Economic impact of the English red meat sector

Report to AHDB by Pareto Consulting

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Executive summary

Red meat is a key element of England's agri-food sector, encompassing on-farm production (mostly, but not exclusively, on specialist farms), plus upstream suppliers (e.g. animal feed, fertiliser, veterinary services) and downstream processing (e.g. slaughtering, food manufacturing, butchers).

On-farm production of beef cattle, pigs and sheep had an estimated value of *c.*£5 billion in 2023, representing *c.*19% of total agricultural output in England. Its estimated gross value added (GVA) was *c.*£1.8bn, with associated farm labour amounting to an estimated *c.*56K standard labour requirements (SLRs). Upstream suppliers plus downstream meat processing and butchers add to these figures, raising the estimated overall output of the English red meat sector to *c.*£20.5bn and overall GVA to *c.*£5.5bn. Estimated overall employment of *c.*120K generates *c.*£2.5bn of labour income, which will recirculate through the economy to generate further activity and employment.

However, breeding livestock numbers of red meat species are at, or close to, their lowest level since 1973 when the UK joined (what later became) the European Union. This decline reflects various factors, including market volatility, changes to the nature of agricultural support and an increasing emphasis on issues such as climate change and biodiversity alongside food production. Red meat farm incomes are low, with the average livestock farm losing money from farming operations in 2023/24.

Projected further reductions in livestock numbers have implications for upstream and downstream activities, with industry stakeholders increasingly concerned about the loss of critical mass. Once critical mass thresholds are breached, parts of local supply chains withdraw and the viability of remaining parts becomes compromised, leading to a potential domino effect as supply chains reconfigure and production relocates (including abroad, which shifts the location of carbon emissions, as well as jobs and income).

While economic growth rests upon increasing productivity and the reallocation of resources over time, abrupt reconfiguration of red meat supply chains would inevitably lead to local disruption of employment and livelihoods. Moreover, pressure will be felt more acutely in rural areas, where agriculture and allied industries are relatively more important. In addition, knock-on effects for landscapes and semi-natural habitats, cultural and culinary heritage and food sovereignty/security are likely.

Global demand for animal proteins is projected to increase, presenting opportunities but also further challenges from increasing competition in both domestic and export markets. Industry responses to this may include attempts to further improve productivity across the supply chain through consolidation, sharing information and promoting the adoption of best practice in relation to, for example, biosecurity, breeding and feed management. Equally, a market orientation focus on consumer preferences may help, including in relation to product provenance and process attributes (e.g. animal welfare, organic, halal). However, government policy clearly has a role to play in terms of support for farming but also in relation to emissions targets, food-based dietary guidance, border biosecurity, trade deals and labour markets.

The estimated values presented in this report are subject to various caveats. As such, they should be treated as indicative of patterns and relative magnitudes rather than definitive estimates. For example, published data sources are sometimes inconsistent and lack sufficient detail to fully represent all the nuances of supply chains. Moreover, due to data limitations, the totals are lower-bound estimates since they do not include further downstream elements of the supply chain, such as wider food retailing and catering. Nonetheless, the analysis illustrates the economic contribution of the red meat sector in England and highlights opportunities and challenges faced.

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Economic evaluation of the red meat supply chain in England

This report presents indicative estimates of the economic size of the red meat sector in England, in terms of its physical configuration, production output, gross value added (GVA), employment and labour income. The estimates are based on the best available information and help to describe the scale and reach of the sector.

The complexity of the red meat supply chain is illustrated stylistically in Figure 1 below. It encompasses on-farm production of cattle, pigs and sheep (dark blue boxes) but also the upstream provision of farming inputs (green boxes) and downstream processing (light blue boxes) of farm outputs, plus the logistics of livestock movements (orange box and arrows) across the supply chain; for example, supplies of animal feed and fertilisers, primary and secondary meat cutting plants, specialist livestock haulage and auction services, food manufacturing and independent butchers.

Beyond such core activities, important linkages also extend to imports and exports, wholesaling and other retail/foodservice and fifth quarter uses (white boxes). In addition, there is a broader background ecosystem containing more generic suppliers, including energy and fuel providers, other utilities and finance and legal services. The primary focus here is on the core supply chain elements.

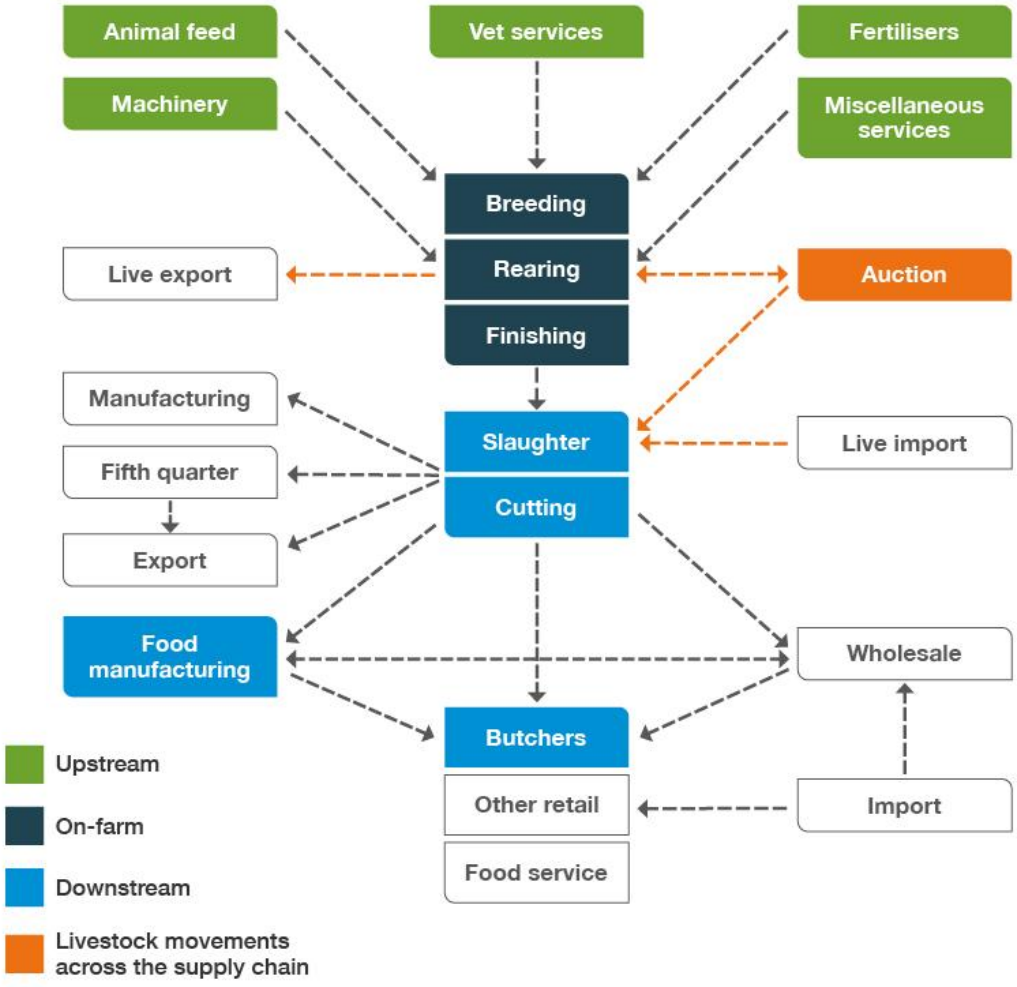

Figure 1. Stylised representation of the red meat supply chain[1]

Assessment of the red meat sector's economic scale and reach requires information on the number and size of firms operating within it, plus information on labour usage and cost structures. Moreover, account must also be taken of the varying degree to which firms are engaged in other supply chains. For example, livestock farms may produce arable and dairy outputs as well as red meat; fertiliser and feed suppliers may sell to multiple types of farms; and vets may have non-farm customers.

A number of official statistical publications and supporting databases contain relevant information. In particular, insights into on-farm production are available via Defra's June Agricultural Survey (JAS) and associated underlying data used for total income from farming (TIFF) calculations. These sources are helpfully accompanied by information on production costs compiled from the annual Farm Business Survey (FAS), with other industry benchmarking data also available.

Separately, some information on broader supply chain linkages (albeit, mostly for the UK or GB, rather than England) is available from the national input-output tables published by the Office for National Statistics (ONS) and related surveys (albeit that results require some disaggregation and are not necessarily directly comparable or consistent with Defra statistics). In addition, industry stakeholders themselves have a good understanding of the sector and can provide valuable sense-checking of official statistics.

All of the above cited sources were used to compile the estimates presented in this report and represent the best available information. However, attempting to construct broadly comparable estimates across the whole supply chain entails recourse to various assumptions and the results should be viewed as indicative. In particular, data is generally only available at an aggregate level and activities attributable to red meat must be disentangled from other on-farm enterprises (e.g. dairy, poultry, arable) but also from other supply chains (e.g. pets, aquaculture). Moreover, accounting for imports and exports to and from England alone is difficult, given movements of livestock and products within the UK as well as to and from the UK. Hence, the findings presented here should be treated as indicative approximations of patterns and relative magnitudes rather than precise values. Nonetheless, the figures are adequate to illustrate the economic structure and contribution of England's red meat sector.

Section 1 focuses on livestock numbers and their distribution across different farm types and regions of England. Section 2 explores how physical production translates into economic output and value added at the farm level, with Section 3 then considering the wider supply chain. Section 4 extends the analysis to consider employment. Section 5 considers some broader economic values arising from red meat production. Section 6 offers some more qualitative commentary on the challenges and opportunities facing the sector, as identified by stakeholders involved in sense-checking the economic estimates. Section 7 provides a concluding summary. Annexes A and B offer some additional material.

[1] Evolved by authors from Thankappan & Flynn (2006). Exploring the UK Red Meat Supply Chain. Working Paper from Cardiff University Centre for Business Relationships, Accountability, Sustainability & Society.

Section 1: Livestock numbers

Red meat livestock – beef cattle, pigs and sheep – have long been an integral component of agriculture in England and are present on over half of all farm holdings. Over 33,000 holdings have cattle, over 36,000 have sheep and nearly 7,000 have pigs[2]. However, numbers of breeding animals are currently at, or close to, their lowest levels since accession in 1973 to what later became the European Union (Figure 2 and Table 1). This reflects a combination of factors, including evolving agricultural policies (some example events are marked), changing patterns of international trade and challenging market conditions.

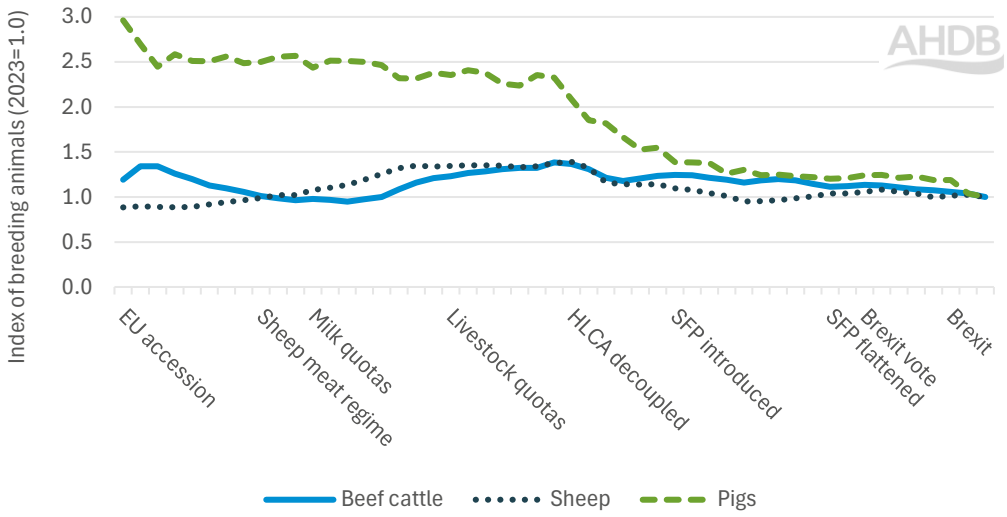

Figure 2. Breeding livestock numbers in England relative to current position, with selected events[3]

Table 1. Breeding beef cattle, pig and sheep numbers in England and percentage change, 2015–2024[4]

Year	Beef cattle	Pigs	Sheep
2015	712,552	412,845	7,056,577
2016	721,158	416,715	7,113,887
2017	721,383	416,181	7,385,191
2018	711,692	408,106	7,382,613
2019	698,586	409,882	7,233,785
2020	688,292	404,788	6,977,348
2021	665,336	402,600	6,873,017
2022	650,836	328,553	7,071,821
2023	627,101	329,015	6,955,500
2024	595,157	325,859	6,567,035
2015–2024	-16.5%	-21.1%	-6.9%

Other parts of the UK have also experienced downward trends in livestock numbers (with the exception of rising pig numbers in Northern Ireland), although the rates of change differ (Table 2).

Table 2. Percentage changes in breeding animal numbers by UK nation, 2015–2024[5]

Country	Beef cattle	Pigs	Sheep
England	-16.5%	-21.1%	-6.9%
Northern Ireland	-13.2%	+8.1%	-0.9%
Scotland	-12.4%	-7.6%	-8.8%
Wales	-15.6%	-45.4%	-7.5%

Regional distribution

Regional agricultural statistics within England are routinely reported for the areas shown in Figure 3 and these are used here for convenience, with full names abbreviated to their leading letters in tables and figures (e.g. NE for the North East, EM for the East Midlands, etc.).

Figure 3. Map of agricultural regions in England[6]

As shown in Figure 4, the South West has the highest share of beef animals (both breeding and other), while the East of England has the lowest share. Similarly, the North West and South West have the highest shares of sheep (both breeding and other), while the East of England has the lowest share. Conversely, the East of England plus Yorkshire and Humberside have the highest shares of pigs (both breeding and other), while the West Midlands has the smallest share.

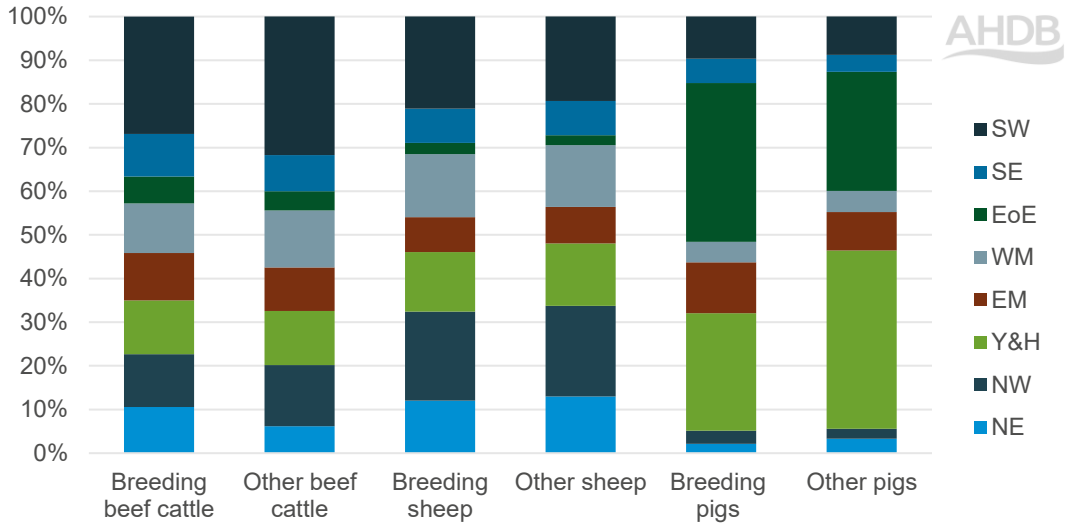

Figure 4. Regional distribution of breeding and non-breeding animals across England, 2023[7]

Farm type distribution

Figures 5 to 7 provide further detail on this specialisation, presenting the numbers of breeding and non-breeding red meat animals by region, but also by farm type. This shows the high proportion of each species on specialist farms, predominantly Less Favoured Area (LFA) and lowland grazing for beef cattle and sheep, plus specialist pig farms for pigs, but also dairy farms for non-breeding beef cattle and mixed farms for non-breeding pigs. The latter reflects on-farm production of pig feed, while dairy beef is an increasingly important contributor to overall beef production as suckler cow numbers decline and dairying artificial insemination practices have evolved to purposively produce beef animals. Sheep are present across a wider variety of farm types but still predominantly on specialist grazing farms.

