

Appendix 1. Sources of grant funding for abattoirs

Various forms of support are available and relevant to abattoirs. These are either available through national organisations (see section 'National Support') or through local organisations (see section 'Local Support') which have a better understanding of the needs of local communities. This chapter describes the various forms of support available and how they may be useful to abattoirs. It is intended to be a starting point for abattoirs looking for ideas and advice regarding how their business can be supported by external organisations.

The information below is correct as of January 2021.

1 National Support

1.1 Apprenticeships

One of the key issues for abattoirs identified in Chapter 5 was a lack of skilled labour. Apprenticeships offer an opportunity to bring new skills to abattoir businesses by training new or existing staff to obtain an official certificate of Level 2 in Abattoir Work. The apprenticeship has a typical duration of 16-22 months. Within 13 weeks of work and training, all apprentices must submit to the Food Standards Agency evidence of achieving the Level 2 Award for Proficiency in Protecting the Welfare of Animals at Time of Killing (WATOK) (Apprenticeships, 2020). Apprentices must pass an end-point assessment to achieve their apprenticeship.

The Apprenticeship Levy is a UK tax on employers with an annual pay bill of more than £3 million at a rate of 0.5% of their total pay bill. The levy funds quality training as well as an increase in the quantity and quality of apprenticeships. As a result, businesses are able to have a proportion of the costs of training apprentices covered. Money raised by the apprenticeship levy is transferred to England, Scotland, Wales and Northern Ireland based on how many employees are based in these locations. Each of the devolved nations can decide how to spend their allocation; therefore, differences exist in apprenticeship funding between UK countries. Abattoir owners in England would be asked to make a 5% contribution to the cost of training their apprentice and the government would pay the remaining 95%, up to the maximum amount of £6,000. The abattoir would need to pay all the additional costs if the £6,000 maximum amount was exceeded (GOV.UK, 2020b).

As small businesses, abattoirs would also likely be eligible for further financial support such as additional funding, national insurance savings and bursaries (Apprenticeships, 2018). For example, in England, owners could obtain £1,000 additional funding when employing an apprentice who is:

- aged 16 to 18
- aged 19 to 24 and has previously been in care
- aged 19 to 24 and has an education, health and care plan (EHCP).

1.2 Big Lottery Fund: Community Assets

This fund is designed to create strong and resilient communities through assets. It is the successor of a fund available in previous years called 'Growing Community Assets'. The amount available in the 2020 application process was between £10,000 and £1,000,000.

1.3 Business rates relief

Business rates are charged on most non-domestic properties and the amount due calculated based on the property's 'rateable value' (Gov.UK, 2020a). Business rates relief is a discount from the local council on the business rates for certain properties. This process is handled differently in England, Scotland, Wales and Northern Ireland. Abattoirs could be eligible for rate relief if their property's rateable value is less than £15,000 ('small business rate relief') or if it is in a rural area with a population below 3,000 ('rural rate relief'). Abattoirs are encouraged to contact their local council to check their eligibility for rate relief.

1.4 The Food Processing, Marketing and Co-operation (FPMC) Grant Scheme (Scotland only)

The FPMC scheme is part of the Scottish Rural Development Programme. The scheme is currently closed to applicants. The scheme provided assistance to develop food processing facilities to ensure more value was retained by both farmers and growers, supporting a successful and prosperous food processing industry. Financial support was available towards tangible costs of projects such as the erection of new buildings, the refurbishment of old buildings, the purchase of new (and second-hand where permissible) equipment, waste treatment minimisation and disposal, computer hardware and software and directly related professional/technical costs such as architects', engineers' and consultants' fees. Variable rates of funding were awarded up to a maximum value of £500 000. There has been a study as to what might replace this scheme, but nothing has yet been decided (Halliday, 2019). Potential applicants are asked to monitor this page where updates on the future of the scheme will appear when available:

<https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/food-processing-marketing-and-co-operation/>

1.5 The Esmée Fairbairn Foundation

The foundation has a long-standing interest in food and in its impact on people, communities and the wider environment. It supports work that demonstrates the important role food plays in wellbeing and that connects people to the food that they eat. As part of this primary aim the foundation seeks to bring about more sustainable food production and consumption policies and practices. The foundation is open to both large-scale strategic interventions and innovative local work. Esmée Fairbairn will support:

- Inventive projects that can test and demonstrate viable alternative approaches to mainstream corporate food production, retail, and consumption.
- The development of food production methods that do less harm to the natural environment, and improve the lives of people, local communities and livestock.
- Work that influences local food buying and selling and promotes the wider uptake of sustainably produced food.

Applicants must develop new methods which can be replicated, or influence policy and practice more widely.

1.6 UnLtd: The Grow It Award

UnLtd is a charitable organisation in the United Kingdom which finds, funds and supports social entrepreneurs with solutions that change our society for the better (UnLtd, 2020a). The Grow It award is for entrepreneurs who have identified a social issue looking to grow their business, make a bigger difference and become sustainable (UnLtd, 2020b). The award offers a range of support, specifically:

- 12 months mentoring and tailored support from an award manager, providing advice on operations and governance, to replication and growth strategies.
- Up to £15,000 which can include personal expenses to allow full-time work on the venture.
- Expert advice including access to workshops and master classes.
- Connections to investors, corporate partners and other successful entrepreneurs.

In order to obtain the funding, the abattoir will need to demonstrate compliance with the following criteria:

- Be between 1 and 5 years old.
- Ready to grow to local, regional or national scale with a logical and appropriate plan to deliver this.
- Have a compelling performance to date.
- The principal objective for the year ahead must not be to secure (significant) investment.
- Targets beneficiaries predominantly based in the UK.

1.7 Shared Prosperity Fund

The UK government has pledged to set up a Shared Prosperity Fund to replace structural funding worth about £2.1 billion per year that the UK received as part of the EU (Brien, 2020). The fund's purpose is to reduce inequalities between communities. However, plans for the fund are currently unclear; they were due to be announced in July 2020 but were delayed due to the coronavirus pandemic. Nevertheless, it is generally agreed that the level of funding should be at least maintained at its current level, it should largely be allocated based on need, and local authorities and partners should be closely involved (Brien, 2020). It is currently unclear how the fund may help to support local abattoirs but it is important to highlight this fund for future reference.

1.8 Turn2Us

A charity supporting those in poverty since 1897, Turn2us provides a Benefits Calculator and a Grants Search Tool, which allows people to identify what benefits and grants they may be eligible for. Furthermore, they offer their own grant funds; the Elizabeth Finn Fund, the Turn2us Response Fund and the Turn2us Edinburgh Trust. Please see www.turn2us.org.uk to identify support opportunities.

1.9 Grant for Business Investment

Grant Business Investment (GBI) is a business grant available in England. It has equivalent grants in the devolved administrations of Scotland, Wales and Northern Ireland (Grant for Business Investment, 2020). It supports projects which will increase productivity, skills, and employment in economically deprived areas. Applicants must show that they need financial help for the project to go ahead. The minimum grant available is £10,000. The grants can be used for projects to:

- launch a new business,
- modernise, expand or re-organise an existing business,
- upgrade a business by introducing innovative new technology or processes,

- take a new product from development to production.

2 Regional support

Responsibility for local economies has shifted from national government to local communities based on the view that people within communities have a better understanding of the community's needs. As a result, there are differences in the opportunities available depending on the business' location. Local support opportunities can be investigated and identified through different resources in England, Scotland, Wales and Northern Ireland.

2.1 Identifying local support in England: Local Enterprise Partnership Growth Hubs

Local Enterprise Partnership's (LEPs, discussed in greater detail below) lead Growth Hubs which offer free support and advice to businesses in England (LEP Network, 2020). There is a network of 38 Growth Hubs which can be identified at:

<https://www.lepnetwork.net/local-growth-hub-contacts/>

Businesses can select the hub for their local area and use the business support helpline and website to obtain tailored business advice. Furthermore, Growth Hubs can help to identify appropriate sources of funding that they can apply for.

