

## Rethinking Ruminants

*A directory of evidence-based facts to tell the true story of British livestock production*

### **Foreword by Michael Oakes, NFU Dairy Board Chairman:**

The British livestock industry has a fabulous story to tell but we need to work harder than ever to get that story heard.

We have put together this document to help farmers and industry advocates promote the benefits of British livestock farming and counter some of the common misconceptions and criticisms which seem to be increasingly aimed at our industry. The NFU are doing a huge amount of work to spread these messages. We have a press office dealing with media queries 365 days a year. Our NFU education programme is delivering lessons in schools about British farming. We produce a huge amount of public facing resources to spread the word at events and shows, and we work with partner organisations to do large scale promotional campaigns. We also deliver positive messages through our NFU Countryside magazine and have a large social media presence.

However, by far our most valuable and effective advocates are our members. Everyone involved in the farming industry can play their part. Everyone has a sphere of influence, which when combined can amount to huge numbers of people, whether it is a school that your children attend, your local parish council, hosting farm visits or even just down the local pub.

We can all do our bit to help spread the word, and I hope this document helps you do that.

### **Foreword by Richard Findlay, NFU Livestock Board Chairman:**

As a UK livestock farmer not only am I producing a delicious and nutritious product that helps feed our country but I am also a custodian and protector of our beautiful British landscape. Over the last 5 years that message has got lost in a barrage of negative media reports often resulting in fiction being portrayed as fact. We need to seize the opportunity to tell our story based on facts and science. As NFU members we are leading the way as climate friendly farmers by having our aspiration to be Net Zero by 2040. Not only is it important for the staff at NFU to be able to lobby on our behalf to help improve our sector, but as members we need the tools to be able to promote British Farming at any opportunity. This document arms members with the facts and figures to help people understand they can stay green whilst still eating red meat.



## The voice of British farming

Although every effort has been made to ensure accuracy, neither the NFU nor the author can accept liability for errors and or omissions. © NFU Food and Farming/NFU Briefing/Feb20



NFU supported by



## Contents

<b>Introduction</b> .....	<b>4</b>
<b>Environment &amp; Climate change</b> .....	<b>5</b>
Key messages .....	5
What is the Carbon Footprint of British Livestock? .....	5
Dairy.....	5
Sheep.....	6
Beef.....	6
Carbon emissions: British farming versus the rest of the world.....	6
Contextualising and comparing the livestock Carbon Footprint .....	7
Linking the environmental footprint of foods to their nutrient density .....	8
Common misconceptions and frequently asked questions .....	10
Does methane from ruminants cause global warming?.....	10
Does cutting out meat/dairy from my diet reduce my carbon footprint?.....	11
Do I need to reduce my meat intake? .....	11
Do ruminants cause water and air pollution? .....	11
How much water does livestock and dairy use?.....	13
Do livestock eat crops which could feed humans or could we plant crops on grassland? .....	14
Are British livestock fed soya and does this drive deforestation? .....	15
Carbon sequestration and the importance of grasslands –how can livestock provide solutions for or mitigate climate change? .....	15
It’s not just about storing carbon in soils! .....	16
What is the role of ruminants in habitat management? .....	16
What are the wider contributions of livestock? .....	17
<b>Health &amp; Nutrition</b> .....	<b>19</b>
Key messages .....	19
Common misconceptions and frequently asked questions .....	20
Does dairy make you fat? .....	20
Does cutting dairy from my diet improve my health?.....	20
Meat and dairy as a nutritionally complete food source.....	21
Is eating a high red meat diet linked to dietary related death? .....	21
The benefits of consuming dairy and meat products .....	22
Bone health .....	22
Dairy as a protein source.....	22
Red meat and dairy consumption can reduce cancer risks .....	22
Dairy as an important source of iodine.....	23

The benefits of red meat for young women.....	23
Meat as a source of protein .....	23
Will red meat make me fat? .....	23
Meat and salt.....	23
<b>Animal Health &amp; Welfare .....</b>	<b>24</b>
Key messages .....	24
British livestock welfare: world leading .....	24
Why are Red Tractor Standards important?.....	25
Common misconceptions and frequently asked questions – health.....	25
Is British meat antibiotic-free?.....	25
Are UK livestock given growth hormones?.....	26
Common misconceptions and frequently asked questions - welfare.....	26
Are all dairy bull calves shot at birth?.....	26
Why are calves separated from their mothers on dairy farms? .....	26
Why are some cows kept indoors? .....	27
How are calves housed on dairy farms? .....	27
Why do farmers shear sheep?.....	28
Why are dairy cows artificially inseminated?.....	28
What happens to livestock during transport? .....	28
How are animal treated at abattoirs? .....	29
<b>The Alternatives.....</b>	<b>29</b>
What are the areas that consumers need to watch out for?.....	29
Bioavailability and fortification.....	29
Salt in meat substitutes.....	29
Heavily processed ingredient lists.....	30
Lab grown meat.....	30
Some common claims and misconceptions.....	30
‘Ditch milk and lower your carbon footprint’.....	30
‘Dairy milk uses more water than almond milk’ .....	31
‘Choosing a vegan diet means that animals are not killed’.....	31
<b>Top Tips .....</b>	<b>32</b>
How to engage with the public and decision makers about livestock farming .....	32
Using social media positively .....	32
Want to try your hand at using a carbon calculator on your farm? .....	33
Personalise your approach.....	34

## Introduction

This document provides a set of key facts, figures and arguments helping farmers and advocates make the case to positively promote the British livestock sector. All of the statistics and claims are based on evidence and sources are supplied to ensure transparency and enable further exploration of complex topics.

The first section of this document gives an overview of some of the key facts and figures about the livestock and dairy sectors in the UK.

### Dairy<sup>1</sup>:

- The average herd size in England is 151 cows<sup>2</sup>
- UK dairy farmers produce a total of 14 billion litres of milk a year
- 98% of the public consume dairy products
- The dairy industry in the UK provides jobs for 80,000 people

### Sheep<sup>3</sup>:

- There are over 15 million sheep in the UK
- In England there are 34,000 people employed on sheep farms and other 111,405 in allied industries, contributing £291.4m to employment.
- The UK produced just under 300,000 tonnes of lamb last year, of which over one-third was exported around the world
- The average person in the UK consumes 1.9kg of lamb per year.
- The sheep sector is worth around £2.5bn.

### Beef:

- The beef sector is worth around £8.7bn
- There are around 57,000 beef farms in the UK
- Total production is over 900,000 tonnes of beef
- The average person consumes around 18kgs of beef every year

### Self-sufficiency:

The UK is not self-sufficient in most livestock production, so despite our productivity within the sector, it is not enough to meet demand. We are around 85% self-sufficient in dairy production, and 75% in beef production<sup>4</sup>. The lamb sector is around 98% self-sufficient, but our seasonal production means we export our surpluses in summer and then import lamb during the winter months.

<sup>1</sup> [AHDB Cow numbers, 2018](#)

<sup>2</sup> [The UK Dairy Industry, Dairy UK 2018](#)

<sup>3</sup> [Sheep in the UK, National Sheep Association](#)

<sup>4</sup> [Beef statistics, National Beef Association](#)

## The British way:

Livestock are the foundation of our farming systems in the UK and have shaped our landscape for many generations. Our temperate climate gives perfect conditions for grass growth, due to extensive rainfall and mild winters. We also have a traditional mixed farming system which underpins all of our agricultural production in the UK. The integration of livestock with arable production means that we can utilise the manure to provide organic fertiliser for our food crops. They also play a vital role in managing soils and reducing weeds in food crops.<sup>5</sup>

## Environment & Climate change

Climate change is one of the biggest challenges the livestock industry is facing. This section addresses issues such as greenhouse gas emissions, water use, pollution, biodiversity and habitat management, to help give you the information you need.

### Key messages

- There are greenhouse gas emissions associated with every food production system and whilst all contribute to climate change, it is important to distinguish between British agriculture's effect on the environment, compared to other countries in the world.
- It is also important to acknowledge the role of British agriculture in contributing to the environment and biodiversity in Britain, as well as other benefits to the country, socially and economically.
- The total Greenhouse Gas (GHG) emissions from all UK sectors were 460 million tonnes (MT) of CO<sub>2</sub>e (Carbon Dioxide equivalent) in 2017.<sup>6</sup>
- The total emissions from British agriculture amounted to 45.6mt CO<sub>2</sub>e.
- British cattle & sheep accounted for 26.2mt CO<sub>2</sub>e.
- UK grasslands sequestered carbon which accounted for a net reduction of 9.2mt CO<sub>2</sub>e.
- If you take into account grassland sequestration, livestock account for 3.7% of UK emissions or 5.7%, if excluding grassland sequestration.