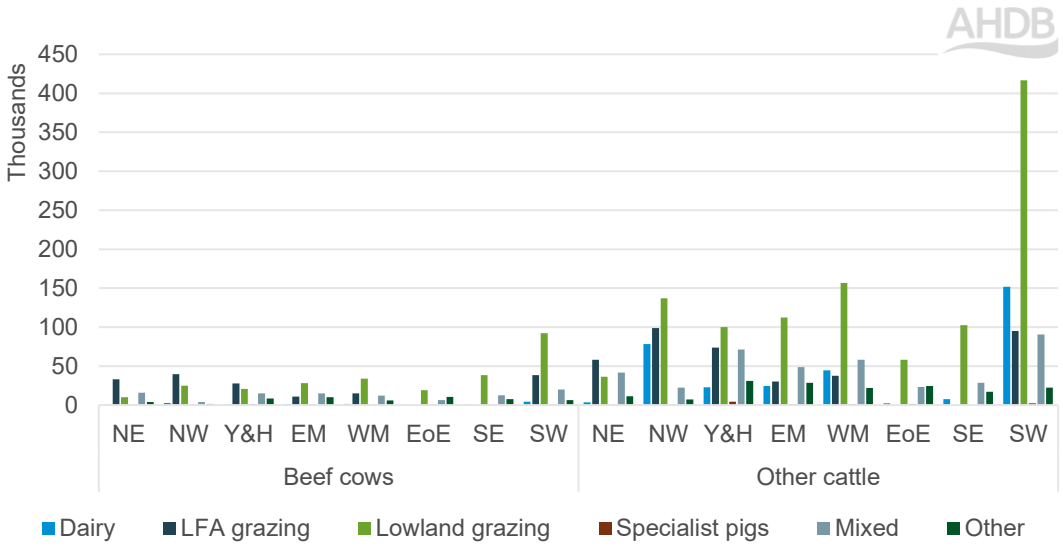

Figure 5. Distribution of beef cows and other beef cattle, by region and farm type in England, 2023[8]

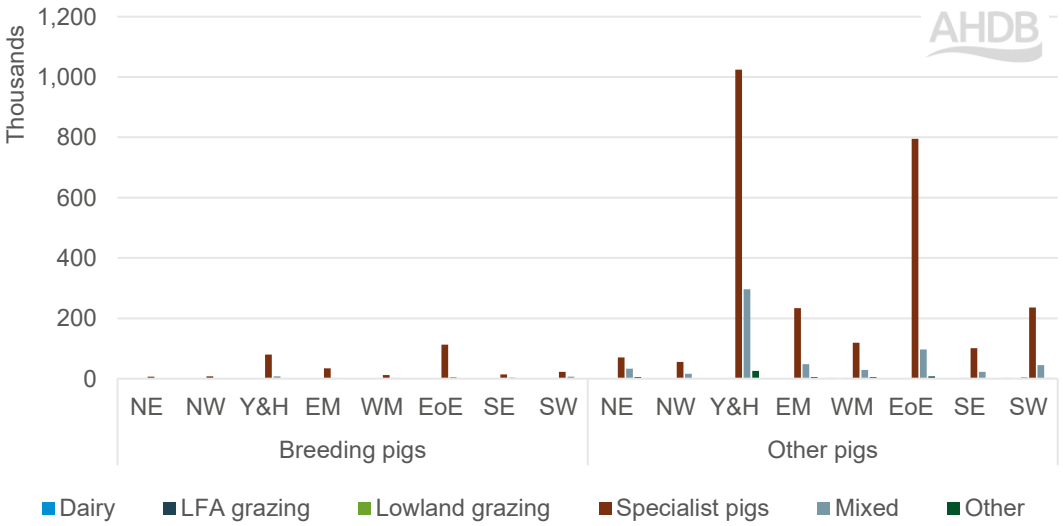

Figure 6. Distribution of breeding pigs and other pigs, by region and farm type in England, 2023[9]

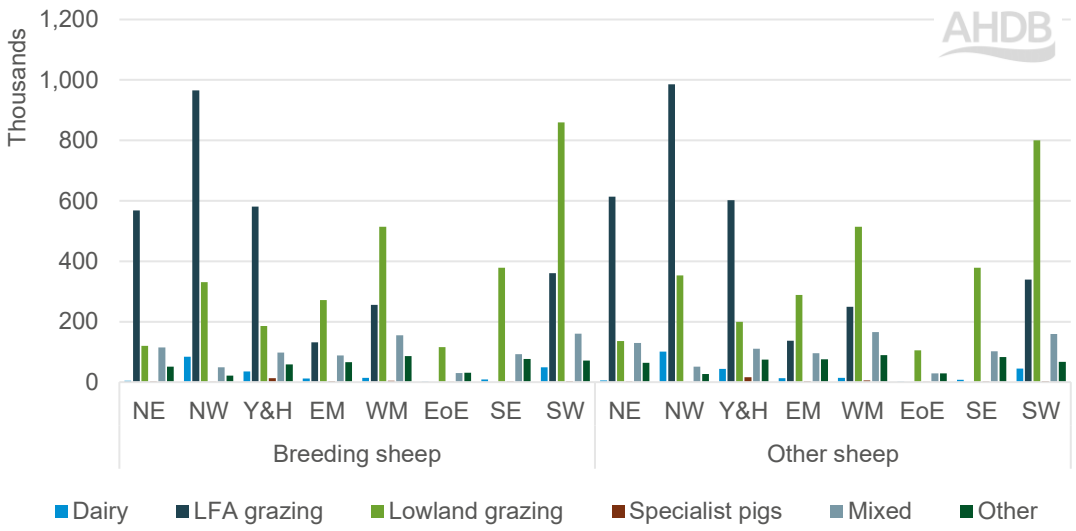

Figure 7. Distribution of breeding sheep and other sheep, by region and farm type in England, 2023[10]

The geographical patterns apparent in Figures 4 to 7 largely reflect underlying biophysical conditions driving regional specialisation. For example, prevailing weather conditions and land capabilities favour livestock grazing in the west and arable production in the east, with the latter providing a ready source of feed for pig production.

However, over time, increasing on-farm specialisation has also shaped local supply chains, which can then self-reinforce regional differences. For example, ruminant production in the east typically has less ready access to veterinary services and abattoirs compared with in the west. Equally, arable production in the west may have less ready access to agronomy services and grain mills than in the east. Consequently, current policy and market signals (including restrictions on nitrogen and phosphorus applications) to encourage the type of more mixed regional farming systems seen historically probably need to be accompanied by a reconfiguration of regional supply chains to recover local critical mass.

Size distribution

The size distribution of breeding herds and flocks is also somewhat uneven, with the majority of herds and flocks being small, but collectively only accounting for a low proportion of total animals, in contrast to the relatively few larger herds (particularly for pigs) and flocks which account for the majority of animals (Figure 8). For example, around 62% of beef breeding herds collectively account for only 20% of beef cows, 67% of sheep flocks account for around 20% of ewes, and around 90% of pig herds account for 20% of sows.

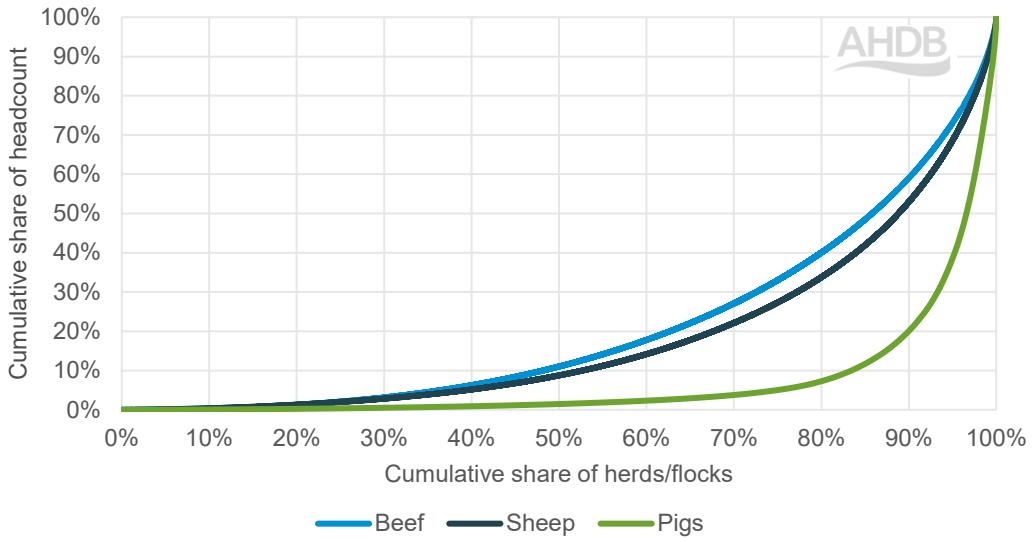

Figure 8. Cumulative distribution of breeding animals against cumulative distribution of herds/flocks, 2023[11]

Summary

Red meat production occurs on around half of all farm holdings across England. However, the number of red meat livestock has declined over time. There is a degree of regional and farm type specialisation, with beef and sheep being concentrated in the west and on livestock grazing farms, plus dairy farms, while pig production is concentrated on specialist pig farms and mixed farms in the east. Herd and flock sizes vary considerably, with smaller units being numerically more common but accounting for a smaller proportion of total livestock than the less numerous but bigger units.

[2] Derived from **https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june**. Totals for each species cannot be summed since some farms have more than one species present, but predominant livestock farm types total to around 54% of all holdings, with around 42% being specialist red meat producers.

[3] Derived from 1973 to 1983 values taken from UK Government's Annual Review of Agriculture (various years), accessed via the National Library of Scotland, plus 1984 onwards values taken from successive issues of Agriculture in the UK data, available under Chapter 2 Structure of Industry: **https://www.gov.uk/government/statistical-data-sets/agriculture-in-the-united-kingdom**

[4] Derived from **https://www.gov.uk/government/statistics/livestock-populations-in-england**

[5] **https://www.gov.uk/government/statistics/livestock-populations-in-the-united-kingdom**

[6] Official International Territorial Level (ITL1) regions, previously termed NUTS1 regions. Map source: **https://www.gov.uk/government/statistics/agricultural-facts-england-regional-profiles/agricultural-facts-summary**

[7] Derived from English geographical breakdowns by region in **https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june**

[8] Derived from June Agricultural Survey data provided by Defra

[9] Derived from June Agricultural Survey data provided by Defra

[10] Derived from June Agricultural Survey data provided by Defra

[11] Derived from June Agricultural Survey data provided by Defra

Section 2: Agricultural output and value added

Livestock numbers are physical measures of production activity but need to be combined with prices to generate output values. Table 3 summarises these for England over the past ten years, expressed in real terms using 2023 prices.

Table 3. Real-terms output values (£bn, 2023 prices) and share of agricultural output (%) in England[12]

Year	Beef		Pigs		Sheep		Red meat	
	Value (£bn)	Share (%)	Value (£bn)	Share (%)	Value (£bn)	Share (%)	Value (£bn)	Share (%)
2014	2.2	9.4	1.3	5.4	1.1	4.6	4.6	19.3
2015	2.1	9.6	1.1	4.9	1.1	4.9	4.3	19.4
2016	2.1	9.9	1.1	5.2	1.0	4.9	4.2	20.0
2017	2.2	9.5	1.3	5.5	1.0	4.4	4.5	19.5
2018	2.1	9.2	1.1	4.9	1.0	4.2	4.3	18.3
2019	1.9	8.2	1.2	5.1	1.1	4.4	4.2	17.7
2020	2.0	9.2	1.2	5.7	1.1	5.1	4.3	19.9
2021	2.2	9.0	1.2	4.9	1.4	5.5	4.8	19.5
2022	2.4	8.6	1.4	5.0	1.4	4.9	5.1	18.5
2023	2.3	9.4	1.4	5.8	1.0	4.0	4.8	19.1

Despite the declining breeding animal numbers shown in Figure 2 and Table 1, the estimated red meat output value of £4.8bn in 2023 was very similar to the 2014 value of £4.6bn. Moreover, the same is true for the individual animal species, as shown in Figure 9.

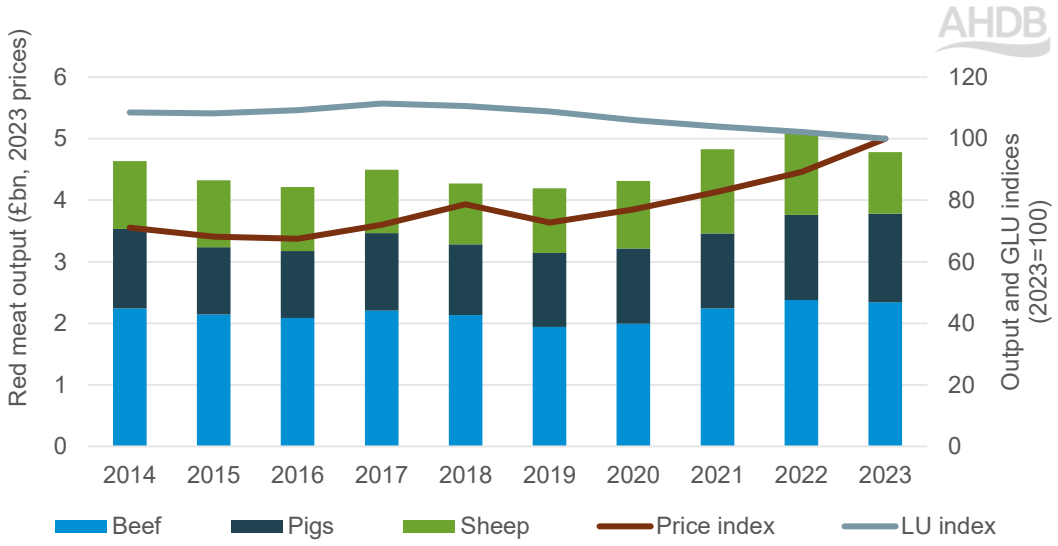

Figure 9. Red meat output per species and indices of red meat prices and total livestock, 2015–2023[13]

Table 3 also shows that the estimated share of red meat production in total agricultural output has, with some year-on-year fluctuations, remained at around 19%. Within this, beef output consistently represents almost 50% of sectoral output value, with pig and sheep output fluctuating around 25% each (albeit, pig output being more often slightly higher than sheep output). Year-on-year fluctuations in sectoral shares partly reflect variation in red meat livestock prices and carcase weights but also that output from other parts of agriculture varies, for example in relation to yields and prices in the arable, dairy and poultry sectors.[14] That is, red meat output as a numerator varies, but so does the total agricultural output denominator.

As Figure 9 shows, the decline in red meat grazing livestock units[15] has coincided with significant price increases. These will have contributed to the maintenance of output values as breeding numbers have declined, but so too will productivity improvements through better management.[16]

Echoing the geographical patterns illustrated by Figures 5 to 7, Figure 10 shows regional variation in the value and composition of red meat output, together with its share of total agricultural output. Regional output is highest in the South West (principally because of beef, some of which will come from dairy herds) and in Yorkshire and Humberside (principally from pigs).

