the plants, insects, birds, and larger mammals we generally associate with the countryside. Unfortunately, our biodiversity is in dramatic decline. The RSPB's State of Nature report in 2013 showed that 60% of UK species have declined over the last 50 years, and 31% have declined strongly. Good integration between agriculture and biodiversity will require that measures are taken to improve the land's productivity and resilience.

3. Good farm animal welfare

Science shows that it is extremely difficult to deliver holistic environmental progress while continuing to rear farm animals intensively indoors. As such good farm animal welfare is a critical indicator of environmental progress.

4. High quality food production

Ethical, environmental, and welfare quality have become essential commodities for Britain to trade successfully at home and around the world. Britain should set the terms of race to the top – and win it. We must transform British farming into a thriving industry that sets the global standard for high quality sustainable food production.

Our policy recommendations

We believe the following seven bold policy recommendations would go a long way to delivering rapid, viable and sustainable agricultural land use and food production. We urge the government to take action to deliver:

1. A national approach to metrics

In summary –

Government should identify key sustainability metrics and ensure they are collected nationally. A national sustainability metrics database will allow food chain stakeholders and government to analyse and drive progress. This database might in fact be a series of databases, and may be delivered by private agencies. At a macro level data must be open and available for all to access, while individual farmers must be able to access their own data to improve standards at farm level.

- **We outline the most important environmental and farm animal welfare metrics and possible transition narratives in appendices one, two and three.**
- **We address the genetics challenge in appendix five.**
- **We address iceberg outcome measures in appendix six.**

Genuine sustainability must take account of ethical, environmental and economic dimensions – for example farm animal welfare, soil fertility, and the market for quality food. Importantly, it is extremely difficult to achieve good environmental outcomes while continuing to keep farm animals in the most intensive farm systems, which rely heavily on high protein feeds produced in arable monocultures, on high levels of fossil fuel and water use, and on routine medications often including human-critical antibiotics. Sustainable agriculture should deliver on- and off-farm biodiversity improvements as well as climate change mitigation and adaptation.

Unfortunately, when addressing greenhouse gas reductions in isolation, decisions have often been made which have resulted in the further intensification of agriculture. This in turn has had a devastating impact on nature, as referenced frequently in speeches by the Secretary of State. Climate change, biodiversity loss and degradation of natural resources are of equal importance and must be addressed together.

Sustainability outcome measures (OMs) are used in FAI Farm's consultancy programmes to help us understand and quantify the impacts food systems and supply chains have on people, animals and the environment. For example, outcome measures focused on animal welfare are designed to be simple metrics that describe how an animal has experienced the environment in which it has lived.

The benefits of outcome measures

- ~ Measure the success of inputs and provide information to support ongoing improvements.
- ~ Improve farm efficiency and profit potential.
- ~ Empower farmers to make their own change.

- ~ Have potential to reduce/remove interference at farm level.
- ~ Help farms to benchmark themselves against peers.
- ~ Could help the UK benchmark itself against other nations.
- ~ Will be most effective if required at national level.
- ~ Little evidence that the market is ready to move independently.

Inputs (for example type and size of farm, the feed used, and the genetics of the animal) and outcomes are both important. Farm systems and other inputs have an impact on a producer's ability to achieve good welfare, while outcome measures provide a robust basis for analysing success and identifying where improvements are necessary.

Traditionally, the sustainability of different food production systems has been defined by 'input' criteria. Although these measures are important in managing a farm system, they do not directly measure the full sustainability impact. Furthermore they fail to accommodate the variation and diversity in farming systems across the world, many of which have an important role to play in food security and livelihoods.

To drive meaningful improvements and progress toward more sustainable food system we believe it is critical to measure the *impact* farming systems have on the issues that matter – people, animals and the environment; and respond to that data accordingly. For example, the data can be used to benchmark producers across farming systems and regions, as well as provide valuable feedback directly to farmers to help them improve the welfare of their animals and profitability of their farms.

Sustainability OMs cover the full production process from farm, through transport, to slaughter. For example, animal welfare measures include the prevalence of mortality, disease and injury. By selecting key species-specific measures, information is collected in a robust, practical and cost-effective manner.

In FAI's sustainability OMs programmes, the data collected is uploaded, independently analysed and presented in a user-friendly way on a custom-built online data portal. The portal can also process input data, such as survey and audits, which alongside the outcomes-based data provide holistic, robust and ongoing information about the sustainability of supply chains. The results allow us to identify outliers; both high-risk areas where improvements should be made, and best-practice producers we can learn from. Solutions may be identified by looking directly at the data and by identifying best practice, which can thereafter be shared with other farmers or included within a code of practice. Alternatively, if solutions to the problem have not yet been identified, new and innovative practices and approaches can be tried and tested through further research.

Importantly, this approach allows farmers to pioneer their own solutions and innovations to make progress, and we recognize that flexible and creative interventions are crucial for tackling some of the long-standing challenges to sustainable food production.

When considering sustainability OMs it is important to give due consideration to how they will be implemented. The key is to identify measures that are practical to implement, that are relevant across multiple production systems, and which demonstrate optimum benefit.

Where are we now?

A workshop at a recent Defra-funded Animal Welfare Research Network conference focussed on the use of indexes and outcome measures to improve farm animal welfare. The conversation indicated a general assumption from academics and Government officials that suitable outcome measures (OMs) are already being collected in the supply chain and that these OMs are consistent across the supply chain.

Unfortunately this is not the case. Certainly some OMs are being recorded in most supply chains (and in the case of chicken, quite a lot), but a wide variety of scoring methods are used, which makes comparison difficult. In addition, traceability to farm level is often absent.

Industry and retailers can have quite a limited understanding of what constitutes good welfare outcomes and so often collect quantities of data which they then fail to process, interpret, or use to drive improvements. Our five categories of farm animal welfare OMs (below) can be used to dramatically improve industry understanding of welfare OMs.

The Agriculture Bill provides a remarkable opportunity to change this. Legislation could be used to require the use of OMs and to clearly identify which measures should be used. Consistency in application and recording is critical. Defra can play an important ongoing role in developing industry understanding of OMs and in ensuring that the data is collected in a manner which contributes to a meaningful national picture.

Farm animal welfare

A central pillar for progress on farm animal welfare is the recognition of animal sentience, which must be enshrined in law. We have been pleased to see Government commitments on this. Furthermore, inputs and outcomes are both important. Farm systems and other inputs are a key determinant of a producer's ability to achieve good welfare, while outcome measures provide a basis for analysing success and identifying where improvements to resources such as housing, space allowance and enrichment are necessary in order to improve outcomes.

Many farm animal welfare metrics categories focus on the existence or absence of suffering, and for this reason it is critically important to include measures relating to positive welfare such as the ability to perform natural behaviours. Accordingly we should, for example, measure the ability of laying hens to be able to properly engage in their core behaviours of foraging, perching, dust-bathing and laying their eggs in a nest. Outcomes and inputs work together to build a comprehensive picture of farm animal welfare.

Farm animal welfare metrics themselves should be considered from birth to death on a species by species basis, but the core principles are common and can be used to help ensure a good life for all farm animals. We support the

Farm Animal Welfare Council's Good Life Framework, and believe that to obtain an accurate picture of welfare, outcome measures have to cover:

- *Liveability* (for example the rate of mortality)
- *Disease* (including the use of antibiotics)
- *Injury* (including bruising, feather pecking, and mutilations such as tail docking)
- *Mobility* (for example, gait scores)
- *Behaviour* (an animal's ability to display behaviours, which meet their welfare wants and needs - the bed-rock of farm animal welfare science).³

Species-specific directives developed by the EU have helped identify important outcome measures for broilers, laying hens, pigs, and veal calves. These baseline measures should be reviewed and enhanced where possible. Currently, there are no directives for cattle, sheep, fish, or other farmed species and so a process should be initiated to identify key outcome measures and the means by which to collect and use data.

Enforcement of baseline laws will also be critical. For example, the routine tail docking of pigs has been illegal since 1994 but still exists on farms that have not been designed to accommodate pigs' natural behaviour. Routine mutilations should be phased out and outcome measures used to encourage farm system adjustments such as lower stocking densities and the provision of adequate enrichment. In this example, the support of vets will be integral to further progress.

Finally, it is helpful to reflect on the role that citizens can play in delivering and supporting improvements. Method of production labelling of (EU) shell eggs and (UK) pork products have been extremely successful in raising standards. Method of production labelling provides a clear and objective 'front end' for consumers, while OMs provided detailed 'back end' information for farmers, industry, and Government. Method of production labelling systems for other meat and dairy products could play an important role in establishing the Gold Standards that the Secretary of State said he would like to see.

Genetic challenges - a transition to more robust farm animal breeds is needed

Government and society face a fundamental challenge. Over the last few decades selective breeding has enabled farmers and scientists to dramatically increase production. Government and the market have supported this because it has helped keep prices down and inflation low.

³ Where reasonable outcomes measures do not exist, inputs should be used as a proxy indicator. For example, stocking density for broilers (an input) is used as a measure because measuring dust bathing and other natural behaviours is currently difficult and time consuming. In time, motion capture technology may be able to measure this natural behaviour outcome. Inputs measures may include, Housing (e.g. the use of enriched cages for laying hens, farrowing crates for sows and zero-grazing for dairy cows), Outdoor conditions e.g. the use of trees and bushes in the range provided for free range hens, Space allowance e.g. for broilers, Environmental enrichment e.g. for fattening pigs and broilers, Flooring e.g. the use of fully slatted floors for fattening pigs, Lighting levels, Air quality, Genetics e.g. the use of fast growing broilers and high yielding dairy cows, and finally, the use of behavioural mutilations to 'fit' animals to systems that do not meet their needs.

Unfortunately, from a farm animal welfare perspective, selective breeding has focussed on key yield factors while failing to address the health and welfare needs of farm animals themselves. In our view, farm animals are not units and commodities, but individuals, each with distinct and particular wants and needs.

We now face an acute moral challenge. Farmwel believes that in a morally progressive society good farm animal welfare is an important end in itself. We should take action to build positive welfare models, which not only avoid negative factors but also provide opportunities for animals to have positive experiences such as the ability to perform their natural behaviours, enjoy fresh air and daylight, and experience the joy of living.

To address some of the biggest on-going challenges for certain types of animal farming will require a fundamental change in genetics, and a shift to more robust breeds. High yielding dairy, broiler and laying hen breeds are inherently vulnerable to key health problems. Government can help farmers make the transition to more robust genetics by rewarding farmers who put farm animal welfare first by encouraging the use and development of more robust breeds.

In [appendix 5](#) we have listed breeds with particular welfare challenges, alongside more robust examples. However, it is important to say that genetics changes all the time, so while this breed information is correct today in 2018, it may be less accurate in a couple of years' time.

Welfare at slaughter

Farmwel believes that welfare at slaughter should also be considered and the use of outcome measures introduced for all species and slaughter methods. Slaughter OMs should cover lairage, handling, and slaughter.

Slaughter OMs would:

- Provide the opportunity for national monitoring by the FSA
- Help ensure continuous maintenance and improvement of standards
- Help identify training needs and improve efficiency
- Mean that the UK is able to compare itself at a global level
- Allow the FSA to index slaughterhouses – providing greater choice for farmers, retailers, religious consumers, and restaurants concerned about welfare at slaughter.

Currently UK slaughter standards are the responsibility of the operator, although the FSA requires the presence of an Official Vet (OV) to check the slaughter line. Monitoring the point of killing is just one of the OV's many quality assurance duties, and there is no formal or standardised system for reporting outcomes.

We believe that OMs should be agreed nationally to help index slaughterhouses and compare standards. OVs should spend a fixed proportion of their time at the slaughter line. The informal 'daybook' system should be replaced, and an iPad or equivalent device should be used to record and manage information locally and to feed directly into a national data set.