## What is the Carbon Footprint of British Livestock?

[Want to make some global comparisons? Find out more HERE](#)

### Dairy



The carbon footprint of a litre of British milk is around 1.25kg CO<sub>2</sub>e, compared to a global average of 2.9kg CO<sub>2</sub>e per litre. ([Dairy Sustainability Framework, 2017. AHDB 2014](#))

<sup>5</sup> [Countryside Online, NFU 2018](#)

<sup>6</sup> [2017 UK Greenhouse Gas emissions, Defra 2018](#)

Greenhouse gas emissions from UK milk production have fallen by 24% since 1990 and further methane emissions can be achieved through new approaches to cattle **breeding** and **feeding**.<sup>7</sup> Around 76 million UK cows would be needed to produce all of the dairy products in the world. Currently there are 287 million worldwide.<sup>8</sup>

43% of dairy farmers currently produce or use renewable energy through solar panels, wind turbines and anaerobic digestion.<sup>9</sup>

## Sheep



The carbon footprint of a kilo of lamb produced in England or Wales is around 14.6kg Co2e compared to a global average of 24kg CO2e per kilo. ([AHDB Change in the Air, 2010](#), [FAO, Tackling climate change through livestock, 2013](#))

## Beef



The average carbon footprint of a kilo of British **beef** is 17.12kg CO2e, which makes it one of the lowest in the world, compared to the global average of 46kg CO2e per kilo. ([AHDB Change in the Air 2013](#)).

British beef has a greenhouse gas footprint equivalent to 40% of the global average. This is owed to our climate and geography making this country one of the most sustainable places in the world to produce beef and lamb. In some instances, beef production in Britain is up to 4 times more efficient than other parts of the world.<sup>10</sup>

## Carbon emissions: British farming versus the rest of the world

[Compare emissions from milk production to plant-based alternatives HERE](#)

The average global emissions for an equivalent litre of **milk** is 2.4kg CO2e. In some places that figure can be as high as 7.5kg CO2e.<sup>11</sup>

Sheep production in Britain and Western Europe accounts for 9.2% of the total global greenhouse gas emissions from sheep meat. Latin America and the Caribbean account for 9.5% of the total global greenhouse gas emissions from sheep meat.<sup>12</sup> However, due to the efficiency of UK systems, we produce more than double the kilograms of protein for a similar share of emissions.

<sup>7</sup> [The Dairy Roadmap 2018](#)

<sup>8</sup> [The Dairy Roadmap 2018](#)

<sup>9</sup> [The Dairy Roadmap 2018](#)

<sup>10</sup> [Tackling climate change through livestock: a global assessment of emissions and mitigation opportunities FAO 2013](#)

<sup>11</sup> [Greenhouse Gas emissions from the dairy sector, FAO 2010](#)

<sup>12</sup> [Global Livestock Environmental Assessment Model, FAO 2019](#)



### Contextualising and comparing the livestock Carbon Footprint

GHG emissions are big numbers, which may not mean much to people. To put the emissions of livestock in context, here are some comparisons.

- Emissions from UK **aviation** account for 35MT CO<sub>2</sub>e per year. This is **30%** more than UK livestock emissions.<sup>13</sup>
- Around half the British population do not fly and 70% of the flights are taken by just 15% of the population. In contrast, meat and dairy products are found in over **98%** of British households.<sup>14</sup>
- The import of consumer goods from China to the UK were 54MT Co<sub>2</sub>E in 2016, compared to 5.5MT Co<sub>2</sub>E for the entire UK agriculture industry in the same year. Imports from China have increased by 276% since 1997.<sup>15</sup>
- When comparing direct emissions, the global output of livestock is 11.3%, compared to 19.5% from transport. The global output of emissions from the energy supply sector is nearly 3 times more than global output of livestock emissions. (29.3% compared to 11.3%).<sup>16</sup>

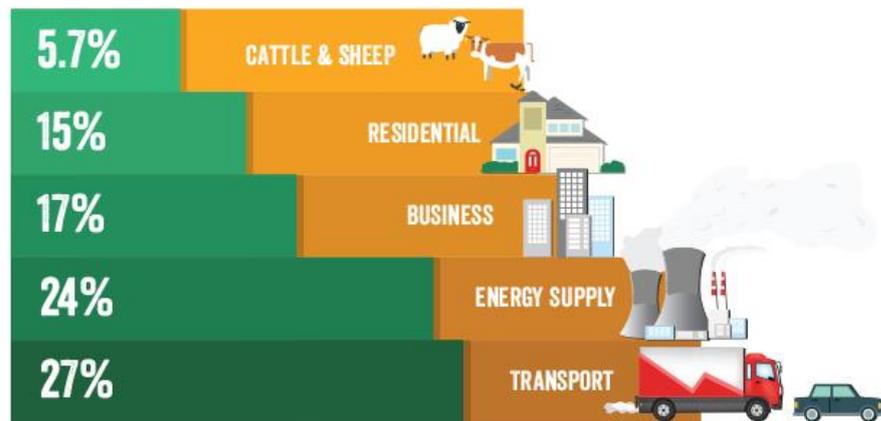
<sup>13</sup> [Responding to the carbon challenge, Airlines UK 2017](#)

<sup>14</sup> [A Free Ride, 2019](#)

<sup>15</sup> [The UK's Carbon Footprint, Defra 2016](#)

<sup>16</sup> [Sectoral greenhouse gas emissions by IPCC Sector, EEA 2016](#)

# GREENHOUSE GAS EMISSIONS IN THE UK



\*Other: 7% . Other includes, Waste Management, Public, Industrial Processes and the Land Use, Land Use Change and Forestry (LULUCF) sectors (note that LULUCF acts as a net sink of emissions).

## Linking the environmental footprint of foods to their nutrient density

[Find out more about the nutritional benefits of meat and dairy HERE](#)

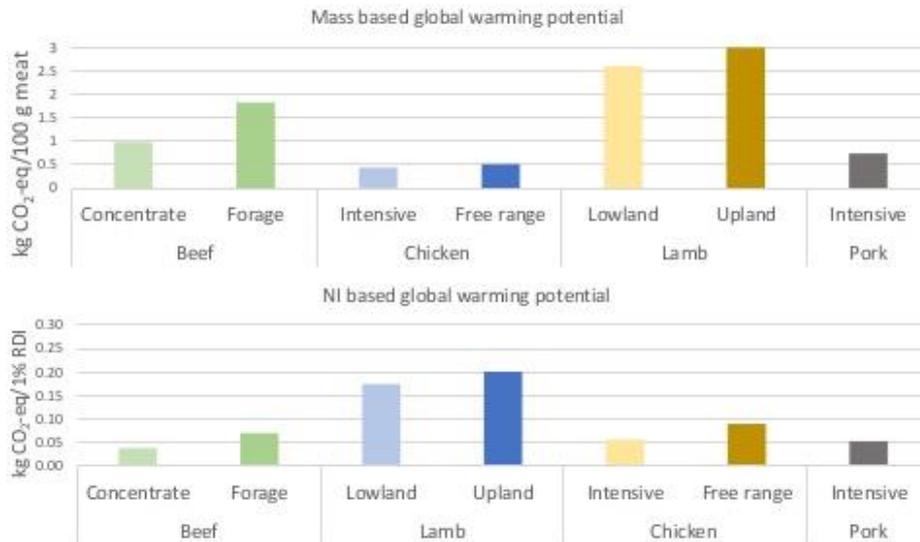
The environmental impact of foods must be linked to **nutrient density** and health. as reduced land use presents challenges in meeting the nutritional and health needs of an expanding population.

In livestock production, productivity improvements through animal breeding or grassland management can assist in this area. Whilst meat and dairy have higher GHG values per gram, they are substantially more nutrient-dense with considerably lower GHG values per 100kcal compared to grains or sweets.<sup>17</sup> Perhaps we should be asking ourselves if measuring CO<sub>2</sub>e per kg of meat is correct? Should we not be concentrating on its nutritional value? Dr Michael Lee from Rothamsted has been considering nutritional information and arable land use when calculating the GHG emissions of food. By considering the nutrient index results show beef fed on either concentrates or forage have the lowest kgCO<sub>2</sub> equivalent per 1% of recommended daily intake. When looking at arable land use per nutrient index lamb has the lowest impact.<sup>18</sup>

<sup>17</sup> [Energy and nutrient density of foods in relation to their carbon footprint, Drewnowski et al., 2014](#)

<sup>18</sup> <https://www.slideshare.net/trufflemedia/dr-michael-lee-capstone-address-sustainability-metrics-associated-with-product-quality-and-land-use>

### Mass-based GWP vs NI-based GWP



McAuliffe et al. (2018) *Food and Energy Security* *Beef performs best*

### Finally: Arable land use (ALU) per NI provision



*Lamb performs best*

Plant-based alternatives to milk are often **inferior nutritional substitutes** of milk. The protein content of plant-based alternatives only contain an average of 48% of the protein content of whole milk.<sup>19</sup>Milk is one of the **most nutritionally complete** foods available, as a source of calcium, vitamin B2, protein, vitamin B12, iodine and carbohydrates. Milk is effective at rehydrating the body.<sup>20</sup>

Milk has the highest nutrient density in relation to GHG emissions of a range of compared beverages, including soft drinks, orange juice, beer, wine, bottled carbonated water, soy drink, and oat drink.<sup>21</sup>

<sup>19</sup> [Nutrient density and nutritional value of milk and plant-based alternatives, Chalupa-Krebzdak et al., 2018](#)

<sup>20</sup> [Milk and dairy farming facts, AHDB 2019](#)

<sup>21</sup> [Nutrient density of beverages in relation to climate impact, Smedman et al., 2010](#)

## Common misconceptions and frequently asked questions

### Does methane from ruminants cause global warming?



Methane contributes to global warming. However, its significance as a GHG has been questioned by scientists. Farmers work hard to reduce their emissions through productivity and renewables. They also protect our largest carbon store, in grasslands.