However, agricultural output from other sources (notably dairying and cropping, respectively) is also high in these regions. Consequently, lower aggregate red meat output is proportionately more important in the North East and the North West, where other agricultural output is also lower.

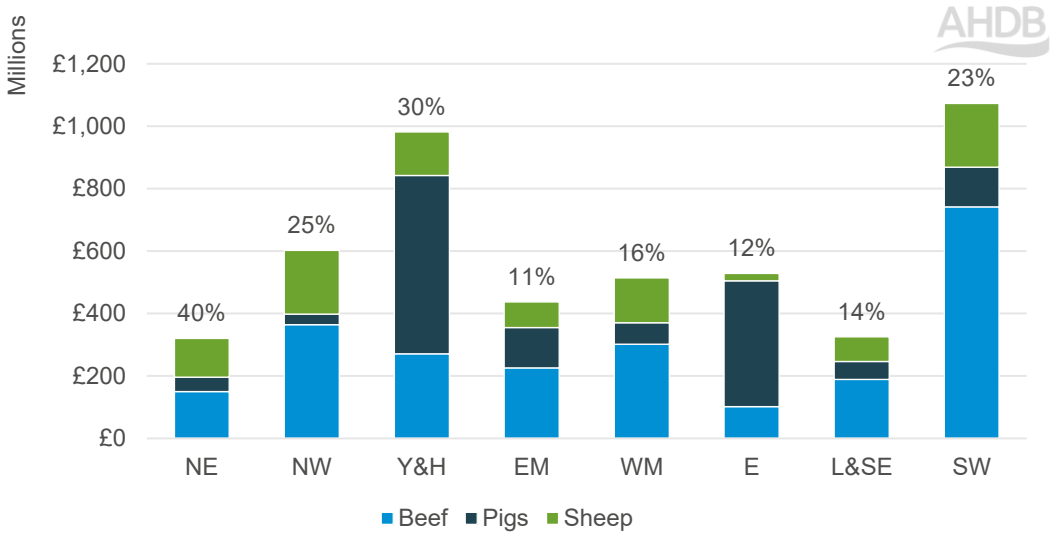

Figure 10. Red meat output value (£m) and share (% total regional agricultural output), by species and region, 2023[17]

Estimating gross value added

Although output levels are of interest, the act of production incurs costs, which must be deducted to determine value added. For example, the consumption of intermediate inputs such as animal feed, energy and veterinary services must be accounted for in order to estimate gross value added (GVA). Once such costs are considered, total agricultural output (i.e. red meat plus all other farming sectors) across England in 2023 of *c.*£25bn translated into GVA of *c.*£10bn.[18]

Unfortunately, although red meat output is identified separately within published statistics, the costs (and therefore estimated value added) associated with red meat production are not. This reflects the way that costs are recorded and reported on a whole-farm basis rather than commodity or enterprise basis, meaning that they are not allocated to specific production activities.

Estimation of GVA for red meat, therefore, requires some additional information and assumptions to suggest how costs might be distributed plausibly across different on-farm production activities. While this is possible using the best available information, the process unavoidably introduces additional uncertainty and, hence, results need to be viewed as only indicative approximations.

Table 4 presents such indicative approximations of regional GVA for on-farm red meat production in England in 2023, totalling *c.*£1.8bn.[19] The pattern broadly follows that for output, with GVA being highest in the South West plus Yorkshire and Humberside, but proportionately more important to the North East and North West. As would be expected given the relatively low profitability of many livestock systems, red meat's share of GVA is lower than its share of total agricultural output.

Table 4. Estimated on-farm red meat output and GVA (£m) in England, 2023, by region plus share of regional total agricultural GVA[20]

	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng
Output (£m)	321	602	981	437	514	529	325	1,073	4,782
Inputs (£m)	195	360	644	273	312	358	199	650	2,990
GVA (£m)	126	242	337	164	202	171	126	423	1,792
GVA%	15.7	9.9	10.3	4.2	6.5	3.9	5.3	9.0	7.2

Summary

To summarise, on-farm red meat output has fluctuated over time as both prices and physical production levels have varied. Nonetheless, despite declining breeding animal numbers, its share of agricultural output remains significant, at 19% nationally and between 11% and 40% regionally. GVA is lower because of expenditure on inputs, and its relative importance also varies regionally. The next section extends value analysis to upstream and downstream portions of the supply chain.

[12] Derived from https://www.gov.uk/government/statistics/total-income-from-farming-in-england and Table 1 above and https://www.gov.uk/government/statistics/agricultural-price-indices. Whereas Defra reports livestock capital formation separately, it has been included here within individual species outputs since the store trade is an integral component of beef and sheep production.

[13] Derived from June Agricultural Survey data provided by Defra.

[14] It should also be noted that total agricultural output includes some agri-environmental and diversification activities, amounting to £2.7bn or 11%. Stripping these out or attempting to include them where produced alongside red meat would inflate the calculated value share of red meat reported in Table 3.

[15] Species headcounts in Table 1 have been converted to equivalent grazing livestock units (GLU) using average coefficients published here: **https://assets.publishing.service.gov.uk/media/5a80f39ce5274a2e87dbcbd9/fbs-definintions-4oct16.pdf**

[16] For example, see rise in estimated total factor productivity for English agriculture over period 2014 to 2023 **https://oifdata.defra.gov.uk/themes/natural-resources/E4/**

[17] Derived from **https://www.gov.uk/government/statistics/total-income-from-farming-for-the-regions-of-england**

[18] **https://www.gov.uk/government/statistics/total-income-from-farming-in-england/total-income-from-farming-in-england-in-2023#section-2-outputs-and-subsidies**

[19] Judging the accuracy of this estimate is difficult in the absence of a relevant published benchmark. However, the methodology also generated an estimate of £9.8bn for total agricultural GVA, which is similar to the published total of £10bn.

[20] Published Farm Accounts Survey data on Gross Margins (GM) **https://assets.publishing.service.gov.uk/media/675ff0281857548bccbcfa13/fbs_farmaccountsengland_table6_and_7_2023_24.ods** allow calculation of GM:output ratios by farm type that can be applied to the regional JAS data provided by Defra. This allows total published GVA and NVA to be apportioned pro rata according to each farm type's relative importance to red meat production in each region.

Section 3: Wider output and value added

The preceding sections considered only on-farm production, drawing on relatively detailed information available from the June Agricultural Survey, the Farm Business Survey and total income from farming calculations. However, none of these extend beyond the farmgate. Yet Figure 1 highlighted the extent of both upstream and downstream elements of red meat supply chains, where output and added value will also be generated.

Upstream inputs and services

Table 4 suggests that farms producing red meat livestock spend *c.*£3.0bn on upstream goods and services. Some of this will be from other farms – for example, purchases of young livestock for finishing, hay, silage and straw and some contracting services. However, much will be from non-farm firms – for example, suppliers of feed, fertiliser, other agro-chemicals and machinery, plus services from agricultural engineers, vets, hauliers and auction marts. Other, non-core but still essential suppliers include water and energy utilities, legal and accountancy firms and research institutions.

Estimating the number of individual upstream suppliers is challenging since many operate across other supply chains and double counting is difficult to avoid. For example, feed suppliers may also sell into aquaculture and poultry production, vets may also handle companion animals, and hauliers may serve multiple sectors.[21]

However, while individual firms may not be easily enumerated, it is possible to use economic multiplier coefficients derived from input-output (IO) tables to estimate the aggregate value of output and added value generated by firms supplying red meat farms.[22] Conveniently, recent research for Defra disaggregated the UK-level ONS IO tables to provide country-specific Type I multipliers for different subsectors of agriculture.[23] Applying these multiplier coefficients to Table 4 produces the results shown in Table 5 for estimated upstream output and GVA.

Table 5. Estimated upstream red meat output and GVA (£m) generated by firms supplying farms, by region[24]

	NE	NW	Y&H	EM	WM	E	SE	SW	Eng
Output (£m)	201	362	703	284	317	399	203	649	3,118
GVA (£m)	80	147	208	110	127	111	80	261	1,104

Upstream output reflects inputs supplied by firms to farms for on-farm red meat production, with the estimated national total reassuringly similar to the estimated national farm expenditure in Table 4.[25]

Table 5 also presents an estimate of the GVA associated with direct interactions between farms and upstream suppliers. The GVA figures are lower than output estimates since upstream suppliers incur costs in their own production activities. Nevertheless, the GVA generated still amounts to *c.*£1.1bn, in addition to the estimated on-farm GVA of £1.8bn.

The regional values presented in Table 5 need to be interpreted with care since they represent the upstream values generated by suppliers in a given region, but suppliers may be located in a different region to the farms they support. That is, supply chains can span administrative boundaries. The national total will be more robust, but it too will not necessarily relate solely to England, given that farms may source supplies from across national boundaries too; for example, especially if close to the border with Scotland or Wales.

The estimates presented in Table 5 also incur some other strong assumptions and build upon estimates in Table 4, which themselves embody some uncertainties. For example, potential variation in multiplier coefficients across regions, farm types and farm sizes is not catered for, nor the possibility that linkage relationships are not linear. Equally, errors in the farm-level estimates will propagate upstream. As such, the results should be viewed as indicative of relative magnitudes and patterns rather than offering precise estimates.

Downstream meat processing

Downstream users of farm output also generate further output and GVA. For example, although a small volume will be exported live, meat processing is the principal outlet for livestock. Indeed, there were 147 red meat abattoirs in England in 2023, of which 121 handled cattle, 84 pigs and 116 sheep.[26] Within this, larger abattoirs accounted for the majority of throughput (Figure 11).[27]

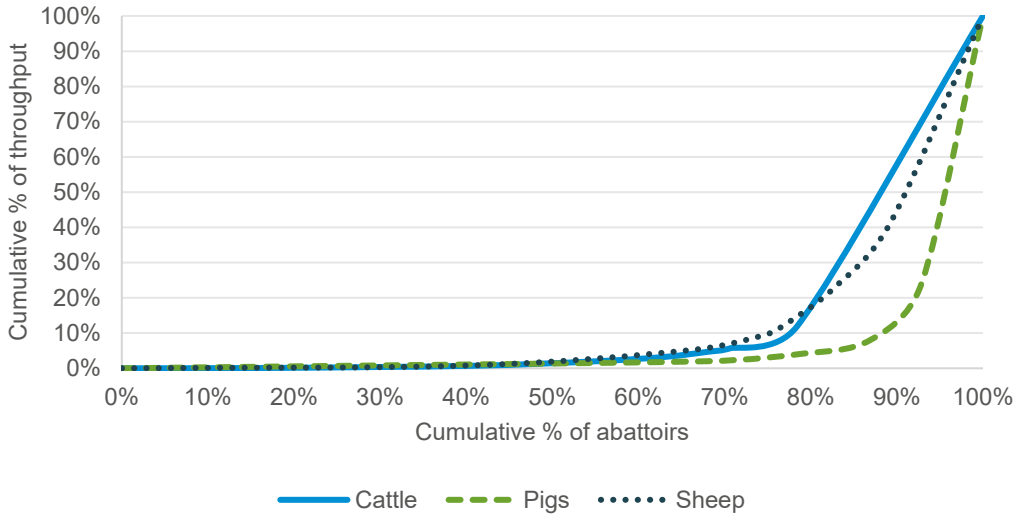

Figure 11. Cumulative distribution (%) of throughput against cumulative distribution (%) of abattoirs, 2023[28]

Estimated throughput of these English abattoirs in 2023 was approximately 1.7m cattle, 8.2m pigs and 10m sheep. This represented almost 1.5bn tonnes of dressed carcases from home-grown livestock, with an estimated deadweight value of almost £5bn (Table 6). Within this, pig meat accounts for the highest share of volume, but beef and veal the highest share of value.[29] It is worth noting here that a proportion of animals being slaughtered in England are sourced directly or indirectly (i.e. they spend time being finished in England) from Wales and Scotland. Some English animals are also slaughtered elsewhere.

Table 6. Deadweight volume (kt) and value (£m) of domestic red meat purchased by abattoirs, 2023[30]

Sector	Abattoirs in England				Abattoirs in Great Britain			
	Volume (kt)	% kt	Value (£m)	% £m	Volume (kt)	% kt	Value (£m)	% £m
Beef and veal	535	36.1	2,311	46.5	735	41.4	3,176	50.7
Pig meat	736	49.6	1,524	30.6	755	42.5	1,564	25.0
Mutton and lamb	210	14.2	1,121	22.5	286	16.1	1,528	24.4
Total	**1,481**	**100**	**4,974**	**100**	**1,776**	**100.0**	**6,268**	**100**

This deadweight carcase value represents a core component of input expenditure to the primary meat processing sector, which includes the slaughter of live animals but then also splitting and cutting carcases into, for example, quarters or primal cuts and the generation of fifth-quarter products such as offal and skins. While a high proportion of carcase meat is converted into fresh and frozen forms for retailing and food catering, some is subject to secondary processing into manufactured food products such as mince, pies and cured meats.

Estimates of outputs and GVA from primary and secondary processing are reported by the ONS Annual Business Survey (ABS) at the UK level.[31] However, while primary red meat processing is reported separately from primary poultry processing, secondary processing into manufactured food products is not. Consequently, the estimates presented for secondary processing in Tables 7 and 8 below are somewhat speculative, based on assumptions about the proportion of secondary processing relating to red meat rather than poultry products. For simplicity, it is assumed here that half of the total meat product manufacturing value is related to red meat.[32]

Tables 7 and 8 also present estimates for output and GVA associated with specialist meat retailers. These are primarily independent butchers, buying carcases (whole or part processed) for on-site conversion into joints, cured meats and pies, for example. As such, albeit reported separately, they are a more directly consumer-facing part of the secondary processing. However, again, ABS reporting does not separate red meat from poultry (or indeed wild game), and hence the estimates presented are less reliable than the primary processing figures. For simplicity, it is assumed here that all butchers' output, GVA and employment are related to red meat.[33]

Table 7. Estimated core downstream red meat output (£m), by region, 2022[34]

Sector	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng
Abattoirs (£m)	66	680	2,476	741	1,299	1,289	269	624	7,443
Manufacturing (£m)	40	377	814	460	271	349	228	201	2,740
Butchers (£m)	78	382	345	160	291	218	549	349	2,371
Total (£m)	184	1439	3,635	1,361	1,861	1,856	1,046	1,174	12,554

Table 8. Estimated core downstream red meat GVA (£m), by region, 2022[35]

Sector	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng
Abattoirs (£m)	11	108	394	118	207	205	43	99	1,185
Manufacturing (£m)	12	110	238	135	79	102	67	59	803
Butchers (£m)	21	101	91	42	77	58	145	92	626
Total (£m)	44	319	723	295	363	365	255	250	2,614

The estimated downstream output generated from red meat is *c.*£12.6bn and GVA is *c.*£2.6bn. The latter adds to the upstream GVA of *c.*£1.1bn and on-farm GVA of *c.*£1.8bn to suggest total red meat GVA of *c.*£5.5bn. As shown in Table 9, this represents *c.*0.3% of total GVA for England, although is higher than this in all regions outside London and the South East, most notably in Yorkshire and Humberside (see Figure 12).[36] While a proportion of suppliers and processors are located in rural areas, many are actually in peri-urban locations, reflecting the importance of transport links and labour availability.