2.2 Identifying local support in Scotland: Scottish Enterprise

Scottish Enterprise is a sponsored non-departmental public body of the Scottish Government (Scottish Enterprise, 2020). They are Scotland's national economic development agency and offer a wide range of business support including tailored advice, skills training and funding and grants. Scottish abattoirs are encouraged to explore the range of support available on their website:

<https://www.scottish-enterprise.com/>

2.3 Identifying local support in Northern Ireland: Enterprise Ireland

Enterprise Ireland is a governmental organisation responsible for supporting the development of Irish enterprises in world markets. They provide a range of funding and support opportunities for companies in order to improve efficiency and growing international sales. Abattoirs in Northern Ireland are encouraged to explore the range of support available on their website:

<https://enterprise-ireland.com/en/funding-supports/>

2.4 Identifying local support in Wales: Business Wales

The Welsh Government's Business Wales offers a range of support to Welsh businesses, including their Finance Locator which helps companies find grants, loans and other finance opportunities relevant to their specific businesses. Abattoirs in Wales are encouraged to explore what support is available to them on their website:

<https://businesswales.gov.wales/businessfinance/types-finance-and-how-apply/grants>

3 Local support

Below are some examples of local support which may be relevant to abattoirs in the UK. This list is not exhaustive but intended to provide some ideas and examples as a starting point for

research into locally available support; opportunities such as these can be identified using the search tool resources in England, Scotland, Wales and Northern Ireland described above.

3.1 Assets of Community Value and the Community Right to Bid

Assets of community value are buildings or other land which have recently been, or are presently used, to further the social wellbeing or social interests of the local community and could do so in the future (Localism Act, 2011). Once listed as Assets of Community Value with the local authority, the local community will be informed if they are listed for sale within the five-year listing period. The community can then enact the Community Right to Bid, which gives them a moratorium period of six months to determine if they can raise the finance to purchase the asset. This allows local communities to save and take over assets which are significant to them. The power lies with local authorities who have an understanding of the needs of the local community. Local communities could apply for their local abattoir to be listed as an Asset of community Value, and thus be provided with the Community Right to Bid should the abattoir be listed for sale.

3.2 Community Ownership Funds

The 2019 Conservative Manifesto committed to establishing a £150m Community Ownership Fund to encourage local takeovers of civic organisations or community assets that are under threat (The Conservative and Unionist Party, 2019). This is based on the view that individuals working within any given community can usually come up with better solutions to local challenges than a distant government. This could provide an excellent opportunity for local communities to take control of their own abattoirs and local food networks. This has previously been achieved in Mull, where the abattoir is a community-owned Provident Limited Company with a board of voluntary directors. However, it is currently unclear when the community ownership fund will become available and how support can be applied for.

3.3 Local Enterprise Partnerships

Local Enterprise Partnerships' (LEP) were set up in England in 2011 by the Department for Business, Innovation and Skills. They do not apply to Scotland, Wales or Northern Ireland. They are voluntary partnerships between local authorities and businesses and are based on three key themes (DBIS, 2010). First, the shifting of power from general to local government and to local communities and businesses because those who understand their economies are best able to lead their development. Second, promoting efficient and dynamic markets and increasing confidence to invest by creating the right conditions for growth and prosperity, and allowing markets to work. Third, using focussed investment to tackle barriers to growth that the market will not address itself.

LEPs support the creation of private sector jobs, and particularly support communities currently dependent on the public sector. They are not defined in legislation, but the Government did specify that they are to provide the vision, knowledge and strategic leadership needed to drive sustainable private sector growth and job creation in their area. It is up to each LEP to agree the form it takes informed by the activities they wish to pursue (DBIS, 2010).

Criteria in the application process focusses particularly on: 1) the demonstration of direct engagement with a broad range of local businesses, 2) suitable economic geography and 3) support from local authorities, and 4) added value and ambition (i.e. *'whether the proposal sets out a clear vision in terms of local economic priorities and demonstrate how it will create the right environment for business and growth, over and above that which would otherwise occur'*) (DBIS,

2010)). When proposals meet these criteria, the Government commit to moving quickly to formally establish the partnership.

Abattoirs play an important role in supporting local rural economies (see Chapter 5), and are thus well suited for LEPs. In fact, LEPs are currently known to be working with abattoirs in Cornwall and likely also elsewhere in England (Duddridge, 2020). LEPs are not a direct source of business funding (businesses are expected to fund their own day-to-day running costs), although they do obtain some money to support new local infrastructure (Duddridge, 2020). Nevertheless, LEPs are well connected with other government funding sources and can provide appropriate expert advice on where funding for abattoirs may be obtained. The main sources of support that LEPs can provide for abattoirs are business advice, skills training and official government recognition of their importance to local economies. Furthermore, given appropriate communication between LEPs in different regions regarding their work with abattoirs, it would be possible for the National LEP organisation to evidence the importance of maintaining abattoir infrastructure to government (Duddridge, 2020).

3.4 Skills Advisory Panels (SAPs)

Skills Advisory Panels (SAPs) aim to work with local employers to build an evidence base of current and future local skill requirements (Department for Education, 2018). They then address skills and employment challenges by working closely with local skills providers (i.e. colleges, universities and other providers) and careers advisory services. A lack of skilled labour was highlighted as a primary threat facing small abattoirs (Chapter 5). Therefore, there is an opportunity for abattoirs to collaborate with SAPs to highlight the immediate need for new skilled abattoir workers. SAPs are equipped to allocate resources appropriately to help local skills providers meet the requirements of abattoirs. SAP responsibilities are usually taken on by the employment and skills board of local enterprise partnerships (LEPs). Therefore, abattoirs are directed towards their LEP for assistance regarding SAPs.

3.5 Business Investment for Growth Grant (BIG)

The [BIG grant](#) is for businesses in the Chorley area who wish to expand by making capital expenditures, creating jobs in the process. Expenses the grant can cover include renovation or building of business premises, security improvements and engineering works. You can apply by submitting an application form on the council website. Get up to 50% of the project costs up to a maximum of £10,000 per business, with grants of £2,000 available for each job created.

Appendix 2. Case studies

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Case Study 1 “Agriculture of the Middle”

Farmers, ranchers, food distributors and retailers concerned about the disproportionate disappearance of mid-sized farms and ranches in America and of the markets and infrastructure needed to maintain their viability have formed an alliance named “Agriculture of the Middle” (Agriculture of the Middle, 2020). The “middle” referred to rests between the direct-sales and the commodity marketing channels. The group aims to reach consumers who care about the impacts of their food purchases and it uses marketing innovations to do so. Members of the alliance distinguish their produce in the marketplace using values such as environmental stewardship, food quality and fair trade. The alliance also initiates research, education and policy strategies to help keep farmers and ranchers on the land.

Case Study 2 Examples of marketing strategies use to add value by private kill retail farmers

Survey methodology

An online survey was created using the program 'Online Surveys'. The full survey comprised of one main section entitled 'value added through private kill retail'. Farmers were asked: '*what livestock species do you rear and sell the greatest number of through your private kill retail business*', followed by '*what breed of this species do you sell the greatest number of through their private kill retail business?*'. Farmers were then instructed to refer to that specific breed when answering the remaining questions.

Specifically, they were asked how many of this breed they sell through their private kill retail business per year; the estimated gross retail value per head when sold through the private kill retail business; what costs they incur when processing this breed for their private kill retail business; and what costs they incur when retailing this breed for their private kill retail business.

Farmers were then asked what their alternative route to market would be if this breed was not sold through their private kill retail business (select from: 'liveweight sales through the ring' or 'deadweight sales direct to abattoir'); the estimated market price per head when using this alternative route to market; and the costs that would be incurred when using this route to market.

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Survey distribution

Fifteen farmers who had participated in prior research connected to this study were approached via email. In addition, the link to the survey was shared with private kill retail farmers registered on a mailing list by the Association of Independent Meat Suppliers (AIMS).

Survey Analysis

The responses of each respondent are analysed as independent case studies, with an emphasis on the following values,

(a) = the value of each animal sold through PKR less the *processing* and *retailing* costs incurred in doing so.

(b) = the value of each animal sold live/deadweight less the direct costs of doing so.

(c) = (a) less (b), the additional value (the mark-up) for each animal sold through the PKR business.