**FARMERS PRODUCE  
RENEWABLE ENERGY  
THAT HELPS POWER  
AN AVERAGE OF  
10 MILLION UK  
HOMES**

NFU CYMRU NFU

According to Professor Myles Allen of Oxford University, that **methane**, unlike CO<sub>2</sub> which accumulates in the atmosphere, dissipates over a relatively short period of time. The maintenance of herd sizes means that methane emitted by cows today can offset the methane that has been previously released.

**“If we were to reduce UK agricultural methane emissions by 20% between now and 2050, that would be enough to fully compensate for the ongoing global warming impact of carbon dioxide and nitrous oxide from agriculture, even if these are reduced to zero over the same time period.”**

*Professor Myles Allen, professor of geosystem science at Oxford University<sup>22</sup>*

Measures like using natural feed additives and further improving cattle and sheep **health** will support these ambitions, while the use of sheep’s **wool** in clothing, and as an insulation material by the construction industry could boost the **bioeconomy**.<sup>23</sup>

<sup>22</sup> [Climate metrics for ruminant livestock, University of Oxford 2018](#)

<sup>23</sup> [Achieving net zero: Farming’s 2040 goal, NFU 2019](#)



The NFU's **Net Zero** goal and the drive for further production efficiencies will be integral to reducing emissions from agriculture, with an ambition for the industry to become Net Zero by 2040.

### Does cutting out meat/dairy from my diet reduce my carbon footprint?

**Every type** of food production has an environmental impact and livestock production is no different. However, it is misleading to say that by cutting out meat or dairy from your diet you will drastically reduce your carbon footprint. There are a number of activities which **make more of an impact** than eating a strict plant based diet, for example, one less flight, driving a more efficient car and switching to green energy.<sup>24</sup>

The IPCC state in their latest report, that balanced diets including animal-sourced products deriving from sustainable, low GHG systems present major opportunities for **climate change** mitigation as well as for **human health**.<sup>25</sup>

### Do I need to reduce my meat intake?

A balanced diet important and all food groups should be considered for their individual benefits. Instead of specifically reducing an intake of meat or dairy products, consumers should consider where they purchase their food. Buying high quality, sustainable British produce from high welfare producers with positive environmental credentials is a better option than cutting out meat entirely.

Our meat purchases have fallen a lot since the 1970's.<sup>26</sup>

In 1974 we were buying on average per week:

- 198g Beef
- 113g Lamb
- By 2018 that figure has dropped to:
- 99g Beef
- 36g Lamb

### Do ruminants cause water and air pollution?

Farmers follow strict rules and regulations from Government when storing and utilising organic **manure** to prevent diffuse water pollution of nitrates and ammonia into the atmosphere, as well as soil erosion.

One of the most effective mechanisms to increase soil carbon and soil organic matter is through manure application.<sup>27</sup>

<sup>24</sup> [The climate mitigation gap: education and government recommendations miss the most effective individual actions, Wynes and Nicholas 2017](#)

<sup>25</sup> [Climate change and land, IPCC 2019](#)

<sup>26</sup> [Family food datasets, Defra 2019](#)

<sup>27</sup> [Capturing Cropland and Grassland Management Impacts on Soil Carbon in the UK LULUCF Inventor, Defra 2014](#)

The **Environment Agency** penalise any farmers who are not complying with **regulations** and it can affect any payments they receive. Therefore, farmers work hard to ensure good practice on their farm. 90% of farmers maintain active **nutrient management** plans, which reduce incidence of diffuse **water pollution**, as well as minimising greenhouse gas emissions.<sup>28</sup>

Government agencies carry out **cross compliance** inspections, particularly in Nitrate Vulnerable Zones, where farmers must follow very specific rules to be compliant with requirements. Otherwise, they are at risk of losing payments or being fined.<sup>29</sup>

Farmers are working hard to reduce **ammonia** by altering feed and managing manure, for example covering slurry stores can reduce emissions by 90%. This can also offer reductions in feed or fertiliser price for farmers, thus further incentivising their work, beyond the environmental benefits.<sup>30</sup>

Livestock play an important role in maintaining and enhancing **soil** for growing crops. The introduction of grass and clover leys and livestock into arable rotations is beneficial to soil health and fertility.<sup>31</sup>



With good management, livestock **waste** acts as a highly effective natural **fertiliser** of crops, with beneficial constituents for soil health by providing supplemental nutrients for crop growth. Organic manures improve water filtration rate, water holding capacity and the hydraulic conductivity of the **soil**. Using natural manure as fertiliser also reduces the use of **chemical fertiliser**.<sup>32</sup>

The amount of artificial **fertiliser** used on farms has fallen dramatically in the last 30 years. Since 1990, the amount of **Nitrogen** fertiliser used on grassland has fallen over 60% from

<sup>28</sup> [Testing the water: the English beef and sheep production environmental roadmap – phase 2, AHDB 2010](#)

<sup>29</sup> [Nitrate vulnerable zones, Defra 2018](#)

<sup>30</sup> [Cost effective slurry storage strategies, AHDB Dairy 2009, Covering slurry stores on farms, AHDB 2019](#)

<sup>31</sup> [Livestock and the arable rotation, AHDB 2019](#)

<sup>32</sup> [Effective animal waste management systems, Mondal 2019](#)

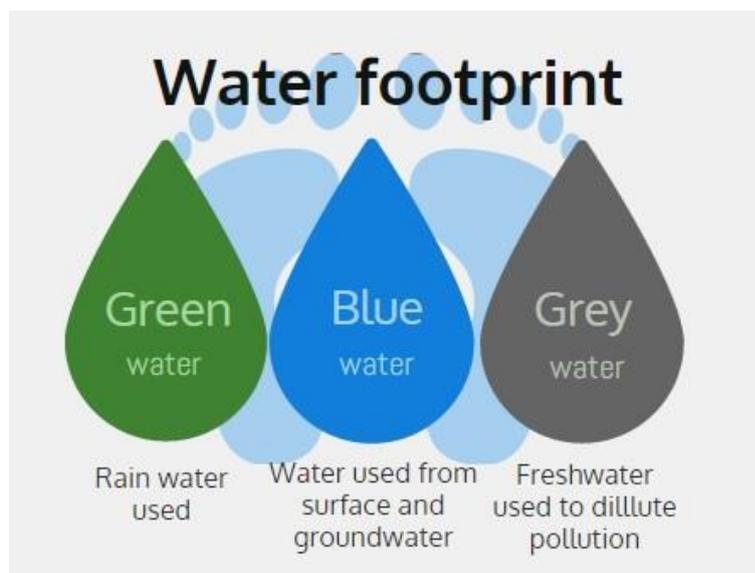
130kg/ha to 50kg/ha.<sup>33</sup> Furthermore, the amount of **plant protection products**, (herbicides and insecticides) used on UK grassland has **dropped by nearly half** since 1990.<sup>34</sup>

Water pollution incidences caused by agriculture in England reduced by 6% in 2018-19. It was the only sector to cause fewer incidents than the previous year.<sup>35</sup> Furthermore, the total number of incidents in agriculture was also **lower** than in any other sector, including water companies, illegal waste sites and other regulated industry sectors.<sup>36</sup>

**Just 31 water pollution cases** were attributed to dairy and livestock farmers in 2018-19. With 6909 dairy producers<sup>37</sup> in England alone (in 2019) and 26127 beef cow holdings<sup>38</sup> (in 2016 – last count), that equates to **only one incident over 12 months**, per 1066 dairy and beef producers.

### How much water does livestock and dairy use?

Water usage is a complex issue to measure. When calculating water footprints, water is split into three different groups.<sup>39</sup>



The distinction between blue water and green water is very important. Many headline figures just describe water usage as a whole, for example some claims are made that beef uses 17,000 litres for every kilo produced. This is vastly misleading as much of the water is rainfall falling on pasture land. Blue water is a more significant factor to look at, as it is potentially water which could be used as drinking water or for irrigation of other crops. For beef, the amount of blue water used per kilo is actually around 67 litres or just 0.4% of the total water volume involved.