Regional values should again be interpreted with care since they relate to the estimated additional output and value added where the downstream activity is located, rather than where the livestock were produced (Annexe B shows the distribution of calf registrations, calving cows, heifers, prime slaughterings and cull cow slaughterings by region – highlighting, for example, higher prime kill in Yorkshire and Humber than locally reared animals). Similarly, a proportion of English abattoirs' throughput originates from beyond England[37] and estimated values (*c.*£721m) for these have been added to the national totals, but the regional processing locations generating it within England are unknown.

Table 9. Estimated total red meat GVA (£bn) and share of total regional GVA, by region, 2022[38]

Sector	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng
Red meat GVA (£bn)	0.25	0.71	1.30	0.57	0.69	0.66	0.46	0.93	5.5
% Total regional GVA	0.4	0.3	0.9	0.4	0.4	0.4	0.1	0.5	0.3

Potentially, consideration could also be extended to other downstream activities. For example, smaller proportions of carcase plus fifth-quarter outputs pass to other sectors, including wider food manufacturing, pet foods and even electronics. However, red meat is a smaller element of such sectors' input expenditure and attributing a specific fraction of their overall activity levels, GVA or employment to domestic red meat linkages is somewhat tenuous.[39]

Similarly, while food-catering services and multiple retailers represent the dominant consumer market outlets for meat products in the UK, red meat represents only a small fraction of the total products and services offered. For example, meat processing output (including poultry) represents *c.*6% of food catering's input expenditure and meat (including poultry) sales account for *c.*5–7% of multiple-retailers' turnover.[40] Consequently, attributing a specific fraction of overall output, GVA or employment in such sectors to red meat alone requires strong assumptions and risks exaggerated overclaiming of the unique influence of red meat on more distant downstream activities. Moreover, the overall magnitude of retailing and catering would outweigh core red meat elements, skewing the presentation of results.

For this reason, downstream attention is confined to primary and secondary processing plus butchers, albeit that this necessarily means that values presented are lower-bound estimates.

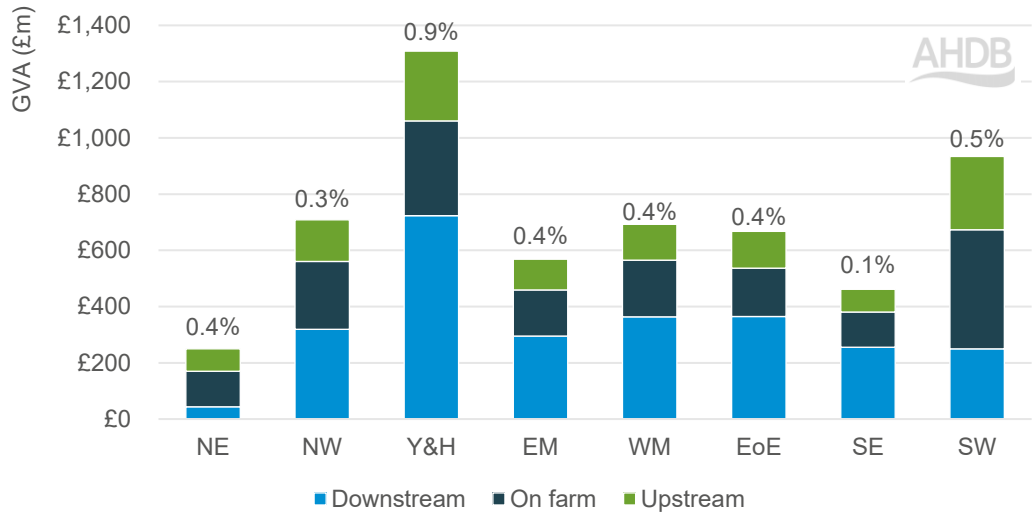

Figure 12. Indicative GVA (£m) for red meat sector by region in England and share (%) of regional GVA, 2023

Summary

Upstream and downstream linkages to on-farm red meat production represent additional economic activity that generates further output and, more importantly, GVA. Estimation of this is challenging, but indicative values suggest that on-farm GVA of £1.8bn is matched by a further £3.7bn off farm, raising total GVA for the sector to £5.5bn (excluding food catering and retailing). The next section considers employment associated with these estimated output and GVA figures.

[21] Nonetheless, industry sources suggest that there are 72 livestock auction marts, plus 387 certified livestock hauliers, 243 certified animal feed manufacturers and 143 certified fertiliser merchants in England.

[22] IO tables and multiplier coefficients are estimated from Annual Business Survey data and attempt to describe structural relationships between different sectors of the economy in terms of which sectors buy and sell to each other **https://www.ons.gov.uk/releases/inputoutputsupplyandusetablesbluebook2024**

[23] Thomson et al. 2024. **Evaluating the significance of agri-supply chains in rural economies: Inter-industry dependency insights from disaggregating UK Input-Output tables. SRUC Report to Defra**

[24] Calculated by multiplying numbers in Table 6 by multiplier coefficients presented by Thomson et al.

[25] The slight (4%) difference may reflect rounding errors in underlying calculations and/or imprecision in the regional allocation of activities and/or some double counting. Estimated farm expenditure on upstream supplies is also similar to the estimate in Thomson et al. of *c.*£2bn, which (adjusted to 2023 prices) is equivalent to *c.*£2.8bn in real terms.

[26] https://ahdb.org.uk/beef-lamb/england-abattoir-numbers and **https://ahdb.org.uk/pork/england-abattoir-numbers**

[27] Ibid

[28] Derived from https://ahdb.org.uk/beef-lamb/england-abattoir-numbers and **https://ahdb.org.uk/pork/england-abattoir-numbers**

[29] Derived from Latest cattle, sheep and pig slaughter statistics – GOV.UK and Chapter 8: Livestock – GOV.UK. The Table 6 value of £4,974m is within 4% of the £4,782m in Table 4, offering some reassurance of internal consistency of calculations.

[30] Derived from Latest cattle, sheep and pig slaughter statistics – GOV.UK and Chapter 8: Livestock – GOV.UK plus Slaughtering of pigs since 2003 – Department of Agriculture, Environment and Rural Affairs and Slaughtering of cattle and sheep since 2001 – Department of Agriculture, Environment and Rural Affairs

[31] Disaggregation to England and to regions within England was undertaken here pro rata on the basis of regional employment in meat processing reported in the ONS Business Register and Employment Survey, accessed via NOMIS. Business Register and Employment Survey (BRES): provisional results 2023, revised results 2022 – Office for National Statistics and Nomis – Official Census and Labour Market Statistics. See also Section 4 of this report.

[32] Quantitative data on the relative share of manufacturers' activity related to red meat vs. poultry meat is not readily available. However, the ONS IO tables and Defra's food consumption data (Family food data sets – GOV.UK) suggest that significant proportions of each of the deadweight totals shown in Table 6 are diverted to meat manufacturing, with poultry accounting for at least 40%. The Economic Impact of the Poultry Meat Industry does not extend its analysis to include secondary processing of poultry meat.

[33] Quantitative data on the relative share of butchers' activity related to red meat vs poultry (or indeed wild game) is not readily available. However, industry stakeholders suggest that red meat dominates. Moreover, stakeholders also suggest that butchers would not exist without domestic red meat supplies. Hence, in the absence of better information, attributing reported totals solely to red meat is an acceptable first approximation, albeit that it will slightly exaggerate results.

[34] Derived from ABS UK-level data, disaggregated to regional level pro rata using employment data.

[35] Ibid.

[36] Derived from regional gross value added (balanced) by industry: all ITL regions – Office for National Statistics

[37] For example, approximately 230K cattle, 1m pigs and 1m lambs are sourced from Scotland and Wales. Source: derived from data provided by AHDB. See also Bevan et al. 2019. An Assessment of the Opportunities to Retain and Increase Sheep and Lamb Processing in Scotland.

[38] Ibid.

[39] For example, the UK IO tables suggest that output from meat processing (including poultry) accounts for *c.*4% of total input expenditure for other food manufacturing (e.g. baked products).

[40] Food catering estimate derived from the ONS IO tables. Multiple-retailer estimate inferred from published Annual Purchasing Survey (APS) and Annual Business Survey (ABS) data, plus pers. comm. AHDB.

Section 4: Employment, GVA/FTE and income

On-farm employment

In terms of on-farm employment, agriculture involves the use of (permanent, seasonal or casual) hired and/or family labour (paid or unpaid), in either a part-time or full-time role. For example, the June Agricultural Survey reports a total workforce headcount of *c.*284K, of whom *c.*160K are part-time or casual. Within this, *c.*59K of *c.*99K workers on specialist red meat farms are part-time.[41]

However, agricultural labour usage is notoriously difficult to estimate due to the prevalence of self-employment and often excessive working hours. In particular, part-time status is a broad category defined as anything below 39 hours a week, which can include workers with very few hours. Equally, given the nature of farm work, full-time is not necessarily only 40 hours. Moreover, even on a specialist red meat farm, not all labour is necessarily devoted to red meat production. These complexities make it challenging to estimate employment related to red meat using published workforce headcount data. For example, although it may be that all farm workers on a farm with any livestock will be involved (however trivially) with livestock at some point over a production cycle, given that many of the herds/flocks are very small and not on specialised holdings, many workers will not be engaged primarily in livestock production. While offering a better guide, restricting attention to only specialist farms may still overestimate the livestock-specific workforce, since even specialist holdings can have non-livestock enterprises (and, indeed, non-farm enterprises) to which some labour is allocated.

An alternative approach to estimating on-farm labour usage for specific enterprises is to use standard labour requirements (SLRs). SLR coefficients represent an estimate of the labour typically required for a given activity and are derived from various sources, including surveys and economic models. Estimated total regional on-farm red meat SLRs are shown in Table 10, with a national total of *c.*56K. This suggests that *c.*30% of total agricultural SLRs are associated with red meat production (higher than the share of output, reflecting the relatively labour-intensive nature of red meat species). These estimates carry a degree of uncertainty, not least since current SLR coefficients are somewhat dated and may not reflect contemporary labour usage.

Table 10. Estimated on-farm SLR (K) associated with on-farm red meat production, by region, 2023[42]

	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng
On farm (K)	4.5	7.6	8.6	5.3	6.7	4.7	4.8	13.4	55.7

Employment beyond the farmgate

Beyond the farm level, labour is also deployed on a range of activities throughout the wider red meat supply chain – for example, upstream in the manufacture of inputs, such as animal feed, pharmaceuticals and chemicals, plus in advisory, haulage and veterinary services, but also in government administration and academic research. Equally, downstream usage of farm outputs creates employment, most notably in the meat processing sector.

Data for downstream employment is available from various ONS publications. As with output and GVA, attention here is restricted to meat processing and butchery rather than more distant elements of the supply chain. Regional figures available via NOMIS from the Business Register and Employment Survey suggest downstream employment of *c.*47K full-time equivalents (FTE) across abattoirs, butchers and manufacturing (Table 11).[43]

Table 11. Estimated labour usage (FTE K) associated with red meat production, by region[44]

	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng
Upstream (K)	1.4	2.3	2.7	1.6	2.0	1.5	1.5	4.0	17.0
On farm (K)	4.5	7.6	8.6	5.3	6.7	4.7	4.8	13.4	55.7
Abattoirs (K)	0.2	1.7	6.1	1.8	3.2	3.2	0.7	1.5	18.3
Butchers (K)	0.5	2.6	2.4	1.1	2.0	1.5	3.8	2.4	16.3
Manufacturing (K)	0.2	1.7	3.7	2.1	1.2	1.6	1.0	0.9	12.4
Total red meat (K)	6.8	15.9	23.5	11.9	15.1	12.5	11.8	22.2	119.7
% Regional labour	0.5	0.4	0.8	0.5	0.5	0.4	0.2	0.7	0.4

Table 11 also shows estimated upstream employment of *c.*17.0K. This was derived by applying employment multipliers presented in Thomson et al. (2024) to the estimated on-farm labour usage shown in Table 10. This approach was preferred to direct recourse to ONS data, given the challenges of having to isolate red meat jobs from related input supplies (e.g. animal feed for dairy and poultry, general maintenance services). Hence, the indicative estimate for total employment across the supply chain as far downstream as meat processing and butchery is *c.*120K. This represents *c.*0.4% of the national workforce but ranges from *c.*0.2% and *c.*0.8% regionally across England (Figure 13). As with GVA, the share of labour locally in rural and peri-urban areas will be higher than in the wider region.

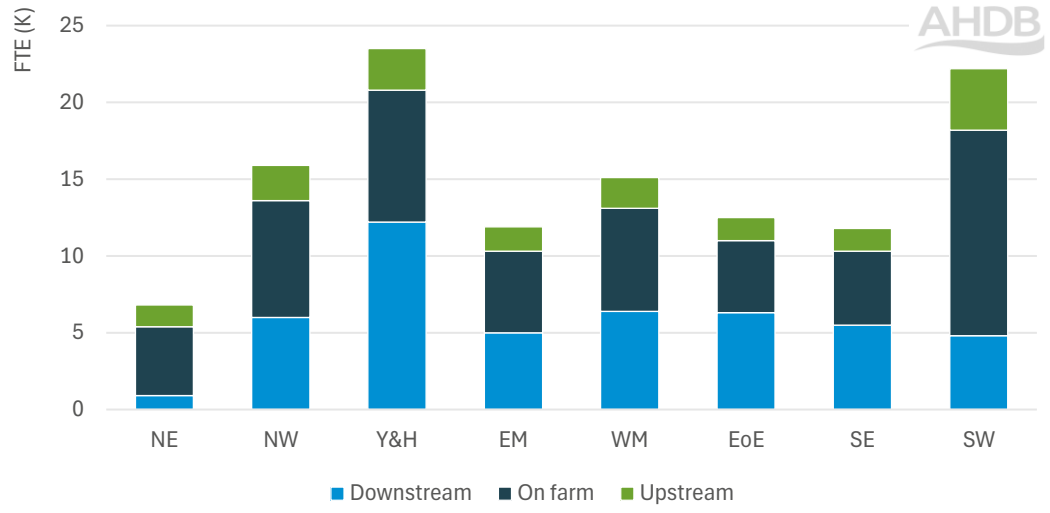

Figure 13. Indicative labour usage (K FTE) for red meat sector and share (%) of regional workforce, 2023[45]

GVA/FTE and income

The regional GVA and workforce estimates presented above can be used to derive approximate GVA/FTE figures per section of the supply chain and per region. Table 12 shows these. Given underlying uncertainties, the figures are again purely indicative but reveal some interesting relativities. For example, estimated GVA/FTE is lowest on farm at *c.*£32K – approximately half the level in meat processing and upstream. Butchery GVA/FTE is also relatively low.

Table 12. Estimated GVA/FTE (£K) per section of red meat supply chain, and estimated mean income/FTE, 2023[46]

	NE	NW	Y&H	EM	WM	EoE	SE	SW	Eng	Income
Upstream (£K)	57.1	63.9	61.9	68.8	63.5	67.3	53.3	65.3	68.6	35.0
On farm (£K)	28.0	31.8	39.2	30.9	30.1	36.4	26.3	31.6	32.2	13.1
Abattoirs (£K)	55.0	63.5	64.6	65.6	64.7	64.1	61.4	66.0	64.8	32.6
Manufacturing (£K)	60.0	64.7	64.3	64.3	65.8	63.8	67.0	65.6	64.7	27.2
Butchers (£K)	42.0	38.8	37.9	38.2	38.5	38.7	38.2	38.3	38.4	19.0

GVA/FTE needs to be sufficient to cover labour costs but also fixed costs. The latter will be relatively high for capital-intensive upstream activities, such as manufacturing feed and fertiliser, and downstream meat processing activities. The low on-farm value highlights pervasive pressures on farm viability.