Four Lincoln Red sold each year through a box scheme (England)

This farmer sells four cattle (Lincoln Red) each year through a box scheme. The estimated gross (i.e., before costs) retail value/head sold through the retail business was £2,800. The farmer delivered livestock to the abattoir and collected the carcasses themselves. The farmer incurred processing (slaughter and butcher fees of £550 per head) and transport (£60 per head) costs. The farmer described his retailing fees as insignificant (specifically '*Peanuts. Tel calls and*

¹ The final survey received internal ethical approval from the Human Ethical Review Committee at Newcastle University. Informed consent was obtained from all participants.

emails'). For this farmer, the value of each animal sold through PKR less processing and retailing costs incurred in doing so was estimated to be £2,190 per head (£2,800 - £550 - £60).

The alternative route to market of these animals would be liveweight sales through the ring. The estimated market price/head liveweight was £1,200. Assuming typical livestock auctioneer fees of 3.5%, and halving of the £60 transport costs, the value of each animal sold liveweight would be roughly £1,128 (£1,200-£42-£30).

Therefore, the additional value (the "mark-up") after retail costs/head of each animal sold through the PKR business is some **£1,062**.

350 Texel x Romney/Lleyn through retail business (England)

The farmer sells 350 sheep (breed Texel x Romney/Lleyn) each year through their retail business, a farm shop and through local catering and retail businesses. The farmer delivers the livestock to the abattoir using their own transport, the abattoir returns the carcasses, allowing the farm to use their own cutting room.

The estimated gross (i.e., before costs) retail value/head of the animals sold through the private kill retail business is £170. Processing costs incurred included transport (£10 per head), slaughter fees (£16 per head), and butcher fees (£16 per head). Retail costs included 'consumables, electricity, water etc. 12% of turnover', but no estimate was provided.

Therefore, the value of each animal sold through PKR less processing costs incurred in doing so is £128 (£170 - £10 - £16 - £16) – this excludes retail costs.

The alternative route to market for these animals would be liveweight sale through the ring. They would have an estimated market price per head of £100. The costs of selling through this channel include transport, at £3 per head and fees, of about £3 per head.

Therefore, the value of each animal sold liveweight less the direct cost of doing so is £94 (£100 - £3 - £3).

The mark-up before retail costs for each animal sold through the PKR business is **£34** (i.e., £128-94).

This farmer commented: 'Running our shop makes the farm viable. All of our pigs, sheep, cattle, goats and turkeys are sold through it'.

Texel sheep through own farm shop (England)

The farmer sells 350 Texel sheep each year through their own farm shop. The farmer delivers the livestock to the abattoir themselves, and the carcasses are returned by a wholesaler. The estimated gross (i.e., before costs) retail value/head of these animals sold through the private kill retail business is £200. Processing costs include a slaughter fee (£12 per head) and own butcher costs (£25 per head). Retailing costs include staff and packaging (estimated at £5 per head).

Therefore, the value of each animal sold through PKR less the processing and retailing costs incurred in doing so is £158 (£200 - £12 - £25 - £5).

The alternative route to market for these animals would be deadweight sales, direct to abattoir. The estimated market price/head sold deadweight was £105, the selling costs included transport, estimated at £2 per head, and fees of £1.50 per head. Therefore, the value of each animal sold deadweight less the direct cost of doing so is £101.50 (£105 - £2.00 - £1.50).

The mark-up, including retail costs/head for each animal sold through the PKR business is **£56.50**. This farmer commented: 'Farm shop run as a separate business, benefit to farm is better prices for heavier lambs'.

Oxford Sandy and Black pigs sold through own retail shop (England)

The farmer sells 18 pigs (Oxford Sandy and Black) each year through the retail business. They sell the meat from these livestock through their farm retail shop, a box scheme, online sales, and at markets and festivals. The farmer has adopted the following business model,

'We take our animals to the abattoir, which then takes the carcasses to the butcher, who in turn turns them into what we need for the next few weeks, i.e., sausages, bacon, primals to fulfil our orders. If retailing at shows, 90% of the meat is sold as barbecue items'.

The estimated gross (i.e., before costs) retail value/head of these animals sold through the private kill retail business is some £844. Processing costs include slaughter fees (£30 per head), butcher fees (£2.85 per kg live weight) and transport (£0.18 per mile). The farmer estimated that these processing costs total £519 per head.

Therefore, the value of each animal sold through PKR less processing costs is £325 (i.e., £844 - £519).

The preferred alternative route to market for these animals would be liveweight sale, through the ring. However, this raises a problem: there is no effective ring value benchmark for Oxford Sandy and Black pigs as they are not a breed used in large volume pork supply chains. At the time of the survey, an 87 kg deadweight carcass was being sold for 165p/kg, therefore valuing a typical pig at £145.

Therefore, the value of each animal sold liveweight less the direct costs of doing so would be about £142 (£145 - £1.80 - £1.60). The mark-up before retail costs/head for each animal sold through the PKR business is some **£183**.

This farmer's retailing costs included a farmers' market stall costs (£220/year), show costs (£3,500/year), website costs (£100/year) and travel (£600/year). However, as the farmer also rears and sells cattle through the retail business, so these retail costs need to be divided between the pork and beef sales. The farmer commented,

'We breed and retail our own beef and pork, and find that they help sell each other, i.e., people will want a burger and a sausage sandwich, as people will eat sausages in the morning and burgers in the afternoon. I was surprised how expensive our butchering costs were, but we have changed our butcher, so hopefully it will be a bit cheaper. However, we do not employ staff, so a lot of these costs would have to be paid in "labour" costs if we did the processes in house. We do not have to have a fridge room, or pay for disposal of heads, trotters, blood etc. There are a lot of hidden charges the butcher and abattoir pay which we would have to pay if we did it all ourselves. Having in the past sold 8 month old pigs for £35, I can only say we would not keep pigs if we were not retailing them ourselves.'

Angus cross sold through a retail business (England)

The farmer sells 3 cattle (Angus crosses) each year through their retail business, their principal customers are family and friends. The farmer delivers the livestock to the abattoir themselves, and the customers pick up the meat from the abattoir. The estimated gross (i.e., before costs) retail value per head of these animals sold through the private kill retail business is estimated at £5,000. Processing costs were estimated at £225/head. The farmer incurred no costs

associated with retailing the meat (the farmer specified that retail costs were '*None, meat is packed for me*').

Therefore, the value of each animal sold through PKR less the processing and retailing costs incurred in doing so is estimated at £4,775 per head (£5,000 - £225).

The alternative route to market for these livestock would be deadweight sales direct to abattoir, with an estimated value of £1,000 each. The costs of selling this breed deadweight were not specified.

Therefore, the value of each animal sold deadweight was roughly £1,000 excluding transport and abattoir charges and costs.

The mark-up including retail costs/head but excluding the direct costs of selling deadweight for each animal sold through the PKR business is **£3,775**.

Case study 3 Conservation grazing businesses

Conservation grazing uses domesticated grazing livestock to maintain and increase the biodiversity of natural or semi-natural grasslands, heathlands, wood pasture, wetlands and many other habitats. These environmentally valuable habitats are usually not economic to farm as they are often isolated or small, but they often benefit from less intensive grazing, which is a key characteristic of conservation grazing. This approach has, for example, proven beneficial in restoring and maintaining grassland and heathland ecosystems. For these reasons, conservation grazing is widely used by organisations such as Wildlife Trusts and The National Trust, but it is also a Countryside Stewardship agri-environment scheme management option open to all farmer. Option SP8 pays farmers for grazing livestock on the “native breeds at risk list” a supplement of £94/ha. The specific management requirements for this option are tailored to each site, but all farmers need to graze in accordance with a stocking calendar agreed with Natural England, and to keep appropriate records.

There is no register of the number of conservation grazing sites or herds kept for the UK. But this research has identified case studies which illustrates how managers market their livestock locally to give consumers the opportunity to support their activities through their purchasing behaviour.

3.1 Conservation grazing in the North-East of England.

This site is grazed with 100 Swaledale and 50 Hebridean sheep. The manager sells all the Hebridean and as many Swaledales as possible through a private kill service. Any Swaledales surplus to demand are sold in batches of 10 – 15 through the ring, for an average of £80, but this varies between £55 and £85 from year to year.

