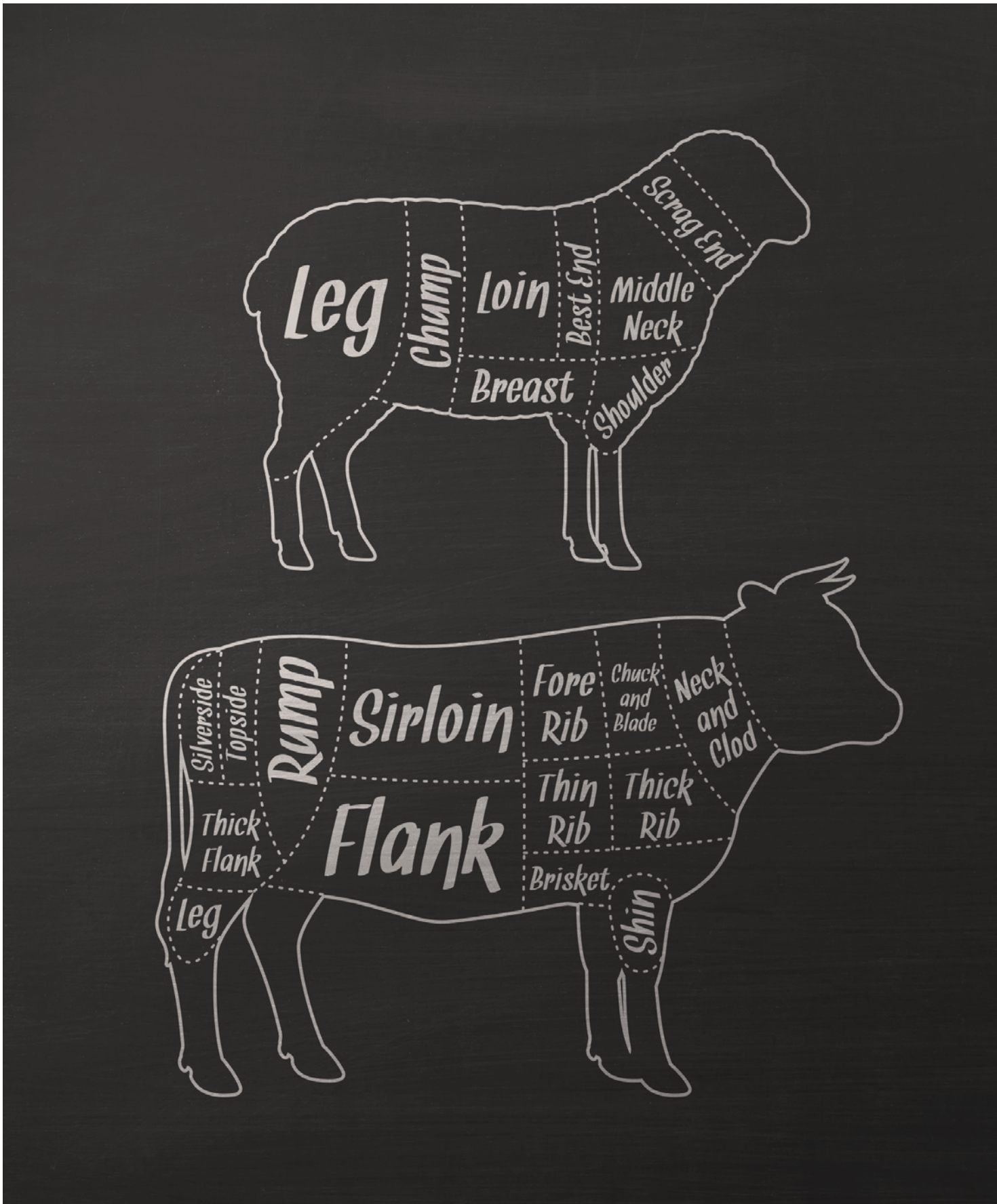


Red Meat Outlook



80%

Of UK beef and sheep meat is consumed domestically

16%

Of UK beef and sheep meat is exported to the EU

£4.25bn

Output value of UK sheep and beef markets at the farm gate

Necessity to change breeds innovation

We investigate beef and sheep meat markets with a view to the future of production and consumption

The red meat sector has been the focus of unprecedented media attention and now unprecedented disruption. While it has not been possible to take account of the full impact of coronavirus in this report, the sector was facing substantial pressure before it hit, and it is not unreasonable to expect that many of the challenges in ethics, climate and land use will persist once the crisis has calmed.

