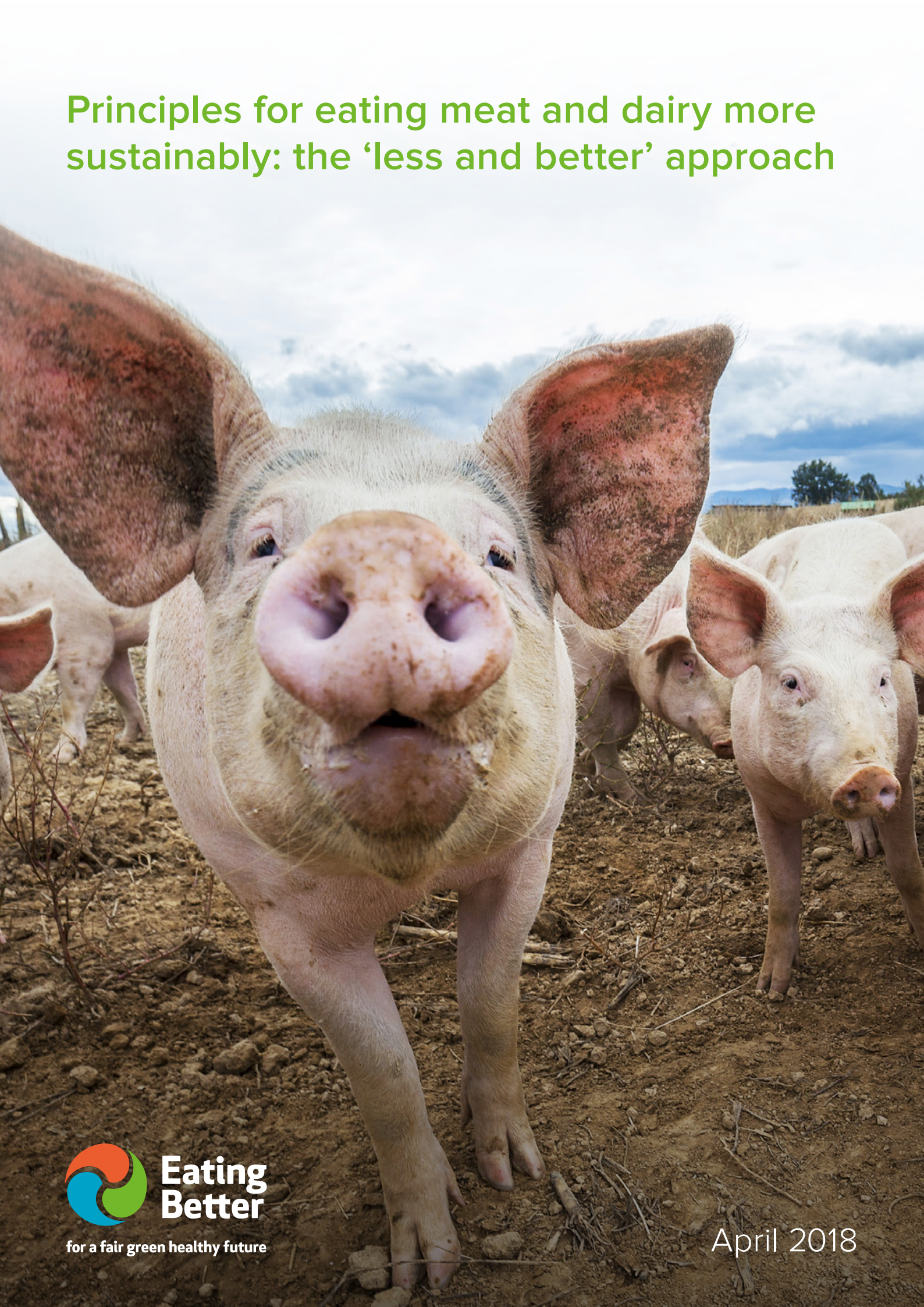
Principles for eating meat and dairy more sustainably: the ‘less and better’ approach



Eating Better

for a fair green healthy future

April 2018

Contents

This report was written by Sue Dibb and Elena Salazar de Llaguno of Eating Better. The report draws on research and the expertise of Eating Better alliance organisations and other farming interests.

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Introduction

The food on our plates sustains us but is also making too many of us – as well as our planet – sick. We need diets that are not just healthy but sustainable too. There are many elements to achieving this goal, but one that is key – if we are to feed a growing and more affluent global population healthily, fairly and sustainably and live within planetary boundaries – is to reduce the high level of livestock products that we eat in countries such as the UK.

The evidence of the need for this shift is clear. The 2015 Paris Climate Agreement commitments to keep global temperature rise within safe limits cannot be met without including dietary change as a priority solution.[1] We need urgent action to reduce meat consumption of at least 50% by 2030 in high consuming countries including the UK.

Climate change is not the only challenge. Livestock production is a driving force behind wide-scale global biodiversity loss, particularly through the increasing cultivation and use of crops such as soya for feeding intensively produced chicken, pork and dairy. Additionally, it is increasingly recognised, including in the Government's Eatwell Guide dietary guidelines,[2] that predominantly plant-based diets with smaller quantities of animal products are needed to address the spiralling health care costs to individuals, society and the National Health Service (NHS) from obesity and diet-related disease including heart disease, cancers and type 2 diabetes.

For Eating Better, a focus on 'less' to reduce consumption of livestock products, particularly to address climate change, is only part of the picture. We also recognise there can be benefits including for animal welfare, the environment, health, reducing waste and for farming livelihoods from shifting our consumption towards 'better' meat and dairy for the livestock products that we do choose to eat.

But what does this mean in practice? As awareness of Eating Better's 'less and better' message for people's health and the health of the planet has grown, we're often asked: what do we mean by 'better' meat and dairy? How much 'less' is necessary, and should that apply to all types of meat? Isn't it better to avoid beef and choose chicken? Conversely isn't it better to choose extensively pasture-fed beef and lamb over intensively produced chicken? For some people, veganism and cutting out all animal products seems the best solution. But then, isn't some land only suitable for grazing while also locking carbon into the soil? Are there better forms of farming we should support, that provide higher standards of animal welfare, avoid the unnecessary use of antibiotics, provide environmental benefits and which support rural landscapes and livelihoods?

We recognise there are not always straightforward answers. How do we, for example, weigh up the evidence on greenhouse gas emissions from different species of livestock, against the value of nature and landscape, animal welfare concerns, and health issues?

Often there are positive synergies, for example between public health and the health of the environment, but not in all circumstances. There can also be trade-offs. Greenhouse gas (GHG) efficiency can be improved by large scale intensive production systems – but at what cost to animal welfare and local pollution? We also need to consider how individual priorities, for example towards animal welfare or health, will also shape personal preferences.

This report aims to navigate a way through these questions, to clarify Eating Better's less and better messaging and to provide practical guidance. Whilst we cannot claim to provide absolute answers, we believe that choosing better means aiming to reduce negative impacts across a range of factors. We offer a set of eight principles to help navigate the complexities involved, together with a guide to labels for choosing better.

We intend that the report assist all those similarly grappling with the complex issues, in helping find a way forward that has broad support. The report draws on research and the expertise of Eating Better alliance organisations, and other farming interests, and the outputs from an Eating Better workshop in collaboration with the Food and Climate Research Network. We are grateful for this input. We welcome further feedback.