Average earnings for downstream sectors can be derived directly from the ONS Annual Hours and Earning Survey (ASHE). The same is true for upstream sectors, although some additional assumptions are required.[47] Self-employed earnings are not reported in the same way but have been estimated here from published FBS results for farm business income (FBI). This is not a perfect analogy for employee earnings but is sufficient to indicate approximate relative magnitudes of incomes.

Hence, estimated mean earnings per FTE are shown in the final column of Table 12. These suggest that butchery pays a lower income to workers than meat processing or upstream suppliers. However, again, estimated on-farm incomes per FTE are the lowest. Moreover, this low figure includes public support via the Basic Payment Scheme (BPS) and agri-environmental schemes, which have already changed since 2023. Excluding such payments results, on average, in negative incomes for farm work.

Applying the average income per FTE to the estimated workforce figures presented above suggests that total income to labour across the red meat supply chain is *c.*£2.5bn. This recirculates through the economy, stimulating additional economic activities, GVA and employment beyond the red meat sector.

Summary

To summarise, employment across the red meat sector is estimated to total *c.*120K. This estimate is subject to some uncertainties, particularly with respect to food manufacturing and upstream firms.

Similarly, indicative GVA/FTE estimates can be derived from estimated regional GVA and workforce figures. These highlight the relatively low GVA for on-farm labour, something that carries forward to very low income as well, despite public support payments.

[41] Derived from Agricultural Workforce in the United Kingdom at 1 June – GOV.UK and Structure of the agricultural industry in England and the UK at June – GOV.UK

[42] Derived from regional June Agricultural Survey data on individual land cover areas and livestock headcounts, multiplied by published SLR coefficients – fbs-uk-farmclassification-2014-14mar23.pdf

[43] **Data set Selection – Query – Nomis – Official Census and Labour Market Statistics** – Part-time headcounts converted to full-time equivalents assuming 50% weighting.

[44] Derived from regional June Agricultural Survey data on individual land cover areas and livestock headcounts, multiplied by published SLR coefficients – **fbs-uk-farmclassification-2014-14mar23.pdf**

[45] Regional workforce figures derived from **JOBS05: Workforce jobs by region and industry – Office for National Statistics**

[46] GVA/FTA derived from GVA and employment estimates presented above. Mean income/FTE for upstream and downstream elements estimated from **Earnings and hours worked, industry by four-digit SIC: ASHE Table 16 – Office for National Statistics**; on-farm figures estimated from published FAS data.

[47] For example, in relation to the broad categories of maintenance and support services.

Section 5: Other economic contributions

The preceding sections have described the contribution of red meat production in terms of market output, GVA and employment. However, the economic contribution of agriculture and livestock extends beyond these to include other non-market effects too. For example, as the primary land use in parts of England, livestock grazing exerts a significant influence on landscape appearance and habitat suitability for biodiversity. Unlike livestock, neither of these can be readily traded in markets[48] but do nonetheless have economic value as public goods, contributing to social wellbeing and supporting ancillary activities such as tourism.[49]

Equally, red meat production also plays a significant role in greenhouse gas (GHG) emissions, largely because of enteric methane from ruminant digestion. Various technical options to mitigate such emissions are available, including continued incremental productivity improvements and new technologies such as methane-inhibitor feed additives. Yet, achieving sectoral emission reduction targets would be less challenging if agricultural sequestration was accounted for alongside emissions rather than being treated separately within the national greenhouse gas accounting framework.[50]

While landscapes, habitats and carbon are not the primary outputs from red meat production, they are by-products (externalities) that will be altered if the size of the red meat sector changes and/or adjusts its production processes. Moreover, while alternative (imported) supplies of food might conceivably be available, the place-specific nature of landscapes and habitats means that imported substitutes are not feasible.

Equally importantly, red meat production features prominently in other aspects of cultural heritage beyond landscape features. For example, continuity of land use patterns and traditional management practices provide cultural connections to earlier generations, while experiences and capabilities are part of what defines a sense of place. The latter contributes to local community identity and cohesion but also extends to meeting the expectations of visitors, whether tourists or returning former residents, for how rural areas should look and feel.

Although often neglected in discussions of ecosystem services,[51] cultural heritage is a recognised category delivering intangible but life-enriching and life-affirming benefits. Indeed, public perceptions often identify aspects of cultural heritage more readily than more scientifically objective services such as climate and water regulation.

The cultural significance of red meat also extends to its consumption. For example, dietary preferences are intrinsically linked to notions of national and regional identify. This relates to sensitivities around freedom of culinary choice but also to maintenance of traditions and intergenerational connections, plus notions of food sovereignty, if not food security.

While food consumption patterns do change over time (e.g. poultry accounts for an increasing share of meat consumption), overt policy interventions to directly influence dietary choices are still rare. This gives an indication that the cultural value of food is recognised politically, if not necessarily articulated in such terms. Indeed, debates around food-based dietary guidance, such as the UK's Eatwell Guide, recognise that reducing red meat consumption may pose nutritional risks to some groups. Moreover, dietary change may be less effective at reducing agricultural GHG emissions than alternative mitigation options, particularly once international variation in production efficiencies (i.e. comparative advantage), rising global meat demand and the scope for carbon leakage across borders are considered.[52]

Similarly, the contribution of continuity of land use and management practices to cultural identity and a sense of place is acknowledged in debates around the viability and vibrancy of rural economies and communities – for example, current sensitivities around local community rights under large-scale afforestation or rewilding of upland areas driven by external investment.

Quantifying the economic value of landscapes, habitats and intangible cultural heritage is difficult. As public goods, they are not valued directly by markets and hence do not generate observed market prices. Nonetheless, it is apparent that the economic contribution of red meat production extends beyond measurable output, GVA and employment to include other important public-goods elements relating to habitats, landscapes and wider cultural heritage elements.

These additional elements amplify the need to consider how changes to agricultural production affect not only those directly involved on farm but also others in the supply chain and wider rural communities. Equally, they widen the basis upon which productivity and efficiency need to be measured, to account for various externalities (both positive and negative).

One possible way to frame the underpinning importance of red meat production (or agriculture more generally) to England is to regard it as a foundational sector.[53] Foundational sectors are often characterised by apparently low productivity, profitability and incomes, yet provide mundane or backbone goods and services that other parts of the economy rely upon, particularly public goods.

Agriculture and red meat livestock have foundational characteristics in that they generate public goods (e.g. landscapes, culture), their market outputs sustain economic activity elsewhere (e.g. along agri-food supply chains and in rural areas), yet they suffer from persistent apparent low profitability.

A foundational perspective is not a reason to forgo opportunities to improve how the sector performs, but it is a reason to consider carefully what the consequences of enforcing change may be and how workers and communities can be helped to transition in a just manner under enforced change.

[48] Nascent markets for natural capital remain small and subject to technical and political challenges.

[49] While tempting, attributing all rural tourism GVA and employment solely to agriculture is disingenuous since other features also attract visitors, e.g. castles, family lineage, festivals. Rather than inviting criticism for overclaiming, the qualitative association between agricultural landscapes and tourism is merely noted here.

[50] The National Inventory used for setting emission reduction targets and monitoring progress against them reports agricultural emissions separately from sequestration. The latter is reported for land use, land-use change and forestry (LULUCF). This artificial separation means that carbon sequestration (but also land-use change emissions) involving farming is not used to give a net position for agriculture. Similar attribution issues arise with renewable energy, for example.

[51] The framework now used to describe how society benefits from the natural environment, distinguishing between provisioning services (e.g. food and timber production), regulating services (e.g. climate stability, flood management), supporting services (e.g. soil formation) and cultural (e.g. amenity, heritage).

[52] See **Balancing health and sustainability: the role of red meat in the UK diet – AHDB**. Also **backing-british-beef-2035-vision.pdf and Animal Frontiers 15 (1), Oxford Academic**.

[53] A concept adopted by the Welsh government – **The foundational economy – GOV.WALES**

Section 6: Commentary

Beef and sheep meat production is likely to continue declining through the rest of the decade, according to UK forecasts completed by AHDB.[54] Though AHDB has not forecast pig production through to 2030, there seems to be little evidence to counter the established trend of further decline in production.[55] Against this backdrop, stakeholders from across the red meat supply chain were asked to identify the main issues and opportunities affecting the English red meat industry going forward. Given the relative importance of English production, their thoughts cover prospects at the GB level too. Six themes were identified.

Stabilising the production base is the priority

The economic contribution of the red meat industry to England and Great Britain will fall if the decline in the production base is not arrested. Currently, the adverse consequences of a shrinking supply of animals are being highlighted most by processors. For producers, the shortage of supply has resulted in high sheep and cattle prices (pig prices are back from their 2024 highs). England is not alone, long-term declines in breeding numbers are also being reported across the EU, the USA (cattle) and New Zealand (sheep).

Despite the marked improvement in cattle and sheep prices, fears were expressed that the decline in the English suckler beef herd and sheep flock could accelerate because of the complete removal of direct support payments. Instead, farmers are eligible for grant income for delivering environmental outcomes that generally involve reducing stocking rates. However, many livestock farms in the upland areas (where most youngstock are born and raised) that appear to have been most dependent on direct income payments failed to apply for environmental schemes before applications were paused.

Pig production is likely less exposed to changes in English farm support. Most breeding herds are enterprises within lowland cropping farms that are broadly less dependent on direct support payments. Many arable farms also run standalone pig-finishing enterprises. Poor weather, low crop prices and high input costs over the past couple of years have been of greater concern for such farms.

Lowland, largely arable, farms are also where many lambs and most cattle are finished. As such, these farms simply work on economic margin but clearly are completely dependent on the rearing farms for throughput. Commissioning work to gauge the structure and concentration of cattle finishing in England would be helpful. Still, the primary concern is the lack of farmers prepared to breed and rear sheep and beef cattle; evaluating the future intentions of breeding farms is probably more important.

Projected further reductions in livestock numbers have implications for upstream and downstream activities, with industry stakeholders increasingly concerned about the loss of critical mass. Once critical mass thresholds are breached, parts of local supply chains withdraw and the viability of remaining parts becomes compromised, leading to a potential domino effect as supply chains reconfigure and production relocates (including abroad, which shifts the location of carbon emissions, as well as jobs and income).

At the time of consulting stakeholders, Defra was reviewing the English farm support regime, and stakeholders were hopeful that the application process would be reopened. However, given an almost certain reduction in overall funding across Whitehall, the broad view was that English farming should expect less support in future. Subsequent funding announcements following the comprehensive spending review were perhaps better than had been feared, but a degree of policy uncertainty remains.

There are broadly four options available to avert further decline of the production base.

- Improve productivity
- Scale up
- Develop new production models
- Import livestock

These are not mutually exclusive; indeed, all four will be necessary.

Higher lambing and calving efficiency were identified by AHDB in the 2030 forecasts as routes to support production levels. Comparison with Danish metrics also suggests that there is scope to lift sow productivity in England. However, a lack of scale, especially in English cattle and sheep farming, means that, even given exceptional levels of per head and per hectare performance, size will limit viability. New Zealand sheep farmers run around 2,500 ewes to a labour unit and achieve an average national lambing percentage above that of the UK at 130%.

Cattle originating from the dairy herd have long been a large contributor to the English beef industry. Uptake of sexed semen by dairy farmers to target replacements from their best cows has significantly raised the proportion of their herds put to beef bulls. Not only do the resulting crossbred animals yield good-quality beef, but the all-year-round calving pattern of most English (and GB) dairy herds means that cattle supply is relatively smooth, unlike Ireland, for instance, where spring calving dominates. The current contribution of the English (and GB) dairy industry to the beef industry is, however, unclear. To fully exploit this source, a strategic review would help.

An alternative production model that is also emerging is based on cattle (mainly) and sheep being produced as a by-product of environmental schemes. Unlike the dairy beef model, eco-production is based more on extensive grazing suited to traditional breeds. Critically, the low stocking rates characterising this model generally mean lower production, with farm profitability therefore underpinned by environmental grant income or private-sector environmental payments.

Importing more store and finished livestock (for direct slaughter) into England is a final obvious option. Currently, some three-quarters of the pigs born in Scotland are killed in England. Competition for store cattle at Scottish marts from English finishers has been notably greater since 2022. Anecdotal reports suggest that these suckler-bred cattle are attractive to English finishers because some processors want very heavy carcases, presumably to lift meat yield per animal, so offsetting the lower availability of finished cattle.

Figure 14 draws from Thomson's (2025)[56] analysis of Cattle Tracing System data. It shows that *c.*80K movements of cattle were made between Scottish and English agricultural holdings in 2024: *c.*15K for previously calved cows (of which 34% were from dairy breeds);[57] *c.*35K for youngstock (of which 49% came from dairy-breed dams); *c.*30K for uncalved animals (of which 29% came from dairy-breed dams).

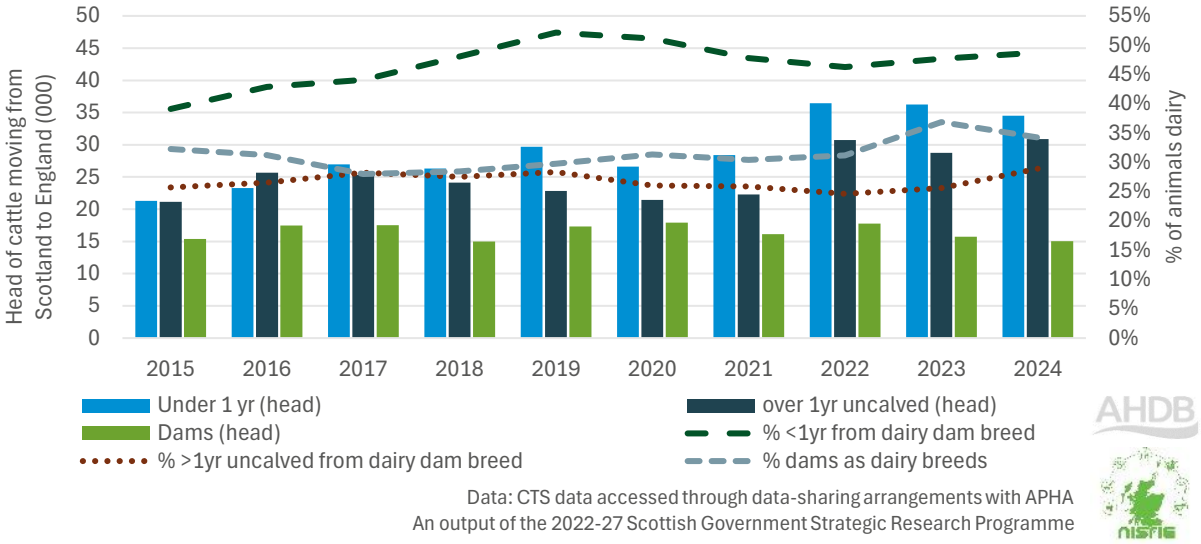

Figure 14. Number of cattle movements to agricultural holdings from Scotland to England 2015–2024, including proportion from dairy dam breeds (uncalved animals) or dairy-breed dams

Figure 15 shows that *c.*49K cattle slaughtered in English abattoirs in 2024 were sourced from Scotland. The majority (*c.*33K) of these were cull cows, of which 56% were dairy breeds. Of the remaining *c.*16K (down from *c.*21K the previous year) of Scottish bulls, steers and uncalved heifers slaughtered in England, *c.*23% were from dairy-breed dams.