Last year, UK producers were faced with deep uncertainty as our trading relationships with the EU and other significant beef producing nations entered negotiations. The coronavirus crisis has showed us again that it's not just trade arrangements that could disrupt existing supply chain patterns. Longer term, if other climate-impacting sectors of the economy suffer deep and perhaps lasting reductions in demand, particularly to personal and international travel, agriculture's climate impact will be of more significance, not less. Equally, media hype around meat-free diets seems to have disappeared as people rush to secure food, and food producers have been flipped from villain to hero. But the

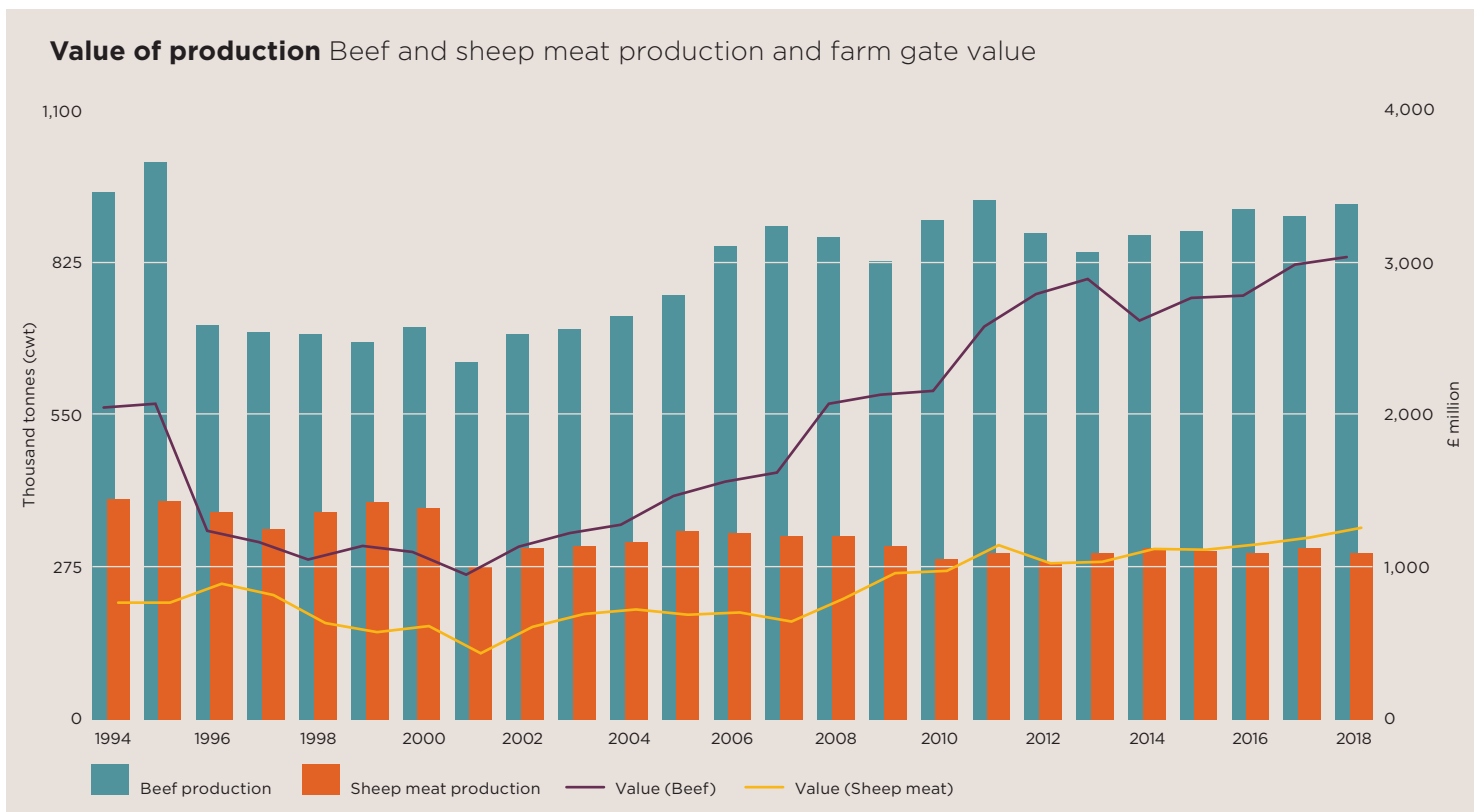
possible role of animal protein consumption in creating the crisis means that a great deal of introspection is likely to follow.

It's impossible to say if the current reevaluation of food by society will produce lasting change, but accountability and scrutiny are likely to remain pressing concerns and, globally, demand from developing areas of the world is predicted to keep rising, as consumption of protein correlates with higher living standards. These are strong demand fundamentals.

2020 will be a year of great change, and necessity will breed innovative solutions. Producers looking to prepare their businesses for 2021 and beyond need to carefully consider fundamental policy drivers, as well as their target markets and value-add proposition to ensure lasting benefit. This report provides an update on the beef and sheep meat markets at what could be a critical turning point in our food system, together with a wider look at the pre-existing consumer trends and behaviours, and thoughts about the future sustainability of the red meat sector.