<sup>33</sup> [UK fertiliser consumption trends and statistics, AIC 2019](#)

<sup>34</sup> [Pesticide usage statistics, Fera 2019](#)

<sup>35</sup> [Pollution incidences summary, Defra 2019](#)

<sup>36</sup> [Agriculture reduces water pollution incidences, Pollution Solutions 2019](#)

<sup>37</sup> [UK Dairy producer numbers, AHDB 2018](#)

<sup>38</sup> [UK Cattle Yearbook, AHDB 2018](#)

<sup>39</sup> [Water Footprint 2018](#)

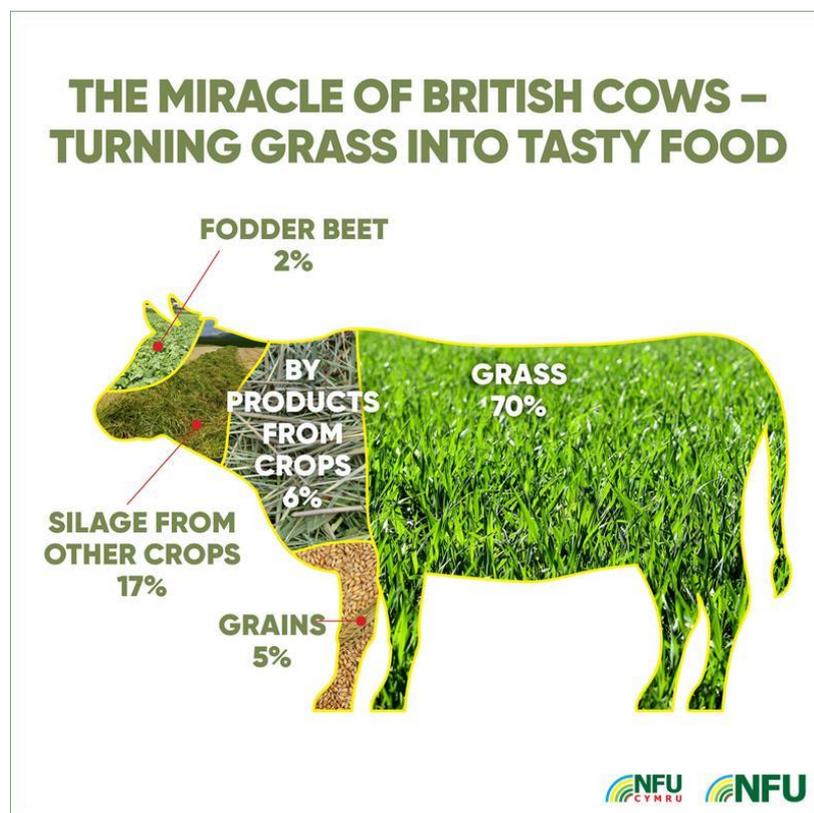
For dairy production, the total water use is around 1000 litres of water per litre of milk. Again, 99% of this is rainfall, so the amount of blue water is actually only 8 litres, per litre of milk.<sup>40</sup>

[Find out more about water usage in dairy production compared to alternatives HERE](#)

### Do livestock eat crops which could feed humans or could we plant crops on grassland?

Around **65%** of farmland in the UK is only suitable for growing grass for animals to eat. If we did not graze livestock on it we could not use it to produce food to help feed a growing population. Grazing livestock on this land allows us to turn **inedible grass** into high quality, **nutrient-rich** beef and lamb.<sup>41</sup>

**70%** of a typical British cattle herd's diet is **grass**, with the remainder of their diet from by-products or silage and grains from other crops grown – food which may never have been used in the human food supply chain. This can minimise greenhouse gas emissions from food waste in the supply chain.<sup>42</sup>



By feeding ruminants a small amount of **cereals** or protein crops to supplement a forage based diet, they can convert and increase the amount of **protein** available to humans. For example, feeding of beef and dairy cows has been shown to create more protein than they take in from potentially **human-edible** crops.<sup>43</sup> For every kilo of potentially human-edible plant

<sup>40</sup> [Volumetric consumption of British milk, AHDB 2018](#)

<sup>41</sup> [Feeding the nation, Countryside Online NFU 2019](#)

<sup>42</sup> [Feeding the nation, Countryside Online NFU 2019](#)

<sup>43</sup> [Cattle Farm Practices Survey, Defra 2019](#)

protein that dairy cows eat, they produce 1.41 kilos of edible proteins output for humans. Beef produce 1.09 kilos of **edible protein** output, per kilo of input they receive from potentially human-edible plant protein.<sup>44</sup>

Food-producing farm animals, especially ruminants such as cattle and sheep, have the unique capacity of being able to digest the by-products of arable product processing that are not consumed by people as food or drink. As a result, the livestock sector makes a vital contribution to the circular economy.<sup>45</sup> This can provide an opportunity to increase the resilience of food production in a changing climate.

### Are British livestock fed soya and does this drive deforestation?



Some British livestock are fed **soya**, but it is not as simple as saying this drives **deforestation** as a result. We import around 3 million tonnes of soya every year, but only around a third of this (mainly by-products) goes into cattle feed. ([Efeca, Sustainable soya baseline study, 2018](#))

Also, soymeal is the main form of soya fed to livestock, and most of this comes from Argentina, with less than 1% coming from Brazil.<sup>46</sup>

The demand for soya oil is growing as it is the second largest oil used in human food chains worldwide. So even if British livestock farmers didn't use any soya, it may not have any meaningful impact on the amount grown worldwide.<sup>47</sup>

86% of the global livestock feed intake is made of materials that are currently not eaten by humans. Soybean production (for oil) is the main driver of agricultural land use, but represents just 4% of the global livestock feed intake.<sup>48</sup> It is not as simple as saying to stop using soya.

### Carbon sequestration and the importance of grasslands –how can livestock provide solutions for or mitigate climate change?



Extensive, grass-based production systems, such as in the UK can contribute positively to mitigating against emissions. Livestock grazing helps to offset carbon emissions by capturing it and storing it below ground, as the grassland or permanent pasture acts as an effective carbon sink. ([AHDB – Red meat and Environment, the facts. 2019](#)).

[What other ways can livestock store carbon? Find out HERE](#)



Grassland is an extremely valuable but fragile carbon sink. Livestock play a huge part in managing this carbon sink, which could be lost if it was ploughed up for an alternative use.

<sup>44</sup> [Use of human-edible animal feeds by ruminant livestock, Wilkinson and Lee 2017](#)

<sup>45</sup> [Feed industry use of co-products, Fefac 2019](#)

<sup>46</sup> [Sustainable soya baseline study, Efeca 2018](#)

<sup>47</sup> [Are dairy cows and livestock behind the growth of soya in S.America? Sustainable Food Trust, 2017](#)

<sup>48</sup> [Livestock: On our plates or eating at our table? A new analysis of the feed/food debate, Mottet et al., 2017](#)

The scale of carbon stored in grasslands is high, with average stocks in managed pastures in England and Wales of about 135 t C/ha. Other areas, such as “semi-natural” grassland, including rough grazing and upland peat soils stocks store around 260 t C/ha.<sup>49</sup>

Grassland soil carbon in Great Britain is estimated to be 2097 teragrams of carbon to a depth of 1 m, with about 60% of the total below 30cm. This means in total that 2.9bn tonnes of soil carbon is stored in grassland soil in Britain – equivalently offsetting emissions produced by UK livestock in 110 years!<sup>50</sup>

200 million tonnes of carbon are stored in England’s uplands alone, an area only suitable for livestock grazing.<sup>51</sup>

A study has found that grasslands could be a more reliable carbon sink than woodland. Unlike forests, grasslands sequester most of their carbon underground, while forests store it mostly in woody biomass and leaves. If trees go up in flames, the burned carbon they formerly stored is released back to the atmosphere. When fire burns grasslands, however, the carbon fixed underground tends to stay in the roots and soil, making them more adaptive to climate change.<sup>52</sup>

Well managed grazing produces food and fibre while keeping the soil covered with vegetation, improving water storage, preventing erosion and nutrient migration, maintaining water quality, and providing wildlife habitats. Carbon sequestration can be enhanced in grasslands through grazing management.<sup>53</sup>

### It’s not just about storing carbon in soils!

40% of the weight of clean wool is pure biogenic carbon – carbon emitted by formerly living matter which has absorbed carbon through its life. Sheep consume this biogenic carbon when they eat grass and transform it into the amino acids of the wool fibre.<sup>54</sup>

### What is the role of ruminants in habitat management?

53% of Sites of Special Scientific Interest land is found in the uplands grassland areas, with 96% of upland SSSI’s being in favourable or recovering condition. Appropriate grazing is key to conserving many priority habitats such as limestone grassland and upland heath.<sup>55</sup>

***“Land abandonment poses one of the greatest threats to biodiversity as it removes the brakes on succession. Most open landscapes in the UK will revert from grassland to scrub and, ultimately, to woodland as large plants reach for the light and outcompete many smaller species. Grazing and disturbance by livestock – particularly by native breeds that can out winter - ‘re-sets’ this ecological clock, allowing a high diversity of these valuable early-succession flowers to thrive in open sunlight.***

<sup>49</sup> [Capturing Cropland and Grassland Management Impacts on Soil Carbon in the UK LULUCF Inventor, Defra 2014](#)

<sup>50</sup> [Capturing Cropland and Grassland Management Impacts on Soil Carbon in the UK LULUCF Inventor, Defra 2014](#)

<sup>51</sup> [Countryside Online, 2019](#)

<sup>52</sup> [Grasslands more reliable carbon sink than trees, UC Davis 2018](#)

<sup>53</sup> [Carbon sequestration in grassland systems, Mahanta 2014](#)

<sup>54</sup> [Wool and the carbon cycle, IWTO 2019](#)

<sup>55</sup> [A manifesto for the Uplands, NFU 2019](#)