Environmental goals

Animal welfare is one important aspect of sustainable farming. There are five other critical areas that we believe should be addressed: soil improvement, land system use, weather resilience, biodiversity improvement, and energy neutrality.

Soil – Soil health has reduced dramatically over the last century. Improvements in fertility will help to ensure future harvests, improve on-farm weather resistance, and help sequester carbon dioxide. Soil quality, and nitrogen, phosphorous and carbon content can be measured on farm, and big data options such as the use of GPS can help with measurements at a landscape scale.

Land system – The way farms are managed is important for retaining distinct landscape character and heritage. Good land system management ensures that land is as productive as it can be while protecting the value of its natural capital. By improving the appropriateness of land use we can improve human nutritional outcomes, while boosting food security, biodiversity, and soil outcomes. We should import animal feed proteins from sustainable sources and aim to boost home markets for alternative proteins.

Weather resilience – Farms and farm animals are inherently vulnerable to the weather, but we can reduce the risks of poor harvests by improving the management of farm land. Simple interventions also mean that farms can help reduce the risk of downstream flooding, which has such a devastating impact on homes and communities. By more efficiently managing water (for example, storage, recycling, and natural flood defences), increasing farm-based flora (hedges and trees, which also provide shelter for farm animals), and improving soil quality, we can deliver stronger weather resilience, and reduce the financial risks to farmers and to communities.

Biodiversity – Good biodiversity is critical to future harvests, soil health, and reversing the decline in British species of flora and fauna. Soil quality, and inputs such as rich hedgerows, set aside, verges, tree cover, and ditches and dykes all play a crucial role. The technological developments of the last century have led to a sharp reduction in biodiversity-supporting inputs and a sharp increase in the use of chemicals. In the next century we must restore our natural capital, and new technology such as drones and lighter solar farm vehicles will increasingly play a role. Government can support technological development by requiring biodiversity improvements, and measuring, for example, the increase in birdlife, insects, soil fertility, and carbon sequestration.

Energy neutrality – For government to achieve its greenhouse gas and air quality targets farms must be motivated to play their part. Neutrality is quite straight-forward to measure and many tools already exist to help farmers analyse their impact. Energy neutrality is a simple outcome measure, and its requirement would frame an approach to energy management that could be interpreted at farm and scheme level. Energy should include electricity (use, production, and export), and gas/diesel use (and biogas/diesel production).

New technology and data

It is now possible to measure multiple sustainability outcomes effectively, cheaply, and while reducing the burden of paperwork. In our experience farmers are happy to collect information if they can see the purpose, for example if it helps them farm more efficiently, improves farm gate prices, or is linked to farm payments. The objective should be to automate collection and analysis as far as possible, to reduce the human and financial impact, and then to ensure that farmers are able to access data for use as they continue to improve standards.

Google, GPS and other big data solutions can help measure local and landscape level outcomes, while CCTV can be set to help record and capture instances of positive or negative farm animal behaviour.

Implementing a metrics approach

We strongly recommend that standardised collection of key sustainability metrics should be required from day one of the transition period. In appendices to this document we have outlined these key metrics, and we have indicated clearly which metrics are easy to implement, and which will require more time and consideration.

2. Charging for non-renewable assets

In summary –

Government should introduce charging for the use of non-renewable natural capital assets. In the first instance charges should be introduced to strongly disincentivise the use of nitrogen and phosphorous because of the impact they have on our land and waterways. Funds raised should be used to fund the restoration and maintenance of renewable assets.

- Britain has lost 84% of fertile topsoil since 1850 and the erosion continues in some areas at between 1cm and 3cm a year.⁴
- The abundance of flying insects has plunged by three-quarters over the past 25 years.⁵
- 9% of UK greenhouse gas emissions and up to one-third of global emissions come from agriculture.⁶

There is no doubt that nature is in crisis – however we view the natural capital approach, championed by Dieter Helm, as a key opportunity to incentivise the successful restoration and maintenance of nature.

In addition to using natural capital analysis to underpin investments in positive management of renewable assets, such as biodiversity, fresh water and clean air, we believe that government should use strong financial disincentives to direct producers away from key non-renewable assets that pollute our soil, air, and water.

We believe that the polluter-pays principle should now apply to damaging agricultural inputs in order to protect human health and the environment. Powerful financial disincentives should be introduced to penalise the use of nitrogen and phosphorous, and the production of carbon dioxide.

Planetary boundaries research, which measures nine Earth system processes, has warned that we have already crossed four of the nine planetary boundaries within which humanity can develop and thrive. Planetary boundaries were developed by the Stockholm Resilience Centre and Will Steffen from the Australian National University.

Nitrogen and phosphorus flows to the biosphere and oceans

The planetary boundaries literature states that, ‘The biogeochemical cycles of nitrogen and phosphorus have been radically changed by humans as a result of many industrial and agricultural processes. Nitrogen and phosphorus are both essential elements for plant growth, so fertilizer production and application is the main concern. Human activities now convert more atmospheric nitrogen into reactive forms than all of the Earth’s terrestrial processes combined. Much of this new reactive nitrogen is emitted to the atmosphere in various forms rather than taken up by crops. When it is rained out, it pollutes waterways and coastal zones or accumulates in the terrestrial biosphere. Similarly, a relatively small proportion of phosphorus fertilizers applied to food production systems is

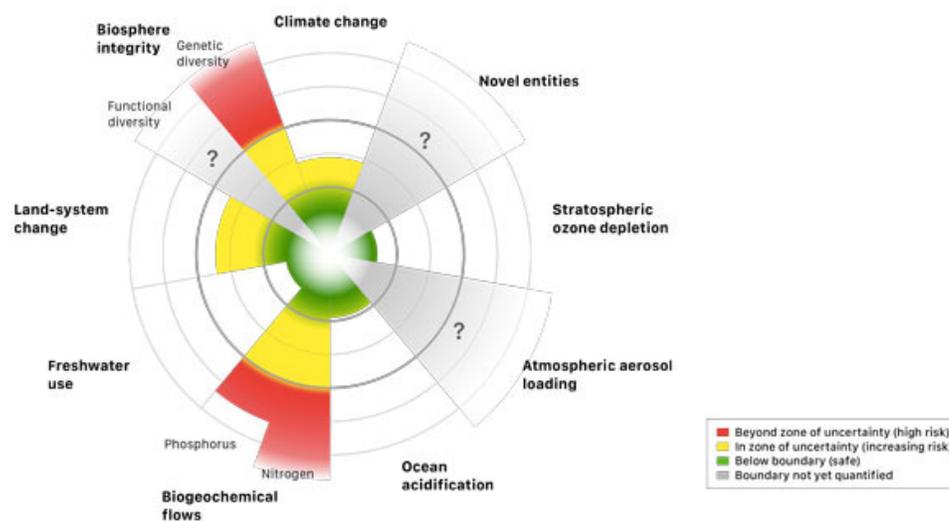
⁴ <https://www.gov.uk/government/speeches/the-unfrozen-moment-delivering-a-green-brex-it>

⁵ <https://www.theguardian.com/environment/2017/oct/18/warning-of-ecological-armageddon-after-dramatic-plunge-in-insect-numbers>

⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69225/pb13622-ghg-emission-projections.pdf and <https://www.nature.com/news/one-third-of-our-greenhouse-gas-emissions-come-from-agriculture-1.11708> and <http://www.bbc.co.uk/news/science-environment-36315952>

taken up by plants; much of the phosphorus mobilized by humans also ends up in aquatic systems. These can become oxygen-starved as bacteria consume the blooms of algae that grow in response to the high nutrient supply. A significant fraction of the applied nitrogen and phosphorus makes its way to the sea, and can push marine and aquatic systems across ecological thresholds of their own.’ The manufacturing processes used to mine minerals and produce phosphorous and nitrogen inputs also uses fossil fuels and produces greenhouse gases. In the diagram below we can see phosphorous and nitrogen flows clearly marked as ‘high risk’.⁷

In our view, in year one of the transition period, non-renewable asset charges should be applied to the use of agricultural nitrogen and phosphorous inputs. These should be increased significantly through each year of transition, and should continue to increase until no manufactured phosphorous and nitrogen inputs are used on UK soils.



⁷ <http://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html>

3. Creation of a permanent Farmland Forest

In summary –

A new permanent Farmland Forest, using 5% of farmland, should be established to strengthen biodiversity, improve hedgerows, manage water, enrich farm animal environments, improve animal health outcomes, and enhance beauty. This woodland would also sequester the equivalent of UK agriculture's total methane emissions, forever.⁸

Tree planting provides the opportunity to deliver an enormous range of absolutely critical sustainable farming outcomes. Trees, planted in the right place, will:

- Substantially enhance biodiversity
- Improve soil quality and help arrest the loss of top soil
- Improve water management, helping to reduce bogging and flood risk
- Improve the control of dangerous parasites such as liver fluke by reducing lying water and boosting biodiversity levels (increasing predation of the water snails that host and disperse the parasite in its early stages)
- Create shelter from extreme weather, leading to improve animal health and resilience
- Improve the health and welfare of farm animals
- Strengthen hedgerows, as part of ongoing hedgerow management and improvement
- Create and contribute to wildlife corridors
- Enhance beauty, complement heritage, and enrich the countryside
- Screen development, for example clean energy installations
- Sequester carbon

UK greenhouse gas emissions from agriculture are approximately 9% of total UK emissions, and equate to 45MtCO₂e per year.⁹ To offset agriculture's total emissions would require approximately 180 million mature trees (assessed on an average sequestration value across a range of species) which would require (based on average spacing requirements) about 225,000 hectares of land. This equates to 1.3% of UK farmland. Sequestration would occur by year 30, which would roughly take us to the year 2050. *We believe planting trees on 1.3% of farmland would be highly achievable.*

However, we also believe that a drive to deliver higher quality, healthier food and diets could make even more land available to be transitioned into permanent woodland. Methane currently represents 36% of UK agriculture's total emissions, and has an approximately 10 year active life. By planting 648m trees on 4.68% of farmland we could, by year 30, sequester agriculture's total methane emissions, forever – providing that methane emissions are not allowed to exceed their current annual total. *We believe there is a strong argument for planting a new Farmland Forest on 5% of farmland – to strengthen biodiversity, improve hedgerows, manage water, enrich farm animal environments, and improve animal health outcomes, and offset UK agriculture's total methane emissions, forever.*

⁸ *We could, by year 30, sequester agriculture's total methane emissions, forever – providing that methane emissions are not allowed to exceed their current annual total.*

⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69225/pb13622-ghg-emission-projections.pdf

England itself represents 77% of the UK and, if we assume equal responsibility from all parts of UK agriculture, we would need to plant 138.6m trees on 1.3% of English farmland, or 498.96m trees on 4.68% of English farmland.

We believe that both these planting targets are achievable, given the right incentives, over a five-year timescale – meaning that the Farmland Forest, if the policy began alongside a transition period starting from 2021, could be planted by 2026, delivering mature sequestration by 2056.

The sequestration of carbon emissions is just one important aspect of this policy recommendation. Crucially, tree planting, if done well, will strengthen biodiversity, improve hedgerows, manage water, enrich farm animal environments, improve animal health outcomes, and enhance beauty. These are all of critical importance to the sustainable future of UK agriculture.

For this policy to be a success farmers must be advised well, but then empowered to take control of their own woodland management schemes. Farmers should not be overly restricted by existing planting formulas and regimes.

To achieve the greatest benefit for multiple outcomes farmers should be able to develop tree management plans which include marginal land, boggy patches, field boundaries, hedgerows, and hard to reach corners – trees could be planted in lines, clumps, spinneys and woodland areas – they could integrate with farmland animals or be on set aside land. Tree planting should also integrate with farm and landscape type. The integration of trees with livestock farming is increasingly common in sustainable systems. For example, many free range hen ranges already host trees, with ideal tree densities of 20% of the total land area.