£11.3bn

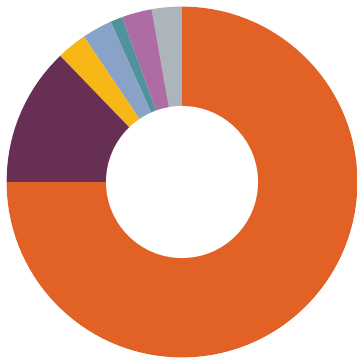
Implied retail value of beef and sheep meat supplies including net effect of imports and exports



Source Defra

“Nine percent more beef is currently consumed in the UK than a decade ago”

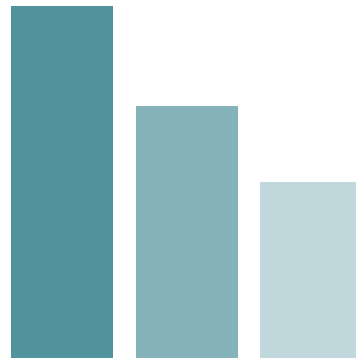
Best description of your usual eating habits



- Meat eater 81%
- Flexitarian 14%
- Vegetarian 3%
- Pescatarian 3%
- Vegan 1%
- Other 3%
- Don't know 3%

Source YouGov 2019

Most important reason for becoming vegan



- Animal ethics/welfare 32%
- To improve personal health 23%
- Environmental impact of meat production 16%

Source AHDB/YouGov Consumer Tracker

Is the rise of veganism in the UK overplayed?

A look beyond the marketing headlines

There is no doubt a growing portion of consumers in the UK are actively reducing their meat intake. Veganism's media profile has climbed rapidly, fuelled by social media, high-profile influencers and well-funded marketing campaigns. However, as a dietary choice it remains niche. According to YouGov, in 2019 just 1% of the population identified themselves as vegan. However, as a concept it has had a more significant influence on consumers, as over half the population say that they adopt some vegan buying behaviours (Opinion Matters poll). Alignment with broader climate change advice and the ethical debate around human interaction with animal species influences additional consumers to reduce their meat consumption.

Those who have cut their meat consumption are often classed as 'flexitarians' although the qualification criteria vary. In some cases having one or more meat-free meals a week (like 'meat-free Monday') is classed as 'flexitarianism', while in their 2019 dietary study YouGov defined flexitarians as those who mainly follow a vegetarian diet but occasionally eat meat. Against this stricter definition it

found 14% of the population described themselves as flexitarians.

For many years consumers have been encouraged to limit their consumption of red meat and eat more fruit and vegetables by government healthy eating guidelines. The impact of this advice has been poor: fruit and vegetable consumption remains well below recommended levels, but flexitarians have taken the message on board. Later this year healthy diets will receive renewed focus once Henry Dimbleby's National Food Strategy is published.

For the red meat sector, flexitarians are the more important consumer sector as they account for a bigger share of the market and crucially they remain consumers of some meat. Flexitarians, with their underpinning motivations, will logically favour quality over quantity, which means there are opportunities for producers and processors to capture a greater share of value in the food chain by aiming branded products at this group, which demonstrate high animal welfare and product quality with a low environmental impact. Aligning UK production with a 'less and better' mantra may be the best strategy.

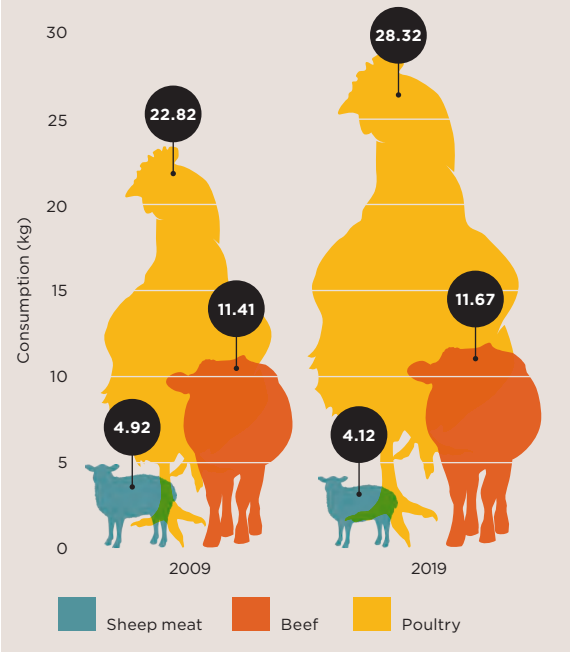
THE UK CONSUMES MORE BEEF THAN A DECADE AGO

Due to population growth, 9% more beef is consumed in the UK than a decade ago. Furthermore, per capita consumption remains relatively flat with any reduction yet to show in annual per capita figures. With the UK population set to continue growth of almost 5% by 2030, the forecast is for beef markets to match this with a 4% expansion over the same period.

Sheep meat (mostly lamb) consumption has seen a gradual decline in the UK for some time. This is likely due to limited cooking versatility and a perceived higher price point. Although consumption has trended down 10% in the last decade, it is still much higher in the UK on a per capita basis than in many other developed nations, a legacy of the historic importance of the wool trade within Britain's economy. Today consumers benefit from a high quality product being readily available locally.

Overall meat consumption per head has increased as, on average, Britons consume over 61kg of animal protein annually, up from 56kg a decade ago. Productivity gains in the pork and poultry sectors have reduced their costs of production making them more affordable sources of meat protein, leading to an increase in overall meat consumption and displacement of some beef and lamb within consumers' baskets.