It is also timely, as the UK explores what a future post-Brexit food and farming strategy might look like. Eating Better's research into **Beyond the CAP: Policies to support better UK meat and dairy production post-Brexit**, sets out 10 recommendations for livestock's role in a sustainable food and farming system.

The focus of the report is the consumption and production of meat and dairy from land-based livestock production. We do not include fish or seafood or address broader sustainability issues related to their production and consumption. Further information on selecting fish from sustainable sources is available **here** from our partner Sustain: the alliance for better food and farming.

Our focus is mainly on the UK though we recognise that our research and conclusions will be useful for others working elsewhere. Environmental issues such as climate change are global, though others will be more localised. Different geographies and cultures will also shape livestock production and consumption patterns.

The context

UK diets, along with those of most EU countries, are on average high in animal products with annual per capita consumption of meat around twice the global average and milk supply over two and a half times the global average.[3] Globally meat consumption has almost doubled over the last fifty years in part due to increasing population numbers, but also as living standards rise people can, and do, generally consume more animal protein.

Livestock production is a central element of UK farming, accounting for almost two thirds of agricultural land and 55% of the value of total agricultural output, a total of over £14bn in 2014.[4] Aside from its economic importance, livestock production has shaped environments and landscapes, local cultures and traditions in both highlands and lowlands throughout the UK. Some of our most iconic landscapes and wildlife depend on land appropriately managed through grazing. However, the cultural and environmental role of livestock production has changed radically in recent decades, with increased specialisation, concentration and intensification of production in most sectors towards larger industrial scale farming and away from smaller mixed farms.

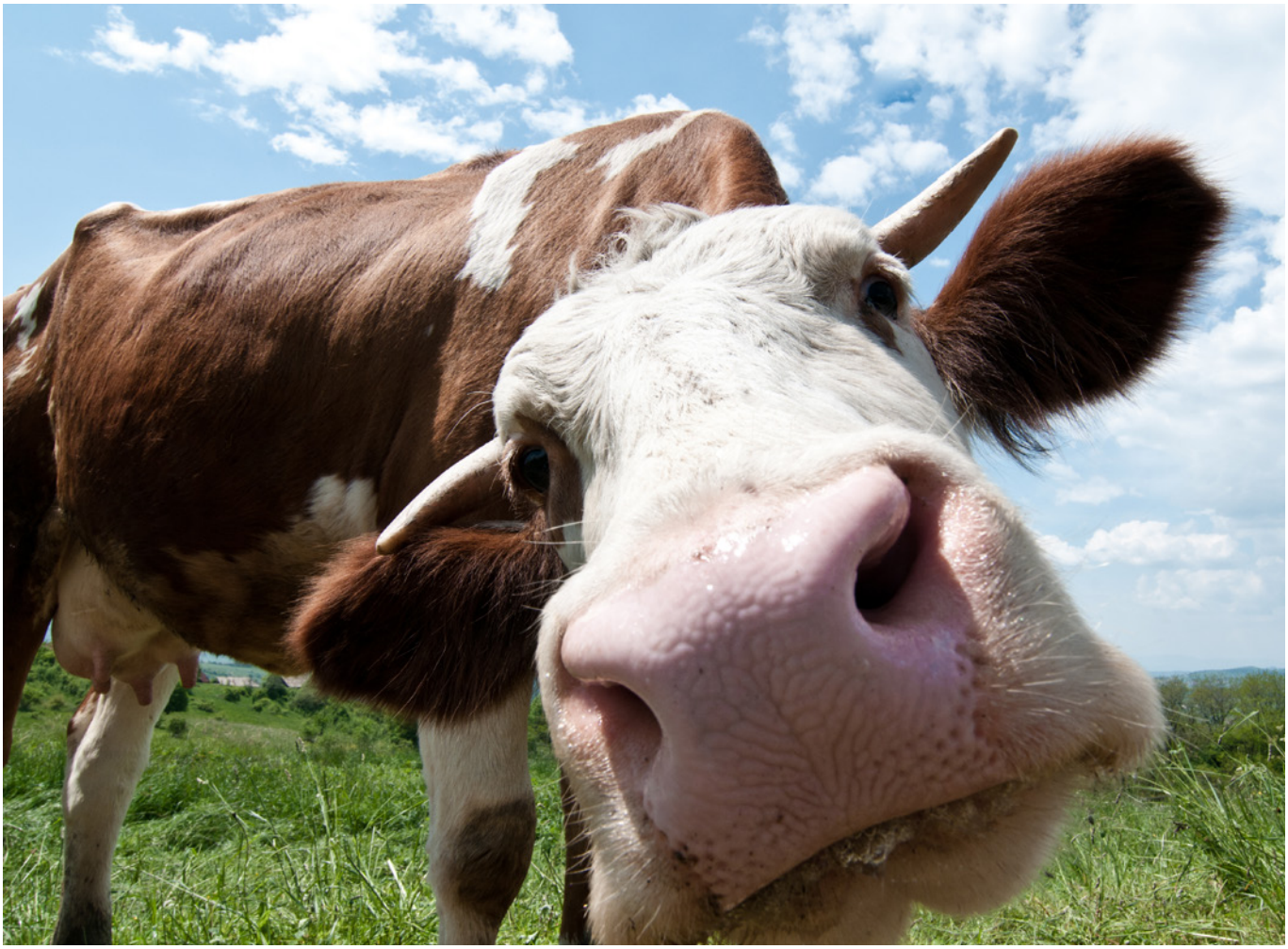
A study from Oxford University found that reducing average meat consumption in the UK to two or three servings a week could prevent 45,000 premature deaths a year and save the NHS £1.2 billion.

For example, although there are 10,000 pig farms in the UK, 92% of UK-produced pork comes from just 1600 farms (16%).[5] 95% of chickens reared for meat are kept indoors[6] in large-scale, automated factory units which can hold hundreds of thousands of birds. Dairy production too has intensified, so that milk production per cow has doubled over the last 40 years but at the expense of animal welfare, with cows typically worn out after just three lactations.[7] A shift towards cheap animal feed (including subsidized cereal production, imported soy with zero import tariffs and high sugar feeds such as maize silage which increases soil degradation and erosion[8]) has made the intensification of livestock production possible.

For some this is welcomed as increased productivity, provides food relatively cheaply and in large quantities. However, such high levels of intensive production and consumption have led to a host of serious environmental and social impacts, including local pollution from waste, deforestation and habitat conversion (in countries growing soy feed for poultry, pig and dairy production), climate change, animal welfare concerns and overuse of antibiotics contributing to the global public health crisis of antibiotic resistance. Large-scale intensive pig and dairy production units have also encountered local public opposition. Grazing systems can avoid some of these negative impacts but are not without environmental and animal welfare challenges, particularly when poorly managed. Overgrazing for example, can result in soil erosion and a biologically depleted environment with poor water retention, contributing to flooding.

The environmental footprint of livestock production and consumption is coming under increasing scrutiny, including its significant contribution to GHG emissions. Although the whole food chain contributes to these emissions, it is the agriculture stage – and specifically livestock production – where the greatest impacts occur accounting for 14.5% of global GHG emissions.