We believe this policy would leave an extremely positive, lasting and visible legacy. It could be funded directly by government, and in partnership with food businesses and food producers. We believe it could win the support of farmers, citizens and politicians across Britain.

4. Accountability for citizens

In summary –

- A. *Farm contracts should be published on-line*
- B. *The public should have a right of access to all farmland*
- C. *Citizen science and reporting capacity should be enhanced*
- D. *Method of production labelling should be introduced for all meat and dairy products*
- E. *Method of slaughter labelling should be introduced for all meat products*

A. Farm contracts should be published on-line

Public funds must be accountable. Hospitals, schools and police services, all engage directly with the general public and report regularly. There are mechanisms to hold these services to account at local, regional and national levels.

There are no such comparable mechanisms for food producers, despite the fact that agriculture is a major recipient of public funds. In the future all public money should be accountable – and all public contracts, including the level of public support should be held on-line in one easy to access portal.

B. The public should have a right of access to all farmland

Public access to farmland has been implemented successfully and comprehensively in Scotland, and implemented at over 1000 feet in England and Wales. The time has come to provide open access, with associated rights and responsibilities, to all farm land in the United Kingdom.

The relationship between farmers and other countryside users has been substantially degraded over the last forty years, partly because farm sizes have expanded, partly because farms are no longer such significant employers, partly because most farms no longer form the centres of their communities, and partly because most farms now sell to major retail chains and restaurants instead of village shops and local towns. These changes, alongside many others, have created an unhelpful separation between farmers and citizens. This is often most apparent when farmers want to develop their land with new buildings or clean energy installations.

Ramblers, dog walkers, back-packers, campers, and wildlife enthusiasts are also neighbours and customers. The majority of people who walk on any given footpath are local to the farm and walk the same paths regularly. Where good relationships are maintained countryside users will become food champions who want to support local producers and buy local products.

A new right of public access would help to re-establish the link between producers, taxpayers and all countryside users. It would help to improve accountability for public funds. It would deliver a legacy that people would value forever.

C. *Citizen science and reporting capacity should be enhanced*

In addition to nationally required metrics, government should strongly support citizen science approaches to gathering and recording information.

The RSPB's Big Garden Birdwatch is a superb example of a nationally important database maintained through the contributions of 500,000 citizen volunteers. This model, and others like it, would be perfect for collecting and maintaining data on wild flowers, butterflies, and many other aspects of nature that provide important proxies for biodiversity as a whole, and many others. The Citizen Science portal Zooniverse¹⁰ shows the remarkable level of ability and interest that citizens show in contributing to a wide variety of research projects.

We would also like to see greater participation from citizens in reporting problems on farms. From the positive (identification of injured or escaped farm animals, applauding farmers with great standards, sending pictures of their livestock), to the negative (plough damage to heritage sites, water pollution, or hedge cutting at the wrong time of year), we would like to see the development of mobile and on-line tools to help citizens participate in essential reporting to help both farmers and inspectors. Tools that can identify which farmer to call when an injured animal is found, or which agency to refer a pollution complaint to, could be extremely helpful in improving farm outcomes and efficiency, and animal welfare.

Government has proposed a risk-based approach to future inspections, which we would oppose. However, by engaging citizens in appropriate targeted reporting through mobile and on-line tools it may be possible to streamline and target spot check inspections while maintaining the current level of routine inspections.

D. *Method of production labelling should be introduced for all meat and dairy products*

Mandatory method of production labelling provides the government with a straight-forward opportunity to deliver increased opportunities and growth in all meat and dairy sectors, by improving consumer choice, and allowing the market to influence and reward improvements in farm animal welfare. Existing initiatives demonstrate the success of method of production labelling in delivering consumer-supported price differentiation.

Market-led improvements

The government has previously declared its intention to empower consumers to make informed choices in order that the market can drive further improvements in farm animal welfare. Method of production labelling of meat and dairy products is the best way to deliver on this. Clear, objective labelling provides consumers with the information they most want to know: 'how was this animal kept?'

Method of production labelling is the natural partner of country of origin labelling. If the government chooses to retain COOL, then method of production labels will help complete the origin story for consumers. Consumers are equally concerned about both 'where' and 'how' an animal has been reared.

¹⁰ <https://www.zooniverse.org/>

Confusing labels distort the marketplace

Research has provided compelling evidence that, based on the label alone, most consumers, even those who feel they have 'a reasonable, basic knowledge' or 'a good knowledge' about 'how farm animals are kept and reared', are likely to misinterpret the farming method used for meat and dairy products. Most consumers are unable to identify from the label how the animals that provided the meat or dairy products were farmed, such as whether they were kept outdoors, indoors with good facilities, or in basic conditions, or in a mixture of these systems.

This research demonstrates that consumers are confused, explicitly or implicitly, over the farm systems used to produce their meat and dairy foods. This is important because labels influence consumer behaviour directly at point of sale. Confusing labels have a significant adverse economic impact on those producers operating to higher welfare standards because they undermine natural consumer preferences, preventing the market place from operating efficiently.

The research indicates that the market place for higher welfare animal products is unhelpfully distorted, against higher welfare meat and dairy products, by the widespread use of confusing labels for meat and dairy products from systems likely to result in lower welfare.

The widespread existence of confusing labels undermines the competitiveness of higher welfare brands and disincentivises new entrants, further improvements, and innovation.

Case study – mandatory egg labelling rules (EU)

The mandatory EU egg labelling rules provide a successful labelling precedent, using terms that are short and easily understood by consumers. Under these rules, egg packs must be labelled 'eggs from caged hens', 'barn eggs' or 'free range eggs'.

European Commission figures show the proportion of cage-free egg-laying hens in Europe rose from 19.7% in 2003 to 42.2% in 2012. In the UK, over 50% of the eggs we produce are from cage-free hens. The remarkable rise in the production of cage-free eggs suggests that consumers are reacting positively to the availability of clear information as to farming method. The Commission has officially recognised the link between increased sales of higher welfare eggs and mandatory labelling. It has also recognised that the labelling scheme allows consumer-supported price differentiation.

Case study – voluntary pork labelling (UK)

In the UK, voluntary method of production labelling of pork products has facilitated substantial growth in higher welfare pig meat, and led to greater overall value of the UK pork market.

A voluntary code of practice for labelling pork products was introduced in the UK by the British Pig Executive (industry trade body) in 2010. Prior to this date the labelling terms 'outdoor bred', 'outdoor reared' and 'free range' had been used for some pork products by food retailers. However, without consistency or clear definitions

this had led to confusion amongst consumers as to what farming systems they were supporting when buying pork labelled with these terms. The voluntary code of practice introduced clear definitions for these terms, setting out key elements of the farming systems they described. This information was made available to the public on a website (www.porkprovenance.co.uk) and all major retailers in the UK signed up to applying the definitions when using the labels on their own brand products. Each of these methods of production has better welfare potential than intensive indoor pig farming. At least 40% of UK pigs are now born outdoors and assured as 'outdoor bred', 'outdoor reared', 'free-range', or 'organic'. Around a third are assured by the RSPCA scheme, Freedom Food.

The scheme is successful because it has been adopted on a whole industry basis, meaning it operates as though it were mandatory. However, we believe that even greater market penetration could be achieved for UK pork products from outdoor systems, if indoor intensive systems were also labelled. This would provide complete transparency, and enable consumers to make a full and fair comparison.

The Anderson's report to the Oxford Farming Conference in 2015 noted that, '40% of UK pigs are reared outdoors, involving higher costs which is unique to the UK pig herd, but also attract[ing] premium prices.'

Underpinned by robust outcome measures

Farmwel believes that method of production labelling should be underpinned by robust welfare outcome measures. These objectively measure welfare and provide a mechanism that can give reassurance that systems generally felt to be associated with higher welfare (outdoor and extensive indoor systems) are indeed delivering good welfare.

The AssureWel project is already delivering robust and affordable welfare outcome assessments as part of existing farm assurance schemes, such as Soil Association, Freedom Food, and Red Tractor. More information about welfare outcome assessment can be found on the AssureWel website: www.assurewel.org

A small change

Farmwel views mandatory method of production labelling as a simple measure to enhance transparency, which will help increase marketplace opportunities for farmers and has the potential to deliver significant growth across all meat and dairy product areas. In addition to aiding growth, labelling will also help deliver market-driven improvements in farm animal welfare.

Method of production labelling will benefit consumers, who will be able to correctly identify products from farming systems associated with higher animal welfare. It will reward farmers working to higher welfare standards and encourage others to do the same.

Mandatory method of production labelling will increase producer confidence in the market for higher welfare meat and dairy products, incentivising new entrants, and stimulating further improvements, and innovation.

E. Method of slaughter labelling should be introduced for all meat products

Towards the end of 2017 we met Defra ministers and officials to propose mandatory labelling of all meat products according to method of slaughter using a unique numbered or coded system. Such a system would create objective transparency. This would allow consumers to select products based on their personal ethics or religious beliefs, and empower citizens to drive slaughter standards from the market place.

In recent years there have been attempts to introduce slaughter labelling both in the United Kingdom and at European level. These attempts have been unsuccessful, partly because they have focussed on the issue of pre-slaughter stunning. Ongoing debate between critical stakeholders on the science of stunning, and the reasonable fear that a 'stunned'/'unstunned' label may lead to the victimisation of people who support religious slaughter, has led to deadlock. It is time to change the conversation. Our objective should be comprehensive transparency, and a simple and objective labelling system that empowers consumers.

Label objectives

- To improve public information, enabling citizens to drive standards
- To improve the capacity for retailers and restaurants to respond to consumer preferences
- To improve supply and demand relationships between wholesalers and abattoirs

Why is a label necessary?

Public concern about slaughter has increased, but much debate and media coverage has centred on the issue of pre-stunning and has not always been well informed. Method of slaughter labelling would improve consumer choice and help to ensure that retailers and restaurants are better able to respond to consumer preferences.

We recommend a simple coding system for all approved slaughter methods, which would be objective and helpful in driving welfare outcomes for all farm animals. Labelling should also be underpinned by robust welfare outcome measures focussed on handling, lairage, stunning, and slaughter to help improve and maintain standards. The combination of public information, science, and formalised assurance could improve the end of life outcomes for millions of UK farm animals each week.

Changes to UK labelling laws would have a global impact due to the long supply chains managed by UK retailers and restaurants. We also hope that improvements in UK law would be replicated overseas.

Halal and Kosher

It's important that Halal and Kosher customers can accurately identify meat products slaughtered to the appropriate religious standard. Equally it's important for other citizens to be able to identify meat products which meet their own ethical preferences.

By labelling all meat products by method of slaughter, we will be able to ensure closer correspondence with consumer preferences.

Innovation and pre-stunning

Methods of pre-stunning vary considerably, from the use of electric water bath to the penetrative captive bolt. There is also a wide variance in each system's welfare potential. The use of a captive bolt for cattle has good welfare potential if administered correctly. The electric water bath system for poultry can have a lower welfare potential as it requires live shackling of birds and can leave some birds unstunned.

CO₂ gas stunning of poultry can create visible aversion for up to five minutes and therefore has lower welfare potential than inert gas stunning. However, CO₂ is easier for slaughterhouse operatives to identify and so remains the preferred gas stunning method.

Around 20m birds are killed each week in Great Britain, and according to figures from the FSA's 2013 survey of UK slaughterhouses, around a quarter of birds were electrically stunned, and well over a half were gassed. We believe that most of these birds would have been gassed using CO₂ or a high CO₂ mix.

Greater transparency would lead to increased innovation to improve slaughter methods and could help create a market for the most humane slaughter systems.

Retailers and restaurants

Slaughter labelling will empower consumers to drive slaughter standards from the market place. It will also mean that retailers and restaurants are better equipped to respond to consumer preferences, which may vary around the UK.

This increased scrutiny will help to ensure that slaughterhouses adopt best practice and focus on good outcomes. Labelling will also mean that sustainability organisations are able to work with retailers and restaurants to overcome supply chain challenges.