When sheep reach slaughter weight the manager contacts a network of customers and takes orders and payment. He then takes groups of 3 to 5 sheep to the local livestock market where they are collected by transport organised by the abattoir. The abattoir delivers the carcasses to one of three butchers that he regularly uses, they make up half carcass boxes and let the customers know their order is ready for collection. In this way the livestock, carcasses and meat are always handled and transported by specialist red meat chain businesses and the manager’s marketing involvement is limited to making the sales, taking the payments, and paying abattoir and butcher.

The Hebridean, which are excess lambs sold by local smallholders, retail at £150/head. Abattoir costs are £16/head and the butcher charges £30/head. These sheep have smaller carcasses than more commercial sheep, and therefore would fetch on average £45/head through the ring. Therefore, by selling locally, using local businesses, to local customers he can add about £55-60 to the value of each animal. The mark-up is less for the Swaledales, at between £20 and £50/head.

The business relies on the abattoir being prepared to organise a livestock collection and meat delivery service. Without the collection services the private kill business would not be an economic proposition because the abattoir is too far away to make the transport of small numbers of livestock. The withdrawal of this service would mean having to replace the Hebridean flock with a more commercial breed. The manager states the net effect of this as being to,

- remove the opportunity for consumers to support the conservation grazing scheme through market purchases,
- reduce the biodiversity and landscape value arising from the use of the rare breed,
- reduce the value to the local economy by

- removing a market for the smallholders' surplus Hebridean stock,
- reducing the services offered by the local butchers, and
- reduce the educational value of their conservation grazing activities.

3.2 Multi-site conservation grazing in the South of England

This conservation grazing enterprise covers several dispersed sites. The manager out-winters a closed herd of Belted Galloways, selling between 80 and 90 prime beef cattle each year (culls are sold through the ring). The heathland sites are best managed by over-winter grazing, so smaller weight Belted Galloways (which weight up to 650 kg) are used.

The preferred local abattoir (there is a choice of two) involves an 80 minutes journey. However, the abattoir owner has only a short-term lease on the property which reduces the incentives to invest in his business. The conservation grazier comments,

"If the abattoir that we currently use was to close its private kill service, it would be very difficult to know what to do. [Name of abattoir withheld] would be the only local choice [40 minutes away] but would not want to use it."

He contacts his network of seven or eight butchers when there is prime beef stock ready for market. The butchers place their orders and pay. He delivers the livestock to the abattoir, which slaughters the livestock and delivers the meat to the nominated butchers, who are responsible for paying the delivery charge. He estimates that by marketing his livestock this way he doubles the value of the animals to the scheme. He lists the impacts on the conservation grazing scheme should the abattoir closes as,

- loss of "easy" income,
- enforced changes in the farming system,
 - either to producing stores from the herd,
 - or to move away from sucker herd totally and buy in and rearing stores.

However, a risk assessment of these options supports retaining the closed suckler herd because,

- breeding from a closed suckler herd allows cattle to be selected for temperament
 - as a direct result many of his stock are productive at 9 and 10 years of age,
- increased biosecurity risks and veterinarian costs, and
- additional transportation, loading and unloading.

Case Study 4 The potential for the use of animal by-product waste as feed for insect production

Insect farming is the practice of raising and breeding insects as livestock. Studies have shown that it is theoretically possible to add value to abattoir waste by using it in insect farming.

The organic waste material used as the feed source depends in part on the insect species farmed. In their study, Lalander *et al.* (2019) fed Black Soldier Fly (BSF) larvae on eight urban organic waste materials (food waste, fruit and vegetables, abattoir waste, abattoir waste mixed with fruit and vegetables, poultry manure, human faeces, primary sludge, undigested sludge and digested sludge) plus two control substrates which have previously been used as model substrates (poultry feed and dog food). This allowed the researchers to identify how different waste substrates affect BSF composting in terms of larval growth (biomass conversion ratio, final larval weight), larval development time, and waste reduction.

Their results revealed that BSF larvae grew largest on abattoir waste (including that mixed with 50% fruit and vegetables), and were smallest when fed undigested sludge. Furthermore, the highest waste-to-biomass conversion ratio was achieved with the abattoir waste. The authors conclude that abattoir waste are highly suitable substrates for BSF production.

Wang and Shelomi (2017) reviewed the literature on BSF as animal feed and human food; concluding that BSF larvae are 'edible, nutritious (especially when defatted), and can theoretically be reared more sustainably than extant farmed insects (and, therefore, extant farmed animals). This makes them a potential protein source for humans and livestock both in the future and in the developing world' (Wang and Shelomi, 2017: p 13).

However, legal restrictions in the USA and EU mean waste-fed BSF cannot presently be legally used as animal feed or human food due to concerns over hygiene and the spread of disease (Wang and Shelomi, 2017: p 13). In turn, changes to these legal restrictions require safety assessment of BSF fed on waste materials. Pending such safety data, the European Food Safety Authority recommends insects used as animal or human feed not be fed manure or certain ruminant meat substrates (Wang and Shelomi, 2017). This is despite Van Huis and Oonincx's (2017) conclusions that insect farming has major environmental advantages when compared to livestock production, including, requires less land and water, produces lower greenhouse gas emissions, generates a high feed conversion efficiencies; and transforms low-value organic by-products into high quality food or feed.

Therefore, studies have shown that abattoir waste can be used as a feed source for BSF production. And that insects can provide a much-needed alternative protein source for human and animal food. And can do so by recycling various forms of organic waste materials which can reduce the environmental costs of producing proteins. However, such use is currently prevented by regulatory barriers.

Case study 5 Can traceability increase the value of UK-produced hides?

The All-Party Group on Animal Welfare report (2020: p 38) recommends that stakeholders consider

“putting together a business case for integrated solutions to the use of hides. The Abattoir Sector Group with the help of Leather UK could set out a useable model” (APGAW, 2020: p 38).

The process of turning hides into leather is time consuming which favours countries with lower labour costs, and therefore the majority of leather used in the UK is imported. However, whilst the quality of the hides remains an important determinant of the quality of leather it produces, recent changes in consumer awareness has made purchasers increasingly concerned about the provenance of the goods they purchase, the farming practices used to rear the animal, and the quality of life the animal led. This has placed an increased importance on how leather is sourced, perhaps particularly so for the handbags, belts, shoes and upholstery produced by top quality brands.

In the UK, all cattle are assigned an individual number at birth which accompanies the animal throughout its life and forms an important component of the Food Chain Information traceability system. Technologies now increasing in use, such as ear chip, radio frequency identification tags, are able to convey information, such as the age, breed, place of origin, farm production system, and other quality of life indicators. However, hides do not currently form part of this traceability system, and Thakur et al. (2020) identified the tanning process as the weak link in assuring traceability in the hide supply chain because this is where “hides are subject to both chemical and mechanical stressors” (second page).

Any large-scale introduction of traceability for hides will depend in part on whether the price premium consumers are willing to pay covers the additional costs of introducing traceability systems based on, for example, adapting ear chips, dot peening, DNA testing, licensed stamps or laser engraving.

Alice Robinson, a graduate designer from the Royal College of Art Fashion Accessory course, is at the forefront of this debate. She has focused on how leather is produced by exploring how hides of individual animals can be traced from the farm, through the slaughterhouse and tannery, to be returned to the farmer. Her colleague and collaborator, Sara Grady, is currently working with farmers in the Hudson Valley and an abattoir to create traceability systems that link consumers to leather manufacturers and a tannery in New York, and ultimately to its supplying farmers and individual livestock.

Case Study 6 Use of EU PDO marque to support a local abattoir: the Lakeland Herdwick PDO (Class Group 1:1 Fresh meat (and offal)) (EC, 2006)

Lakeland Herdwick meat is renowned for its distinctive flavour and quality. The breed's hardiness and ability to graze over a wide area of fell is key to the maintenance of the Lake District landscape as it currently exists. Fresh meat and offal produced from Lakeland Herdwick breed lambs and sheep provides an example of the use of the European Standard Protected Designation of Origin (PDO) status (EC, 2006) to support an iconic breed but also a local abattoir.