UK consumption per capita



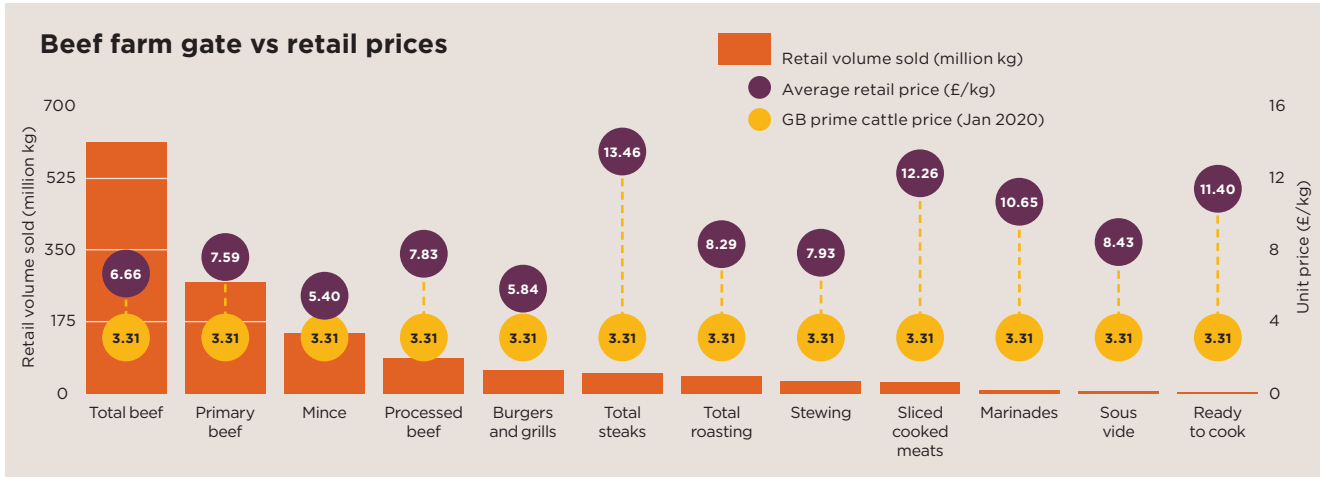
Source OECD



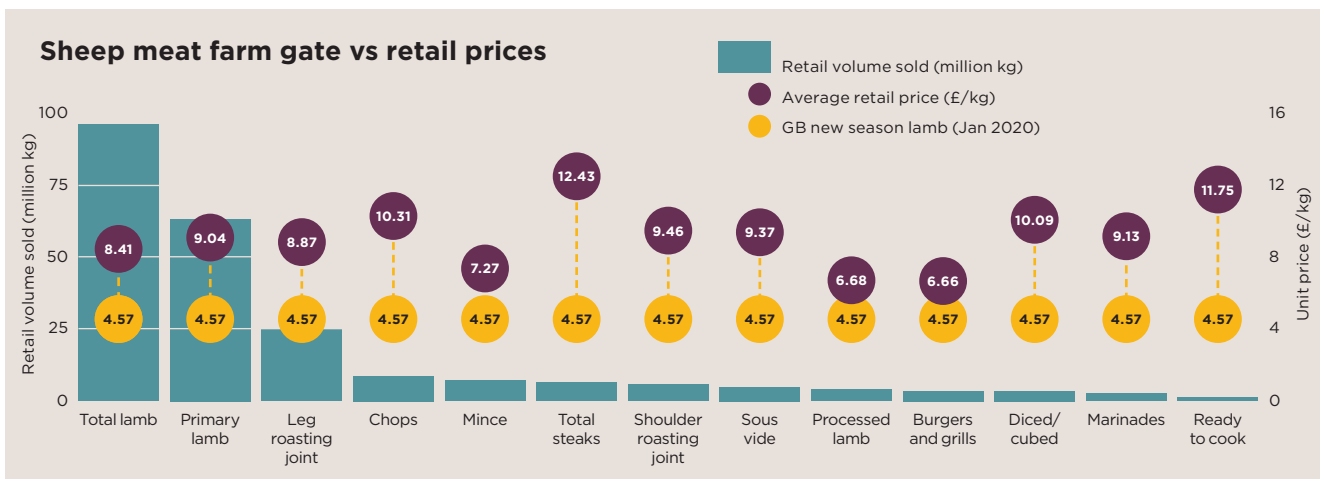
The alternative protein sector (plant based meat substitutes) is less than 1% of the \$1.4 trillion global meat market. Although this sector has seen significant investor attention over the past five years, it will be some time before it gains a significant market share.