Underpinned by welfare outcome measures

Farmwel believes that method of slaughter labelling should be underpinned by the use of robust OMs, which can be used to assess and improve welfare. Slaughter OMs should cover lairage, handling, and slaughter.

Currently UK slaughter standards are the responsibility of the operator, although the FSA requires the presence of an Official Vet (OV) to check the slaughter line. Monitoring the point of killing is just one of the OV's many quality assurance duties, and there is no formal or standardised system for reporting outcomes.

We believe that OMs should be agreed nationally to help index slaughterhouses and compare standards. OVs should spend a fixed proportion of their time at the slaughter line. The informal 'daybook' system should be replaced, and an iPad or equivalent device should be used to record and manage information locally and to feed directly into a national data set.

Proposal

A unique numbered or coded system should be used to identify the method of slaughter, and should be used for all meat products sold in the UK. Numbers or codes would relate to one of the Defra approved methods of slaughter. Numbered alphabetically:

1. Electrical – head only
2. Electrical – head to body
3. Electrical – water bath
4. Gas - CO₂
5. Gas - CO₂ and inert
6. Gas – Inert
7. Halal
8. Halal – pre-stunned
9. Jewish Shechita
10. Non-penetrative captive bolt
11. Penetrative captive bolt
12. Shot

For 'Halal – pre-stunned' we recommend that the stunning method is referenced in brackets after the first number. So, for example, a chicken that has been pre-stunned using the electric water bath would be labelled with a number 8 for 'Halal – pre-stunned', followed by a number (1) for 'Electrical – water bath' – in other words: 8 (1).

5. Clean energy from every farm by 2030

In summary –

All farms should be generating clean energy by 2030, for own use and for export to the grid. Government should support a full range of clean energy options. Each proposal should be considered on a case-by-case basis but a planning presumption in favour of renewables development should be established. Community-based clean energy schemes should be particularly welcomed by planning authorities.

All farms have the capacity, through land and buildings, to generate some or all of their own electricity. Many farms will be able to partner with clean energy companies and use their land to generate larger amounts of electricity for export to the grid. Key opportunities are associated with wind energy (the cheapest form of new energy infrastructure) solar, biomass (such as willow), and hydro.

In addition to renewable energy's contribution to clean air and improved national respiratory health, investment in wind, solar and hydro projects can reduce on-farm costs over time, and produce significant income streams. If farming is to transition successfully following the removal of the basic farm payment then it is important that farmers and land owners are able to diversify and make best use of the natural resources available to them.

Renewable energy has often faced opposition at local level from small but well-organised groups. However, we believe that the need to de-carbonise our energy supply is such that a planning presumption in favour of renewables development should be established. Certainly, it is important that the results of impact assessments are taken fully into account, and that local communities have the opportunity to comment and influence planning decisions, but we feel that the national need for clean energy should be prioritised.

Anaerobic digestion (AD) also represents an opportunity, but we should be careful that it is only produced in a sustainable manner. Many on-farm AD plants rely on slurry and crops from intensive farm systems, which perpetuate other environmental and farm animal welfare challenges. In our view, AD should not be used as a green veneer for intensive animal-rearing systems. We are also concerned that maize is grown as an AD feed crop, and is unsustainable. Maize requires high levels of chemical inputs to grow in the UK, and when harvested it leaves the ground bare because the roots are removed. Bare soil during the winter months contributes to poor water management and erosion. While we are keen to support the deployment of all renewables wherever possible and when appropriately sited, we believe that government should reconsider its approach to anaerobic digestion alongside its ambitions for sustainable agriculture.

Finally, we urge government to encourage community-based clean energy schemes. Experience shows that when communities own a stake in a renewable energy development opposition swiftly falls away. Community-based clean energy projects should be particularly welcomed by planning authorities.

6. A rapid transition, with metrics required from day one

In summary –

We seek a rapid transition, over no more than five years, with some sustainability metrics collection required from day one as a condition of continued basic farm payments (BFP).

Five years

The changes proposed by government, alongside a fresh, honest and intelligent approach to land use will secure farm incomes for generations to come. The quality market offers substantial rewards. Diversification into energy, branded markets, local services, and leisure activities will underpin future farm incomes. Contracts to deliver specified public goods will provide a rich seam of reward for those who choose to adapt and recognise that farming has become about more than simply the production of volume commodities.

Evidence from previous reforms shows that the length of transition is less important than the transition itself. For example, the EU phased in enriched cages for laying hens over 10 years, and some farmers still complained that they had not had time to make the necessary changes. Early adopters however got in fast and upgraded their systems in a timely fashion meaning they were able to spread the cost and reap the reward.

The government must be strong in its objectives and signal clearly that changes are permanent. Farmers must then take responsibility for implementation, take control of their own prospects, and begin to deliver changes that will prepare their businesses for the next 10 – 20 years.

With nature in crisis it is essential that we take this once in a lifetime opportunity to re-set British agricultural land use and food production. A rapid transition is imperative if we are to arrest natural degradation and restore and maintain the land that nourishes British citizens, that protects us, and which makes us happy.

We believe that five years is sufficient for farmers to adjust to a new policy approach.

Metrics

In addition, we strongly recommend that the collection of key sustainability metrics should be required from day one of the transition period. In appendices to this document we have outlined these key metrics, and we have indicated clearly which are easy to implement and which will require more time and consideration.

A standardised national approach can be implemented quickly and built on as time goes by. Importantly, the principle should be adopted at a very early stage with empowering legislation included in the agriculture bill.

The standardisation of metrics already collected at abattoirs during ante- and post-mortem would be the obvious first step, alongside the removal of the existing ad hoc day book system, and the implementation of a tablet-based data-recording system which feeds directly into a nationally accessible database.

7. A national quality brand

In summary –

Government should consider investing in a national food brand similar to Ireland's Origin Green. This would help to focus an approach to metrics, and could be used to promote British environmental and welfare quality at home and around the world. We recommend a brand built on all-round sustainability, which champions high environmental standards (climate and biodiversity) and excellent farm animal welfare.

Origin Green¹¹ is the national sustainability programme for the Irish food and drink industry, launched by Bord Bia, the Irish Food Board, in 2012. It is still the only sustainability programme in the world which operates on a national scale, uniting government, private sector and food and drink producers. It is popular with farmers, and is used by government to promote Irish food around the world. In a promotional film for Origin Green a farmer comments that in the old days, 'they didn't call it sustainability, it was an instinct; an understanding that being in harmony with nature was a good thing.'

While there are many reasonable criticisms of Origin Green (for example that the entry level metrics are not tough enough and that the focus on climate change mitigation distorts its sustainability approach), it remains a powerful idea. Ireland has taken the decision to act nationally, to build a strong, resonant brand, and to celebrate Irish farming at a global scale. Claims made by Bord Bia and by ministers when promoting Irish food are now unified and based on clear empirical evidence.

We believe that Britain should take a similar approach. We can learn and build from the experience of Origin Green, to develop an excellent, quality-focussed, and robust sustainable food brand. Our brand should set high standards for entry, above base-line legislation, and should aim to embrace at least half of British food producers within five years of its introduction. The brand should guarantee and help deliver excellence built on:

- *Climate change mitigation*
- *Biodiversity improvements*
- *Excellent farm animal welfare*

A national approach to metrics will be critical, but where Bord Bia inspects farms every 18 months, a UK brand should be built on a combination of regular private assurance inspections and continuous development through closed loop metrics that provide information nationally and at farm-level. In this way, we believe a unique and compelling brand could be launched within three years of the start of the transition period. National metrics collection will allow government to build an accurate picture of British agricultural sustainability, and to set a reasonable standard for brand entry.

Brand membership should be available to farmers who genuinely meet high sustainability standards – and importantly, membership should feel good. Farmers should feel proud of their membership, and feel the benefit of

¹¹ <https://www.origingreen.ie/>

government backing as their commitment to environmental and farm animal welfare quality is promoted at home and around the world.

Government should set high brand standards, above baseline law, and be prepared to review and raise these standards as farmers rise to meet the challenge. In this way the brand will continue to drive improvement and innovation throughout its existence.

Appendix one – farm animal welfare metrics

- **Easier to implement metrics will often be recorded at the abattoir.**
- **Harder to implement metrics will largely require on-farm recording during inspections, by farmers or vets, or using technology.**
- **These lists are indicative and not fully comprehensive (i.e. they do not cover all possible measures under the categories of liveability, disease, injury, mobility and behaviour¹² as outlined in Section I).**
- **They do not include all UK farmed species or life stages .**

Easy to implement –

Abattoirs already capture a lot of ante- and post- mortem data which could be used much more efficiently and effectively to provide information for government agencies, and analysis and feedback for producers. Abattoirs should become dynamic data hubs, harvesting information, and processing it directly into national databases.

Currently, UK slaughter standards are the responsibility of the operator, although the FSA requires the presence of an Official Vet (OV) to check the slaughter line. Monitoring the point of killing is just one of the OV's many quality assurance duties, and there is no formal or standardised system for reporting outcomes. As a result, standards and metrics vary considerably between and even within slaughterhouses – for example, one large processing plant may provide chicken products for several major buyers (e.g. retailers), each of which will require different measures and scoring methods. Action should be taken to standardise important slaughterhouse metrics so that government, food businesses, and producers themselves can monitor and analyse progress on a level playing field right across the UK.

Input and outcome measures should be agreed nationally to help index slaughterhouses and compare standards. OVs should spend a fixed proportion of their time at the slaughter line, and the informal 'daybook' system should be replaced. An iPad or equivalent device should be used to record and manage information locally and to feed directly into a national data set.

Harder to implement –

Many other metrics will need to be collected at farm level. Some of these may already be required by retailers and regularly recorded, for example mortality, while others will be noted once a year in an annual assurance inspection. Over time technology will mean that more measures can be collected regularly in real time.

¹² Where reasonable outcomes measures do not exist, input measures are important to ensure good welfare is achieved. For example, stocking density for broilers (an input) is used as a measure because measuring dust bathing and other natural behaviours is currently difficult and time consuming. In time, motion capture technology may be able to measure this important behavioural outcome. Inputs measures may include, Housing (e.g. the use of enriched cages for laying hens, farrowing crates for sows and zero-grazing for dairy cows), Outdoor conditions e.g. the use of trees and bushes in the range provided for free range hens, Space allowance e.g. for broilers, Environmental enrichment e.g. for fattening pigs and broilers, Flooring e.g. the use of fully slatted floors for fattening pigs, Lighting levels, Air quality, Genetics e.g. the use of fast growing broilers and high yielding dairy cows, and finally, the use of behavioural mutilations to 'fit' animals to systems that do not meet their needs.

We urge government to standardise and require key sustainability metrics, and to work with farmers, assurance schemes, and retailers to ensure ongoing recording and reporting. For example, in Sweden, Denmark, and The Netherlands it is mandatory to report anti-microbial usage, in order to help reduce environmental and human health impacts and to improve farm animal welfare.

At a private level some standardisation efforts are already underway. For example, AssureWel is working with Red Tractor to develop and deliver farm animal welfare inspections as part of Red Tractor inspections, while RSPCA Assured has been working to embed welfare metrics for many years.

New technology can also be used to automate metrics reporting and analysis. This has the advantage of reducing the burden on farmers while helping to improve efficiency. A good example of new technology in action is FAI Farm's hen box system. A box sits in the house and manages key husbandry aspects, such as like lighting, air quality, feed consumed and feed remaining (producers often run out of feed and this system sends info to the feed mill and places an order). While some data recording is automatic, farmers can also input information directly using software on their phones or tablets. Alerts go off if lights aren't working, ammonia levels get too high, or ventilation isn't working – and these alerts can be set to different levels of importance. The software provides farmers with the precise information they need to manage their flocks well, and also sends regular data to the retailer. Farmers feel more in control of issues and the system helps them understand why egg production has dropped (for example, one farmer turned lights on once at night and forgot to turn them off, and saw a subsequent fall in egg production because of the disturbance).