The Lakeland Herdwick PDO is indicated by a stamp that guarantees all carcasses and cuts of meat sold under this marque are derived from pure-bred flocks of Herdwick ewes and rams that have been born, raised and slaughtered in County of Cumbria, in an area widely known as "Lakeland". The PDO requires all sheep sold under the Lakeland Herdwick PDO to be processed through a small family-owned abattoir "Aireys", which was established in 1830 and is located close to the area where Lakeland Herdwick sheep are produced.

The Herdwick Sheep Breeders Association (HSBA) oversees the criteria under which Herdwick sheep may be accepted for sale as Lakeland Herdwick. It conducts annual audits of farmers and companies known to be selling Herdwick products and records these details on the HSBA database. Therefore, the PDO provides consumers with the confidence that the produce they purchase complies with all required qualities and provenances.

A typical Herdwick lamb needs to be between 8 to 12 months old at time of slaughter, which is longer than the typical commercial lowland lambs - which can be as young as 4 months at slaughter. But even so, it has a smaller liveweight and produces a smaller carcass than more commercial breeds, which can make it difficult to market through normal red meat marketing outlets.

By purchasing products protected by the Lakeland Herdwick PDO, consumers can therefore be sure they are supporting a breed that is ideally adapted to the particular climatic and environment of the Lakelands. It allows them to be confident they are helping protect a centuries old traditional farming system, and are supporting fell farmers and a family abattoir and in doing so, helping the sustainable management of a World Heritage Site landscape.

Case study 7 Channel Island abattoirs (on Guernsey, Jersey and Alderney)

There are abattoirs on the islands of Jersey, Guernsey, Alderney and Sark. Each is small, with a throughput below 1k LSU/year, and each typically slaughter on one day a week. Table S7 the size and operational practices of these abattoir.

These abattoirs have received state support in the form of capital investment and where necessary as subsidies to cover running costs. The funds have been made available because the abattoirs are considered key strategic investments because they are necessary for the continuation of animal husbandry on the islands.

Table S7 Comparison of abattoirs on the Channel Islands

Location	Ownership	Size of island	Slaughter licences	Slaughter fees	Additional services	Comments
Guernsey	Owned by the State of Guernsey (received £1.7m investment) Opened Nov. 2013 Estimated 20 yr. to return investment	65 square Kms	Cattle, pigs, sheep, goats (some 300,000 kg meat produced/yr.)	Cows, £127, sheep, £28, Pigs (<100 kg), £40.5, (>100kg) £49	Meat butchery service on site (used by FBO free of charge). No emergency slaughter on non-slaughter day	400 LSU/yr. throughput, slaughters one day a week. 13 dairy farms on the island. Small lairage so uses timed deliveries and rapid slaughter. Charges specify payment fee paid to slaughterman and separate charge levied by State of Guernsey (a return on their investment charge). Licenced to export to European mainland and UK but freight charges too high to make this viable.
Jersey	Supported by state government	118 square kms (6,000 ha of farmland)	Cattle, pigs, sheep, goats	Cattle £41.66 Pigs £20.84 Sheep £20.84	Cattle £2,69/day Pigs & sheep £1.37/day	600 LSU/yr. throughput. Some 36,000 livestock, of which 5,000 cattle, of which 2,800 are dairy cows. Guernsey imports meat partly because there is insufficient prime meat produced on the island.
Alderney	A farm based micro-abattoir (built 2012). A jointly run venture by local farmer and the State.	8 square kms (3 miles long by 1.5 miles wide)	Has only three commercial farms on the island.	No prices available	Butchery service on site	A small herd of cattle is kept by the Alderney Wildlife Trust for conservation grazing. VO oversight from Guernsey State Veterinary Service. Improved animal welfare as no need to send animals to Guernsey for slaughter.
For comparison: Isle of Mull slaughter and carcass dressing charges published in 2020 were: Cattle £145, sheep and goats, £25, pigs (80-100kg) £60 and over 100kg £77. Charges include 1 week hanging for sheep and pigs, and 3 weeks hanging for cattle.						

Case study 8 Feasibility study for an abattoir on the Isles of Scilly (Houghton, 2011)

A feasibility study into building an abattoir on the Isles of Scilly (Table S8) concluded that if the business model of the proposed abattoir was designed

“simply to provide a service for slaughtering animals on the Islands, [then it] is unlikely to be viable given the current numbers of livestock on the Islands.”

However, the study considered

“there was the potential to increase livestock numbers on the Islands and combining the construction of an abattoir with the establishment of a “Meat Marketing Co-operative” does appear to have the potential to create significant long term benefits for the Islands economy” (Houghton, 2011: p 5).

The capital cost of the investment into the abattoir and incinerator was estimated to be between £400,000 and £450,000. However, the budget predicts the abattoir will not return a profit before deducting finance charges and depreciation charges until the third year of operation, and then only of £600. After deducting finance and depreciation there is a budgeted loss in that year of £9,598. However, the overall benefits of the investment to the islands was estimated to be somewhere in the order of £245,000 (Houghton, 2011: p 26).

Because of the overall benefits to the Isles the report recommends that the funding that was then available should be applied for to build the abattoir because “without this funding it is hard to see how such a project might take place in the future” (Houghton, 2011: p 32). But together with the commitment from 100% of the Islands’ livestock producers, and if match funding could be found, the project should provide many positive long-term benefits for the Islands economy (Houghton, 2011: p 32). The report concluded that to be successful the project would,

- Provide significant support for the tourism sector,
- Facilitate the development of the market for “Island produced” meat,
- increase in the number of stock taken to slaughter weight on the island (currently many livestock are sold off the island as stores),
- require a suitably trained labour force for the abattoir, and a manager who could also co-ordinate the retail activity (p 31).

Table S8 Summary of feasibility study for an abattoir on the Isles of Scilly (financial and throughput data for third year of operation (2014)).

Abattoir and year of study	Current situation	Facilities under consideration	Slaughter licences	Initial capital investment	Budget forecast	Key assumptions	Incentive for investment
Scilly Isles	No abattoir on the Isles. All finished stock ferried to mainland.	Micro-abattoir slaughter with incinerator specifically for abattoir use and butcher facilities. Slaughter one day/week, 35 weeks/yr.	Cattle, sheep & lambs, pigs. Charges (for year 3 (2014), £180/cattle, £30/lamb, £45/pig.	£400,000 – £450,000	Operating costs of £32,000/yr. (excluding capital repayment), approximately £1000/day. £600 profit before finance & depreciation charges in year 3. Loss of £9,598 after finance & depreciation charge in that year	Throughput in year three 90 cattle, 120 lambs, 240 pigs slaughtered/yr., generating a revenue of £32,000. Availability of trained slaughtermen and licensed official veterinarian	Using existing island incinerator not practical, and removing waste from the island considered to be “too expensive and require considerable documentation” (p. 16) Increase cattle herd to take advantage of agri-environment scheme payments will deliver “significant agri-environmental benefits to the island” Improve land use at proposed abattoir site.
<p>The report advised: “The above projections are unsustainable in isolation at this level of throughput, although it can be seen the model breaks even before finance and depreciation in year three. Other income sources may be generated from the waste and skins. Costs could increase, particularly regulatory costs, insurance and labour. It may be possible to run the facility more efficiently, reducing the number of days is operates” (p 19).</p>							
<p>(Source: (Houghton, 2011)).</p>							

Supplementary Appendix.

Additional information for selected Chapters

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Supplementary information for Chapter 1

S1 The practices and processes used by abattoirs in the UK

This Appendix provides a brief summary and overview of the practices and processes employed by abattoirs to deliver market goods to the customer, and non-market goods from land to the public.

All meat from cattle, sheep, pigs and goats that enters into the human food chain must pass through a Food Standard Agency (FSA) regulated abattoir. Each abattoir's unique stamp forms one component in the regulations and assurances that underpin the UK meat industry's reputation for supplying safe, wholesome and high-quality meat and meat products to consumers throughout the UK and further afield.