Globally greenhouse gas emissions from agriculture, forestry and fisheries have nearly doubled over the past fifty years and are predicted to increase by an additional 30% by 2050 unless there are greater efforts to reduce them.[9] Land management, agriculture and the natural environments have crucial roles to play in reducing emissions and improving resilience to climate risks, including the role of carbon sequestration through active soil management, reforestation where appropriate and habitat restoration. The UK Committee on Climate Change has warned that the UK agricultural sector has failed to reduce its climate impact over the last six years and is not on track to deliver relatively modest agreed non-CO2 emissions reduction of at least 3 million tonnes of carbon dioxide equivalent per year (3MtCO2e) in England (4.5 MtCO2e in the UK) by 2022.[10]



Yet, even such agricultural production efficiencies and other on-farm carbon reduction measures would be insufficient to achieve the GHG emission reductions required by 2030 to avoid dangerous levels of climate change. As the Committee on Climate Change makes clear, measures to curb consumption are also essential: "*Diet change and reducing food waste will be needed to deliver deeper cuts in agricultural emissions beyond 2030. Therefore, consideration of these options before 2030 will be required in order to prepare for their implementation.*"[11]

As well as being a significant cause of climate change, livestock production, particularly intensive systems, is responsible for a number of other environmental impacts both directly, from animal rearing, and indirectly from the crops grown to feed livestock. These include nitrogen pollution, water pollution from slurry and manure, and soil and vegetation damage from overstocking. Additionally, livestock farming, in particular intensive pig and poultry production, is a major user of antibiotics worldwide and poses a threat to human health that has been described as a ticking time bomb of potentially apocalyptic proportions.[12]

The importance of healthy and sustainable eating patterns with moderate amounts of meat consumption is increasingly being recognised in national dietary guidelines, including the UK's Eatwell Guide.[13] Evidence increasingly points to the need to reduce consumption of livestock products by at least half from current UK levels in order to reduce climate impacts.

Modelling indicates that halving the consumption of meat, dairy products and eggs in the European Union would lead to a 25-40% GHG emission reduction, a 40% reduction in nitrogen emissions, and 23% per capita less use of cropland for food production.[14] Such dietary shifts will also provide public health benefits. A study from Oxford University found that reducing average meat consumption in the UK to two or three servings a week could prevent 45,000 premature deaths a year and save the NHS £1.2 billion.[15]

1. Choose better for the climate

What's the problem?

In the UK we eat a lot of meat and dairy, with consumption around twice the global average. This comes with a high carbon footprint. To lower the climate change impacts from what we eat – and to meet the Paris Agreement targets - we need to significantly reduce the amount of meat and dairy that we consume and shift our eating patterns towards those that are plant-rich. In the UK, and other high meat consuming countries, evidence points towards this meaning at least halving our consumption by 2030.[16]

How does livestock contribute towards GHG emissions?

Raising animals for food is a key driver of both direct agricultural emissions and land use change including deforestation in some areas of the world[17] and accounts for 14.5% of total GHG emissions globally.[18] Of the 10% GHG emissions from agriculture in the UK,[19] livestock production accounts for the majority (estimated around 60-70%). Agriculture in the devolved administrations is relatively more important for emissions, and for the economy, than for the UK as a whole where 2015 emissions were 29% of the total for Northern Ireland, 18% in Scotland and 13% in Wales.[20] This is in addition to the emissions (alongside biodiversity loss) from deforestation and other land use changes in countries like Brazil and Argentina caused by the soy grown for our imported animal feed.

Livestock rearing gives rise to GHG emissions from:

- Enteric (stomach) emissions of methane from ruminant animals themselves;
- Nitrous oxide, from fertiliser applied to grazing land as well as the breakdown of animal manure and urine;
- Carbon dioxide from
  - Land use changes induced by the production of feed (either in Europe or elsewhere); e.g. clearance of rainforest and scrubland, ploughing of grassland, draining of peatland, and from turning land to cattle ranching;
  - The production of fodder and feed: emissions from the production and application of mineral fertiliser; the production of pesticides;
  - On-farm energy consumption;
  - Changes in the extent to which carbon sequestration takes place in land used for feed and fodder production (including grassland and grazing).

Are all types of livestock the same?

All types of meat have a relatively high carbon footprint, and are generally significantly more emissions intensive than non-animal products.[21] Meats from ruminant animals – cows, sheep and goats - contribute more direct greenhouse gases than meat from monogastric animals – poultry and pigs. But how the animals are reared also has a significant impact on overall emissions. For a number of reasons, it is not enough simply to swap between different types of meat, e.g. from beef to chicken to reduce GHG emissions.

Firstly, we need to look at the volume of consumption, which is highest for chicken and pork, our most popular meats, which increases the greenhouse gas impact from these meats overall. Additionally, it is also important to consider how animals have been reared – in particular how they have been fed. Lower greenhouse gas emissions achieved by the intensification of production can come at the expense of animal health and welfare, and an unsustainable reliance on high levels of antibiotic use.

Also, through its reliance on grain and soy feed, intensive chicken, pork and dairy production contributes towards indirect GHG emissions through deforestation and land use change, particularly in South America. Extensive ruminant production on pasture (see below) can be less resource intensive including of arable feed demand than intensive monogastric production.

Through its reliance on grain and soy feed, intensive chicken, pork and dairy production contributes towards indirect GHG emissions through deforestation and land use change.

What about dairy products?

Owing to the relatively high water content of milk, emissions associated with one kilo of milk are low relative to those from the same amount of beef. However, milk also contains less energy and protein per gram. On the other hand, cheese has a relatively high GHG intensity (8-10 times that of milk, depending on the hardness of the cheese[22]) meaning that cheese can have a higher impact (per kilogram) than pork.

What about pasture-fed grazing systems?

Maintaining and building soil carbon stores is vital for addressing climate change and permanent pasture for grazing livestock is one way to achieve this. However, the extent to which this will occur is highly variable, in part dependent on local conditions such as climate, geography, soils and type of grassland.

It has been calculated that the maximum global potential of carbon sequestration in soils could globally offset 20%-60% of emissions from grazing cattle, 4%-11% of total livestock emissions, and 0.6%-1.6% of total annual greenhouse gas emissions.[23] Sequestration diminishes over time and it is unlikely that grazing livestock can fully offset emissions in this way unless kept at very low stocking densities, as overgrazing may lead to soil degradation, erosion and compaction, which significantly diminish the ability of grasslands to store carbon.[24]

Keeping land as pasture for grazing can also have other benefits, for wildlife, for landscape value and for animal welfare – see **principle 2** and **3** below. It is also worth bearing in mind that other patterns of land use change, such as afforestation or rewilding, might be more effective as a carbon sequestration strategy though at the expense of food production.

For these reasons, we consider that choosing 'better' includes meat and dairy from pasture-based production systems, but only when they are eaten as part of lower meat diet overall. Simply switching to grass-fed from intensive systems, at the same level of consumption, would be catastrophic for land-use change and deforestation and is likely to lead to higher greenhouse gas emissions.

Our approach

Despite differences between the type of livestock product and the specifics of the production system, all meat production has a high impact in terms of greenhouse gas emissions. Hence from the perspective of tackling climate change we need to eat less of all types of meat. And while we promote eating 'better' meat and dairy for that which is still eaten, this only makes sense in the context of consuming considerably less.