Laying hen welfare metrics

<i>Indicators</i>	<i>Abattoir – easier to implement</i>	<i>On-farm – easier to implement</i>	<i>On-farm – harder to implement</i>
Farm – breed		Yes	
Farm – beak trimmed flock		Yes	
Farm – system used (i.e. Organic, free range, barn eggs, caged eggs.)		Yes	
Farm – first week mortality in lay		Yes	
Farm – total mortality in lay		Yes	
Farm – total culls		Yes	
Farm – antimicrobial use (name, quantity, number treated, average weight at treatment)			Yes
Farm – feather cover			Yes
Farm – positive behaviours			Yes
Slaughter measures – slaughter age	Yes		

Slaughter measures – transport time (inc. loading and unloading)	Yes		
Slaughter measures – dead on arrivals	Yes		
Slaughter measures – PMI rejects	Yes		
Slaughter measures – Injuries (leg bruises and wing breaks)	Yes		
Slaughter measures – keel bone damage	Harder		

Broiler welfare metrics

<i>Indicators</i>	<i>Abattoir – easier to implement</i>	<i>On-farm – easier to implement</i>	<i>On-farm – harder to implement</i>
Farm – breed		Yes	
Farm – system used (i.e. Organic, free range, extensive indoor, intensive indoor.)		Yes	
Farm – stocking density kg/m ²		Yes	
Farm – 7 day treated with antimicrobials		Yes	
Farm – antimicrobial use		Yes	
Farm – leg cull		Yes	
Farm – 7 day mortality		Yes	
Farm – total mortality		Yes	
Farm – salmonella		Yes	
Farm – campylobacter		Yes	
Farm – gait score			Yes
Farm – positive behaviours			Yes
Slaughter – weight of birds processed	Yes		
Slaughter – age at slaughter	Yes		
Slaughter – dead on arrivals	Yes		
Slaughter – PMI rejects	Yes		
Slaughter – Hock marking	Yes		
Slaughter – Pododermatitis	Yes		
Slaughter – bruises and breaks	Yes		
Slaughter – gait score	Harder		

Dairy cattle welfare metrics

<i>Indicators</i>	<i>processor – easier to implement</i>	<i>On-farm – easier to implement</i>	<i>On-farm – harder to implement</i>

Farm - breed		Yes	
Farm – system used (i.e. Organic, seasonally grazed, permanently housed.)		Yes	
Farm – planned and unplanned culls		Yes	
Farm – calving percentage		Yes	
Farm – antimicrobial use			Yes
Farm – lameness			Yes
Farm – disease status (BVD, Johnes)			Yes
Farm – body condition score			Yes
Farm - mastitis			Yes
Farm – positive behaviours			Yes
Processor – Bactoscan	Yes		
Processor – Somatic cell count	Yes		

Beef cattle welfare metrics

<i>Indicators</i>	<i>Abattoir – easier to implement</i>	<i>On-farm – easier to implement</i>	<i>On-farm – harder to implement</i>
Farm - breed		Yes	
Farm – mortality		Yes	
Farm – calving percentage		Yes	
Farm – antimicrobial use			Yes
Farm – lameness			Yes
Farm – disease status (e.g. BVD, Johnes)			Yes
Farm – body condition score			Yes
Farm – positive behaviours			Yes
Slaughter - cleanliness	Yes		
Slaughter – rejects/condemnations	Yes		
Slaughter – bruising new and old	Yes		
Slaughter – abscess	Yes		
Slaughter – fractures	Yes		
Slaughter – swellings	Yes		
Slaughter – joint lesions	Yes		
Slaughter – lung pathologies	Yes		
Slaughter – internal parasites	Yes		
Slaughter – other pathologies	Yes		

Finishing lamb welfare metrics

<i>Indicators</i>	<i>Abattoir – easier to</i>	<i>On-farm – easier to</i>	<i>On-farm – harder to</i>
-------------------	-----------------------------	----------------------------	----------------------------

	<i>implement</i>	<i>implement</i>	<i>implement</i>
Farm - breed		Yes	
Farm – mortality (weaning and total)		Yes	
Farm – Flock replacement rate		Yes	
Farm – antimicrobial use on farm			Yes
Farm – lameness			Yes
Farm – disease status			Yes
Slaughter – rejects/condemnations	Yes		
Slaughter – bruising new and old	Yes		
Slaughter – abscess	Yes		
Slaughter – fractures	Yes		
Slaughter – swellings	Yes		
Slaughter – joint lesions	Yes		
Slaughter – lung pathologies	Yes		
Slaughter – internal parasites	Yes		
Slaughter – other pathologies	Yes		

Finisher pig welfare metrics

<i>Indicators</i>	<i>Abattoir – easy to implement</i>	<i>On-farm – easy to implement</i>	<i>On-farm – harder to implement</i>
Farm - breed		Yes	
Farm – system used (i.e. Organic, free range, outdoor reared, outdoor bred, intensive indoor.)		Yes	
Farm – disease status			
Farm – total mortality on finisher farm		Yes	
Farm – antimicrobial use		Yes	
Farm			
Slaughter – intact, unbitten tail at point of slaughter	Yes		
Slaughter – dead on arrival	Yes		
Slaughter – dead in lairage	Yes		
Slaughter – fight and bite wounds	Yes		
Slaughter – lameness	Yes		
Slaughter – joint lesions/arthritis	Yes		
Slaughter – skin condition/lesions	Yes		
Slaughter – abscess	Yes		
Slaughter – bursitis	Yes		

Slaughter – liver lesions	Yes		
Slaughter – Bruising	Yes		
Slaughter – lung conditions	Yes		
Slaughter – pericarditis	Yes		
Slaughter – part carcase condemnations	Yes		
Slaughter – whole carcase condemnations	Yes		

Appendix two – environmental metrics

<i>Indicators</i>	<i>On-farm measure</i>
Energy neutrality – electricity	Yes
Biodiversity improvement, citizen science	Usually
Active flood management measures in place	Usually
Percentage of water used that is from renewable/recycled source	Yes
Percentage of water of streams/rivers on farm that have riparian zone planting or are protected from livestock	Yes
Yes/no use of effluent management plan for storage and application of manure	Yes
Nitrogen, phosphorous, and potassium levels in farm and downstream waterways	Collected on farm, tested in lab
Percentage of dry matter intake from forage (grass, straw, silage etc)	Yes
Percentage of soy used in feed rations that is 'certified' as sustainable (RTRS for example)	Yes
Soil organic matter	Collected on farm, tested in lab
Visual soil assessment (Soil structure, porosity, colour, and earthworm count)	Yes
Greenhouse gas impact assessment	On-line

Appendix three – welfare metrics change map

Using these **examples of sustainability metrics** we have outlined possible transition narratives to deliver improved welfare below. This list is not comprehensive.

Pig welfare metrics

<i>Indicators</i>	<i>Change mechanism</i>	<i>Legislation</i>
Aggression related injuries – easier to achieve	Outcome measure (OM) is recorded in abattoir grading.	Immediate
Intact, unbitten tail at point of slaughter – more difficult	Financial incentive for early adopters; OM recorded at grading.	Immediate requirement to measure. Immediate legislation to ban, with 5 year delay
Free farrowing	Possible financial assistance for early adopters.	Immediate legislation to ban, with 5 year delay

In more detail

<i>Species</i>	Pigs
<i>Welfare indicator/OM</i>	Aggression related injuries – cuts/scratches/bite marks
<i>Challenge</i>	Requires knowledge and change in husbandry.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Essential to set and require an injury metric at national level. ◦ Target setting. Use the levels of damage in top 10% of producers as the five-year target for all other producers. ◦ Knowledge deficit: many farmers will need to learn new husbandry skills and implement change in management. For example, important not to mix pigs from different batches after weaning ◦ Reduce intensity – increase feeding and drinking space per pig. ◦ Don't provide liquid diets, so it takes longer to eat.
<i>Short term lever</i>	Requirement for injuries to be reflected in grading at abattoir.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data used to measure outcome, with information fed back to farmer. ◦ Peer-to-peer benchmarking.
<i>Risks</i>	Farmers may not know how to adapt.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaigns targeted at farmers. ◦ General PR.

<i>Species</i>	Pigs
<i>Welfare indicator/OM</i>	Intact, unbitten tail at point of slaughter
<i>Challenge</i>	Tail biting is an abnormal behaviour largely due to lack of enrichment in the form of foraging and manipulable material in pig pens. Around half of UK pigs raised on slats with minimal or no enrichment (in breach of the law). Thus, the challenge is to change to partially slatted, deep litter, or outdoor farm systems.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Capital will be needed to upgrade to higher welfare systems, and government could choose to help with the costs. ◦ Knowledge deficit: many farmers will need to learn new husbandry and system-management skills. ◦ Intensive pig units take up less space, meaning the number of pigs raised is likely reduce, at least in the short term.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Immediate financial incentive per pig with intact, unbitten tail at point of slaughter. Existing higher welfare producers and early adopters will benefit. ◦ Mandatory method of production labelling, underpinned by robust welfare outcome assessments delivered as part of existing farm assurance schemes. Labelling empowers citizens to drive and support improved welfare from the market place, and rewards farmers to deliver improvements.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data used to measure outcome, with information fed back to farmer. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ New legislation, delayed for 5 years, should require all pigs to have an intact, unwounded tail at point of slaughter. ◦ (Docking should be allowed in an emergency, but all systems should by this time be designed to manage pigs with tails. Emergency docking is currently allowed in legislation but vets just sign off every litter – so needs vet engagement, so that they aren't doing this and are instead working with farmers to implement right management/systems.) ◦ At the point of implementation, financial incentive per pig should be removed.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data. ◦ Farm assurance can be used to monitor system suitability.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers wait too long to make the change, and miss the deadline. ◦ Poor knowledge leads to lower welfare during the transition (how to manage new system or farmers try to implement 'half way house' system to reduce costs) ◦ Routine tail docking and enrichment laws are currently very poorly enforced – farmers may bank on continued poor enforcement and fail to implement change.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Clarity and resolve from government about implementation date. ◦ Expert advice from Defra from day one.

	<ul style="list-style-type: none"> ◦ Information campaigns targeted at farmers. ◦ General public PR, including information about method of production labelling. ◦ Additional legislation could be used to ban fully slatted systems. ◦ Training offered to farm assurance schemes, including farm inspectors. ◦ Appointment of regional change champions: free-lance pig farmers paid to deliver on-farm advice to other farmers. ◦ Capital support could be offered to farmers for system upgrade – however, it could be argued that routine tail docking and enrichment laws have been in place for a long time, and farmers should have already adapted. ◦ Welfare quality is more valuable than volume pork production – early adopters are more likely to benefit from the best markets.
--	---

<i>Species</i>	Pigs
<i>Welfare indicator/OM</i>	Free farrowing
<i>Challenge</i>	Requires system change – removing sows from farrowing crates will require new system design and knowledge about how to manage sows and prevent piglet mortality.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Capital will be needed to upgrade to higher welfare systems, and government could choose to help with the costs. ◦ Knowledge deficit: many farmers will need to learn new husbandry and system-management skills. ◦ A shift in genetics will help ensure sows are suitable for free farrowing. ◦ (There is a new free farrowing indoor pen design called PigSafe, fits into space of ~1.5 conventional farrowing units.)
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Financial assistance could be provided to compensate for higher mortality prior to law coming into force. ◦ A capped fund could be used to encourage early system upgrade. ◦ Method of production labelling to help citizens drive and support improved welfare from the market place.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	New legislation, delayed for 5 years, should require only free farrowing. At the point of implementation, compensation should be removed.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Mortality should also be recorded nationally.