Source: Rabobank

“ Opportunities to increase exports to non EU countries are progressing, with China lifting a 20-year ban on UK beef imports ”



Source AHDB, Kantar



Source AHDB, Kantar

UK meat production

Growth in export markets is key to achieving higher prices

BEEF

Domestically, the UK beef market has struggled for the past two years. Reduced slaughter volatility numbers and a recent levelling of the GB R4L average deadweight price suggest that the market is close to equilibrium, but lacklustre consumer demand evident at both retail and food service level is pushing prices lower. The disruption to food service caused by the coronavirus outbreak has yet to be factored into markets, but is likely to result in a major shift to cooking at home and hence meat purchases from farms, butchers and supermarkets.

Exports are likely to play an increasingly important role in balancing the supply and demand situation and setting domestic prices. Market access negotiations to non EU countries are now taking place and recent

announcements of China and the US lifting 20+ year UK beef import bans are promising signs of progress. These markets alone present an almost £300 million opportunity to sell high quality, hormone-free product into key growth markets.

SHEEP MEAT

The UK sheep meat market has traded in line with five year average prices, having retreated from above average prices over the past two years. Brexit uncertainty has reduced breeding flock numbers 4% year on year, the largest change for a decade. The reduction has followed the longer term trend of year on year declines in domestic consumption rates. Imports and exports remain largely in balance by volume with the two largest classes; UK whole carcass exports into the EU offset by

NZ lamb leg imports. This trade accounts for seasonal fluctuations in production and consumer demand prior to the Easter spike.

UK sheep meat producers face considerable uncertainty over the coming months while transition period trade negotiations play out. Estimated impacts of a 'no-deal' Brexit could result in tariff rates as high as 45%-50% of carcass value on EU27 exports effectively forcing close to 33% of domestic lamb production into other markets. The scope for displacing imported product with this extra supply is limited due to the highly seasonal nature of the production and consumption cycles, the manufacturing capacity available in the UK and carcass balance issues because UK imports are skewed towards leg cuts, while the majority of exports are whole carcasses.

260%

Estimated mark up between farm gate and retail value

50%

Of prime beef doesn't meet ideal target market specifications

70%

Average percentage of UK meat processor workforce with EU nationality

Disrupting the supply chain

Proposed policy changes are likely to target the entire supply chain to achieve optimal outcomes. Opportunities will arise for those looking to work collaboratively

Consumers are becoming more alert to the provenance of their food and the impact of their consumption choices. They have become more willing to buy added value products that tap into their values, communicate quality, or offer other benefits such as convenience. In response, the supply chain is developing more branded products and selling a story to capture additional value.

Retaining and building consumer trust is essential to the long term viability of the sector. Investment in lowering environmental impact, high ethical standards and premium product quality may increase costs in the short term but are likely to become costs of market entry. Increasing collaboration and transparency across the supply chain will help account for this fairly and go some way to realigning consumer price expectations. However, all stakeholders can spread the load by driving extra value.

PRODUCERS

Significant value is added to red meat beyond the farm gate. According to the AHDB, UK farmers sell their red meat for a total of £4.25 billion and it is then processed to achieve a wholesale value of £11.3 billion (including a net £0.9 billion contribution from import/export balance). This 260% mark-up shows there is potential for producers to capture additional value. Lobbying for the basis of pricing to be switched from subjective carcass assessments to objective quality measurements would help close the gap and pass value back to those producing a product meeting consumers' desires. Producers can also add value by diversifying into direct retail, or seize an opportunity that the Agriculture Bill is due to provide in England, to build their market power and potentially develop branded produce by

collaborating with other farmers to form a Producer Organisation (PO). The PO designation allows exemptions from certain competition laws, but has historically been restricted to the fresh fruit and vegetable sector. It is credited with the rapid growth of UK soft fruit production over the last 20 years.

PROCESSORS

Efficient, profitable processors are an essential part of the supply chain and the longevity of the sector. Their future looks challenging, with lower throughput increasing marginal costs as well as the increasing difficulty of accessing affordable skilled and unskilled labour. According to the British Meat Processors Association, on average 70% of a processor's workforce are EU workers. The UK's points based immigration system will favour skilled workers, roles with a salary over £25,600 and roles that are listed on the 'shortage occupations list'. The proposed list does not include any meat

processing roles, where 60% of the workforce are classed as unskilled. However, these roles have been acknowledged as key roles under the new coronavirus measures. Cooperative partnering with processors or cost plus margin processing agreements may offer opportunities to leverage a branded product and ensure processor supply is maintained. Investment in data, innovation and technology disruptors are essential in managing businesses and boosting profitability.

RETAILERS

Retailers hold enormous power in the supply chain and are largely responsible for balancing sales volume with the best possible price point per cut. While greater price transparency can always be demanded from premium product lines, the cheaper end of the market is perhaps of greater significance as the product often comes at greater cost than what is seen on the label. There is a shift to supply chains working with producers who can prove their

environmental credentials, but without necessarily paying them any more to do so. Understanding the value of on-farm sustainability metrics in gaining higher margin market access is increasingly important, particularly as net zero and shareholder activism drives change in corporate behaviours.