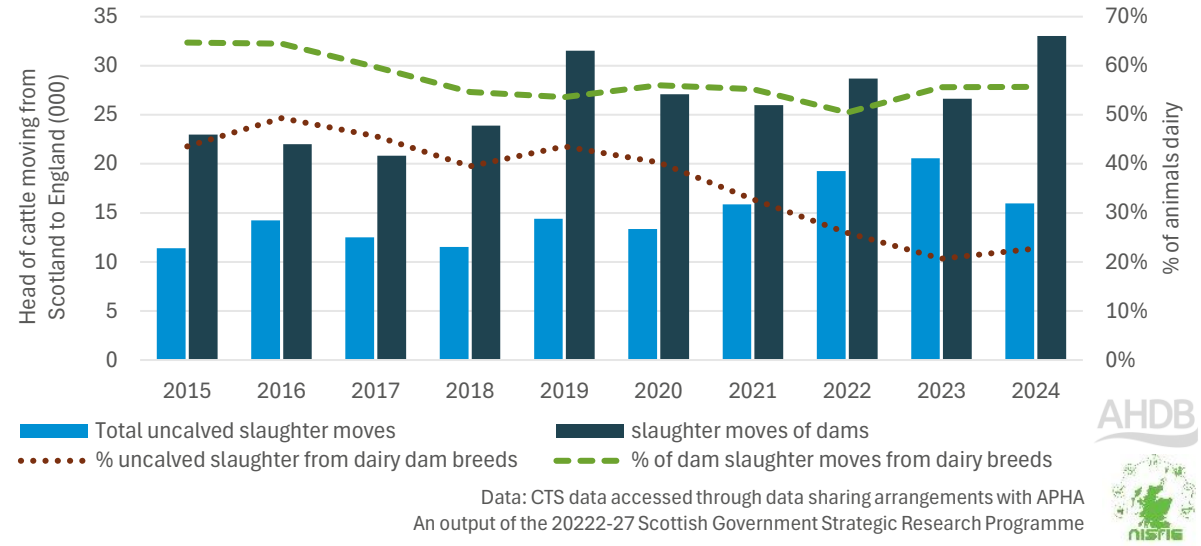

Figure 15. Cattle moves to slaughter in England from Scottish holdings, 2015–2024, including proportion from dairy dam breeds (uncalved animals) or dairy-breed dams

Based on 2017 figures, 59% of Scottish prime lambs were slaughtered in England and Wales and 90% of all Scottish cull sheep.[58] Fears that regulations to stiffen livestock transport rules would make intra-GB trade more difficult are now considered less of a threat. Nevertheless, there is evidence that England-based processors are taking steps to better capture livestock supply from Scotland[59] and Wales.

Better coordination and information sharing both horizontally (between farmers) and vertically (between farmers and processors) would help underpin the production base. However, the English sheep and beef industries largely still operate on traditional lines, especially at the production level.

Production contracts are more evident in pig finishing, while the concentration of beef finishers means that the flow of cattle to abattoirs can be managed more effectively via relationship-based contracts. There is limited vertical integration by processors back into the finishing stage. Likewise, though there are some notable examples of integrated supply chains (e.g. Buitelaar beef, Pathway Farming), there is general distrust in contracting production on all sides. The Food Supply Chain Fairness Bill currently progressing through the UK Parliament aims to support better supply chain coordination.

Whatever the production system, it was noted that better uptake of best practice is required. The lack of improvement of long-term productivity in sheep and beef farming indicates that the current beef and sheep knowledge transfer (KT) system is not fit for contemporary purpose. England no longer has an equivalent independent research and dissemination organisation like, for instance, Teagasc in Ireland. In the pig industry, chain-specific KT systems are developing, with Cranswick recently announcing a 10-year initiative with Sainsbury's. Crucially, this initiative is reported to involve fairer pricing arrangements.

The rebasing of farm support in England means that the red meat industry is increasingly becoming dependent on its own actions to deliver a positive future. However, the Government still has an important role in helping the industry adjust to market forces, with improving productivity along the supply chain and (especially) on farm a perennial challenge. Hence, grants to support productivity improvements are important, so too a robust college education system, rural digital connectivity and legalisation to ensure fairer supply chain contracts.

Finally, the Government, ultimately, controls the regulatory burden. The recent decision by the Government to retain the small abattoir discount for meat inspection charges has been welcomed, but processors still warn of compliance costs higher than those applied in other countries, undermining industry competitiveness. Labour availability (both for staff and inspectorate) is also a major concern for the processing sector, given a tightening of immigration rules. Equally, new regulations being considered for castration and tailing will add costs to home production that may not be recoverable and disadvantage the industry competitively.

Delivering what the customer wants

Demand for red meat domestically has been resilient over the last year or so. Recognising limitations of the data set, the Kantar Worldpanel data reveals that consumption of beef and lamb has been marginally up in both volume and value terms. In contrast, consumption of pork has been slightly down. The proportion of vegetarians in the population remains very low, and demand for alternative meats is dropping. Still, long-term per capita consumption of red meat has fallen considerably, with poultry meat the main beneficiary.

Globally, however, the growth in demand for red meat is positive. The importance of the EU market for sheep meat is well appreciated, but overseas markets are also important for extracting value from parts of all three species that domestic consumers don't want: demand across the balance of the carcase is critical to overall returns. So, there is good reason to renew efforts to identify and deliver what consumers both in Britain and overseas want.

Cost and convenience remain key demand drivers. Beef mince scores well on convenience but is at a cost disadvantage to chicken, given the high cost of cattle and drop in feed costs benefiting poultry production costs. Lamb is a high-cost meat with limited convenience formats. And while pig meat is generally competitive cost-wise, pork is not a popular protein for making quick meals in Britain. By comparison, bacon is relatively cheap and convenient but is struggling for reasons explained below.

The domestic consumer is trading off quantity for quality. So, delivering consistently high meat eating quality based on taste, succulence and tenderness is increasingly important. Lamb generally scores well for eating quality, whereas beef can be more variable. The current grading (and payment)

systems used in Britain only reward meat yield (though it was noted that many traditional butchers do account for eating quality through buying from known sources).

Other competitor countries (e.g. Australia) use carcase grading technologies that can identify and reward farmers for producing carcases that deliver high eating quality meat, thereby putting them at a big advantage in meeting British shoppers' growing demand for quality.[60]

Health concerns are affecting demand for meat. Red meat and especially processed red meats like bacon, burgers and kebabs are particularly vulnerable. While chicken nuggets may also suffer long term, chicken meat scores well generally as part of a healthy diet. On the plus side, unprocessed red meat scores highly for the micronutrients (e.g. iron, vitamin B12, zinc) it provides.

How meat is produced – its provenance – also impacts consumer demand, though concerns were raised as to how much is driven from government regulation as compared to the consumer. On the farm, provenance covers how well the animal is treated (health and welfare) and how its production interacts with the environment. Meat produced organically scores highly for provenance, but organic meat accounts for less than 1% of domestic meat consumed on a volume basis.

For non-organic producers of cattle, sheep and pigs, there is no tangible link between how that meat is produced and its market (farmgate) price. There is a small premium for being farm assured, but that primarily targets high animal health and welfare standards. Roughly half of GB pigs are born outdoors (perceived as higher welfare), but only 18% are sold under a label that reflects that fact. Pig producers will shortly be obliged to invest in more welfare-friendly conditions for sows but seem unlikely to gain a premium on their end price.

Producing more environmentally friendly meat seems to be driven more by government emissions targets rather than the consumer. While there is some frustration in the industry as to the accounting of emissions at the national level, there is general agreement that livestock farmers, who account for over 90% of supply chain emissions, would, in most cases, benefit financially from carbon auditing, identifying where they can lift productivity and cut costs.

There is also a concern that government does not fully appreciate that the encouragement of extensive (and less) livestock production in England will not improve global emissions if imports of meat rise. Monetising other environmental benefits (e.g. more biodiversity) of regeneratively produced meat also remains very niche in terms of overall demand for red meat.

Perhaps the best example of provenance on meat demand is halal, which covers the handling of the animal and subsequent meat to comply with Islamic law. The importance of the Muslim customer to the sheep industry is fully recognised. Yet while the New Zealand and Australian sheep industries guarantee full halal compliance, the British sheep industry does not. There seems little appetite by the Government to correct this by allowing trials to demonstrate how (electrically) stunned slaughter is halal acceptable (as the Australians and New Zealanders have). As an aside, scarcity of CO_2 for stunning remains a concern.

The importance of fifth-quarter (offal, hides, sinews, etc.) sales was also raised. A significant share of these products is exported, so awareness of the global marketplace, particularly beyond Europe, is important. The reclassification of the UK's bovine spongiform encephalopathy (BSE) status from "controlled risk" to "negligible risk" in mid-2025 was welcomed as a positive market development, although it was still dependent on formal recognition by the EU, which could take several months.

Greater exposure to trade since Brexit

Prior to leaving the EU, the British red meat industry was part of the biggest single market in the world. Though only a major exporter of sheep meat, unfettered access to the rest of the EU was important in

balancing carcase sales across all three species. Fortunately, the UK-EU free trade agreement ensured that trade in meat products has remained tariff-free. However, it is no longer frictionless, due to non-tariff barriers that add costs and time delays that reduce shelf life.

A major concern is that inspection rates are not being applied symmetrically: far fewer loads of red meat imported from the EU are being checked (see also biosecurity concerns below). The recent announcement of closer alignment with the EU on sanitary and phytosanitary (SPS) measures confirms that the UK government is exploring options to reduce non-tariff barriers, which should improve trading. Ireland remains a source of live cattle, with only *c.*3K being exported directly to Great Britain but *c.*24K to Northern Ireland, from where some may subsequently reach Great Britain.[61] Live pigs and sheep are also exported from Northern Ireland to Great Britain.

The new post-Brexit trading arrangement between Great Britain and Northern Ireland is a particular concern, both in terms of added cost and biosecurity (see next section). Despite the subsequent simplifying of arrangements agreed under the Windsor Framework, the pig industry estimates an extra 6% has been added to the cost of each tonne sent to Northern Ireland.

British beef and sheep farmers are also more open to competition from imports, thanks to recent free trade agreements (FTAs) with Australia and New Zealand. The threat from Australia is greater, given that very little beef and sheep meat could be imported tariff-free when the UK was in the EU. Further, while New Zealand already effectively had open access regarding sheep meat, the progressive reduction in beef tariffs is significant. Although New Zealand and Australia are both net importers of pig meat, the export opportunities for the British pig industry are considered minimal.

Greater access to antipodean beef and sheep meat may be welcomed by some processors. However, the slaughter and disassembly stages of processing generally offer slim margins, with most value added in the further processing and packing stages. For instance, the logistics (and margin) of meeting a spike in demand for lamb at Easter have long been easier from contracted imported New Zealand “legs” rather than dealing with whole lambs from home producers bought on the spot market. Hilton Food Group, a major supplier of meat and meat-based products to UK supermarkets, slaughters no animals in Britain.

The consequences of potential new tariffs by the US government are difficult to predict at this stage. But there are already signs that New Zealand and Australia are taking advantage of their new trade deals with the UK (and in New Zealand’s case, the EU) to reduce their exposure to the Chinese market. While there are some concerns about the equivalence of production standards[62] in the Australian and New Zealand FTAs, the trade deal with the USA is potentially of greater concern, though the US beef industry does produce a big tonnage of non-hormone-treated beef.

On the other hand, the UK’s recent joining of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) potentially offers opportunities to grow exports in Asia. It is unclear how trade negotiations with the Gulf Cooperation Council currently stand, but an FTA with Middle Eastern countries is seen as a positive development.

A large proportion of inputs into the English red meat industry are imported. Consequently, the industry is exposed to price (exchange rate) and availability risk, which could be exacerbated given an international trade war. Based on FBS costings, concentrated feeds (animal feed in AHDB statistics) and fertiliser are the two biggest imported inputs, with medicines and vaccines also sensitive to supply from overseas.

Pig production accounts for the biggest share of concentrates used, with sheep production the least. Beef probably requires marginally more than sheep, based on a broad split of cattle concentrates usage for dairy production. Trade sources indicate that just 3% of GB feed usage is for organic production, while 55% of all concentrates is a by-product of the human food industry. Soya – the dominant purchased protein in livestock rations – is the main concern facing the industry, owing to its association with deforestation. The drop in oilseed rape grown in Britain due to the ban on

neonicotinoids means that the supply of home-produced protein is falling. The deforestation ban also has adverse implications for low-cost, good-quality sources of fibre, owing to the importance of soya hulls and palm kernel cake in ration formulation.

All three major fertiliser nutrients – nitrogen, phosphate and potash – are largely imported, though lime is readily available domestically. The high cost of gas effectively ended domestic manufacture of nitrogen fertiliser. It was speculated that the loss of home supply may mean that the proposed carbon border adjustment mechanism may not be the cost threat once expected. Still, the jump in the cost of all three nutrients since 2022 has hit usage, while pricing is exposed to currency volatility and competition from major buyers like China and India.

As pigs are often run alongside crops on lowland farms to take advantage of the symbiotic relationship between crop and animal, pig production is less exposed to the jump in fertiliser cost over the last few years. Beef and sheep farmers were already limited users of fertiliser before the price hikes in 2022. Alongside costs, encouragement (grant income) for lower stocking rates and regenerative farming methods may limit exposure of drystock farming to the high cost of fertiliser.

A notable comment from the input industry was how a lack of haulage capacity can limit availability of both feeds and fertiliser at key times of the year, like early spring. Subcontracting deliveries to outside hauliers is necessary at such times.

Vaccine availability has also become a problem in recent years despite long-term dependence on imported product. It seems that leaving the EU has increased the bureaucracy in approving new vaccines. The consensus is that the industry will have to accept periodic supply problems.

Biosecurity under threat

Another threat to future production raised by stakeholders was biosecurity. The industry is exposed to health threats via a range of routes, some of which are more difficult than others to combat.

Weak or poorly applied border control processes are exposing the red meat industry to avoidable risks. Foot-and-mouth disease (FMD) and African swine fever (ASF) are two of the most significant risks facing the sector. The situation is exacerbated by a surge in illegal meat imports of bushmeat in 2024, with notable seizures at Dover and Stranraer.

While the UK should have more rigorous import controls since leaving the EU, robustness in stopping illegal imports via the Channel Tunnel and especially via Northern Ireland is being questioned. It was noted that being excluded from intelligence-sharing networks was another consequence of Brexit weakening biosecurity defences.

It is more challenging to prevent health threats posed by migratory birds and midges. The latter are responsible for spreading bluetongue and Schmallenberg viruses to areas of England nearest to the continent. The movement of livestock from these parts can further transfer the viruses to other parts of Britain, which implies the need to impose strict movement controls. Climate change-driven temperature increases are expected to amplify the incidence of midge-borne diseases. The confirmation by Defra in March of bird flu found in a sheep in Yorkshire highlights serious concerns about health risks imported by birds.

Yet the biggest challenges to the health of cattle, sheep and pigs come from a range of diseases that are controllable with good practice. The effectiveness of national campaigns to better control diseases like TB, Johne’s and BVD in cattle, scab and Jaagsiekte in sheep, and swine dysentery in pigs are questioned.

A big part of the challenge is getting widespread uptake of best practice by farmers with, for example, overuse of anthelmintic wormers leading to growing resistance problems and therefore productivity

and animal health issues, plus concerns about environmental pollution, particularly of waterbodies. Better uptake of the animal health and welfare grants by English livestock farmers is an obvious means to encourage better health management on farms.

Net zero

Net zero targets are particularly challenging given the way that they are set and monitored. For example, the devolved administrations have adopted slightly different targets, timelines and approaches to the overarching UK-level ones.[63] Moreover, no account is taken of comparative advantage or carbon leakage. For example, the UK is a net importer of beef, and England a net importer from Scotland. Equally, domestic red meat production has a comparatively low emissions intensity, such that reducing domestic production in favour of other countries' production (either via imports to the UK and/or displacing UK exports) could increase global emissions, with intra-UK trade replicating this at a domestic scale.