<i>Risks</i>	<ul style="list-style-type: none"> ◦ Increase in mortality in free farrowing systems. ◦ Farmers wait too long to make the change, and miss the deadline. ◦ Poor knowledge leads to lower sow and piglet welfare during the transition.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Clarity and resolve from government about implementation date. ◦ Expert advice from Defra from day one. ◦ Information campaigns targeted at farmers. ◦ General public PR, including information about method of production labelling. ◦ Training offered to farm assurance schemes, including farm inspectors. ◦ Appointment of regional change champions: free-lance pig farmers paid to deliver on-farm advice to other farmers.

Laying hen welfare metrics

<i>Indicators</i>	<i>Change mechanism</i>	<i>Legislation</i>
Dead on arrival at slaughterhouse – easier to achieve	OM recorded at abattoir.	Immediate
Keel bone damage – more difficult	Requirement for OM to be recorded at abattoir where possible. X-rays/cameras used at slaughterhouse in longer term.	Immediate requirement to measure. Followed by regular 5 year target setting based on achievement of top 10% of producers.
Beak trimming – difficult	OM recorded on farm and farm assurance	Immediate requirement to measure.

In more detail

<i>Species</i>	Laying hens
<i>Welfare indicator/OM</i>	DOA at slaughterhouse
<i>Challenge</i>	Requires training, improved transport, and better lairage standards.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Catching teams need good training. ◦ Improved legislation to cover transportation issues such as stocking density, weather-related adjustments. ◦ Drivers need better training to ensure correct shade/ventilation. ◦ Lairage improvements needed, including shading/ventilation and waiting times. ◦ Target setting. Use the DOA for top 10% of abattoirs as the five-year target for all other abattoirs.
<i>Short term lever</i>	◦ National slaughter metrics introduced (see below). DOA recorded at abattoir and fed into a national data set.

<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data, with information fed back to farmer. ◦ Peer-to-peer benchmarking.
<i>Risks</i>	Additional costs associated with lower density transport.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaign targeted at farmers. ◦ Training/retraining requirements.

<i>Species</i>	Laying hens
<i>Welfare indicator/OM</i>	Keel bone damage – new or old breaks due to poor bone health
<i>Challenge</i>	Requires system improvement. Requires a change in genetics – birds have been bred for high egg production and at the expense of bone health (calcium deposition). We need a fundamental shift to more robust breeds of egg-laying hen.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Set and require a metric for keel bone damage at a national level. ◦ Target setting. Use the levels of keel bone damage in top 10% of producers as the five-year target for all other producers. ◦ Need to develop a slaughter measure and automated to deal with line speeds at processing. ◦ Capital and knowledge will be needed to upgrade to better designed house systems, and government could choose to help with the costs. ◦ Need to consider genetics; transition to breeds that produce fewer eggs and/or development of breeds that produce same numbers of eggs without compromising bone health. Additional research required.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ National metric and target setting. ◦ A robust breed could be required as an OM underpinning extensive indoor, free range, and organic method of production labels. ◦ Financial incentives for producers who are RSPCA Assured. (RSPCA Assured requires the use of more robust breeds.)
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data can be used where available, with information fed back to farmer. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ New legislation could define and require acceptable flock percentage for keel bone damage, potentially delayed for 3-5 years to enable transition. ◦ Requirement for x-ray/cameras machines at slaughter houses to identify keel bone damage.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir post mortem data based on x-rays. ◦ Farm assurance could be used to monitor system improvements.

<i>Risks</i>	<ul style="list-style-type: none"> ◦ Reduced yields. ◦ Shift to more robust breeds may require additional husbandry knowledge.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra from day one. ◦ Information campaigns targeted at farmers. ◦ Training offered to farm assurance schemes, including farm inspectors, around equipment and layout. ◦ Appointment of regional change champions: free-lance hen farmers paid to deliver on-farm advice to other farmers. ◦ Capital support could be offered to farmers for whole system upgrades which aim to take advantage of quality market for cage-free eggs.

<i>Species</i>	Laying hens
<i>Welfare indicator/OM</i>	Beak trimming
<i>Challenge</i>	Requires system improvement, additional research, and a likely reversal of the trend towards very large flock sizes.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Should consider addressing the current trend towards very large flock sizes. Research needed to look at impact of separating birds into smaller colonies. ◦ High provision and maintenance of foraging/pecking materials. ◦ Capital will be needed to upgrade to safer systems, and government could choose to help with the costs. ◦ Farmers will need to learn new husbandry and system-management skills. ◦ Lots of research needed into managing transition.
<i>Short term lever</i>	◦ Maintain method of production labelling, but underpin with robust welfare outcome assessments introduced within existing farm assurance schemes. Labelling empowers citizens to drive and support improved welfare from the market place, and rewards farmers to deliver improvements.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data. ◦ Farm assurance records. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	May be an option for legislation in due course.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Without the right system and husbandry changes, non-beak trimming can lead to high mortality. ◦ Poor knowledge leads to lower welfare during the transition.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Clear indication from government about required direction of travel. ◦ Addition research into non-beak trimming options for transition

	<ul style="list-style-type: none"> ◦ New evidence about non-beak trimming options communicated effectively to farmers and schemes.
--	---

Broiler welfare metrics

Indicators	Change mechanism	Legislation
Hockburn/pododermatitis – easier to achieve	Requirement for OM to be recorded in farm assurance and at abattoir.	Immediate requirement to measure. Followed by regular target setting based on achievement of top 10% of producers.
Gait score – more difficult	Requirement for OM to be recorded in farm assurance.	Immediate requirement to measure. Followed by regular target setting based on achievement of top 10% of producers.

In more detail

Species	Broilers
Welfare indicator/OM	Hockburn/pododermatitis
Challenge	Requires improved litter quality/husbandry/gut health plus range management for organic and free range flocks
Managing transition	<ul style="list-style-type: none"> ◦ Set and require a metric for hockburn/pododermatitis at a national level. ◦ Knowledge deficit: farmers will need information about reducing hockburn/pododermatitis. ◦ Much improvement can be made with litter quality. Underfloor heating can be used to improve OM, along with longer or better flock turnaround. ◦ On-farm OM recording can be used by farmers to analyse the success of system adjustments and to improve efficiency. ◦ Target setting. Use the levels of hockburn/pododermatitis in top 10% of producers as the five-year target for all other producers.
Short term lever	<ul style="list-style-type: none"> ◦ Mandatory method of production labelling, underpinned with robust welfare outcome assessments introduced within existing farm assurance schemes. Hockburn/pododermatitis is used as an OM. ◦ Introduction of metrics and target setting.
Compliance mechanism	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Abattoir post mortem data. ◦ Peer-to-peer benchmarking.

<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers may not know how to adapt.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaigns targeted at farmers. ◦ General PR.

<i>Species</i>	Broilers
<i>Welfare indicator/OM</i>	Gait scoring
<i>Challenge</i>	Requires a fundamental change in genetics – a shift to more robust broiler breeds. Poor leg health is because of genetic selection for high growth rate whereby bones are unable to develop at sufficient rate to support body weight. Long term solution is for higher welfare breeds (which are likely to be slower growing and will have lower breast meat yield) and there is significant pressure coming from NGO's on this issue. However a breed change will significantly affects cost of production and in the short term people prefer large breasted birds.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Set and require a gait score metric at national level. ◦ Target setting. Use the levels of keel bone damage in top 10% of producers as the five-year target for all other producers. ◦ There is a potentially large market for extensive indoor broiler meat, but mandatory method of production labelling will be required to develop it, preferably underpinned with robust welfare outcome assessments introduced within existing farm assurance schemes. Labelling empowers citizens to drive and support improved welfare from the market place, and rewards farmers to deliver improvements. ◦ Government could use legislation to insist on more robust breeds. ◦ Capital will be needed to upgrade to higher welfare systems, and government could choose to help with the costs. ◦ Knowledge deficit.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Financial incentives for producers who are RSPCA Assured. (RSPCA Assured requires the use of more robust breeds.) ◦ A robust breed could be required as an OM underpinning extensive indoor, free range, and organic method of production labels.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data can be used where available, with information fed back to farmer. ◦ OM recorded as part of farm assurance. ◦ Membership of higher welfare assurance scheme. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	◦ New legislation, delayed for 5 years, should require all broilers to be robust breeds.

	<ul style="list-style-type: none"> ◦ At the point of implementation, financial incentive for early adopters should be removed.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Abattoir data can be used where available, with information fed back to farmer. ◦ Breed recorded as part of farm assurance. ◦ Membership of higher welfare assurance scheme.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Possible public backlash against smaller breasted birds. ◦ Shift to more robust breeds may require different husbandry knowledge.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ General PR about the importance of a shift to more robust broiler breeds. ◦ Focus on quality market: extensive indoor, free range, and organic. ◦ Careful manage/restrict imports of low welfare/poor quality chicken meat. ◦ Expert advice from Defra from day one. ◦ Information campaigns targeted at farmers. ◦ Appointment of regional change champions: free-lance broiler farmers paid to deliver on-farm advice to other farmers. ◦ Capital support could be offered to farmers for whole system upgrades which aim to take advantage of quality market.

Dairy cattle welfare metrics

<i>Indicators</i>	<i>Change mechanism</i>	<i>Legislation</i>
Bumps and bruises – easier to achieve	OM recorded at abattoir for cull cows, and regularly on-farm and during farm assurance for lactating cows	Immediate requirement to measure. Followed by regular 5 year target setting based on achievement of top 10% of producers.
Lameness – moderately difficult	Requirement for OM to be recorded regularly on farm and in farm assurance.	Immediate requirement to measure. Followed by regular 5 year target setting based on achievement of top 10% of producers.
Anti-microbial usage	Requirement for OM to be recorded regularly on farm and in farm assurance.	Immediate requirement to measure. Followed by regular 5 year target setting based on achievement of top 10% of producers.

In more detail

<i>Species</i>	Dairy cows
<i>Welfare indicator/OM</i>	Bumps and bruises
<i>Challenge</i>	Bumps and bruises are usually associated with poor lying conditions, walkways and milking parlour design. Requires system improvement – appropriate bedding and cubicles; on-farm investment.

<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Requires a metric at national level. ◦ Capital may be needed to upgrade farm facilities. ◦ Advice on design.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Dairy standards should be set in legislation. ◦ Introduction of metrics and target setting. Achievements of top 10% of producers should be used as the five-year target for all other producers.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Abattoir data for cull cows used to measure outcome, with information fed back to farmer. ◦ Peer-to-peer benchmarking.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers may not know how to adapt.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaigns targeted at farmers. ◦ General PR.

<i>Species</i>	Dairy cows
<i>Welfare indicator/OM</i>	Lameness
<i>Challenge</i>	There is a need for regular mobility scoring and the implementation of positive husbandry on farm. Evidence (work with M&S) shows that regular lameness scoring and dedicated visits (yearly) with advice can improve lameness.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Important to set and require a lameness metric at national level. ◦ Target setting. Use the levels of keel bone damage in top 10% of producers as the five-year target for all other producers.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Dairy standards should be set in legislation. ◦ Introduction of metrics and target setting. Achievements of top 10% of producers should be used as the five-year target for all other producers. ◦ Mandatory method of production labelling, underpinned with robust welfare outcome assessments introduced within existing farm assurance schemes. Lameness is used as an OM. ◦ Ongoing farm monitoring.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Abattoir data. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Use of metrics and target setting.

	<ul style="list-style-type: none"> ◦ Evidence-based tightening of dairy standards over time.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Abattoir data.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers may not know how to adapt.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaigns targeted at farmers. ◦ General PR, so that public understand the issue. ◦ Mandatory method of production labelling.