**“Early succession habitats like hay meadows and permanent pastures, grazed by the right amount of livestock at the right time, can support an astonishing 770 species of wild flower and are crucibles of biodiversity. Nearly 1,400 species of pollinators and other insects rely on species-rich grassland for their survival and they, in turn, support a myriad of bird and animal life. Re-creation of these open habitats must be seen as a priority as urgent as planting trees.”**

*Dr Trevor Dines, Botanical Specialist, Plantlife, on the publication of Plantlife research showing meadows face mounting risks from poor legal protection, and from land abandonment and undergrazing, July 2019*

Without grazing ruminants on grassland, it would naturally revert to scrub, which would reduce biodiversity and habitats for a wide range of animal and plant life that contribute to the landscape. This could mean the potential loss of up to 770 species of wildflower and 1400 species of pollinators and other insects, which rely on the species-rich habitats created by grassland and ruminant grazing.<sup>56</sup>



There are also several examples where livestock are critical to the lifecycle of wildlife – for instance, the Large Blue Butterfly. The Large Blue breeds in warm and well-drained unimproved grassland and livestock play a key role in producing suitable habitat conditions through grazing.<sup>57</sup> Defra studies found that without the contribution of livestock grazing, it was too difficult to manage Large Blue Butterfly conservation sites as livestock grazing was required to maintain precise conditions and sward heights of grass.<sup>58</sup>

### What are the wider contributions of livestock?



Livestock production has a far broader purpose in the UK than as a food source, with significant social and economic contributions to local communities through tourism and biodiversity.

<sup>56</sup> [The state of nature, Dr Trevor Dines, Plantlife 2019](#)

<sup>57</sup> [Large Blue priority species factsheet, Butterfly Conservation 2019](#)

<sup>58</sup> [Large Blue butterfly, UEC 2019](#)



**£121 million** is the estimated total that beef and sheep contribution to **biodiversity** value in England alone. ([AHDB, Testing the Water, 2013](#))

The landscape created by farming is part of what brings over **3 billion visits** to the British countryside every year. This in turn supports local jobs and businesses. Such attractions include the treasured landscapes of the National Parks, with 9 National Parks being in upland farming areas.

**70%** of drinking water is sourced from the Uplands, where best practice farming on managed grazing enhances water quality at source, rather than relying on expensive treatment units.<sup>59</sup>

Farmers are central to mitigating against flood risk. Through good management, farmers contribute to “slow the flow” initiatives which reduce flooding in lowland areas. These schemes also benefit wildlife, and cost considerably less than conventional flood defences.<sup>60</sup>

The English Uplands has been placed on the UNESCO World Heritage List for Outstanding Universal value. This is due to its harmonious landscapes which have been created by the combined work of natural and human activity in agro-pastoral land-use systems, including grazing native breeds. These traditions are central to the spectacular landscape, underpinning delivery of natural and cultural heritage.<sup>61</sup>

Sheep produce wool, which is worth more than £100 million to the British economy. It is 100% natural, a renewable fibre source as sheep produce a new fleece every year, and is biodegradable. Wool can be used in clothing without any concerns over microplastics and microfibres, and is a natural insulator which can help reduce domestic carbon emissions when used in the home. But we only have this fantastic natural resource if we have a profitable livestock industry.<sup>62</sup>

<sup>59</sup> [Countryside Online, 2019](#)

<sup>60</sup> [Uplands Flood Solutions, CIWEM 2014](#)

<sup>61</sup> [The English Lake District, UNESCO, 2017](#)

<sup>62</sup> [Producer information and wool values, British Wool 2019](#)

**WOOL IS WORTH  
£100 MILLION  
TO THE BRITISH  
ECONOMY**

British sheep are shorn by experts to high standards of animal welfare

NFU Cymru NFU

Did you know, that aside from being a food source, 99% of a cow can be utilised to create pharmaceutical products such as medicine to treat diabetes, as well as other household goods including bandages and antifreeze.<sup>63</sup>

## Health & Nutrition

It is common for accusations about perceived health impacts to be levelled against meat & dairy products, so this section aims to set out the facts and address some of the common misconceptions.

### Key messages

- Meat and dairy play an incredibly important part of a healthy balanced diet.
- Red meat is one of the richest sources of essential nutrients such as iron, zinc and B vitamins in the diet. It is a significant source of protein and modern red meat now has much lower fat contents than 20 years ago, with fully trimmed lean beef containing just 5% fat.
- Dairy products are highly nutritious with milk, cheese and yoghurt all containing high-quality protein, calcium, B vitamins, iodine and potassium. Eating these foods improves bone health, especially in children and teenagers, and provides a balanced package of essential nutrients.
- Dairy products provide more protein, calcium, magnesium, potassium, zinc, and phosphorus per calorie than any other food.<sup>64</sup>

<sup>63</sup> [Dairy By-products, Dairy Max 2019](#)

<sup>64</sup> [Dairy products, yoghurt and bone health, Rizzoli 2014](#)

- If you are thinking about reducing or removing meat or dairy products from your diet, it is important to consider the consequences for your nutritional intake as many substitute products do not contain comparable levels of nutrients as meat and dairy do.



## Common misconceptions and frequently asked questions

There appears to be a large mismatch between public perceptions of harm from the consumption of milk and dairy products and the evidence from long-term prospective cohort studies. These studies provide convincing evidence that increased consumption of milk can lead to reductions in the risk of vascular disease and possibly some cancers and provide an overall survival advantage.<sup>65</sup>

### Does dairy make you fat?



Dairy doesn't make you fat! Studies and meta-analyses have shown that increased dairy consumption can protect against weight gain and obesity. ([International Dairy Federation, 2019](#))

It is increasingly recognized that the effects of milk and dairy foods on health extend beyond the benefits of the individual nutrients they contain. Rather, the unique combination of nutrients and **bioactive** factors, and how they interact with each other in the **dairy matrix**, combine to produce the overall positive effect on health.<sup>66</sup>

### Does cutting dairy from my diet improve my health?

#### [What about the effect of cutting dairy from your diet on the environment?](#)

The NHS recommend that milk and dairy foods are good sources of important **nutrients**, so do not cut them out of your or your child's diet without first speaking to a GP or dietitian.<sup>67</sup>

<sup>65</sup> [Milk dairy product and consumer health, a short review, Givens, University of Reading 2007](#)

<sup>66</sup> [The importance of the dairy food matrix in the evaluation of the nutritional quality and health effects of food, IDF 2019](#)

<sup>67</sup> [Milk and dairy nutrition, NHS 2019](#)

## Meat and dairy as a nutritionally complete food source

From a nutritional standpoint, the majority of plant-based alternatives do not have the **nutrient richness** of dairy products. On average, conventional milks contain greater levels of protein, carbohydrate, fat, **vitamins** such as B2, B6, B12, C, D and A, niacin, folate, pantothenate, biotin, and **minerals** such as potassium, **calcium**, phosphorus, zinc, chloride and **iodine**.<sup>68</sup> Recent reductions in milk consumption have also led to sub-optimal intakes of calcium by teenage females in particular.<sup>69</sup>

A study of infant nutrition found that consumption of inappropriate plant drinks as an alternative to infant milk formula in fact led to severe nutritional deficiencies in the children, citing the composition of these alternatives as hypocaloric with inadequate levels of protein, vitamin, and mineral concentrations.<sup>70</sup> Another study supported these findings, concluding that deficiencies (as a result of consuming dairy alternatives) can promote infections and severe metabolic disorders.<sup>71</sup>

Lean red meats can play an important part in a healthy balanced diet as they have a high nutrient density. This means that they contain a wide variety of nutrients in a relatively small amount of food.<sup>72</sup>

## Is eating a high red meat diet linked to dietary related death?

A Lancet report into the health effects of dietary risks shows that out of all deaths linked to diet, a diet high in red meat caused the fewest.<sup>73</sup>

<sup>68</sup> [Putting Dairy back on the daily menu, Dairy APPG 2016](#)