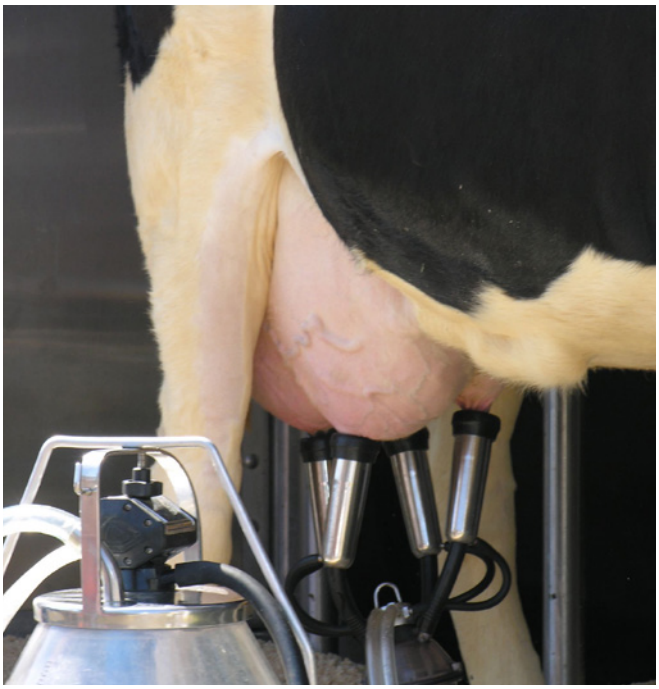
This means:

- Eating less meat, of all types
- Eating less cheese, and moderating milk consumption
- Shifting the balance of the diet towards more plant-based foods, including plant based sources of protein such as beans and pulses.
- Minimising food waste

2. Choose better for animals

What's the problem?

The drive to produce meat and milk cheaply while maintaining profitability for livestock farms requires extracting more value from the farm space and animals that are reared. This has led to adaptations in intensive farming systems to obtain higher meat and dairy yields at lower running costs. This intensification of meat and dairy production is achieved through very specific breeding, housing and husbandry practices that can severely restrict animal behaviour and compromise animal health and welfare. Animals raised in intensive systems are usually exceptionally fast growing, have larger litter sizes, produce significantly more muscle (meat) or milk and have access to minimal amounts of space.



Our approach

Choosing better meat and dairy products means prioritising systems that ensure high standards of welfare for livestock. This means that livestock live in well managed extensive conditions that enable natural behaviour, support good health, including enjoying a natural diet, and that they are bred and kept in conditions that support their resilience. Unless we have direct experience of conditions on a particular farm, the simplest way of doing this is choosing products with a credible animal welfare certification, such as organic, RSPCA Assured, or Pasture For Life.

Farm animal welfare concerns from intensive production

Chickens: Modern commercial chickens raised for their meat (broilers) reach a slaughter weight of 2-2.5kg in 5-6 weeks compared with 12 weeks, 30 years ago.[25] Breeds with such fast growth suffer from high levels of cardiovascular problems, responsible for a major portion of flock mortality;[26] lameness, which affects the vast majority of broilers;[27] and high levels of hunger and stress.[28] These problems are agravated by behaviour restriction resulting from overcrowding, as typical stocking densities are between 16 and 19 birds/m^2 at slaughter weight.

Pigs: Cardiovascular problems and leg problems are widespread in pigs as a result of breeding for faster growth.[29] Pigs are also bred for increased litter size, which often leads to lower piglet birth weight and higher piglet mortality.[30] Competition for access to teats is increased in larger litters[31] leading to a greater risk of injuries to the piglets and to the sow's teats. Piglets are often subjected to tooth clipping to reduce the risk of injuries which causes acute pain and distress.[32]

Most piglets in the EU are also routinely tail-docked in an attempt to address abnormal behaviour (tail biting) caused by lack of appropriate substrate to explore and sufficient space. Most breeding sows in the EU are confined in crates during farrowing and lactation and many also spend up to four weeks confined in a stall during early gestation, causing suffering. Since 2003, routine tail docking and tooth clipping are prohibited for pigs in the EU, but despite this, these procedures continue to be performed routinely in most EU countries including the UK, for example 70% of British pigs are still tail docked.[33]

Beef Cattle: Beef cattle are bred for fast growth, efficient feed conversion and large meat yield. This has resulted in a greater incidence of leg disorders and calving problems. Some breeds have a 'double muscling' gene which causes them to have oversized muscles, their calves often have to be delivered by Caesarean section. These animals are also more susceptible to stress.[34]

Cattle are naturally adapted for a high-fibre, low-energy, forage-based diet. Intensive systems often use low-fibre, high-energy, grain-based diets, in order to promote rapid weight gain during the finishing period, which can lead to a range of production diseases, lameness[35] and development of abnormal oral behaviours, possibly exacerbated by restrictive environments, such as tongue-rolling, object-licking, chain-chewing or bar-biting.[36] Housing of cattle on slatted floors increases the risk of injuries, particularly to the feet, joints and tail.[37]

Dairy cows: Milk production per cow has more than doubled in the past 40 years due to selective breeding. This increase in yield has been accompanied by declining ability to reproduce, increasing incidence of health problems such as lamenes and metabolic disorders, and declining longevity in modern dairy cows.[38] Studies across Europe indicate that typically between 20% and 40% of dairy cows are suffering from lameness at any one time.[39, 40, 41, 42, 43]

The level of milk production of specialised modern dairy cows, particularly the Holstein breed, is significantly higher than what can be sustained on a diet of pasture alone. The feeding of high levels of concentrate feed in an attempt to support higher milk yields leads to digestive problems and associated health and welfare issues.[44] Maximising milk yield is a driving force behind the trend towards taking cows off pasture in favour of permanent indoor housing, even though there are a large number of studies showing that cows kept on pasture are healthier.[45]

Sheep: Sheep have been less affected than most species by the intensification of livestock production and most still have access to pasture or range. Sheep reared for meat are nevertheless bred for efficient feed conversion, increased muscularity and increased litter size. Mortality is higher in lambs born from litters rather than single births, especially for triplets and higher multiples.[46]

Problems with aggression are more likely with housed sheep, particularly when they are densely stocked and when mixed with unfamiliar individuals, have reduced feeding time and a lack of space for exercise

3. Choose better for nature

What's the problem?

Agriculture is the principal source (83%) of ammonia, a major cause of poor air quality, with most emissions coming from indoor livestock production and nitrogen fertilizer.[47] Additionally, agriculture is also responsible for 16% of water pollution, with dairy production being the biggest contributor by a significant margin.[48]

Agricultural intensification, particularly from arable farming, is the leading cause of harm to UK farmland wildlife.[49] In relation to livestock production, abandonment of mixed farming systems, intensification of grazing regimes, increased use of fertilisers and loss of hedgerows have all had significant damaging impacts on farmland wildlife.

In some areas, extensive and well-managed livestock production is an important conservation tool in managing semi-natural habitats such as plant and wildlife-rich meadows and pastures, often referred to as high nature value (HNV) farming. For example, extensive beef production, when managed sympathetically with the environment at low stocking densities, can have a positive environmental impact for biodiversity and landscape. Sheep grazing is a key management tool for the maintenance of many sensitive habitats in upland and hill areas of the UK,[50] though overgrazing can be a problem.

Not all grassland is biodiversity-rich. Intensively managed grasslands that are stimulated by fertiliser application to support higher livestock stocking densities are used in many pasture operations, and they tend to have very little biodiversity value. Moreover, some grasslands are temporary and may be periodically ploughed, releasing carbon when the land is turned to crop production.

The UK intensive livestock industry is heavily reliant on imported feed, mostly cereals and oilseeds, particularly soya, as a source of protein. An estimated 97% of the world's soymeal is fed to livestock, mainly to chickens and pigs. The expanding global need for animal feed is a major cause of deforestation, in particular in South America and South East Asia. This leads to a loss of high value habitats in addition to being one of the major drivers of global climate change.[51] Similarly, pressure to convert natural grasslands to animal feed production can also have a very serious impact on biodiversity. A case in point is the conversion of large parts of the Brazilian Cerrado into agricultural land for soya feed production, which currently presents a major threat.[52]

Our approach

Significantly reducing demand for meat and dairy products, alongside an emphasis on choosing better, could allow for more nature-friendly extensive systems with appropriately low stocking densities. This could be expected to ease the pressure on landscapes and minimise impacts on the environment and nature.