FOOD SERVICE

Food service offers plenty of opportunity to drive innovation and value by showcasing the potential of red meat. However, it must first overcome the major disruption related to coronavirus. Widespread closures of restaurants and large franchise chains force significant volumes of beef and sheep meat back onto the open market. McDonald's alone source on average 4,100 tonnes of British and Irish beef monthly and any extended closure could prove troublesome for producers unless retail demand responds accordingly. Realigning a disjointed supply chain needs stakeholder collaboration to find a profitable solution for all.



65%

Of UK farmland is only suitable for growing grass

45.6m

Tonnes total GHG emissions from UK agriculture

9%

Of total UK emissions are attributed to the UK agricultural sector

Achieving net zero

The livestock sector in the UK is uniquely positioned to make use of otherwise unproductive land

With the UK committed to achieve net zero greenhouse gas emissions by 2050 and land use uniquely offering the potential to sequester carbon, agriculture's future is being shaped by this ambition. Emissions accountability is coming to all sectors and farmers should be actively looking at ways they can contribute.

The 2050 commitment is based upon the recommendations of the Committee on Climate Change. In 2020 the Committee released an updated land use policies report that recommended significant land use change to achieve the necessary levels of climate change mitigation and adaptation.

Under its plan 4.6 million hectares of UK land needs to be released and repurposed. This major structural change would involve reducing the arable area by 30% and the area of grassland by 11%. It is suggested that the released area could be used for more trees, environmental adaptation (peatland bogs, rewilding) and energy

crops to achieve net zero on a national scale.

Despite this scale of land use change, food production from the UK is expected to be maintained, and globally it needs to increase. The UK remains one of the most sustainable places in the world for agricultural production, livestock included. Rich soils, favourable climatic conditions and topography lead to efficient and reliable agricultural production even under a variety of future climate-related environmental changes. Furthermore, around 65% of UK farmland is only suitable for growing pasture. Utilising these large areas of upland and hillside land for productive livestock grazing limits the spread of aggressive and undesirable vegetation that otherwise possess limited or no alternative value or benefits to biodiversity. Proposed policy changes and the repackaging of subsidy to focus more on environmental benefits suggests adopting sustainable livestock and environmental management practices will pay dividends.



COMPARING CARBON FOOTPRINTS

Red meat often shoulders a large portion of the human induced carbon footprint. But is that justified when compared to other common activities?

Figures shown in kilograms CO₂ equivalent emitted, the metric used to standardise different emission types

522



UK average meat consumption per year
(18.2kg beef, 4.9kg lamb)

450



Return flight London to Rome

760



Annual emissions from a petrol car driving 50 miles per week (operation only)