Livestock are produced by many farms of various sizes across the UK using many, diverse farming systems. Each farmer will use a livestock system that best suits and utilizes the available resources. Farmers carefully select livestock species, breeds, grazing strategy and determine land use to suit their livestock enterprise and wider business objectives. Some livestock farmers specialise in breeding stock, some in producing store animals, others sell animals (culls and finished) for slaughter. Finished animals, those ready for market, are sold either through livestock markets (the ring) where they are paid on a headage basis by the auction market, or directly to abattoirs, where every carcass is graded, and farmers are paid on a grade-adjusted deadweight basis. Fees and various deductions are levied before payment.

Livestock are transported either by commercial businesses or by farmers or farm staff in farm transport. The rules and regulations that govern every stage of the food supply chain, from transportation, to arrival and processing by the abattoir, to the consumer are overseen by Local Authorities and Food Standard Agencies (FSA), to ensure high standards of animal welfare and meat hygiene¹.

Abattoirs must acquire licenses to slaughter cattle, sheep, pigs and goats and to butcher their carcasses. Qualified official veterinarians are employed by the FSA but a charge for their time is levied on each abattoir. They must inspect each animal before it is slaughtered (ante-mortem inspection). Carcasses are also inspected post-mortem by Meat Hygiene Inspectors. Comprehensive documentation, referred to generically as Food Chain Information must accompany livestock from the farm to the abattoir. These documents detail, for example, the number and type of animal(s) transported, and the farms where they originate. This paperwork is checked and overseen by the FSA officials, who are required to report specific animal health issues to the FSA (Hanley et al., 2019: p 1).

Those farmers who sell livestock directly to abattoirs are sent detailed information about the quality and value of each carcass. They are either paid directly by the abattoir, or by their livestock agent. Farmers who sell stock through livestock markets are paid on the day of the sale but rarely receive details of carcass quality.

When livestock arrive at the abattoir they are penned (lairage), inspected (and washed if necessary), slaughtered, dressed (i.e., gutted and skinned), deboned and cut into primals (animal sections), chilled and matured (i.e., hung). Each operation is tailored to suit the intended market. CCTV is installed to record all livestock-related operations.

¹ Provision of the official veterinarians and meat hygiene inspectors is the FSA responsibility. In January 2020 this service was outsourced to the incumbent suppliers Eville and James for three years from the 30th March.

Abattoirs typically operate as a flowline. Starting with a whole carcass, meat is passed along the line from one workstation to the next where trained staff use specialist equipment to carry out individual processes to produce packaged meat products. This allows carcasses to be cut, packed and labelled into pre-ordered joints according to the purchaser's (e.g., a food manufacturer, retailer or wholesaler) specifications. Meat will be hung in fridges to customer's requirements. Some may be frozen, depending on its intended market and current supply and demand. The cutting and processing plants that prepare carcasses to the customer's requirements may or may not be in the same building or at the same site as the abattoir.

The farmgate value of livestock depends on the combined revenue summed across all the cuts of meat sold, and income from the sale of offal and hides/fleeces, and on the fees, charges and levies incurred. Abattoirs are handicapped in their aim to maximize revenue by,

- variability in carcass conformation,
- difficulties forecasting sale volume and cuts,
- the need to supply fixed weight, standard portion orders,
- the value of hides and fleeces,
- difficulties carcass balancing.

Carcass balancing refers to the difference between the number and type of cuts demanded by UK consumers and the number and type that can be supplied from UK production. Cuts and meat in short supply are imported, and surplus home-produced items exported. This trade has created a complex global web involving the import and export of different cuts and joints from the same species.

UK and EU trade plays an important role in the carcass balancing trade. For example, in 2018, 273,400t of the 289,500t of fresh or frozen beef consumed in the UK was imported from EU countries and 98,000t of the 110,500t exported went to EU countries (AHDB, 2020b: Tables 9.2 and 9.5). For fresh or frozen sheep meat, 79,000t of the 83,200t exported went to EU countries (AHDB, 2020d: Table 9.5), and for fresh or frozen pork, 99.5% of the 456,653t imported came from EU countries and 63% of the 217,690t exported went to the EU (AHDB, 2020c: Table 8.3 and 8.7).

Wholesale processing and manufacturing businesses purchase meat directly from abattoirs to produce, for example, sausages, bacon and other cured meats, pies and other manufactured foods. These products are sold through various retail outlets, including supermarket chains (which sell over 90% of red meat in the UK), to the 6,500 independent butchers (which sell about 6% of red meat), and various food catering services, such as fast-food chains, schools, hospitals, restaurants, cafes and pubs.

Edible offal is used in the human food chain and by the pet food industry, and some is exported. Surplus offal is disposed of, either in anaerobic digesters, incinerators, bio-digesters or landfill. Hides and fleeces are typically sold overseas for processing. Their value depends on global supply and demand. When prices are low this trade becomes uneconomic and these materials are disposed of along with other by-products.

Abattoirs process livestock from three suppliers:

- **From farmers, for their private kill business.**
Farmers collect the carcass of livestock finished on their own farm, which they process themselves and sell through their own retail outlets or keep for home consumption. The farmer pays a slaughter fee, the AHDB slaughter levy, and any charges for butchery services provided by the abattoir.
- **From retailers, for their private procurement business.**

A retailer may purchase animals on the farm and secure the carcass of these animals for their own sales. For example, large retailers purchase livestock from dedicated farmer supply groups and process the livestock through specified abattoirs. Independent butchers can also select livestock from specific farms. In both cases, farmers are typically paid on a deadweight basis.

- **From livestock markets.**

Abattoirs (and independent butchers) may purchase livestock from auction markets to meet domestic or overseas orders. Farmers arrange for their stock to be taken to the market, and buyers arrange for the stock to be transported to an abattoir. Farmers are paid on a liveweight basis, i.e., the bid price less costs, typically on the day of sale, the purchaser pays abattoir fees and charges.

Abattoirs may also receive fees for slaughtering casualty animals, and a small number are specially licenced to slaughter stock diagnosed with TB. Fewer are owned and managed by universities, where they are also used to educate veterinarian students and professionals.

Supplementary information for Chapter 3

S3.1 Waitrose red meat food supply chain

Waitrose sources beef directly from over 500 farms, venison from some 45 farms, lambs from around 400, and pork from 240 producers (Waitrose, 2020a). All beef is from animals which born and reared on a British farm. All cattle are supplied through exclusive sourcing arrangements with the Dovecote Park or Waitrose farmer producer groups, and slaughtered at two sites (Dovecote Park, undated): at Stapleton, in Yorkshire, which slaughters up to 30k head/yr., and at Skellingthorpe in Lincolnshire, which slaughters up to 90k head/yr. All Dovecotes beef (and veal and venison) producers are farm assured and comply with Waitrose’s Beef Protocol. Waitrose,

“Supports and intends to integrate the SALSA (Safe And Local Suppliers Approval) scheme into their local and regional sourcing strategies in the future.” (Waitrose, 2020b).

All Waitrose fresh pork, including bacon, sausages, gammon and ham are supplied and processed by Tulip Natural Farming (a division of USA company Pilgrim’s Pride) through its Spalding plant, which slaughters over 90k LSU of pigs each year. The plant supplies primals to one of its twelve processing plants. Tulip Natural Farming is the largest pig producer in the UK with 30% of the UK market share (Tulip, undated). It sources pigs from more than 250 pig farms located primarily in East Anglia, Lincolnshire, Yorkshire and the South West. It also owns two pig farms, in Norfolk and Suffolk which

“breeds and rears around 1.5 million pigs a year using industry-leading production systems, including outdoor born, straw-finished, RSPCA Freedom Food Assured, free range and organic” (Tulip, undated).

A subsidiary of Tulip Natural Farming, Dalehead supplies Welsh and West Country lambs with Welsh Lamb PGI status from a network of over 400 farmers. It prides itself on,

“working extremely closely with our farms to go beyond Red Tractor standards and produce the very best quality lamb around” (Tulip, undated).

Waitrose claims its supply chain delivers animal welfare standards above the legal minimum requirement, and that these assurances are independently audited and verified. Furthermore, Waitrose has established a Waitrose Animal Welfare Development Group which intends to report in 2020. In recognition of its responsibilities to its consumers, and sensitive to the considerable loss of value to its brand value should any infringements occur, Waitrose makes additional information available, including, for example, detailed transport information, on its web site. This is shown in Table S3.1 (Waitrose, 2020a).