Choosing livestock products that have a diet based around local food sources and home-grown feedstuffs, using for example European native legumes such as beans, peas or lucern, can help reduce our reliance on unsustainable soy. Some certifications, such as Soil Association Certified Organic, require feedstuffs to be produced locally whenever possible. The Pasture for Life certification promotes the benefits of diverse grasslands, prohibits the feeding of soy and only permits cereal feeding in the case of multiple birth bearing ewes.

4. Choose better for feeding the world fairly

What's the problem?

Food production puts an enormous strain on both agricultural and wild land. During the last decade, demand for food has led to global expansion of farmland at a rate of about 10m hectares per year.[53] One-third of the calories produced worldwide, and half of all plant protein, including around 40% of all the cereals and legume grains produced every year is fed to animals.[54] This requires a vast amount of land: nearly one-third of the world's 14 billion hectares of cultivated land is used to grow animal feed.[55]

Feeding animals large quantities of grain and protein crops that could be eaten by humans has implications for food security too. Plant-based feed is converted into animal food products, but a significant amount of the nutrients and calories contained in the feed is lost in the process, resulting in lower net food production. The most efficient use for human-edible crops would be to serve directly as human food, which would allow finite food production to go significantly further: it has been calculated that halving world consumption of grain-fed meat could free up enough food to feed 2 billion more people.[56]

Ruminants such as cows and sheep are particularly inefficient at turning feed into human-edible calories and protein, their feed conversion rates are much lower than that of other livestock.[57] This makes feeding grains to ruminants an especially wasteful means of providing human food.

Our approach

In the context of finite planetary resources and population growth, a better food system could reasonably be expected to prioritise producing the kinds of foods that allow people to live healthier lives and preserve our natural resources. Healthy human diets show a lot of variability, yet shifting diets away from meat and dairy overconsumption would provide health benefits for high consuming individuals and countries, and ensure resources are used more efficiently.

Livestock can make a net contribution to human food supply where they are kept in foraging/scavenging systems or fed on crop by-products and food waste/surplus. Ruminants could be kept on grasslands where this brings additional benefits. This is what is known as a 'livestock on leftovers' approach (see 7. Choosing better for minimizing waste).

5. Choose better for health

What's the problem?

In the UK, and increasingly in rich and poor nations around the world, Western-style diet patterns, high in refined carbohydrates, added sugars, fats, and animal-based foods, are the norm. Such diets do not provide the right balance of nutrients, and they are major contributors to ill health.

Meat and dairy are seen as important sources of protein and can provide valuable nutrients. While a diverse plant-based diet can provide all the protein needed, concern that vegetarians and vegans will not get sufficient protein is a common belief. In fact, nearly half the protein in European diets already comes from vegetal sources.[58] and in the UK average intakes of protein amply exceed nutritional requirements,[59] defined by World Health Organization (WHO) for a healthy adult at 0.66g/per kg of body weight per day.[60]

Certain groups, such as the elderly, pregnant and breastfeeding women do require a little more protein,[61] but in the UK this limit is typically well below actual levels of consumption. Despite popular perception and marketing focussed on the benefits of protein, eating more protein than required is not necessarily healthier, unless an individual is malnourished or undernourished. Excessive protein consumption is linked to some health problems, including kidney stones and the deterioration of kidney function in patients with renal disease.[62] High levels of meat consumption may also displace fruits and vegetables, thus increasing the diet-related burden of disease.[63]

Diets rich in red meat (beef, lamb, pork) and, in particular, processed meats (processed by any means other than heat) have been linked to higher incidence of a range of non-communicable diseases including coronary heart disease, stroke, type II diabetes and cancers.[64,65,66] The WHO's International Agency for Research on Cancer (IARC) has classified processed meat as carcinogenic and red meat as probably carcinogenic.[67] IARC estimated that about 34,000 cancer deaths per year worldwide can be attributed to diets high in processed meat.

Population cohort studies consistently find vegetarians and vegans live longer, have lower risk of mortality, in particular from heart disease and cancer, and tend to have later onsets of age related disability. However, it is important to bear in mind that people who choose plant-rich or plant-based diets tend to live healthier lifestyles in other respects, which could influence overall study results.[68]

A growing body of public health guidance reflects moderating meat consumption for nutrition and sustainability, with a particular focus on reducing processed meat consumption.[69] Increasingly official dietary guidelines, including the UK's Eatwell Guide,[70] Swedish,[71] Dutch,[72] and German[73] guidance, recommend moderating meat intakes.

The World Cancer Research Fund recommends an upper limit of 500g red meat per week, with the optimum for public health outcomes set at 300g/week, and avoiding processed meats.[74] In the UK 6 out of 10 men and 1 in 4 women have been found to consume levels higher than the UK Department of Health 70g/day recommended maximum for red and processed meat.[75]

Production systems and nutrition

Meat and dairy can provide valuable nutrients and a growing body of research[76] has focused on discerning how the type of production system the animal is reared in affects the nutritional profile of animal products. There is some evidence that the meat and milk of animals fed a diet natural to their species contains higher levels of beneficial nutrients, particularly in relation to fats.

For example, pasture-reared lamb and beef have been found to have higher levels of healthier long chain omega-3 polyunsaturated fatty acids compared with cereal-fed intensively produced animals. Additionally, outdoor reared animals tend to have lower levels of fat overall due to higher levels of activity. Higher levels of conjugated linoleic acids (CLA), are found in milk from pasture-fed cattle.[77] [78] There is some suggestions that CLAs may play a role in the prevention of cancers[79] [80] and may have other beneficial effects, including potential roles in reducing adipose (fat tissue) mass, delaying the onset of type II diabetes[81] and inhibiting atherosclerosis (hardening of the arteries).[82]

For chicken, both the rearing system and the breed have an effect on overall fat content. Meat from organic and free-range animals is usually less fatty, containing up to 50% less fat than meat from intensively-reared, faster growing chickens, as well as having higher levels of omega-3 and iron.

There is evidence that organic milk and meat has a beneficial nutrient profile including around 50% higher levels of beneficial omega-3 fatty acids and slightly lower concentrations of saturated fats than conventional products. The difference is thought to be closely linked to outdoor grazing, a rich clover/grass diet and low concentrate feeding which are characteristic of organic production.[83] [84] Omega-3s are linked to reductions in cardiovascular disease, improved neurological development and function, and better immune function. While some evidence exists, further research is needed to establish the comparative impact that these differences may have on human health.

Our approach

Meat and dairy can provide valuable nutrients, though for many people consumption is higher than recommended for health. Reducing consumption, while shifting towards more plant-based diets would have health benefits for the majority of the population. In particular health guidance recommends minimising the consumption of processed meats and keeping red meat (beef, lamb and pork) to less than 70g/day. Choosing meat and dairy products from animals that have a varied natural diet can help towards making our overall diet more nutritious.

6. Choose better for responsible antibiotic use

What's the problem?