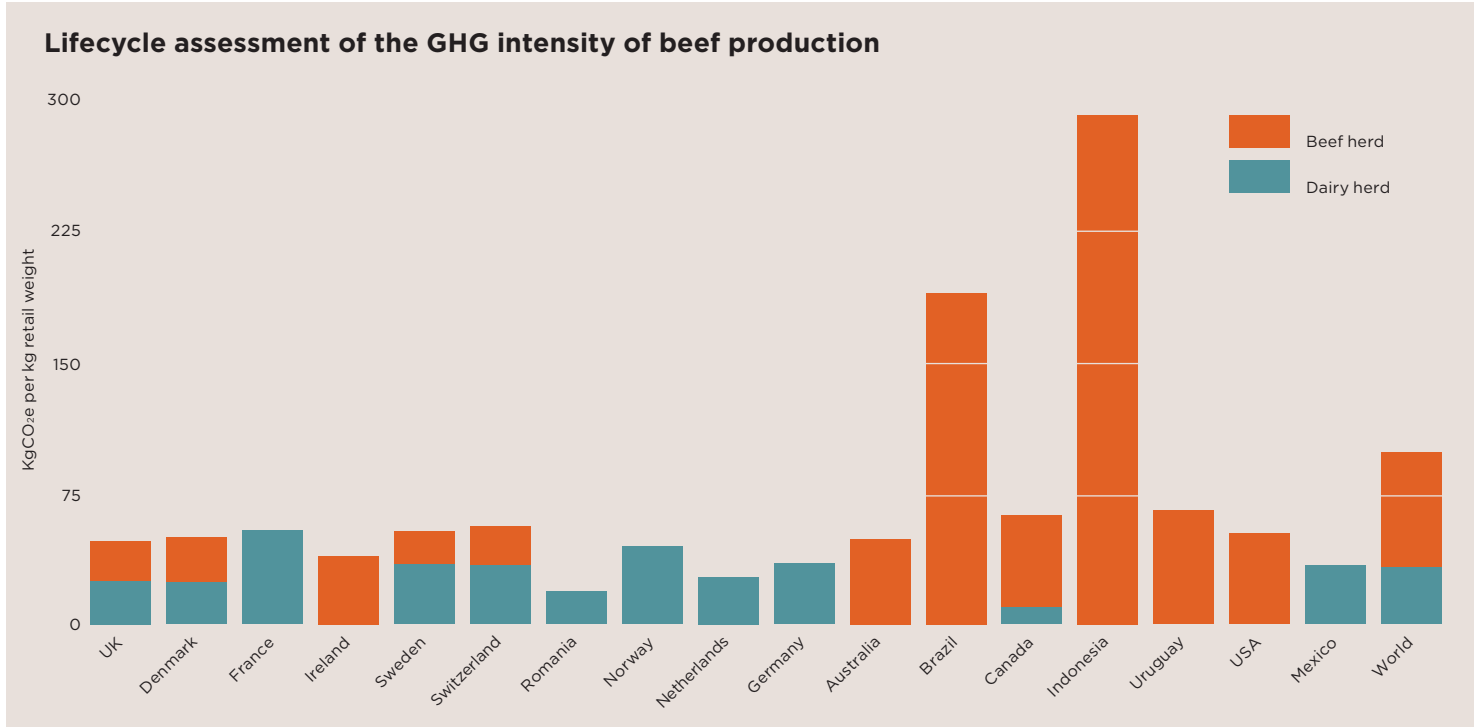
5,400



UK average per capita emissions 2018

Source Climate and Capitalism, Carbon Footprint, Carbon Brief

🍷 UK producers are well positioned to adopt a lower input, more extensive approach to rearing and finishing ruminant animals, which encourages regenerative agricultural practices 🍷



Source Committee on Climate Change: Land use: Policies for a Net Zero UK

Decreasing the carbon hoof-print

Practical steps to reducing greenhouse gas emissions of ruminant herds

1 Low-input, high-output production units
Increasing reproductive rates and survivability together with higher carcass weights achieves greater output per breeder unit while reducing energy intensive (and expensive) inputs. A ewe rearing twin lambs doubles output and for virtually the same environmental footprint.

2 Methane inhibition
Early trials with seaweed added into rations indicate a methane emissions reduction of up to 85% in sheep and 50% in dairy cattle. A Swiss company expects to release a methane inhibitor feed additive within the next five years. Genetics could also play a role as the level of methane an animal emits is in part an inherited trait. Through selective breeding techniques lower emitting animals could be bred within a few generations.

3 Fertiliser
Consider nutrient cycling that mirrors a circular farming model as a substitute for energy intense artificial fertilisers. Adding sulphuric acid to slurry reduces the GHG emissions and increases nutrient value of the substrate. For those requiring artificial inputs, a shift to targeted fertiliser application with controlled release capabilities may be the way forward.

4 Grazing management
Maintaining ground cover is essential for pasture health and longevity. It maximises carbon sequestration potential and ensures a rapid growth response following cell and rotational grazing patterns.

5 Data informed management
'You can't manage, what you don't measure.' A baseline measurement now will inform what effective change looks like. There is unlikely

to be an industry standard carbon tool, so work with supply chains on their requirements or use a consistent methodology for self-evaluation. Natural capital assessments and nitrate loadings are other examples of where to start.

UK producers are well positioned to adopt a lower input, more extensive approach to rearing and finishing ruminant animals, which encourages regenerative agricultural practices. Balancing a productive business unit with a mantra of regenerative agriculture is of mutual benefit to sustainable food production and increasing diversity of plant, animal, insect and tree species. Livestock production plays an essential part in providing balance to the whole ecosystem.

A diverse combination of land use changes together with appropriately managed and grazed grasslands and a carefully considered reduction in herd size can reach a domestic net zero target and still provide a valuable, nutritious food source.

 Irish farmers are set to be paid to capture carbon in their permanent pasture as part of the country's plan to achieve net zero by 2050. The carbon sequestration potential of well managed pastures is estimated between 0.3t CO₂/ha and 0.9t CO₂/ha per annum depending on management practices, and with carbon prices expected to reach €80/t in Ireland by 2030, the scheme could be worth anywhere between €100 million and €300 million across some 4.1 million hectares of grassland.

“ There is no denying livestock emit greenhouse gasses that contribute to global warming, but are they actually increasing the global warming effect? ”



A fair measure?

New research suggests methane is unfairly accounted for its warming effect under current metrics

There is no denying livestock emit greenhouse gases that contribute to global warming, but are they actually increasing the global warming effect?

New research argues that the current metrics used to assess the warming contribution of greenhouse gases incorrectly account for methane, inflating greenhouse gas emissions from ruminants and consequently their significance within the national picture. Methane is a short-lived greenhouse gas that typically breaks down in the atmosphere within a decade, while carbon dioxide and nitrous oxides are long-lived and continue to have a global warming impact in the atmosphere for many generations.

To take this into account, researchers at the University of Oxford have proposed that a new metric known as GWP* should be adopted in place of the established metric GWP100 (global warming potential over 100 years).

Using GWP* reduces the global warming impact of ruminant livestock because it accounts for the breakdown of methane rather than assuming it continues to accumulate. This effectively means that the methane emissions from a steady or declining population of ruminants is not causing additional global warming, as the rate of methane production is cancelled out by the rate at which historic methane emissions decay.

Currently, all policy and reporting on climate metrics use the GWP100 metric, however the IPCC has signalled its intention to report GWP* metrics in its forthcoming report.