Separate reporting for agriculture and LULUCF also means that the profile presented for agricultural emissions is only partial. Specifically, separation of the two means that opportunities for on-farm sequestration (but also some other emission pathways) do not register against agriculture. Indeed, the same is true for electricity and waste, meaning that farm-related emissions and emissions savings are also reported elsewhere.

A more joined-up perspective[64] would not only be more accurate but would also avoid disproportionate pressure being placed upon agriculture (although it is also accepted that there is scope for better mitigation within the narrow definition of agricultural emissions). That English farmers are not compelled to regularly measure their greenhouse emissions seems inconsistent with the shift of government support towards delivering environmental improvement.

Exhortations for dietary change are viewed with scepticism. This partly relates to the possible nutritional risks to some consumers of restricting red meat consumption, but more broadly to competing social objectives and a perceived lack of policy mechanisms. For example, it is not clear whether policy measures beyond guidance (e.g. the Eatwell Guide) will ever be contemplated. Consequently, unless accompanied by import controls (including, perhaps, extension of carbon border adjustment mechanisms to food and agriculture), unilateral reductions in domestic production merely shift emissions abroad, along with jobs, GVA and income.

Stakeholders also noted that political support for net zero appeared to be fracturing, both domestically and internationally, with some large corporate interests already weakening apparent commitments.

Data availability

Finally, while appreciative of ad-hoc efforts to collate and infer red meat statistics for this report, stakeholders were frustrated that reliable figures were not more readily available. In particular, better information on cross-border movements of livestock, plus more granular understanding of upstream and downstream linkages, would be welcome. Nonetheless, the estimates presented were generally judged to be reasonable approximations, albeit that national-level figures were considered to be more robust than regional ones.

[54] **https://ahdb.org.uk/knowledge-library/beef-2030-supply-forecasts-how-beef-production-in-great-britain-may-change-by-2030**; **https://ahdb.org.uk/knowledge-library/lamb-2030-supply-forecasts-how-sheep-meat-production-in-great-britain-may-change-by-2030**

[55] **https://ahdb.org.uk/news/uk-pig-population-further-decline-for-the-female-breeding-herd**

[56] Unpublished analysis by SRUC of Cattle Tracing System data through the **NISRIE** project of the Scottish Government's 2022–2027 Environment, Natural Resources and Agriculture Strategic Research Programme.

[57] Dairy breeds defined from SRUC work for AHDB/LI Ltd. on the establishment of a prototype dashboard for cattle producers.

[58] **https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2019/11/assessment-opportunities-retain-increase-sheep-lamb-processing-scotland/documents/agriculture-environment-marine-assessment-opportunities-retain-increase-sheep-lamb-processing-scotland/agriculture-environment-marine-assessment-opportunities-retain-increase-sheep-lamb-processing-scotland/govscot%3Adocument/agriculture-environment-marine-assessment-opportunities-retain-increase-sheep-lamb-processing-scotland.pdf**

[59] Pickstock have planning permission to build a cattle abattoir in Dumfries and Galloway with a capacity to kill 200–250 daily and create 60 jobs. This contrasts with closure of the Scotbeef plant at Inverurie.

[60] A recent Australian analysis found that just 18% of Britons have heard of high marble-score beef – far lower than the 33% noted for Chinese consumers. United Kingdom market snapshot, Meat & Livestock Australia, January 2025.

[61] **https://www.bordbia.ie/farmers-growers/prices-markets/cattle-trade-prices/live-cattle-exports/**

[62] There are calls from some in the New Zealand red meat industry to rethink environmental compliance. But industry leaders have highlighted that their FTAs with the UK and EU require the meeting of strict standards, so reducing them is not an option. New Zealand farmers seem to be supporting this position, with the number volunteering for the higher-level New Zealand Farm Assurance Programme Plus growing.

[63] Furthermore, although perhaps implied by deducting devolved administrations targets from the UK-level ones, England-specific targets have not been set.

[64] It should be noted that carbon calculators adopting a life cycle analysis (LCA) or Scope 1, 2, 3 approach do span these different categories, but the different perspective to that adopted in the National Inventory can cause confusion.

Section 7: Conclusions

Red meat production is a key element of England's agri-food sector, with red meat livestock – beef cattle, pigs and sheep – present on over half of all farm holdings. Although production is concentrated on specialist livestock farms, production occurs on all farm types and in each region of England.

On-farm production contributed an estimated *c.*£1.8bn of GVA in 2023, but this was amplified by upstream suppliers (e.g. feed, fertiliser, machinery, plus veterinary, haulage and auction mart services) and downstream processing (i.e. slaughter and manufacturing) and butchery to *c.*£5.5bn. Similarly, estimated on-farm labour usage of *c.*56K FTEs is matched elsewhere to generate a total of *c.*120K FTEs across the supply chain.

These estimates are subject to a degree of uncertainty due to data limitations and should be treated as indicative rather than definitive. They are also lower-bound values, given that more distant downstream elements of complex supply chains are not considered, notably food catering and retailing. Moreover, they also exclude other socio-economic values. For example, in relation to landscapes, semi-natural habitats, cultural and culinary heritage and notions of food sovereignty/security. Nonetheless, the estimated values are sufficient to illustrate some of what is at stake under current trends.

Breeding animal numbers are already at historically low levels, prompting concerns about pressures for further structural change across the sector. While a static economic profile of the sector says nothing about how resources released from red meat production could potentially be deployed elsewhere in the economy, disruption to household employment and incomes would be unavoidable if critical mass was lost and supply chains had to reconfigure radically. Moreover, given the location of upstream and on-farm activities (albeit less so for meat processing), disruption would be felt most acutely in rural areas where red meat production is relatively more important.[65]

Yet any downsizing of the English (and GB) red meat industry will not be due to a drop in demand, given continued domestic population growth and rising global demand for animal proteins. Rather, it will be caused by a lack of competitiveness – an inability to put and manage the right type of lambs, piglets and calves on the ground to drive meat production and upstream suppliers. Helping the production base structurally adjust and apply best practice should be the goal for the Government and the industry working together. Agreeing a basis for regularly measuring improvement, as consistently recommended by the Organisation for Economic Co-operation and Development (OECD), should be a priority.

Of course, success will ultimately depend on delivering what consumers want. That will include provenance of the process from farm to plate, but more importantly it will require meeting the cost, quality and health attributes that mostly drive consumer demand for red meat. Government must strike the right balance in setting trade, environmental, labour, biosecurity and other conditions to allow the industry to deliver.

[65] Source: **7_Rural_Economic_Bulletin_15_04_2025.pdf** shows that agriculture, forestry and fishing account for 15% of rural businesses and 10% of rural employment, compared with less than 1% in urban areas.

Annexe A: Methodological notes

Introduction

Information about supply chains is often fragmented, gathered piecemeal in different ways and for different purposes. Consequently, attempts to estimate the economic scale and reach of the red meat sector unavoidably encounter a range of data issues.

The approach taken for this report was to start at the farm-level, where (for historical reasons) the most detailed information is collected and published routinely, and to then subsequently consider additional information from other sources about upstream and downstream activities. While this does ground the results firmly in the most visible portion of the supply chain with the greatest number of individual firms and workers, it does unavoidably lead to some inconsistencies in how different parts of the supply chain are treated, due to differences in data availability and detail.

In particular, information on other parts of the supply chain is generally not so readily available at the sub-national level (requiring recourse to estimated geographical disaggregation) or the sub-sectoral level (requiring recourse to estimated structural disaggregation). For example, the absence of input-output tables for England forces reliance upon UK-level tables, which do not distinguish between red meat and poultry processing, nor between slaughtering and further processing – thereby requiring some further assumptions and adjustments.

It is also apparent that different official statistics are themselves not necessarily consistent where they supposedly overlap. For example, Defra's estimate of the value of domestic livestock slaughtered in UK abattoirs is significantly higher than the equivalent estimate from the ONS input-output tables (implying either higher output and/or lower expenditure on other inputs to meat processing). Equally, the estimated cost of employees in the meat-processing sector is significantly higher in the ONS input-output tables than in the ONS Annual Business Survey.

Such differences may arise for a variety of reasons and essentially make reconciling competing figures impossible. As such, published statistics have been treated as the best available information and sense-checked via industry sources where feasible. Consequently, the composite results presented in this report should be viewed only as indicative rather than definitive, illustrating relativities, patterns and order of magnitude rather than precise values. Opportunities to improve data would be welcome.

Employment

On-farm labour usage is reported in the JAS. However, farm workforce headcounts are notoriously difficult to interpret, given the nature of farmwork, variation in working hours and diversified and off-farm activities. Moreover, for farms with multiple enterprises, apportioning headline labour across different uses is challenging. Consequently, to estimate on-farm labour usage associated only with red meat production (including on non-specialist farms), recourse was made instead to standard labour requirements (SLR). These are estimated average hours required per year for specified farm activities, such as managing a beef cow, with one full-time equivalent (FTE) being 1,900 hours.

Published SLR coefficients were applied to a bespoke extract from the JAS provided by Defra statisticians at York. The extract gave farm activity totals by farm type and region of England, allowing estimation of SLR totals for agriculture overall and for red meat within this. Although the results were consistent with previous calculations, it should be noted that average SLR coefficients ignore likely variation across different types and (especially) sizes of farm. Moreover, published SLR coefficients

are somewhat dated, and it is possible that productivity improvements will have reduced actual labour requirements. Hence, the SLRs are indicative rather than definitive estimates of actual labour usage.

Data on upstream employment linked explicitly to red meat production is not routinely recorded or reported. However, it can be estimated using employment multipliers applied to more easily identifiable employment on farm or further downstream. Moreover, Thomson et al. (2024) recently estimated Welsh-specific multipliers for agri-food subsectors. Applying these to the estimated on-farm SLR labour usage for red meat production generated an estimate of labour usage among upstream suppliers of *c.*17.0K, excluding their activities related to other parts of agriculture or other sectors – for example, animal feed and veterinary services for dairy and poultry production.

Accuracy of estimated upstream employment rests on the accuracy of the on-farm SLR figures (as discussed above) and the multiplier coefficient. For the latter, albeit derived from the 2013 input-output tables and thus already somewhat dated, the Thomson et al. values are consistent with broader published estimates of agricultural multipliers.

A parallel, albeit crude, sense-check is possible by using average input expenditure per farm type derived from the FAS data weighted by the JAS extract to compare with the aggregate input expenditure published within the TIFF estimates, and to then apply pro rata shares to published employment estimates for input supply sectors. This approach suggests that on-farm red meat expenditure is *c.*£3.2bn (compared with the £3.0bn estimated above). Within this, the largest single component is *c.*£1.6bn on purchased feed, which implies perhaps 1.7K upstream jobs in the animal feed sector as a simple pro rata share of reported turnover for the UK animal feed sector.

Veterinary expenditure is much lower at *c.*£0.1bn, but this equates to *c.*1.4K jobs as a share of that sector's reported overall UK employment. A further *c.*1K jobs are associated with other core suppliers, such as marts and fertiliser/chemical/seed suppliers. However, even with a few other identifiable categories (e.g. energy), this amounts to only *c.*4.3K jobs, compared with the 17.0K suggested by the multiplier analysis. At least part of this difference will arise from the estimated further *c.*£1bn spent on miscellaneous services and contracting. Such activities are not readily separably identifiable within published ONS categories but will include a variety of professional services (e.g. accountancy, lawyers) and on-farm maintenance services (e.g. installing and fixing fences, sheds, machinery), which previous Scottish analysis (where more detailed data was available) estimated to account for approximately the same number of upstream red meat jobs as identifiable job categories.

Rounding up, this achieves an overall total of *c.*9.0K – still somewhat short of the 17.0K. This may imply that the multiplier coefficient is too high and/or should not be applied to total on-farm employment. The latter is potentially the case, given ambiguities about how self-employment (which predominates in farming) is handled within input-output tables. Equally, given that the multiplier dates from 2013 IO data, it is possible that it is now slightly lower (e.g. 1.2 rather than 1.3). Either of these possibilities could generate an estimated upstream employment of *c.*10K with only minor adjustments to assumptions. Hence, notwithstanding some uncertainty, the estimate of 17.0K upstream jobs is accepted as sufficiently accurate for the purposes of this report.

Fortunately, some data on downstream employment is more readily available through the ONS Business Register and Employment Survey, which is accessible via NOMIS. In particular, detailed regional estimates are published for meat processing and for butchers. Strictly, the latter sell poultry and game (plus, sometimes other items, such as eggs) but are plausibly only in existence because of the availability of domestic red meat. Hence all their reported employment is assumed to be associated with red meat for the purposes of this report.

Primary processing (i.e. slaughter and basic cutting) of red meat (SIC 10110) is reported separately from processing of poultry (SIC 10120). Again, although some live imports are slaughtered, it is reasonable to attribute all primary processing jobs to domestic red meat availability. However, secondary processing (SIC 10130) by food manufacturers (e.g. into pies, sausages, cured meats, etc.)

does not differentiate between red and poultry meat. In the absence of specific data on the relative throughput or consumption split, it is simply assumed here that half of the sector's output and employment is attributable to red meat.

Although output from meat processing is subsequently used in other sectors, notably food catering and retailing but also pet food and leather or textiles, given expenditure on other inputs and the availability of imports, it is difficult to attribute employment in them purely to red meat, e.g. the absence of domestic red meat supplies would not necessarily mean that such firms would cease to exist. Moreover, given the size of the food retailing and catering workforce, including even a small proportion of such jobs would dominate other estimates. For example, approximately 5% to 7% of food retailing turnover relates to red meat, equating to 150K jobs pro rata. Consequently, as shown in Figure 1, attention is restricted to meat processing, farming and suppliers to farming. As such, the red meat employment estimates presented here are conservative lower bounds.

At the UK level, the entire agri-food sector is estimated to have a workforce of *c.*4.2m. Excluding activities beyond food manufacturing limits this to *c.*0.5m, implying that red meat production accounts for *c.*25% of that part of the UK agri-food sector.

Output and GVA

Aggregate farm output is reported in the total income from farming (TIFF) in England estimates, which are available at the regional level. GVA is also reported but is not disaggregated to individual subsectors of agriculture because variable costs are not allocated. However, reported average input expenditures and gross margins (GM) by farm type reported in the Farm Business Survey are available and can be weighted by the JAS data extract provided by Defra to estimate how aggregate costs could be allocated and hence to estimate GVA. Input expenditure and GM-based results are similar, and both are consistent with the headline TIFF results. However, although sense-checking against stakeholder views offers some reassurance, the absence of alternative sources of information hampers definitive judgements of accuracy.

Defra routinely publishes slaughter statistics and estimates of the volume and value of deadweight dressed carcase meat. This simultaneously represents red meat farm output and the input to the meat processing sector. However, the Defra statistics differ somewhat from those derived from the ABS and the UK IO tables. Despite helpful discussions with government statisticians, it was not possible to reconcile these differences.

As with upstream employment, multiplier coefficients presented by Thomson et al. (2024) can be applied to the farm-level output and GVA. Similarly, results can be partially sense-checked by crudely pro rata apportioning upstream sectors' ABS estimates of turnover and total GVA by estimated red meat employment shares. For example, identifiable sectors yield *c.*£700m of GVA, to which more ambiguous maintenance and support services need to be added. Again, previous analysis in Scotland suggests the latter are *c.*two-thirds of this, implying total upstream GVA of *c.*£1.1bn, which is consistent with the estimate derived by use of the multiplier coefficients. Similarly, identifiable sectors' output amounts to *c.*£2.2bn, with maintenance and other services assumed (again based on previous Scottish analysis) to add £1.2bn, to yield £3.3bn overall – slightly higher but still broadly consistent with the multiplier estimate.