The threat of growing antibiotic resistance and the risk it poses to human health has been described as a ticking time bomb of potentially apocalyptic proportions.[85] It is increasingly becoming a major problem for treating many serious infections, and threatens to have unforeseen impacts on a wide range of medical procedures.[86]

Overuse of antibiotics in farm animals is a key driver of antibiotic resistance. Globally, livestock farming, in particular intensive pig and poultry production, is a major user of antibiotics with their use in food-producing animals higher than for humans. In the EU, for example, 65-75% of all antibiotics used are consumed by animals.[87] Farm antibiotic use has been found to be associated with the development of resistant human infections involving Salmonella, Campylobacter, and to a lesser degree E.coli and enterococci.[88]

Last resort antibiotics such as colistin, used in hospitals to treat multidrug-resistant infections, are widely used on farm animals around the world, potentially compromising their effectiveness. To help preserve the effectiveness of antibiotics important to human medicine, the WHO recommends drastically reducing the use of antibiotics in food-producing animals, including placing severe restrictions on the use of all critically important antibiotics and phasing out all routine use in healthy animals.[89]

Giving animals regular low doses of antibiotics is a common practice in intensive farming systems. Regular antibiotic use promotes growth, although using antibiotics specifically as growth promoters in the EU has been illegal since 2006. However, antibiotics can be used as prophylaxis (to prevent disease) where there is confinement, overcrowding, high animal densities, lack of cleanliness and other stressors, or to treat illnesses arising from inadequate environmental conditions as described in the animal welfare section. Improving animal welfare by addressing the conditions that increase the risk of illness in farm animals, such as providing more space and enriched environments or using slower growing breeds, can lead to higher production costs.

Antibiotics in this situation are used as a way to achieve greater efficiencies, in such a way that such intensive systems can be considered to be unsustainable in the absence of antibiotics.[90] Various recent studies have shown that average antibiotic use is much lower in higher welfare and extensive farming systems, such as certified free range and organic.[91] Organic production differs from conventional production in many respects, several of which are very likely to have an impact on antibiotic use.[92] This could include stocking densities, genetics, growth rates, opportunities to express natural behaviours and access to outdoors. It is well understood that high levels of stress can compromise an animal's immune system, meaning low-stress environments are more conducive to low antibiotic use.

Our approach

Choosing better means taking care to choose products that require minimal antibiotic use in their production. In practice, this means avoiding products produced intensively.

Livestock that are raised with higher standards of animal welfare have been found to be more resilient to illness and require significantly lower amounts of antibiotics in their production. Therefore, selecting products with a credible high welfare standard, such as organic or RSPCA assured, is a good strategy to choose better.

7. Choose better for cutting waste

What's the problem?

According to WRAP, in the home, we waste 10% of edible red meat, 14% of poultry, bacon and ham and 15% of meat products. That's around 570,000 tonnes of fresh meat each year, of which 46% is avoidable with a value of about £1,300M. These wasted products also include embedded water, carbon and other resources used in their production.[93]

WRAP has also researched the extent to which meat products are wasted or lost in the UK's food supply chain to develop more resource efficient strategies within the fresh meat sector.

One aspect is the demand for particular cuts of meat at different times means that maximising the balance of a carcass is a challenge for producers. Encouraging more 'nose to tail' eating, provides opportunities to maximize carcass usage, although there are challenges in engaging UK eaters who often squeamish about offal and are used to eating familiar cuts of meat and a significant proportion of meat in pre-packaged and processed forms. Export markets have developed for parts of animals less favoured in the UK, which reduces the amount wasted at a pre-consumer stage though may add to its carbon footprint.

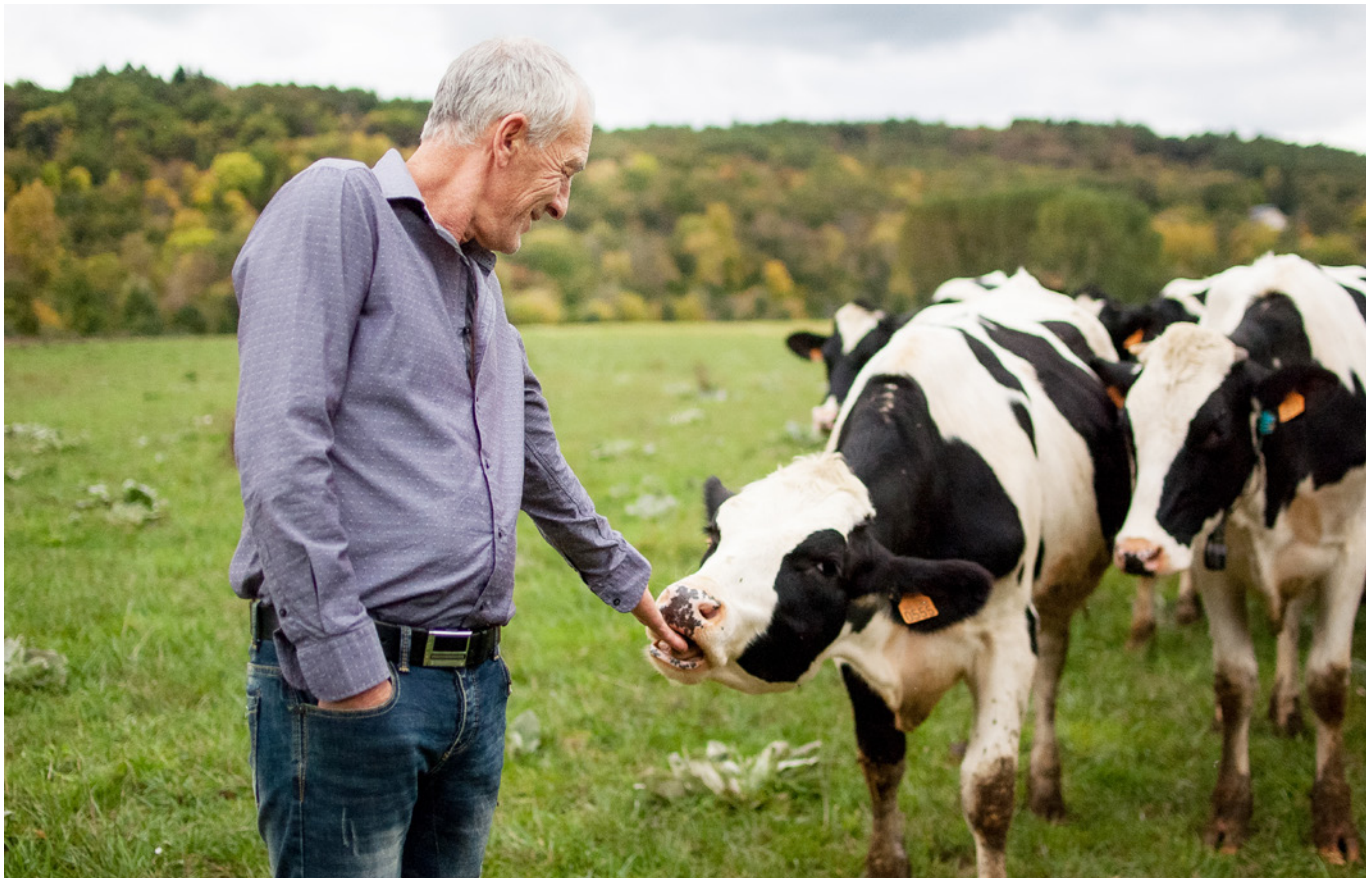
We also 'waste' huge amounts of resources feeding grain and protein crops to animals rather than to people. A feeding 'livestock on leftovers' approach has been gaining traction among researchers.[94] This could see:

- Arable land primarily used for the production of plant-based food for humans.
- Livestock should be fed biomass not suitable for or wanted by humans. For example, more food waste that has been processed for safety could also be used for animal feed for pigs and poultry.[95]
- Grasslands should be used for livestock production if grazing can be justified by reasons other than meat and milk production, e.g. biodiversity conservation, providing a livelihood for vulnerable populations etc.