Using GWP* total UK agricultural emissions in 2016 were 9.5 million tonnes CO₂ equivalent (Mt CO₂e), compared to 45.6 Mt CO₂e if the GWP100 calculation is used, a 79% difference in relative impact. Addressing this misrepresentation is

particularly important for the industry in the rebalancing of policy to focus on heavy carbon emitting sectors such as construction, energy, manufacturing and transport.

GWP* is not a licence to continue as normal for the livestock sector. Limiting the effects of anthropogenic global warming and slowing global temperature rises, requires a worldwide reduction in methane emissions. New methane inhibiting innovations show the potential for progress, as do increases in output per breeder unit and genetic selection against methane producing microbes. Social pressures on the industry should encourage producers to implement change at a farm level, which in combination with fair and effective policy measures can position the sector well for a long, sustainable future.

For more information on GWP refer to Oxford Martin School – Climate metric for ruminant livestock report.*

83%

Of red meat consumption growth is expected from developing nations

45.6Mt

CO2e is total UK agricultural emissions under GWP100 metric

9.5Mt

CO2e is total UK agricultural emissions under the new GWP* metric

The outlook

With a growing population, changing consumers and a precious environment to consider, challenges are aplenty

The red meat industry faces an unprecedented array of challenges. Turbulent markets, trade agreement uncertainty and worldwide consumption pattern disruption from coronavirus (effects unknown at the time of writing) make for a particularly unpredictable business environment.

It is clear that as populations continue to grow, the weight of demand is negating changes in consumption behaviour of the developed world. Competition from poultry and aquaculture, which are often cheaper and more readily available alternative sources of protein will continue.

Before coronavirus, consumption in many developed countries was trending downward as environmental and health concerns weigh on consumers' minds. Many traditional strongholds of red meat consumption were gradually eating less, but a shift to home

consumption could present a temporary or long-term change in consumer behaviour. Producers should be aware that short-term changes may not last if consumers move back to convenience and out-of-home eating again. Flexitarians will continue to demand high quality and value cuts of red meat albeit less frequently.

The UK is well placed to play on its strengths to access these high value markets, but it remains unclear whether or not this will be a factor in trade negotiations, which are likely to focus on financial services with agricultural concessions rather than opportunities. Investment in data and traceability will be justified to meet changing supply chain expectations around climate and environmental impacts. Competition for market share from often cheaper white protein substitutes and an increasing share of plant based food can

still be expected. Wholesalers, manufacturers and retailers need to continue to invest in quality and pass value back down the supply chain to incentivise the higher standards that consumers are demanding from producers.

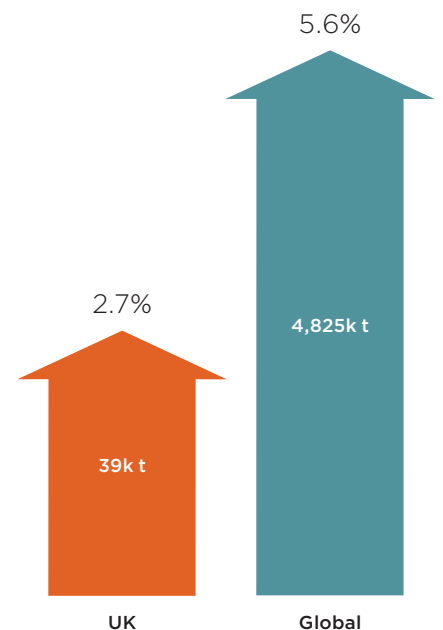
We are moving from an era where business and consumption was financially focused and social or environmental impacts not recognised. Consumers are placing more weight on the social and environmental credentials of products they buy. Rapid change is inevitable as the UK acts to achieve net zero greenhouse gas emissions by 2050 and while challenging for the industry it could be beneficial too. Production processes that emit less carbon often use less energy, so while improving the environmental impact costs can be cut too.

History shows those who are proactive in planning and adopting innovations will hold a competitive advantage.

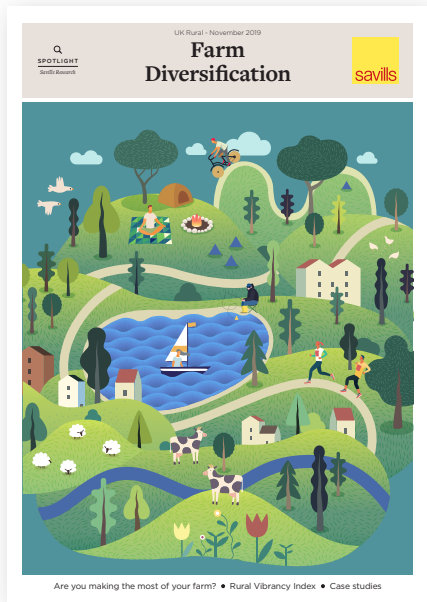
“Today’s consumers and indeed the consumers of tomorrow will place more weight on the social or environmental credentials of products when deciding what to buy”



Beef and sheep meat consumption forecast to 2020-2025



Source OECD



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