<i>Species</i>	Dairy cows
<i>Welfare indicator/OM</i>	Anti-microbial usage
<i>Challenge</i>	Majority of anti-microbial use is due to treating mastitis, so needs to go hand in hand with mastitis management. There is no clear agreed measure of anti-microbial use across different species, so whatever measure is used in the UK may need to be changed in the future. RUMA have recording guidelines, which are difficult to achieve at the moment for dairy. (This is an important distinction as it is much easier for chicken – the vet can give record of prescriptions, which are delivered to whole house, not individual birds, and then using weights can work out according to RUMA, so we recommend the number of courses divided by number of cows in herd.)
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Set and require an antimicrobials metric at national level – for example courses per cow/time period. ◦ Target setting. Use the levels of antimicrobial use in top 10% of producers as the five-year target for all other producers. ◦ More regular contact with vets. ◦ Buying medicines from vets only. ◦ Clearly identifying/labelling critical antibiotics to reduce use. ◦ Requiring farmers to have their own action plan.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Dairy standards should be set in legislation. ◦ Introduction of metrics and target setting. Achievements of top 10% of producers should be used as the five-year target for all other producers. ◦ Mandatory method of production labelling, underpinned with robust welfare outcome assessments introduced within existing farm assurance schemes. Antimicrobial use is used as an OM. ◦ Getting vet engagement

<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Processing data. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Use of metrics and target setting/ benchmarking ◦ Evidence-based tightening of dairy standards over time.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Processing data.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers may not know how to adapt. ◦ Managing mastitis is multi-factorial ◦ Welfare may reduce during transition
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaigns targeted at farmers. ◦ General PR, so that public understand the issue. ◦ Mandatory method of production labelling.

Sheep welfare metrics

<i>Indicators</i>	<i>Change mechanism</i>	<i>Legislation</i>
Percentage of flock with helminths	National metrics and target setting.	Immediate requirement to measure. Followed by regular 5 year target setting based on achievement of top 10% of producers.

In more detail

<i>Species</i>	Sheep and lambs
<i>Welfare indicator/OM</i>	Percentage of flock with helminths (monogeneans, cestodes (tapeworms), nematodes (roundworms), and trematodes (flukes).
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ Requires central database and co-ordination from abattoirs, requires similar scoring systems. ◦ Requires significant effort to eradicate and will require changes to land and flock management practices. Some areas of land may just not be suitable for sheep.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Can be measured on farm, or at abattoir. Abattoir will be easier, but feedback to farmer is essential. ◦ Set and require a helminth metric at national level, ideally broken down by category

	<ul style="list-style-type: none"> ◦ Target setting. Use helminth levels in top 10% of producers as the five-year target for all other producers. ◦ Improved knowledge of land management issues amongst vets. ◦ Requiring farmers to have their own helminth action plan.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ National helminth strategy should be developed – including flock health and land management recommendations. ◦ Introduction of metrics and target setting. Achievements of top 10% of producers should be used as the five-year target for all other producers. ◦ Getting vet engagement. ◦ Financial assistance could be provided to assist with land management, e.g. water management, fencing, and additional flora. ◦ Improved herd health and profit.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Processing data. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Use of metrics and target setting/ benchmarking ◦ Evidence-based tightening of sheep standards over time.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farm assurance. ◦ Inspections. ◦ Processing data.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers don't have adequate flock health knowledge. ◦ Need to change the approach of some vets. ◦ Land management change can be expensive. ◦ Impact on flock if some land needs to be quarantined. ◦ In some areas it may be difficult to reduce helminths.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra. ◦ Information campaigns targeted at farmers. ◦ General PR, so that public understand the issue.

Importance of embedding FAW metrics to improve slaughter outcomes

We also believe that robust slaughter outcome measures should be used to assess and improve welfare. Slaughter OMs should cover lairage, handling, and slaughter.

Currently UK slaughter standards are the responsibility of the operator, although the FSA requires the presence of an Official Vet (OV) to check the slaughter line. Monitoring the point of killing is just one of the OV's many quality assurance duties, and there is no formal or standardised system for reporting outcomes.

OMs should be agreed nationally to help index slaughterhouses and compare standards. OVs should spend a fixed proportion of their time at the slaughter line. The informal 'daybook' system should be replaced, and an iPad or equivalent device should be used to record and manage information locally and to feed directly into a national data set. In time it may be possible for technical solutions, for example motion capture and audio collection software/devices, to replace human auditing of slaughter OMs.

We believe that mandatory method of slaughter labelling should be introduced alongside welfare metrics, and that the combination of labelling and national metrics analysis will provide the best environment for welfare improvements and technical innovation.

Welfare outcome measures will:

- Provide the opportunity for national monitoring by the FSA
- Help ensure continuous maintenance and improvement of standards
- Help identify training needs and improve efficiency
- Mean that the UK is able to compare itself at a global level
- Allow the FSA to index slaughterhouses – providing greater choice for farmers, retailers, religious consumers, and restaurants concerned about welfare at slaughter.

OMs may include:

- Effectiveness of stun measures, for example for captive bolt stunning: animal collapses, no rhythmic breathing, fixed, glazed expression in the eyes, no corneal reflex, relaxed jaw, tongue hanging out.
- Stun to stick times

Slaughter measures have been largely driven and implemented internationally thanks to Temple Grandin. For example, she has identified the five main critical control points for beef or pork slaughter as:

- Percentage of animals stunned correctly on the first attempt.
- Percentage that remains insensible.
- Percentage that do not vocalize (moo, bellow, or squeal) during movement up the race and during handling and stunning. All vocalizations in the stun box or restrainer are counted.
- Percentage that do not fall or slip during handling. Score slips and falls as separate variables.
- Percentage moved with no electric prod (goad).

Appendix four – environmental metrics change map

Examples of environmental metrics and possible transition narratives.

<i>Indicators</i>	<i>Change mechanism</i>	<i>Legislation</i>
Energy neutrality – electricity	Import/export metric at national level. National target setting. Legal requirement for all farms to be generating clean energy for own use and export from 2030.	Import/export metric should be required as baseline metric for continued Basic Farm Payment. Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
Biodiversity improvement	National metrics. Citizen science. In partnership with NGOs.	Can be used to support change and inform policy
Weather resilience – Active flood management measures in place	Financial incentive for projects at landscape scale.	Yes/no required as baseline metric. Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
Percentage of water used that is from renewable/recycled source	Requirement for all farms to use renewable/recycled water by 2030.	% should be required as baseline metric. FA/VAS.
Percentage of water of streams/rivers on farm that have riparian zone planting or are protected from livestock	Requirement to protect all vulnerable waterways by 2025.	% should be required as baseline metric. FA/VAS.
Yes/no use of effluent management plan for storage and application of manure	Plan should be required by year two of transition.	Should be required as baseline metric. FA/VAS.
Nitrogen, phosphorous, and potassium levels in farm and downstream waterways	Requirement to measure from year one of transition.	Should be required as baseline metric. FA/VAS.
Percentage of dry matter intake from forage (grass, straw, silage etc)	Requirement to measure from year one of transition.	Should be required as baseline metric. FA/VAS.
Percentage of soy used in feed rations that is 'certified' as sustainable (RTRS for example)	Requirement to measure from year one of transition.	Should be required as baseline metric. FA/VAS.
Soil organic matter	Requirement to measure from year one of transition.	Should be required as baseline metric. FA/VAS.
Visual soil assessment (Soil structure, porosity, colour, and	Requirement to measure from year one of transition.	Should be required as baseline metric. FA/VAS.

earthworm count)		
Greenhouse gas impact assessment	Requirement to measure from year one of transition.	Should be required as baseline metric. FA/VAS.

In more detail

<i>Environmental metric</i>	Energy neutrality – electricity
<i>Challenge</i>	Electricity can be measured easily when exported to and imported from the grid. All farms can generate at least some renewable electricity on site. Many farms will be able to generate many times more energy than they can use. Nationally, in aggregate, agricultural electricity use could be carbon negative within 5-10 years, and there should be a legal requirement for all farms to be generating clean energy for own use and export from 2030.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Set and require electricity use/export metric at national level. ◦ National target setting to monitor progress. ◦ Establish legal requirement for all farms to be generating clean energy for own use and export from 2030. ◦ Farm-specific planning guidance issued for renewable energy options. ◦ Guidance issued for planning authorities. ◦ Capital and knowledge will be needed to integrate renewables, and government could choose to help with the costs directly, or through tax breaks. ◦ Community energy schemes working in partnership with farms should be encouraged.
<i>Short term levers</i>	<ul style="list-style-type: none"> ◦ Introduction of metrics and target setting. ◦ Legislative change to create presumption in favour of on-farm renewable energy development. ◦ Use of planning regulations for new build (barns etc) and retrofit. ◦ Financial assistance for renewables, such as capital support or attractive feed-in tariff. ◦ Farm assurance.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ OM recorded as part of farm assurance. ◦ On-farm monitoring. ◦ Inspections. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Legal requirement for all farms to be generating clean energy for own use and export from 2030. ◦ Use of metrics and target setting. ◦ Empowering planning legislation.
<i>Compliance</i>	<ul style="list-style-type: none"> ◦ OM recorded as part of farm assurance.

<i>mechanism</i>	<ul style="list-style-type: none"> ◦ On-farm monitoring. ◦ Inspections and enforcement.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Farmers may not know how to adapt. ◦ General public may resist renewable energy schemes.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra, grid, and energy companies. ◦ Information campaigns targeted at farmers. ◦ General PR, so that public understand the issue. ◦ Presumption in favour of on-farm renewable energy development. ◦ Advice about early engagement with neighbouring communities.

<i>Environmental metric</i>	Biodiversity improvement – annual wild bird, wildflower, and butterfly census
<i>Challenge</i>	Biodiversity is diminishing at a remarkable rate. We can use native populations of birds, butterflies and wildflowers as proxies for biodiversity improvement. Inputs such as tree planting and improved hedgerow and waterways will have a direct impact on local biodiversity.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Establish a metric at national level – we suggest counting wild birds, wildflowers, and butterflies on or next to farmland on a single day each year. ◦ Work with NGOs to mobilise their memberships to participate in a series of citizen science-led annual censuses – for example RSPB, Wildlife Trusts, National Trust, etc. The RSPB's Big Garden Birdwatch provides an excellent model. ◦ Publish results annually. ◦ Strongly encourage additional flora and other environmental enhancements on farms. ◦ Encourage engagement between farmers and wildlife groups.
<i>Short term levers</i>	<ul style="list-style-type: none"> ◦ Introduction of metrics. ◦ Partnerships with NGOs. ◦ Evidence-based tightening of environmental standards over time.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Annual citizen science census. ◦ Peer-to-peer benchmarking.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Use of metrics. ◦ Evidence-based tightening of environmental standards over time.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Annual citizen science census.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ NGOs may not help, or be effective in mobilising members. ◦ Farmers may feel threatened by census. ◦ General public may resist renewable energy schemes.

<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Approaches to NGOs should be part of a renewed programme of government action on the environment. ◦ General PR, so that public understand the issue. ◦ Information campaigns targeted at farmers.
---------------------------	---

<i>Environmental metric</i>	Weather resilience – active flood management measures
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ Flooding following extreme rainfall events can be devastating for downstream communities in villages, town and cities. However flooding can be mitigated cheaply and effectively through the deployment of natural flood defences. These are most effective when delivered across the watershed at landscape-scale.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Identify key communities that would benefit from landscape/watershed-scale natural flood management approach. ◦ Measure natural flood defence deployment at national level. ◦ National target setting to monitor progress. ◦ Farm-specific planning guidance issued. ◦ Guidance issued for partner agencies. ◦ Defra to initiate approaches to partner agencies.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Requirement for all farms in key watersheds to deploy natural flood defences by the end of the transition period. ◦ Payment for farmers who adopt ahead of the deadline.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Yes/no required as baseline metric for continued Basic Farm Payment. ◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Requirement for all farms in key watersheds to deploy natural flood defences by the end of the transition period.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Legal requirement. ◦ Ongoing monitoring required by farmer and assurance scheme.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Landscape-scale approach necessary requiring efforts by vast majority of farmers in watershed. Some farmers may refuse to participate. ◦ Flood defences will need maintaining to ensure they remain fit for purpose.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra, Environment Agency and other partners. ◦ Information targeted at farmers. ◦ General PR, so that public and farmers understand the issue. ◦ Natural capital rent/payment for participating farmers. ◦ Legal requirement by end of transition.