Additionally, combining the production of meat and milk through greater use of dual-purpose cattle breeds, which are suited to both dairy and beef production as opposed to specialist breeds used in intensive systems, would be particularly efficient in achieving lower GHG emissions per unit of product.[96] A key challenge to this is that current trends of dairy cow breeding lean towards greater specialisation, with the aim to maximise milk yields. The calves of such pure dairy-bred cattle are not always seen as suitable for beef production. Dual-purpose breeds yield less milk but produce calves that can finish as beef animals.

Our approach

Minimising waste is a key goal for reducing environmental impacts with opportunities along the food chain to value meat as a precious resource, making the most of each carcass and reducing the amount of edible food that ends up in pet food, incinerated or in household rubbish. We encourage people to buy appropriate amounts of meat (a butcher will provide this service compared to pre-packed meat in supermarkets) as well as make the most of the meat that they do purchase, including trying more unusual cuts of meat.



8. Choose better for livelihoods

Eating Better encourages a culture where we place greater value on the food we eat, the animals that provide it and the people who produce it. The ability of farmers and producers along the supply chain to make a viable economic return is a key element of creating a food system that can support better meat consumption. Profitability for smaller livestock farmers is already challenging, from consolidation of large farm businesses, access to markets, unfair trading, lack of firm government intervention on localised procurement as well as retailer power. Smaller artisan producers may also be unable to afford the time or costs of registering within higher standard labelling schemes, even though their practices may exceed the standards required to be labelled in such a way.

Some fear that producing to higher standards will make farmers uncompetitive. But evidence suggests that environmental and animal welfare standards related to livestock production have only a small impact on the competitiveness of meat and dairy products. These costs are a very small proportion of overall production costs, whereas differences in the costs of feed, land and labour are much more significant.[97]

Our approach

Eating Better recommends choosing meat and dairy from smaller scale, higher standard production systems that provide better profits for higher quality producers. Choosing meat and dairy with a known provenance can reconnect producers and their customers such as through farm shops, box schemes, farmers markets and independent butchers. This can help people to value meat through this deeper connection between the person eating the meat, the animal that provided it and the farmer that reared it.

Eating Better also wants to see a realignment of farm subsidies post-Brexit so that public money supports the provision of public goods on farms such as wildlife, farm animal welfare, environmental and landscape benefits, including building healthy soils, enhanced biodiversity, flood alleviation and climate change mitigation. Maintaining and strengthening high standards for environmental protection, food safety, livestock antibiotic use and farm animal welfare in international trade negotiations are necessary so as not to undermine UK farming livelihoods. Additionally, imports must be required to meet UK standards in these areas.

Short of getting to know the particular circumstances of individual farms, and purchasing direct from producers, at farm shops and farmers markets, assurance schemes and labels are often the only way of identifying 'better' meat and dairy products. Overleaf we provide information on labels and assurance schemes.

Schemes vary considerably in their scope, status and standards. Organic standards, for example, are enshrined with EU Organic Regulation, apply to all EU organic production as well as imports, and cover the whole life of an animal.

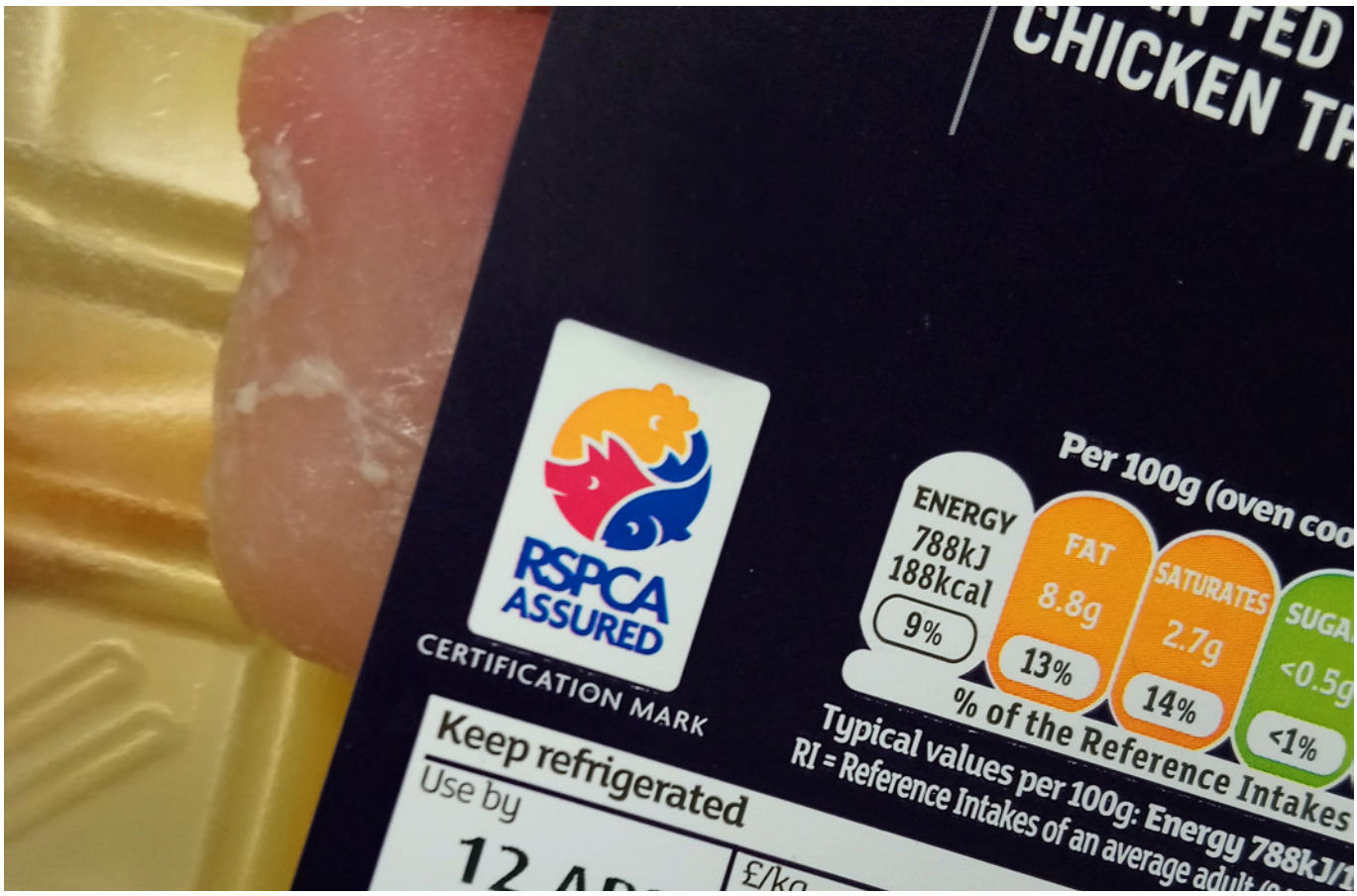
Other terms described on labels are less stringent and may only apply to the way an animal is farmed just for part of its life. For example, a beef product marketed as 'grass-fed' may have come from cattle reared on grass/forage for anything between 51% to 100% of its life, and poultry meat marketed as 'free-range' may have come from birds reared indoors for the first half of their lives and provided with free-range access during the latter half of their lives.