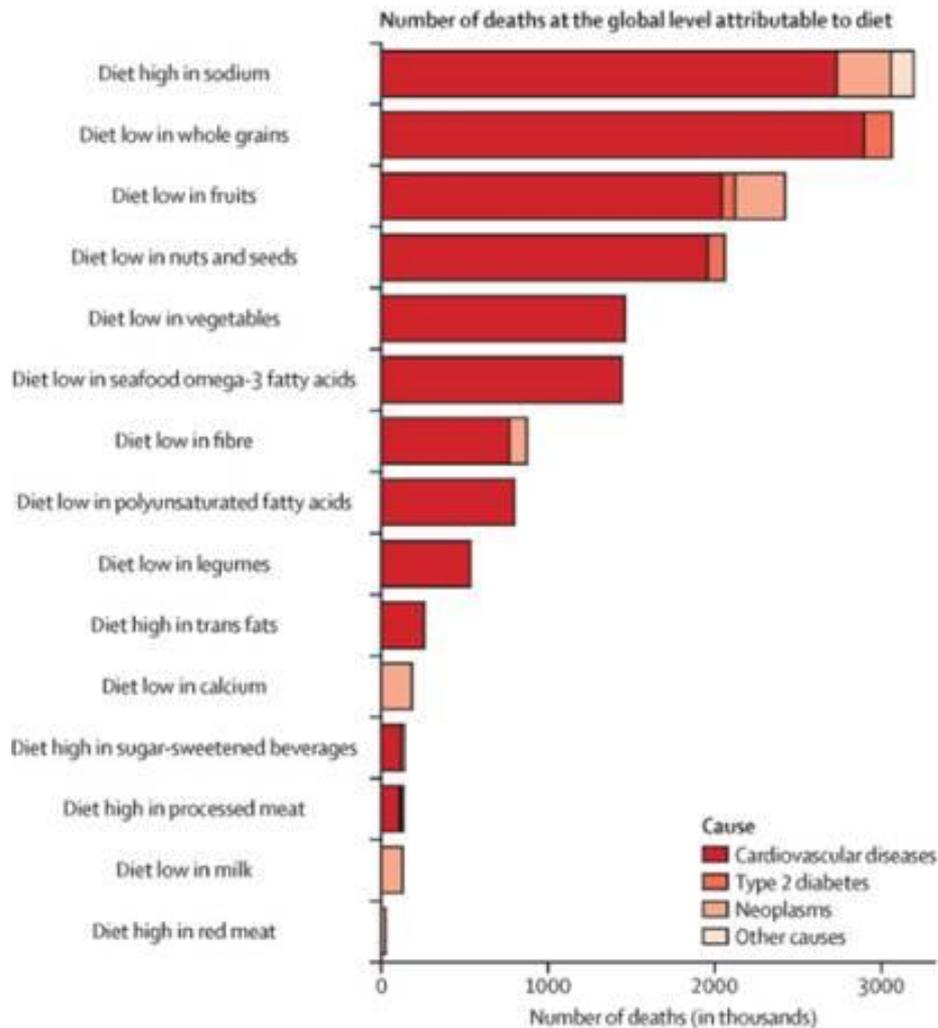
<sup>69</sup> [Red and processed meat consumption and nutritional adequacy among British adults, Cambridge University Press 2018](#)

<sup>70</sup> [Severe nutritional deficiencies in young infants with inappropriate plant milk consumption, Le Louer et al., 2014](#)

<sup>71</sup> [Pediatric nutrition: Severe deficiency complications by using vegetable beverages, Fourreau et al., 2013](#)

<sup>72</sup> [Red meat and nutrition, AHDB 2019](#)

<sup>73</sup> [Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017, Lancet 2019](#)



## The benefits of consuming dairy and meat products

### Bone health

Dairy products could improve **bone health** and reduce the risk of fractures in later life.<sup>74</sup>

### Dairy as a protein source

Milk and dairy foods contain two types of protein: **whey** and **casein** (20:80). Proteins are broken down into **amino acids** which have many roles in the body. Both of these dairy proteins provide a complete source of amino acids. **All 9 essential amino acids are found in milk.**<sup>75</sup>

### Red meat and dairy consumption can reduce cancer risks

The recently updated reports from the International American Institute for Cancer Research on the associations between dairy, red meat, processed meat and various cancers provide further

<sup>74</sup> [Nutritious dairy, Dairy UK 2019](#)

<sup>75</sup> [Dairy products, yoghurt and bone health, Rizzoli 2014](#)

confidence that they are associated with a **reduced risk** of colorectal cancer and high intakes of milk/dairy are **not** associated with increased risk of breast cancer.<sup>76</sup>

### Dairy as an important source of iodine

Milk and dairy is one of the most important sources of **iodine** in the diet. Many people in the UK, particularly young women are deficient in Iodine. There is an association between iodine-deficient pregnant women and lower verbal IQ, reading accuracy and comprehension in their children compared to those born from mothers of adequate iodine status.<sup>77</sup> People who follow a strict plant based diet are at risk of iodine deficiency<sup>78</sup> as they do not eat rich iodine sources, since most plant based alternatives do not contain adequate iodine levels.<sup>79</sup>

### The benefits of red meat for young women

Iron is a vital mineral for red blood cell formation. A deficiency of iron in the diet is the most common dietary cause of anaemia. Currently, a quarter of females ages 19-64 in the UK have iron intakes below the minimum recommended to stay healthy, likely owing to a lack of meat in the diet. Iron from red meat is more easily absorbed by the body than iron from plant based sources.<sup>80</sup>

### Meat as a source of protein

Meat is a major source of protein which helps to improve satiety and fills you up for longer. Protein-rich foods help to control weight.<sup>81</sup>

### Will red meat make me fat?

Red meat is far lower in fat now than it was 20 years ago. About half of the fat found in red meat is in the unsaturated form, which is believed to be healthier. Surveys show that meat is a major contributor of mono-unsaturated fat in the diet. Red meat contains small amounts of omega-3 fats, which help to keep the heart healthy.<sup>82</sup>

### Meat and salt

Fresh red meat is naturally low in salt.<sup>83</sup>

[Want to know more about salt in meat compared to plant based alternatives? Click HERE](#)

<sup>76</sup> [Review: Dairy foods, red meat and processed meat in the diet: implications for health at key life stages, Givens, University of Reading 2018](#)

<sup>77</sup> [Further studies on the iodine concentration of conventional, organic and UHT semi-skimmed milk at retail in the UK, Stevenson et al., 2017](#)

<sup>78</sup> [Iodine Food fact sheet, BDA 2019](#)

<sup>79</sup> [Iodine concentration of milk-alternative drinks available in the UK in comparison to cows' milk, Bath et al., 2017](#)

<sup>80</sup> [Red meat and nutrition, AHDB 2019](#)

<sup>81</sup> [Red meat and nutrition, AHDB 2019](#)

<sup>82</sup> [Red meat and nutrition, AHDB 2019](#)

<sup>83</sup> [Red meat and nutrition, AHDB 2019](#)



## Animal Health & Welfare

This section aims to communicate some of the high standards of animal health and welfare in the UK and answer some frequently asked questions.

### Key messages

- Animal health and welfare standards in the UK are amongst the best in the world, with legislation in place to uphold high standards throughout farm animals' entire lives.
- The UK are one of only 4 countries globally to be given an overall **“A” Rating** on the World Animal Protection’s Animal Protection Index, with most countries achieving between a “E” and “G” rating based upon a number of animal welfare indicator.<sup>84</sup>
- Antibiotic use on UK farms is among the lowest across Europe, with strict withdrawal periods ensuring that any animal entering the food chain is safe for human consumption.<sup>85</sup>
- In the UK, **3 times** more antibiotics are used to treat people than animals on a “kg for kg” basis.<sup>86</sup>

### British livestock welfare: world leading

The British dairy sector is extremely **proud** of its **high standards** of animal health and welfare - a healthy, happy animal is ultimately more **productive**, and dairy farmers do everything they can to ensure this.

<sup>84</sup> [Animal Protection Index, World Animal Protection 2019](#)

<sup>85</sup> [Veterinary Medicines & the Safety of Food from Animals, NOAH 2019](#)

<sup>86</sup> [Farm Antibiotics, Presenting the Facts, RUMA 2019](#)

Britain is at the helm of animal welfare legislation, with the 1965 Brambell report being considered the most influential investigation of the welfare of farm animals kept intensively in the 20<sup>th</sup> century.<sup>87</sup>

The **Brambell report** led to significant improvements in the welfare of farm animals, with the introduction of strong legislation to protect them in the Agriculture (Miscellaneous Provisions) Act 1968 and a Code of Recommendations for the Welfare of Livestock.<sup>88</sup>

The Farmed Animal Welfare Council in 1965 developed the “Five Freedoms” standards which must be met by anyone keeping animals, to ensure the mental and physical needs of animals are met. Farmers abide by these standards to provide good health and welfare to their livestock. These standards include:<sup>89</sup>

#### The Five Freedoms

- ✓ Freedom from hunger and thirst
- ✓ Freedom from discomfort
- ✓ Freedom from pain, injury and disease
- ✓ Freedom to express normal behaviour
- ✓ Freedom from fear and stress

### Why are Red Tractor Standards important?

**Red Tractor Standards** guarantee traceability, food safety and responsibly sourced food, with animal health and welfare at the forefront.<sup>90</sup> These standards ensure farmers maintain robust feeding plans, written health plans and medicine records to monitor and trace medicinal use.<sup>91</sup>

The legislation and standards derive from **scientifically based guidelines**, compiled by experts from the RUMA Alliance, ensuring best practice and **limiting antibiotic use** to instances of absolute necessity.<sup>92</sup>

### Common misconceptions and frequently asked questions – health

#### Is British meat antibiotic-free?

Strict **withdrawal periods** are stipulated for each licensed veterinary medicine, including antibiotics. This means that animal products only enter the food chain when they are definitely safe for human consumption.<sup>93</sup>

The UK is the fifth **lowest user** of on-farm antibiotics in Europe. The amount of antibiotics used on UK farms has been reduced by 53% between 2014 and 2018.<sup>94</sup>

<sup>87</sup> [Farm animal welfare in Great Britain: Past, present and future, FAWC 2009](#)

<sup>88</sup> [Farm animal welfare in Great Britain: Past, present and future, FAWC 2009](#)

<sup>89</sup> [Five Freedoms, FAWC](#)

<sup>90</sup> [Red Tractor 2019](#)

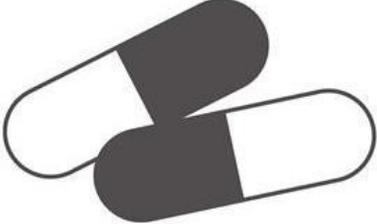
<sup>91</sup> [FAQ's, Red Tractor 2019](#)

<sup>92</sup> [FAQ's, Red Tractor 2019](#)

<sup>93</sup> [Veterinary Medicines & the Safety of Food from Animals, NOAH 2019](#)

<sup>94</sup> [Targets Task Force: Two Years On, Responsible Use of Medicines in Agriculture Alliance 2019](#)

THE UK IS ONE OF THE LOWEST USERS OF ANTIBIOTICS IN THE EU



Antibiotic use was reduced by 53% on UK farms between 2014-2018




### Are UK livestock given growth hormones?

The use of **hormones** for growth promotion in farm animals has been prohibited for use in the UK, since 1981.<sup>95</sup> Hormone use is common in other parts of the world in order to ensure faster growth and minimise production costs.