Table S3.1. Distance from farm to abattoir for Waitrose suppliers of British red meat

Livestock species	Standard	Comment
Cattle	Within 6 hours drive of abattoir	Most are within 4 hours drive of the abattoir
Rose Veal	No information on transport time is provided	All veal calves originate from Waitrose diary supply chain, and are transported to the abattoir by one dedicated, Red Tractor approved haulier.
Venison	No information on transport times is provided	Park deer are “shot using non-lead rifle ammunition” (i.e., field kill).
Lamb	The majority of lambs travel around 30 miles to the abattoir	Taken by the farmers who rear them
Pork	Maximum travel time is 5 hours	Three hours being the average journey time

The legal time limit for cattle transport in the UK is 8 or 9 hours, depending on circumstances.
Transport of Waitrose EU pigs is limited to a maximum of eight hours (each country has an approval process equivalent to Red Tractor with an approved list of hauliers)
Waitrose uses ten “high welfare” transporters with which they transport “75% of lambs, 10-15% of pigs and an average of 30% of cattle”. All hauliers used by Waitrose meet British Red Tractor assured standards.
(Source; (Waitrose, 2020a))

S3.2 William Morrisons Supermarket plc red meat food supply chain

Wm. Morrisons Supermarket owns all the abattoirs, cutting plants, and processing and packaging factories that supply its stores with red meat. It has dedicated procurement arrangements with farmers, but does not own any farms. Therefore, the entire red meat supply chain beyond the farm gate is fully vertically integrated and under its own control.

Its wholly owned subsidiary Woodhead purchase beef from 1,700 farmers, lamb from 1,100 farmers and pork from 140 pig farms. All fresh beef, lamb and pork sales are 100% British produced, and all beef sold is produced to the Red Tractor standard (Morrisons, 2019). A subsidiary, Farmers Boy, supplies all its processed meat requirements (bacon, gammon, pies, sausages, etc.). Woodhead manages three abattoirs which together process some 3,800 cattle/wk., 11,000 lambs/wk. and 30,000 pigs/wk. Its three sites are at Colne in Lancashire, which slaughters over 90k LSU of cattle, sheep and pigs each year; at Turriff in Aberdeen, which slaughters up to 30k LSU/yr. of cattle and sheep); and at Spalding in Lincolnshire, which slaughters over 90k LSU/yr., of cattle and pigs).

Wm Morrisons Supermarket also shares some livestock journey time and distance information with its customers, though it provides less detail. Between 2018 and 2019, 67% of its beef, 59% of its pork, 77% of its lamb arrived from the farm to its abattoir in under four hours (Morrisons, 2019: p 19).

S3.3 Food Standard Agency charges and small abattoir discounts

Table S3.3.1 shows the hourly charge levied by FSA for official veterinarians and meat hygiene inspectors. Table S3.3.2 shows the discounts available to smaller abattoirs. The FSA requires at least two full working days notice (though some allowance is given for certain eventualities, for example, machinery breakdown (FSA, 2020: p 11)).

Table S3.3.1 Hourly charge rates for food business operators from 30 March 2020.

Regulated rates		Non-regulated rates	
FSA time spent on official controls			
Meat Hygiene Inspector	£/hr	Meat Hygiene Inspector	£/hr
Single time	32.40	Single time	32.40
Time and a half	48.60	Time and a half	48.60
Double time / bank holiday	64.80	Double time / bank holiday	64.80
Official Veterinarian		Official Veterinarian	
Single time	44.20	Single time	44.20
Time and a half	66.30	Time and a half	66.30
Double time / bank holiday	88.40	Double time / bank holiday	88.40
These charges include travel costs between premises. The calculation behind the discount changed in 2016/17 in line with the recommendations of the Steering Group on Meat Charging. (Source: FSA (2020))			

Table S3.3.2 FSA discount rates and bands, and hierarchy of hours. (Annual hours bands and discounts 2020/1. Chargeable hours are divided into 12 accounting periods, and discounts are calculated for each accounting period).

Discount band	Game handling establishment (upper hours)	Poultry slaughter (upper hours)	Red meat slaughter (inc. on farm SL) (Upper hours)	Discount rate
1	Up to 189	Up to 579	Up to 189	90%
2	189-801	579-1,683	189-801	75%
3	801-2,511	1,683 – 3,258	801-2,511	50%
4	2,511-6,654	3,258 – 6,030	2,511-6,654	30%
5	6,654-15,321	6,030 – 22,053	6,654-15,321	27%
6	More than 15,321	More than 22,053	More than 15,321	25%
Advisory Visit Fee - £302.40 + VAT.				
Food Business Operators are invoiced approximately three weeks after the end of the accounting period. When FBOs do not receive a discount, the charges are based on the full cost charge rates. Cutting premises sites do not receive any discount on hourly charge rates.				
(Source: FSA (2020))				

S3.4 AHDB levy rates 2020/21 (England)

Table S3.4 AHDB levy rates 2020/21 (England).

Sector	Slaughterer /exporter of live cattle	Producer
	(£/head)	(£/head)
Cattle (excluding calves)	£1.35	£4.05
Calves (not exceeding 68kg deadweight or under 6 months of age is exported)	£0.08 (8p)	£0.08 (8p)
Sheep	£0.20 (20p)	£0.60 (60p)
Pigs	£0.20 (20p)	£0.85 (85p)
No levy is charged on the slaughter of deer, goats or chickens. Exporters of live cattle, pigs and sheep are required to pay a levy (typically similar to that paid by the slaughterer). Levy is not payable for animals imported from another European Member State if it is slaughtered within 3 months in the case of cattle and 2 months in the case of pigs or sheep. Levy is not payable if an animal is subject to compulsory slaughter or the entire carcass is declared unfit for human consumption by the official veterinarian (Source (AHDB, 2020a, HMG, 2008)).		

S3.5 Maximum livestock journey times

Table S3.5 Maximum journey times (hours)

	Basic standard vehicle	Higher standard vehicle		
		Travel	Rest	Travel
Sheep	8	14	1	14
Unweaned lambs	8	9	1	9
Cattle	8	14	1	14
Unweaned calves	8	9	1	9
Pigs	8	24		
Unweaned pigs of more than 3 weeks	8	9	1	9
Goats	8	14	1	14
Unweaned kids	8	9	1	9

Under certain circumstances it may not be possible to comply with these maximum journey times. For example: "If the maximum permitted journey time is reached during the sea journey the animals must be unloaded, rested, fed and watered for 12 hours at or near the port of unloading, before the journey may continue. This rest may only be taken on the lorry if facilities are available to feed and water the animals and the animals have sufficient space to lie down to rest simultaneously. Time spent by animals in pens on board a vessel fitted for the transport of unloaded livestock does not count towards the total journey time" (Defra, 2011: p 17).

Journey time is from first animal loaded to last animal unloaded. There are additional regulations some of which vary with species (Defra, 2011). For example, for sheep and goats: Time on Roll-on/Roll-off vessels counts towards the journey time. Time spent by animals in pens on specialist livestock vessels does not count towards total journey time, provided certain conditions are met. Time whilst on the aircraft during air transport does not count towards total journey time.

(Source: (Defra, undated-c, Defra, undated-a, Defra, undated-b, Defra, undated-d))

Supplementary information for Chapter 4

S4.1 Organisations approached for distribution of farmer survey

Table S4.1 List of organisations approached for help in promoting the survey and the status of their help.