Downstream output and GVA for meat processing and butchers are reported in ABS results. Again, notwithstanding minor interests in poultry and game, all output and GVA for butchers is assumed to be associated with red meat. The same is true for primary processing of red meat, but, in the absence of better information, half of secondary processing is assumed to relate to red meat. As with employment, output and GVA further downstream in food retailing and catering are not included, partly because of challenges in attributing a proportion of their activities to red meat but also because even a

small fraction of their output and GVA will dominate upstream contributions and skew presentation of results.

The implied total GVA of *c.*£5.5bn is *c.*13% of the UK total for that portion of the agri-food sector.

GVA/FTE and incomes

Labour undertaking activities across the red meat sector receives payment in the form of wages and self-employed earnings. Estimates for this income can be derived from several sources. For example, for hired employees, the ABS reports total employment costs (which include on-costs such as pension and employer NI contributions), IO tables report employee compensation, and the ONS Annual Survey of Hours and Earnings (ASHE) reports rates of pay and working times. These offer accessible ways to estimate labour income for upstream and downstream sectors.

Applying ASHE averages for annual pay in meat processing and butchers to those sectors' employment estimates is straightforward and generates income estimates of *c.*£1.24bn. These compare to cruder estimates derived from the ABS of *c.*£1.07bn and from the IO tables of £1.88bn (the latter is inflated by very much higher employment costs, which appear to be an artefact of rebalancing of IO rows and columns overriding initial values from sources such as the ABS).

Similarly, for upstream employment, applying ASHE averages for annual pay in identifiable sectors (e.g. animal feed, veterinary activities) yields estimated income to labour of *c.*£0.25bn. The sectoral profile of remaining labour in maintenance and other services is ambiguous, but at the minimum wage would generate *c.*£0.24bn or £0.37bn as the mean annual earnings for support services to agriculture (taken as a proxy for the range of miscellaneous services involved). An indicative total of £0.6bn is accepted here.

However, farming is dominated by self-employment, which requires a different approach. To an extent, this is accommodated within the IO tables, with a separate entry for gross operating surplus and mixed income. However, sectoral aggregation within the IO tables makes it difficult to estimate red meat's share of this. Fortunately, farming incomes are routinely estimated and published elsewhere by Defra in the form of Farm Business Survey averages and the aggregate TIFF accounts.

Neither TIFF nor Farm Business Income (FBI) are perfect matches for employee earnings. However, FBI is a better approximation and is used here. Specifically, published FBI averages by farm type were converted to per GLU and weighted by the JAS extract provided by Defra to estimate FBI attributable to red meat production. This suggests a total of £0.75bn. However, within this it should be noted that FBI excluding public support payments (i.e. the Basic Payment Scheme and agri-environmental schemes) is, on average, negative for some farm types (including livestock grazing specialists). This highlights the vulnerability of farm-level production to changing policy arrangements.

Incomes have to be paid out of GVA. GVA per FTE was estimated by dividing the estimated regional GVA by the estimated red meat workforce per relevant part of the supply chain. Such estimates are crude, given their underlying uncertainties, but provide an indication of relative values. Comparable published estimates are seemingly scarce. However, rural areas in England have a GVA per worker of *c.*£45K, compared with *c.*£52K in urban areas. Older UK estimates per industry (updated to 2023 prices) suggest *c.*£31K for agriculture and £65.3K for food manufacturing, which are consistent with the estimates generated here. However, again, all estimates should be viewed only as indicative.

Annexe B: Regional cattle distribution – CTS evidence

Table 13. Regional spread of English cattle – evidence from analysis undertaken for AHDB dashboard project

Region	Holdings	Calf registrations by breed type			Dams calving			Heifers calving			Heifers as % dams		Total cattle life days	<36 months uncalved slaughter moves	Cull cows slaughter moves
	number	head	%Beef	%Dairy	head	%Beef	%Dairy	head	%Beef	%Dairy	Beef	Dairy		head	head
East England															
2015	2,644	50,848	81%	19%	51,188	73%	27%	11,623	61%	39%	19%	33%	69.2m	63,495	7,625
2016	2,618	50,528	83%	17%	51,646	74%	26%	11,193	62%	38%	18%	32%	68.6m	61,068	8,104
2017	2,666	49,291	85%	15%	51,341	75%	25%	11,174	65%	35%	19%	31%	68.1m	60,194	7,508
2018	2,607	48,571	85%	15%	50,870	74%	26%	10,990	63%	37%	18%	32%	68.8m	61,382	8,149
2019	2,551	49,836	86%	14%	51,165	74%	26%	11,181	63%	37%	18%	32%	69.4m	64,628	7,658
2020	2,474	50,509	87%	13%	51,552	74%	26%	10,933	63%	37%	18%	30%	67.0m	63,536	8,007
2021	2,385	49,536	87%	13%	49,455	73%	27%	10,076	61%	39%	17%	30%	64.3m	57,065	7,458
East Midlands															
2015	4,867	139,838	68%	32%	136,483	50%	50%	34,420	37%	63%	19%	32%	174.6m	144,853	30,219
2016	4,790	139,809	71%	29%	136,960	51%	49%	33,404	39%	61%	19%	30%	175.7m	144,014	32,490
2017	4,746	140,256	73%	27%	137,739	51%	49%	35,019	38%	62%	19%	32%	175.4m	144,776	32,273
2018	4,634	137,868	73%	27%	136,136	51%	49%	33,361	39%	61%	19%	30%	173.6m	148,024	32,259
2019	4,471	135,430	74%	26%	133,711	51%	49%	32,827	39%	61%	19%	30%	169.4m	144,399	31,065
2020	4,368	135,081	75%	25%	132,278	51%	49%	31,630	39%	61%	18%	30%	165.1m	137,590	31,110
2021	4,193	135,139	74%	26%	129,982	50%	50%	31,068	38%	62%	18%	30%	160.9m	128,578	29,476
North East															
2015	2,230	73,186	91%	9%	71,157	84%	16%	13,350	75%	25%	17%	29%	88.9m	64,914	9,869
2016	2,254	73,293	92%	8%	73,226	84%	16%	13,998	78%	22%	18%	28%	90.0m	68,599	11,080
2017	2,309	72,744	92%	8%	73,946	85%	15%	14,631	77%	23%	18%	31%	90.6m	67,569	11,348
2018	2,270	72,090	92%	8%	73,719	85%	15%	14,623	76%	24%	18%	31%	90.0m	67,954	10,515
2019	2,204	71,723	92%	8%	72,873	85%	15%	13,847	76%	24%	17%	30%	88.7m	66,186	12,107
2020	2,157	72,407	92%	8%	73,266	85%	15%	13,763	77%	23%	17%	29%	87.7m	65,676	12,057
2021	2,109	72,787	92%	8%	72,234	85%	15%	13,267	76%	24%	16%	29%	86.0m	63,263	13,334

Region	Holdings	Calf registrations by breed type			Dams calving			Heifers calving			Heifers as % dams		Total cattle life days	<36 months uncalved slaughter moves	Cull cows slaughter moves
	number	head	%Beef	%Dairy	head	%Beef	%Dairy	head	%Beef	%Dairy	Beef	Dairy		head	head
North West															
2015	7,410	325,143	51%	49%	323,788	23%	77%	94,736	17%	83%	21%	32%	332.7m	115,490	65,258
2016	7,329	324,536	54%	46%	324,857	24%	76%	93,377	17%	83%	21%	31%	336.7m	118,525	72,664
2017	7,254	323,275	55%	45%	324,531	23%	77%	96,221	16%	84%	20%	32%	334.9m	116,781	70,467
2018	7,093	322,225	55%	45%	322,485	22%	78%	93,577	16%	84%	21%	31%	331.3m	120,404	71,186
2019	6,950	323,049	57%	43%	322,514	22%	78%	92,775	16%	84%	20%	31%	328.5m	126,197	71,052
2020	6,848	328,202	58%	42%	327,696	22%	78%	95,246	15%	85%	20%	31%	328.6m	123,141	72,701
2021	6,705	345,479	58%	42%	334,121	21%	79%	95,417	15%	85%	20%	31%	330.2m	112,736	74,543

Region	Holdings	Calf registrations by breed type			Dams calving			Heifers calving			Heifers as % dams		Total cattle life days	<36 months uncalved slaughter moves	Cull cows slaughter moves
	number	head	%Beef	%Dairy	head	%Beef	%Dairy	head	%Beef	%Dairy	Beef	Dairy		head	head
South East															
2015	4,537	119,784	70%	30%	117,173	51%	49%	27,651	40%	60%	19%	29%	146.9m	87,881	19,960
2016	4,458	119,257	71%	29%	117,046	52%	48%	27,615	40%	60%	18%	29%	146.0m	86,911	20,495
2017	4,392	117,921	72%	28%	117,185	52%	48%	27,269	41%	59%	18%	29%	145.5m	84,481	19,278
2018	4,257	117,786	72%	28%	116,940	51%	49%	27,252	40%	60%	18%	29%	144.3m	85,717	20,216
2019	4,177	115,212	73%	27%	114,052	51%	48%	26,857	41%	59%	19%	29%	142.0m	86,861	21,107
2020	3,999	112,421	75%	25%	111,241	52%	48%	25,778	41%	59%	18%	29%	136.1m	92,317	20,719
2021	3,871	110,740	76%	24%	107,837	51%	49%	25,023	39%	61%	18%	29%	129.2m	81,676	19,296
South West															
2015	16,002	600,005	59%	41%	580,336	34%	66%	154,858	24%	76%	19%	30%	677.3m	345,389	114,762
2016	15,834	604,688	61%	39%	586,691	33%	67%	154,354	24%	76%	19%	30%	688.5m	352,666	125,124
2017	15,525	607,759	63%	37%	591,056	33%	67%	157,269	24%	76%	20%	30%	690.5m	366,327	124,442
2018	15,099	602,497	64%	36%	589,562	33%	67%	157,797	24%	76%	19%	30%	689.0m	378,143	130,385
2019	14,764	599,652	65%	35%	585,882	32%	68%	154,105	23%	77%	19%	30%	680.5m	391,793	128,346
2020	14,420	599,728	67%	33%	587,294	32%	68%	153,532	23%	77%	19%	30%	665.6m	400,717	132,028
2021	13,998	617,526	68%	32%	596,315	30%	70%	157,324	21%	79%	18%	30%	658.3m	366,916	128,355
West Midlands															
2015	4,206	160,804	58%	42%	156,331	26%	74%	43,584	18%	82%	19%	31%	172.0m	118,452	43,864
2016	4,142	160,195	60%	40%	156,682	26%	74%	42,470	18%	82%	19%	30%	173.1m	127,882	44,190
2017	4,079	158,030	62%	38%	155,248	26%	74%	42,703	19%	81%	20%	30%	172.0m	129,874	41,199
2018	4,000	155,493	63%	37%	152,919	25%	75%	41,454	19%	81%	20%	29%	169.8m	127,958	41,915
2019	3,891	153,019	64%	36%	151,225	25%	75%	40,971	18%	82%	19%	30%	166.2m	127,823	40,104
2020	3,826	157,050	64%	36%	154,081	25%	75%	41,714	18%	82%	20%	30%	163.8m	125,503	38,786
2021	3,724	165,933	63%	37%	159,884	23%	77%	43,737	16%	84%	19%	30%	163.2m	114,251	39,805
West of England															
2015	778	24,259	57%	43%	23,321	31%	69%	6,269	21%	79%	18%	31%	29.4m	19,282	4,557
2016	764	24,726	60%	40%	23,963	32%	68%	6,659	23%	77%	20%	32%	29.8m	21,373	4,882
2017	747	24,168	62%	38%	23,713	32%	68%	6,476	22%	78%	18%	32%	29.7m	21,554	4,795
2018	736	24,181	61%	39%	23,616	32%	68%	6,501	22%	78%	19%	32%	29.3m	22,448	4,877
2019	714	23,667	63%	37%	23,180	32%	68%	6,305	23%	77%	19%	31%	28.8m	21,786	5,661
2020	695	23,000	65%	36%	22,565	32%	68%	6,002	23%	77%	19%	30%	27.9m	17,416	5,393
2021	674	23,398	66%	34%	22,554	31%	69%	6,028	19%	81%	17%	31%	26.9m	15,245	5,962

Region	Holdings	Calf registrations by breed type			Dams calving			Heifers calving			Heifers as % dams		Total cattle life days	<36 months uncalved slaughter moves	Cull cows slaughter moves
	number	head	%Beef	%Dairy	head	%Beef	%Dairy	head	%Beef	%Dairy	Beef	Dairy		head	head
Yorkshire & Humber															
2015	5,817	145,751	69%	31%	142,464	50%	50%	35,060	38%	62%	19%	30%	190.9m	197,324	27,869
2016	5,739	146,201	73%	27%	145,916	50%	50%	36,950	38%	62%	19%	32%	193.3m	206,554	29,821
2017	5,750	144,766	74%	26%	145,083	51%	49%	35,929	39%	61%	19%	31%	192.5m	210,377	30,570
2018	5,647	142,359	74%	26%	143,446	51%	49%	34,923	40%	60%	19%	30%	191.5m	209,170	33,417
2019	5,542	142,426	76%	24%	141,838	51%	49%	34,543	39%	61%	19%	30%	188.3m	210,046	33,993
2020	5,433	142,730	76%	24%	141,294	51%	49%	33,879	39%	61%	18%	30%	186.6m	219,058	32,497
2021	5,313	145,024	76%	24%	140,967	50%	50%	34,048	37%	63%	18%	30%	186.5m	218,220	30,840

Region	Holdings	Calf registrations by breed type			Dams calving			Heifers calving			Heifers as % dams		Total cattle life days	<36 months uncalved slaughter moves	Cull cows slaughter moves
	number	head	%Beef	%Dairy	head	%Beef	%Dairy	head	%Beef	%Dairy	Beef	Dairy		head	head
England															
2015	48,559	1.640m	62%	38%	1.603m	38%	62%	421,665	28%	72%	19%	31%	1,882.5m	1.158m	324,047
2016	47,995	1.644m	64%	36%	1.618m	39%	61%	420,188	28%	72%	19%	30%	1,902.3m	1.188m	348,936
2017	47,544	1.634m	66%	34%	1.620m	39%	61%	426,839	28%	72%	19%	31%	1,899.8m	1.202m	341,948
2018	46,419	1.624m	66%	34%	1.610m	38%	62%	420,588	28%	72%	19%	30%	1,888.2m	1.222m	352,996
2019	45,334	1.615m	68%	32%	1.597m	38%	62%	413,488	28%	72%	19%	30%	1,862.4m	1.241m	351,126
2020	44,285	1.622m	68%	32%	1.602m	37%	63%	412,578	27%	73%	19%	30%	1,829.0m	1.245m	353,336
2021	43,038	1.666m	68%	32%	1.614m	36%	64%	416,077	25%	75%	18%	30%	1,806.1m	1.158m	349,140

CTS data shows that the number of farm holdings in England registered with cattle in 2021 was 43,038. Collectively, these holdings produced *c.*1.67m calves, of which just over two-thirds were of a beef breed. However, almost two-thirds of dams (cows that had already previously calved) and three-quarters of first-calving heifers were of a dairy breed – highlighting the significance of the dairy herd. Heifer replacement rates are higher for dairy breeds than beef breeds, reflecting underlying differences in production systems and breeding longevity. Total cattle life days is a summary metric (to aid with estimating other performance metrics) showing the cumulative number of days of cattle being alive, summed here across all holdings in England. Finally, of cattle slaughtered in England, *c.*1.16m were prime stock, with a further *c.*0.35m cull cows. At a regional level, differences between prime slaughter numbers and registered calves give an indication of inflows of animals for slaughter from other regions in England or beyond from Scotland and Wales.