Between 90-100% of cattle on feedlots in **America** are given growth promoting hormones in feed and via implants.<sup>96</sup>

### Common misconceptions and frequently asked questions - welfare

#### Are all dairy bull calves shot at birth?

**95%** of calves born to the dairy herd are either reared for beef or stay with the dairy herd. As a last resort, a small number of dairy bull calves may be disposed of at birth. This can happen when the farmer has no market for the calves or is under disease restriction and keeping them on farm may be detrimental for their welfare.

The dairy industry is doing all it can to ensure that the routine euthanasia of calves is phased out through a combination of tools and solutions such as the use of **sexed semen**, change of **breeding techniques** and **integrated markets**. Above all, we need a firm **commitment** from the supply chain to support British.

#### Why are calves separated from their mothers on dairy farms?

Experts recommend that calves are separated from their mothers as soon as possible, to minimise stress. Standard practice on dairy farms is to move calves to a dedicated calf rearing area within **24 hours of birth**, which enables the farmer to give **focused care** to cows and calves. It helps to reduce the risk of disease transmission to a calf and **simplifies disease detection**. Farmers can ensure that the calves' initial colostrum intake is adequate. Cows and

<sup>95</sup> [Hormones in meat, European Commission 2019](#)

<sup>96</sup> [The US-EU Beef hormone dispute, Congressional Research Service 2015](#)

calves have different **requirements** and intake for feeding and management and separation of the calf from the dam facilitates milking and general cow care, by integrating the cow back into her herd and social group.<sup>97</sup>

### Why are some cows kept indoors?

Limited **grass growth and poor weather** over winter means that in **some** areas of the UK, it is not possible to graze cattle outdoors extensively all year round and ensure that their **nutritional and welfare needs** are met. Therefore, housing cattle ensures a balanced diet is fed to each cow and **Red Tractor Standards** require documentation of feed planning, with farmers working closely with vets and industry professionals to formulate appropriate feedstuffs.<sup>98</sup>

[Find out more about cattle diets HERE](#)

In some instances, cows may live indoors all year round for the herd to be managed appropriately for their needs. An indoor environment for cattle allows the farmer to closely **monitor** the herd, which helps the detection of early stages of birth, lameness or disease. Cattle houses are **well ventilated, bright spaces**, with individual resting areas for each cow to lie. These are all requirements of Red Tractor Assurance, derived from expert guidelines to ensure natural cow behaviour as well as strong animal health and welfare regulations.<sup>99</sup>

A study found that cows prefer the **shelter** provided by housing as the weather gets more extreme, especially hot weather.<sup>100</sup>



### How are calves housed on dairy farms?

In the UK, some farmers choose to house their calves in individual hutch arrangements for the first few months of their lives, moving them into larger social, similar size and aged groups, as

<sup>97</sup> [Animal Health and Welfare, Countryside Online, NFU 2019](#)

<sup>98</sup> [Dairy Standards, Red Tractor Dairy Scheme 2017](#)

<sup>99</sup> [Beef and dairy cows welfare recommendations, Defra 2003](#)

<sup>100</sup> [The behaviour of housed dairy cattle with and without pasture access: A review, Charlton and Rutter, Harper Adams University 2016](#)

the calves get older and stronger. Even though some calves may be kept in individual hutches, some farmers may place them next door to other calves to allow them to socialise. What's common across both housing arrangements is the assurance of **good hygiene, ventilation and drainage**, as well as **dry, clean bedding** and the provision of fresh water, milk and feed as per the calves requirements.<sup>101</sup>

### Why do farmers shear sheep?

Shearing is a **pain-free process** and is vital for the health and hygiene of the animals. As most sheep cannot shed their coat, there is a risk of overheating and potential death. This is why sheep are shorn before summer, to ensure their comfort and health. Shearing also reduces risk of blowfly and infection.<sup>102</sup> Government guidance states that farmers should remove the fleece from all mature sheep **at least once a year**.<sup>103</sup>

[Find out more useful facts about wool HERE, HERE and HERE!](#)

### Why are dairy cows artificially inseminated?

Artificial insemination also enables access to a **wider genetic pool** than traditionally available to farmers, meaning they can opt for sexed semen, or particular genetic traits which can ensure that the offspring they produce grow into marketable animals. Furthermore, this can include opting for genetic traits of bulls which improve **productivity** and **performance** of the herd. This can lead to potential benefits for the environment and resource efficiency of feed, for example.<sup>104</sup>

Artificially inseminating cattle can offer a safer process for cow, bull and any handlers involved, if the farm does not have the necessary **infrastructure** to house and move bulls.

### What happens to livestock during transport?

Transport of live animals is **vitaly important** to British farming **productivity**. The current legislation requires anyone transporting live animals to ensure that any journey is adequately planned and the time in transit is kept to the minimum possible. Animals must be fit to travel, and provided with adequate water, feed and rest and provided with sufficient floor space and height.<sup>105</sup>

Anyone who transports livestock for business in the UK must hold an **Animal Transport Certificate**. A Certificate of Competence is required to transport animals on domestic journeys under 8 hours within the UK. **Specialist training** provides livestock transporters with the knowledge of vehicle and road transport regulations as well as the ability to protect the welfare of the livestock.<sup>106</sup>

<sup>101</sup> [Better calf housing, AHDB 2018](#)

<sup>102</sup> [Why do we need to shear sheep, British Wool and RSPCA 2019](#)

<sup>103</sup> [Sheep and goat welfare code of recommendations, Defra 2003](#)

<sup>104</sup> [The value of artificial insemination in beef cattle, MU Livestock Extension 2012](#)

<sup>105</sup> [Animal welfare during transportation, Defra 2012](#)

<sup>106</sup> [Animal welfare during transportation, Defra 2012](#)

For any journey over 8 hours, high specification vehicles are used that ensure comfort on longer journeys, with sufficient floor space and height for each individual.<sup>107</sup>

### How are animal treated at abattoirs?

Since 2018, CCTV has been **mandatory** in all abattoirs in England. This safeguards welfare at this critical time.<sup>108</sup>

UK government require all abattoir workers to obtain a **Certificate of Competence** to work safely and humanely in abattoirs.<sup>109</sup>

This is not a global framework and many countries have little to no processes or policies in place to ensure animal welfare at abattoirs, where animals can also be subject to extreme weather and environments during transport and at the abattoir itself.<sup>110</sup>

## The Alternatives

Alternatives to meat and dairy products have grown in popularity in recent years. Consumers have a right to choose whatever they want to eat, but some of the alternatives make claims against meat and dairy products which may be **misleading** to consumers.

This section aims to address some of the common areas of concern and some aspects which need to be highlighted to consumers if they are considering switching away from meat & dairy.

### What are the areas that consumers need to watch out for?

#### Bioavailability and fortification

Plant based foods contain many vitamins and minerals that are important for a balanced diet and can be a source of **calcium**. However, they also contain a considerable amount of inhibitory substances. These bind to calcium and form insoluble salt complexes, thus decreasing calcium absorption.<sup>111</sup>

Many dairy alternatives are artificially fortified with extra vitamins and minerals because they do not possess the same nutrients that can be found naturally in milk.