Pork products marketed as 'outdoor-bred' may have come from a pig that spent the first few weeks until weaning in an outdoor system and was then reared indoors for the remainder of its life. The description 'free range' is a broad term and different schemes have different standards.

Currently, there is no label that delivers neatly across all our better meat and dairy principles, although organic comes closest. Here we provide a guide to a range a 'better' meat and dairy labels.

We have not included baseline quality assurance schemes such as Red Tractor. While Red Tractor provides assurance on traceability and meeting UK standards, these standards generally reflect minimum legal standards rather than offering higher animal welfare or environmental standards.

Compassion in World Farming provides detailed comparisons of various welfare schemes for broiler chickens, laying hens, sows and meat pigs and dairy cows and calves) identifying where these comply with Compassion's criteria for higher animal welfare. See here: **https://www.compassioninfoodbusiness.com/our-news/2017/06/how-does-compassions-welfare-criteria-compare-to-other-welfare-schemes**



Label	Look out for	Key benefits
Organic including Soil Association Organic standard		**Better animal welfare** **Lower stocking densities** **Antibiotic use restrictions** **More natural feed** **Biodiversity friendly farming** Organic standards are strict and defined in EU law, shown by a green leaf logo on pack, and offer significant benefits in terms of animal welfare, environmental and wildlife protection. There are a number of different schemes. **Soil Association Organic certification** goes beyond the legal EU requirements to offer higher (stricter) standards in key areas. Welfare benefits amply exceed standard industry practice, including prohibiting confinement systems, ensuring bedding and/or environmental enrichment, limits on stocking densities, ensuring free-range access with shade and shelter, specifying stunning and slaughter practices and monitoring welfare through outcome measures. The policy of acceptable use of antibiotics is stringent and prophylactic use is not allowed. Restrictions are also placed on the type and origin of any feedstuffs provided, prioritizing natural diets of local provenance, 100% organic.
Free range	"Free range" stated on packaging	**Some better animal welfare** **Lower antibiotic use** 'Free-range' is a broad term and different schemes have different standards. Free range animals generally have access to the outdoors, tend to enjoy more space and often have a more stimulating environment. Individual labelling schemes reflect a variety of legal standards which differ according to type of livestock and region. For example, in the UK legal requirements for free-range eggs ensure a minimum amount of space and litter for the hens well above standard industry practice. Broiler chickens come from slower growing breeds and birds must reach 56 days old before they are slaughtered, they must have a defined amount of space and have continuous daytime access to open-air runs, with vegetation, for at least half their lifetime. However practices such as beak trimming is still commonplace, and stocking densities and other factors can mean that in practice many birds are unable to access outdoor space even if available. For maximum benefit, look for free-range products that also have a higher-welfare label.
		Better animal welfare **More natural feed** Unlike hens, there are no specific EU laws governing free-range dairy farming. In the UK the **Pasture Promise** label certifies that dairy cows have been grazed outside for a guaranteed minimum of 6 months (180 days) a year. During the winter months, when cows may be housed indoors, certified farmers are still required to maintain a high level of grass in the diet, in the form of conserved silage or hay.

Label	Look out for	Key benefits
Pasture for life		**Better animal welfare** **More natural feed** **Lower stocking densities** **Biodiversity friendly farming** The Pasture for Life mark certifies that Pasture for Life meat and dairy comes from animals raised only on grass and pasture, and not fed any form of grain or manufactured feeds, from birth and until the point of processing. Production standards are based upon the animal's natural diet, and include guidance on the management of natural and semi-natural grasslands and traditional hay meadows, as well as important advice on aspects such as the timing of farming operations to ensure minimal disturbance to nesting birds. Certified Farms must also be able to demonstrate high standards of animal welfare. The QR traceability code provided means that the meat can be traced back to the individual animal or batch of animals, showing its life through from the farm it was born on to the abattoir it was killed in.
RSPCA Assured		**Better animal welfare** The RSPCA Assured certification covers both indoor and outdoor rearing systems and ensures that greater space, bedding and enrichment materials are provided. In addition, on-farm health and welfare monitoring is required and stunning and slaughter processes are specified. The standards offer a number of welfare benefits relative to standard industry practice though are not as stringent as those required for organic production.
Quality based and traditional production labelling, including geographical origin schemes (PDO, PGI)	PDO PGI	Quality-based and traditional production labelling links production to specific methodologies. All PDO (Protected Designation of Origin) and PGI (Protected Geographical Indication) products are associated to particular local landscapes and must adhere to a precise set of specifications. In some cases, particular livestock breeds, diets or farming methods are specified. These traditional systems can have benefits for the environment, food security, or other principles of 'better' production, but such benefits are usually a consequence of production and management practices specific to each label rather than an explicit aim of the certification. Each label has unique characteristics, so choose with care - not all PDO or PGI labels correspond to better production.
Jabugo Ham		**More natural feed** **Low stocking densities** **Biodiversity friendly farming** Jabugo certified Iberico hams must come from purebred black Iberian pigs pastured within the Natural Park of the Sierra de Aracena and Picos de Aroche, in Spain. Production is extensive, the pigs are free-range and raised wholly in the Dehesa, an ecosystem of open Mediterranean Oak woodlands and prairie-like grazing land which produce sweet acorns, the pigs' main food. From an animal welfare perspective, pigs can be spayed and castrated without anaesthesia so can't be fully considered higher welfare.

Conclusions

The purpose of this report has been to provide greater clarity and practical guidance on Eating Better's less and better messaging. We provide answers to commonly asked questions and offer a set of eight principles to help navigate the complexities involved, together with a guide to labels for choosing better. We welcome feedback.

We recognise that shifting our healthy and sustainable eating patterns requires action from a wide range of stakeholders including policy makers, food industry, educators, from our own civil society networks and from the public.

Eating Better has already begun to explore what a post-Brexit food and farming policy that supports better UK meat and dairy production might look like. **Beyond the CAP: Policies to support better UK meat and dairy production post-Brexit**, sets out 10 recommendations for livestock's role in a sustainable food and farming system.

Eating Better also works to engage food businesses in the task of helping their customers make less and better meat and dairy and more plant-based eating choices. Our research: **The Future of Eating is Flexitarian** showcases over 20 companies that are leading the way.

Understanding how to engage the public in shifting their attitudes and food behaviours towards those that are healthier and sustainable is garnering increasing attention. Eating Better's report: **Let's Talk about Meat** identifies a number of potential approaches to motivating behaviour change.

We will continue to build on this work to develop our research, messaging and practical resources.

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Eating Better

for a fair green healthy future

Eating Better is an alliance of over 50 civil society organisations working to build consensus and develop collaborative practical approaches to engage policy makers, food businesses and civil society to catalyse shifts towards healthy and sustainable eating patterns. Eating Better encourages a culture where we place greater value on the food we eat, the animals that provide it and the people who produce it. Eating Better supports farmers who produce meat in a sustainable way.

Moderating our meat consumption – whether red, white or processed meats – while also choosing 'better' meat that is naturally fed, has a known provenance and is produced to high animal welfare, environmental and quality standards can help support farmers without being more expensive for consumers. A 'less but better' approach to meat with meals based around a greater variety of plant-based foods will ensure healthy, balanced diets that are better for the planet and for fairer food systems too.

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