<i>Environmental metric</i>	Water – Percentage of water used that is from renewable/recycled source
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ Most farmers can capture large amounts of rainwater on their land, and some will be able to utilise water that runs over their land or comes from aquifers. Infrastructure needs to be established to manage water and to recycle it wherever possible. Farms must install the capacity to measure mains/renewable/recycled water use.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Requires change in practice/investment to drive use of renewables. ◦ Requires metering of mains water. ◦ Farm-specific planning guidance issued.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ National farm water management strategy should be developed. ◦ Requirement for all farms to have a Water Independence Plan. ◦ Mains water metering for all farms. ◦ Charging introduced for mains water use.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Legal requirement for Water Independence Plan. ◦ Verified by assurance scheme.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Requirement for all farms to be mains water independent by 2030. ◦ Derogations may be necessary (on application) for farms in particularly challenging areas.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Legal requirement. ◦ Verified by assurance scheme. ◦ Enforcement.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Capital investment and change in practice required. ◦ Need to develop farmer awareness of issues and technology. ◦ Farmers won't make the transition quickly enough. ◦ Requires much more proactive maintenance of leaks and broken troughs etc.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra and other partners. ◦ Information targeted at farmers. ◦ General PR, so that public and farmers understand the issue. ◦ Legal requirement by end of transition.

<i>Environmental metric</i>	Water – Percentage of streams/rivers on farm that have riparian zone planting or are protected from livestock
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ Poor riparian zone management leads to water pollution from faecal matter and from inputs such as fertilisers and pesticides. This impacts human health and leisure activities (algal blooms) and harms biodiversity. We must eliminate these forms of pollution.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Many of the HLS schemes require protection of waterways, so perhaps some data could come from there.

	<ul style="list-style-type: none"> ◦ Could be used as a metric to underpin method of production labelling.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ Riparian Zone Plan required ◦ Financial support for infrastructure for early adopters ◦ Financial incentives for working at landscape scale
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Legal requirement for Riparian Zone Plan. ◦ Verified by assurance scheme.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Legal requirement to have implemented their Riparian Zone Plan by the end of the transition, including fencing and planting. (This will also help with animal health challenges such as liver fluke).
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Legal requirement. ◦ Verified by assurance scheme. ◦ Enforcement.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Development of knowledge at farm and assurance scheme levels. ◦ Capital investment and change in practice required.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Training/information on environmental problems and downstream effects of leaching into waterways. ◦ General advice from Defra and other partners. ◦ Information targeted at farmers. ◦ General PR, so that public and farmers understand the issue. ◦ Legal requirement by end of transition.

<i>Environmental metric</i>	Land use – Percentage of dry matter intake from forage (grass, straw, silage etc) Dairy/Beef/Sheep
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ Protein from meat and dairy products are most sustainable when they come from grass-based farm systems. ◦ We must develop sustainable UK agriculture while not exporting our environmental footprint – meaning that we must reduce imports of grain and palm oil linked products that have negative land use impacts in third nations. ◦ We may need to develop UK originated animal protein feed products (for example for chicken and pigs) such as peas and beans. ◦ Some breeds won't be suitable for forage based diets, so long term shift in breed transition.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Requires understanding of the challenges and reasons for change. ◦ May require support for some farmers to shift production to develop this new UK market opportunity.

	<ul style="list-style-type: none"> ◦ May require support to shift towards more robust breeds that can thrive on forage-based diets. ◦ Could be used as a metric to underpin method of production labelling.
<i>Short term lever</i>	◦ National metric and target setting from day one of transition period.
<i>Compliance mechanism</i>	◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
<i>Longer term lever</i>	◦ National metric and target setting.
<i>Compliance mechanism</i>	◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Poor welfare of breeds that can't be maintained on high forage diets if switch diet but not breed. ◦ Farmers won't necessarily know how to farm different breeds, will lead to reduced number of animals because of available land for forage.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ General advice from Defra and other partners. ◦ Information targeted at farmers. ◦ General PR, so that public and farmers understand the issue.

<i>Environmental metric</i>	Soil – Visual soil assessment (Soil structure, porosity, colour, and earthworm count)
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ Britain has lost 84% of fertile topsoil since 1850 and the erosion continues in some areas at between 1cm and 3cm a year. ◦ We need to restore soil health and monitor progress to achieve this.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Requires farmer buy-in – understanding of the challenges and reasons for change. ◦ Will require training, use of local advisory service, and workshops. ◦ We should be focussed on national and farm level improvement. ◦ Important to make the restoration of soil health a national mission.
<i>Short term lever</i>	◦ National metric and target setting from day one of transition period.
<i>Compliance mechanism</i>	◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ National metric and target setting. ◦ Good soil health could be legislated for – options should be considered.
<i>Compliance mechanism</i>	◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS).
<i>Risks</i>	◦ In field test and some aspects subjective.

	<ul style="list-style-type: none"> ◦ Requires mass participation.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Training, use of local advisory service, and workshops. ◦ General advice from Defra and other partners. ◦ Information targeted at farmers. ◦ General PR, so that public and farmers understand the issue.

<i>Environmental metric</i>	Greenhouse gas impact assessment – use of online tool, such as the Cool Farm Tool (https://coolfarmtool.org/coolfarmtool/greenhouse-gases)
<i>Challenge</i>	<ul style="list-style-type: none"> ◦ 9% of UK greenhouse gas emissions and up to one-third of global emissions come from agriculture.
<i>Managing transition</i>	<ul style="list-style-type: none"> ◦ Broader understanding required so that farmers understand that sustainable farming means more efficient farming, and potentially higher profits. ◦ Farm GHG assessment tools have been set up to be as straight-forward as possible for farmers to use. ◦ The first assessment will take longer than subsequent assessments. ◦ Good record keeping will reduce time taken in assessments. ◦ Retailers should be encouraged to require GHG assessments as part of their assurance requirements.
<i>Short term lever</i>	<ul style="list-style-type: none"> ◦ A financial incentive could be offered to early adopters.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS). ◦ Requested for national database.
<i>Longer term lever</i>	<ul style="list-style-type: none"> ◦ Requirement for all farms to audit GHGs annually, using an online tool.
<i>Compliance mechanism</i>	<ul style="list-style-type: none"> ◦ Farmer assessed, with methodology verified by assurance scheme (FA/VAS). ◦ Required for national database.
<i>Risks</i>	<ul style="list-style-type: none"> ◦ Limited farmer knowledge of key issues. ◦ Time taken in the first instance to gather data.
<i>Mitigation options</i>	<ul style="list-style-type: none"> ◦ Expert advice from Defra, Environment Agency and other partners. ◦ Information targeted at farmers. ◦ General PR, so that public and farmers understand the issue.

Appendix Five – Genetics and a transition to more robust breeds

To address some of the biggest on-going challenges for certain types of animal farming will require a fundamental change in genetics, and a shift to more robust breeds. High yielding dairy, broiler and laying hen breeds are inherently vulnerable to key health problems. Government can help farmers make the transition to more robust genetics by rewarding farmers who put farm animal welfare first by encouraging the use and development of more robust breeds.

Below we have listed breeds with particular welfare challenges, alongside more robust examples. However, it is important to say that genetics changes all the time, so while this breed information is correct today in 2018, it may be less accurate in a couple of years' time.

Dairy - High yielding Holstein-type dairy cattle are particularly prone to lameness and mastitis because breeding has focussed on milk yield (an average UK Holstein-type cow will produce more than 9,000 litres per lactation). More robust breeds would include Shorthorn- and Jersey-type cattle (though these breeds may produce closer to 6,000 litres per lactation).

This yield reduction can be off-set by an increase in price, based on quality, providing the consumer is able to differentiate easily. Mandatory method of production labelling of dairy products could help customers reward farmers producing milk to higher welfare standards. Metrics associated with higher welfare labels could include a requirement for more robust breeds.

Broilers – High yielding broilers have inherent heart problems and poor leg health. Genetic selection has focussed on a high growth rate whereby bones and cardiovascular system are unable to develop at sufficient rate to support body weight. More robust breeds would include Hubbards JA757 and JA787 and the Rowan Ranger, which have been approved by RSPCA breed assessment. These birds have the ability to walk well, perch and forage throughout the rearing period.

Government should support a transition to higher welfare breeds (which are likely to be slower growing and will have lower breast meat yield). Market differentiation, through mandatory method of production labelling of chicken products, could help customers reward farmers producing chicken to higher welfare standards. Metrics associated with higher welfare labels could include a requirement for more robust breeds.

Laying hens - High yielding egg-laying hens also have poor bone health. Birds have been bred for high egg production at the expense of bone health (calcium deposition). Government should encourage and support the development of more robust laying hen breeds.

Beef – In beef cattle we should be looking move away from supporting double-muscle breeds such as the Belgian Blue, and focus on support for breeds that calve more easily such as Aberdeen Angus and Hereford.

Appendix Six – Iceberg outcome measures approach to payments

Government has expressed a keen interest in the use of farm animal welfare ‘iceberg’ measures. For example, discussion has focussed on the possibility of pig producers earning a premium for bringing their pigs to slaughter with intact unbitten tails. To be eligible for the premium pig producers would also need to be members of RSPCA Assured, to ensure that a broader range of metrics are being collected and that good standards are being achieved.

This approach is attractive because it utilises a trusted welfare assurance partner to set general standards, and uses a single slaughter metric as the basis for additional payment. This makes welfare payments extremely easy to administer.

For other species single measures indicating very high levels of welfare are unavailable. Instead it will necessary to focus on two or three metrics, which when achieved together indicate excellent health and welfare. Some of these will be able to be collected at the abattoir, but other measures must be collected on the farm.

These are our recommendations, which could be implemented alongside *improved legislative standards*.

Finisher pigs

Slaughter metric

Headage basis for payment

Producer must be RSPCA Assured or Soil Association Organic

Outcome measure: Intact unbitten tail at point of slaughter

Rewarding all achievers

Will require excellent system management to achieve better health and welfare

Broilers

On-farm metric

Whole flock basis for payment

Producer must be RSPCA Assured or Soil Association Organic

Outcome measure: Low levels of pododermatitis

Target should be set, which will requires standardised national metric and collection method.

Will require excellent flock and system management to achieve better health and welfare

Laying hens

On-farm metric

Whole flock basis for payment

Producer must be RSPCA Assured or Soil Association Organic

Outcome measure: Low mortality and good feather cover score

Target should be set, which will requires standardised national metric and collection method.

Will require excellent flock and system management to achieve better health and welfare

Dairy cows

On-farm metric

Whole herd basis for payment

Producer must be RSPCA Assured or Soil Association Organic

Outcome measure: Low levels of lameness and low levels of mastitis and low levels of anti-microbial use

Target should be set, which will requires standardised national metric and collection method.

Will require excellent herd and system management to achieve better health and welfare

Beef

Slaughter metric

Headage basis for payment

Producer must be RSPCA Assured or organic certified by Soil Association or Organic Farmers & Growers

Outcome measure: High levels of cleanliness (and no clipping) and low levels of lumps, lesions and swellings

Target should be set, which will requires standardised national metric and collection method.

Will require excellent herd and system management to achieve better health and welfare

Lambs

On-farm metric

Whole flock basis for payment

Producer must be RSPCA Assured or organic certified by Soil Association or Organic Farmers & Growers

Outcome measure: Low levels of lameness and low levels of helminths and low levels of anti-microbial use

Target should be set, which will requires standardised national metric and collection method.

Will require excellent land and flock management to achieve better health and welfare

For more information, please contact:

ffinlo Costain

Director, Farmwel

ffinlo@ffinlo.org

07920 854 904

www.farmwel.org.uk

END