#### Salt in meat substitutes

Being more heavily processed, meat substitutes are higher in sodium than fresh meat. Even though they're made with beans, tofu, and other plant foods, they can also be high in saturated fat. Manufacturers of meat alternatives often use coconut and palm oils, both of which are high in saturated fat, to give products a mouth feel similar to ground beef. Therefore, it's important to read labels on meat substitutes to determine fat content. Of the meat substitutes available, some are highly processed and contain additives and flavouring.<sup>112</sup>

<sup>107</sup> [Live transport fact file, RSPCA 2019](#)

<sup>108</sup> [CCTV in slaughterhouses, Defra 2018](#)

<sup>109</sup> [Animal welfare training, FSA 2017](#)

<sup>110</sup> [Farm Animal Welfare, Global Review Summary Report, NFU 2018](#)

<sup>111</sup> [Calcium and bioavailability, Dairy nutrition 2019](#)

<sup>112</sup> [Meat substitutes, Hultin 2019](#)

A number of meat-free burgers were found to have 0.89g of salt per serving which is more salt than a large portion of McDonald's fries. Furthermore, some plant-based alternatives were found to contain **more salt per 100g than seawater**. The saltiest processed plant-based sausage substitutes were found to contain 2.8g salt per sausage and two sausages as part of a meal would contribute 5.6g of salt - almost the entire maximum recommended daily limit for adults (6g).<sup>113</sup>

### Heavily processed ingredient lists

When thinking about dietary choices it is important to consider that many alternatives to meat and dairy may be heavily processed and contain many different ingredients.

For example here is the ingredients list of a popular alternative 'burger', which also contains genetically engineered ingredients.<sup>114</sup>

#### Ingredients list for an "alternative" burger

Water, Soy Protein Concentrate, Coconut Oil, Sunflower Oil, Natural Flavors, 2% or less of: Potato Protein, Methylcellulose, Yeast Extract, Cultured Dextrose, Food Starch Modified, Soy Leghemoglobin, Salt, Soy Protein Isolate, Mixed Tocopherols (Vitamin E), Zinc Gluconate, Thiamine Hydrochloride (Vitamin B1), Sodium Ascorbate (Vitamin C), Niacin, Pyridoxine Hydrochloride (Vitamin B6), Riboflavin (Vitamin B2), Vitamin B12.

Lab grown meat is not necessarily better for the environment. A long term impact assessment has shown that upscaling lab grown meat production is not climatically superior to cattle beef production.<sup>115</sup>

Today, even with the most advanced techniques, culture mediums still need either hormones, growth factors, fetal calf serum, antibiotics or fungicides to allow for cell development.<sup>116</sup>

### Some common claims and misconceptions

[Refresh your memory about the benefits of eating meat and dairy products HERE](#)

#### 'Ditch milk and lower your carbon footprint'

On the surface, it may appear that many alternatives to milk have a much lower carbon footprint than dairy milk. However it is important to be aware of nutritional content. For example if looking at protein content, British dairy milk would have a lower carbon footprint per gram of protein than a typical oat drink.

Protein content of milk = 3.4g per 100ml<sup>117</sup>

Protein content of typical oat drink = 1g per 100ml<sup>118</sup>

<sup>113</sup> [Meat Alternatives report, Action on Salt 2018](#)

<sup>114</sup> [What are the ingredients? Impossible Foods 2019](#)

<sup>115</sup> [Climate Impacts of Cultured Meat and Beef Cattle, University of Oxford 2019](#)

<sup>116</sup> [What is artificial meat and what does it mean for the future of the meat industry? Bonny et al., 2015](#)

<sup>117</sup> [Milk facts, Dairy UK 2018](#)

<sup>118</sup> [Oat drink description, Oatly 2019](#)

Carbon footprint per litre of milk = 1.17kg Co2e per litre<sup>119</sup>

Carbon footprint of Oat drink = 0.41kg Co2e per litre<sup>120</sup>

So dairy milk has 3.4 times as much protein per 100g. To equate that in CO<sub>2</sub>:

0.41kg x 3.4 = 1.394kg CO<sub>2</sub>e per litre

In fact when comparing **carbon footprint** with nutrient density as a whole, milk out performs every other beverage. So whilst on the surface, the carbon footprint of soya based drink is around half that of dairy milk, when you take in to account **nutrient density**, milk has half the carbon footprint of soya for the amount of nutrients provided.<sup>121</sup>

[Find out more about carbon footprints and nutrient density HERE](#)

### ‘Dairy milk uses more water than almond milk’

As previously described [here](#), the majority of water associated with dairy production is ‘green’ water, i.e. rainfall. What should be compared is the ‘blue’ water use. This is fresh water and much more relevant to the comparison due to shortages of drinking water.

So to compare almond and dairy again:

To produce one litre of milk it takes 8 litres of ‘blue’ water.<sup>122</sup>

One kilogram of raw California almond kernels was 5290 litres of blue water.<sup>123</sup>

Almond drink is typically only **3% almonds**, so based on the figure above, the average litre of almond drink would require 158 litres of blue water – **nearly 20 times more than** dairy milk!

### ‘Choosing a vegan diet means that animals are not killed’

A study looking at changing diets has found that producing wheat and other grains to service a vegetarian/vegan diet results in at least 25 times more sentient animals being killed per kilogram of useable protein, than for the equivalent in beef. This is linked to habitat loss, pest control and collateral damage caused by machinery.<sup>124</sup>

[How do British livestock assist in habitat management?](#)

<sup>119</sup> [Greenhouse gas emissions on British dairy farms, DairyCo 2014](#)

<sup>120</sup> [Oat drink description, Oatly 2019](#)

<sup>121</sup> [Nutrient density of beverages in relation to climate impact, Smedman et al., 2010](#)

<sup>122</sup> [The volumetric water consumption of British milk, AHDB Dairy 2014](#)

<sup>123</sup> [Water-indexed benefits and impacts of California almonds, Fulton et al., 2019](#)

<sup>124</sup> [Slaughter of the singing sentients: measuring the morality of eating red meat, University of New South Wales 2011](#)

## Top Tips

### How to engage with the public and decision makers about livestock farming

- Invite people on to farm – this could be through Open Farm Sunday, or just a small group of local people. Follow this link for advice on opening your farm to the public
- Set up a social media account for your farm (tips below)
- Engage in the FaceTime a Farmer initiative Write in your local parish or area magazine
- Be open and honest, and talk passionately
- Engage in debate, and use this document to help you get across the facts
- Invite your MP, local councillors or VIPs on to your farm
- Do a farm carbon calculator to see what your carbon footprint is like, and then talk to the public about it. Put up information posters or board around the farm on footpaths to catch the attention of the public.

### Using social media positively

#### Influencing people

- Post images - the British countryside is a beautiful canvas
- Shoot videos and share them - your experiences are stories that need to be told
- Tag your MP and politicians - make your voice heard in the corridors of power
- Share facts and stats - if you're proud of our industry, tell people what it achieves

#### What to think about when you're shooting video with your phone

- Ideally, ask someone else to film you
- Don't stand too close to the camera
- Make sure you fill the screen
- Don't move the camera too fast
- Beware of background noise
- Avoid windy locations
- Make sure you're in good light

#### Dr Jude Capper's 5 'Golden Rules' when communicating via social media<sup>125</sup>

- Share your values: explain why you care and what you do
- 3 P's – Positive, polite and personal: don't say things you wouldn't say at the school gate
- Keep it short, simple and transparent: answer questions in a factual, simple way
- Focus on the important: communicate with consumers who don't have a fixed opinion on agriculture, there'll always be angry people or extreme views that you won't change
- Know when to walk away: Just like if you had an uncomfortable conversation face to face - walk away when things get nasty

<sup>125</sup> [The positive power of social media, Dr Jude Capper 2019](#)

## Want to try your hand at using a carbon calculator on your farm?

### Follow the below links for more information

- Cool Farm Tool <https://coolfarmtool.org/coolfarmtool/>
- Farm Carbon Tool Kit <https://www.farmcarbontoolkit.org.uk/carbon-calculator>
- AgRE Calc <https://www.agrecalc.com/>

### For more information

- NFU Dairy Hub <https://www.nfuonline.com/sectors/dairy/>
- NFU Livestock Hub <https://www.nfuonline.com/sectors/livestock/>
- AHDB Dairy <http://dairy.ahdb.org.uk/>
- Dairy UK <https://www.dairyuk.org/>
- Meat the Facts <https://meatthefacts.eu/>

**Or follow any of the links throughout this directory to find out more.**

## Personalise your approach

Some handy examples for you to personalise your messaging, to explain how you contribute positively to the environment through good practice on farm.

### This is what I do on my farm...

To tackle climate change:

- ✓ I produce renewable electricity
- ✓ I have invested in fuel efficient machinery
- ✓ I use organic fertilisers to reduce reliance on artificial fertilisers
- ✓ I regularly plant trees or hedgerows
- ✓ I have permanent pasture which locks up carbon

### This is what I do on my farm...

To help the environment:

- ✓ I plant wild bird or pollinator mixtures
- ✓ I manage protected habitats with grazing livestock (e.g SSSI's or nature reserves)
- ✓ I leave field margins or unproductive areas for wildlife to use
- ✓ I have lots of woodland and hedgerows to provide habitat
- ✓ I use technology to accurately apply fertiliser and plant protection products
- ✓ I have buffer strips to prevent runoff to water courses
- ✓ I use a borehole or capture rainfall to reduce water usage

### This is what I do on my farm...

To help improve animal health & welfare:

- ✓ I provide brushes or mattresses for my cows to keep them comfy
- ✓ I vaccinate my animals to prevent disease or illness
- ✓ I shear my sheep annually to keep them comfortable and free from disease
- ✓ I have an animal health plan which is developed in conjunction with my vet
- ✓ I am Red Tractor Assured which means I am inspected on the standards which I have to meet