Organisation Promoted survey	
Guild of Food Writers	OF&G Organic
Campaign to Protect Rural England	Rare Breeds Survival Trust
CLA	RSPCA
Compassion in World Farming	Scottish Crofting Federation
Countryside Alliance	Slow Food UK
Eating Better	Soil Association
FARMA – The Farm Retail Association	Sustainable Food Trust
Flexi graze	Tenant Farmers Association
Land workers alliance	the Farmer Network
National Craft Butchers (formerly NFMFT)	Yorkshire Agricultural Society
National Farmers' Union	
Did not respond / declined to promote survey	
Country Land and Business Association	National Sheep Association England
Farm491	National Sheep Association Scotland
Farmers Guardian	National Trust
Farmer's Weekly	Organic Farmers and Growers
Friends of the Earth	Pasture Fed Livestock Association
Greenpeace	Q Guild of Butchers
Guild of Fine Food	Royal Academy of Culinary Arts
Land Magazine	Scottish Craft Butchers/SFMTA
Master Chefs of Great Britain	SUSTAIN
National Federation of Young Farmers Clubs (National Agriculture and Rural Issues Steering Group)	

S4.2 Farmers use of abattoirs for home consumption (HC)

A majority of respondents (65.7%, 197) used the private kill services provided by abattoirs for home consumption (see Table 4.3). Fifty-six of these farmers provided answers to additional questions regarding their use of abattoirs for HC.

Most of these farmers (87.5%, n=49) transported their livestock to the abattoir using their own vehicle, a small number (3, (5.4%)) shared the duty with neighbouring farmers. The same number used an outside transport business, only one farmer (1.8%) used abattoir transport. On average, these farmers visited the abattoir which provided their private kill service on average 4 times per year (standard deviation 6.7, range 0-35).

S4.3 Rare and/or heritage breeds kept by respondents to the farmer survey

Table S4.3 Rare and/or heritage breeds kept by farmers and the number of farmers to report keeping each breed. (N=134).

Species	Breed	Number of farmers	Breed	Number of farmers
Cattle	Angus	5	Lincoln Red	1
	Belted Galloway	6	Red Devon	10
	British white	3	Riggitt Galloway	1
	Dexter	15	Shetland	4
	Dun	1	Shorthorn	5
	English Longhorn	3	South Devon	1
	Galloway	2	Sussex	7
	Gloucester	1	Wagyu	1
	Hereford	7	Welsh Black	1
	Highland	8	White Galloways	1
	Jersey	2	White Park	2
	Sheep	Balwen	1	Kerry Hill
Black Welsh Mountain		5	Lincoln	1
Blue Faced Leicester		1	Lleyn	1
Boreray		1	Manx Loaghtan	5
Castlemilk Moorit		3	Portland	3
Cheviot		2	Romney	1
Coloured Ryeland		1	Ryeland	1
Devon & Cornwall Longwool		1	Shetland	9
Devon Closewool		1	Shropshire	3
Dorset Down		1	Soay	1
Dorset Horn		1	Southdown	2
Exmoor Horn		2	Suffolk	1
Greyface Dartmoor		1	Teeswater	2
Hampshire		2	Torddu	1
Hebridean		8	Wensleydale	1
Herdwick		2	White faced Woodland	1
Jacob		6	Wiltshire Horn	4
Pigs		Berkshire	9	Kunekune
	Cornish/British Lops	4	Large Black	5
	Gloucestershire Old Spot	23	Mangalitsa	1
	Hampshire	1		

Supplementary information for Chapter 5

S5.1 Comparison of abattoir charges, fees and services provided

For price conscious farmers to be able to compare abattoir fees on a like-for-like basis they will need to know if the advertised charges include VAT and the slaughter levy, and what other deductions will need to be added to the “headline” charges. However, it is difficult to compare slaughter and butchering services on a like-for-like basis. The quality of service provided will vary between abattoirs, as will the accuracy of carcass grading and deductions based on those assessments. However, the survey of farmers suggests a lack of clarity exists and provides substantial support for more transparency in pricing. However, in general, and as would be expected, Tables S5.1.1 and S5.1.2 show that slaughter fees are higher for larger animals.

Table S5.1.1 Charges advertised for the State of Jersey abattoir.

Species	2020 charges per animal (including GST)
Cattle	£41.66
Pig/sow/boar	£20.84
Sheep	£20.84
Chiller space costs are	
Additional charge related information: £2.69 for cattle and £1.37 for pigs and sheep for each day the carcass or offal is not collected after the indicated date.	
(Source: (State of Jersey, 2020))	

Abattoirs which offer private kill services are generally reluctant to advertise their charges because many of these customers also buy butchering services. When this is the case, abattoir managers generally prefer to discuss with the farmer their specific requirements, and to discuss the bespoke services available. This also allows the manager to provide specific advice and guidance. However, even so, the provision of standard costs and charges can be of use to farmers. Table S5.1.2 provides a comparison of the charges levied by three abattoirs which advertise their charges online. Whilst this shows the difficulties involved in displaying charges on a like-for-like basis, it would be possible to produce tables that compare abattoir prices along the lines of the milk price tables produced for compare complex milk contracts. Such a service would increase price transparency and be helpful to farmers.

Table S5.1.2 Slaughter charges, butchery charges and charges for additional services offered by Langford Abattoir (as advertised on 12 November 2020).

	Langford Abattoir (University of Bristol) ¹	Mull Abattoir (Island Meats) ²	Long Compton Abattoir ³
Slaughter charges	£	£	£
Cattle	120	145	110
Cattle over 20 months	190	n/s	n/s
Lamb	18	25	23.50
Goat	n/a	25	23.50
Lamb overage sheep	20	n/s	n/s
Pigs (<80kg when dressed)	25	45	32 [#]
Pigs (between 80 and 100 kg dressed weight)	30	60	47 [#]
Pigs (>100 kg dressed weight)	40	77	62
Sows	n/s	n/s	75
"Standard" butchery charges (what constitutes a "standard" service may vary between abattoirs)			
Beef	225	1.30/kg	180 -310
Lambs and goats: /carcase	15	26-32	36.50
Pigs (<80 kg dressed weight).	30	1/kg	23 [#]
Pigs (between 80 -100 kg dressed weight) /carcase	35	1/kg	18 [#]
Pigs (>100 kg dressed weight)	40	1/kg	18 [#]
Making pork sausages (£/kg)	2.75	3.30	33
¹ Charges for Langford Abattoir. Charges exclude VAT and government slaughter levy. A delivery service offered which charges £1.50 sheep/goat carcase, £3 pig carcase and £15 cattle carcase (a minimum charge of £5 for up to 5 miles, £10 for up to 10 miles and £25 for up to 25 miles). A bespoke butchering service is available by discussion. The charge for washing vehicles/trailers onsite is £1/vehicle.			
² Charges for Island Meats (Arran and Mull) as advertised in November 2020. These prices include government levies, hanging charges for sheep, pigs for 1 week, and cattle for 3 weeks. Standard sheep, lamb and pig butchering charges shown. A livestock haulage is service offered. Bespoke butchering services offered (priced as advertised).			
³ Charges for Long Compton abattoir (from 1 st July 2020). Minimum 14 days hanging for beef. Pig sizes are: under 70kgs, between 70 and 100 kgs, and over 100k. Pig butchery charges assume animal slaughtered at the abattoir. Bespoke butchery services are typically also offered (priced as advertised) but standard service only is available during the Covid-19 crisis.			
(Sources: (University of Bristol, November 2020, Island Meats (Arran and Mull), 2020, Long Compton Abattoir, 2020)).			

S5.2 The market value of hides and fleeces

The value of fat livestock depends on the split of meat cuts, the demand for those cuts and for offal, and the prices paid in each market. Offal, hides, skins and fleeces are referred to as the “fifth quarter” and do not form part of the dressed carcass. They typically make up 53% and 48% by weight of a lamb and beef carcass respectively (Osborne, 2018). Category 3 offal can be sold into the human food chain (Osborne, 2018) and hides and fleeces can be processed to supply a range of different markets and diverse outlets, each subject to different levels of demand. The value of hides and fleeces are important to farmers because historically,

“the fifth quarter provided the profit for the abattoir while the carcass meat sales covered the operating costs, however due to changing market conditions this may not always be the case anymore” (Osborne, 2018).

The change in “market conditions” referred to is the recent collapse in the value of hide and fleeces (Figure S5.2). As hides and fleeces are the most valuable parts of the 5th quarter, their fall in value means abattoirs need to balance their books by raising their fees and charges, which therefore reduces the net deadweight price they can pay for the livestock.

The fall in global demand and value of hides and fleeces

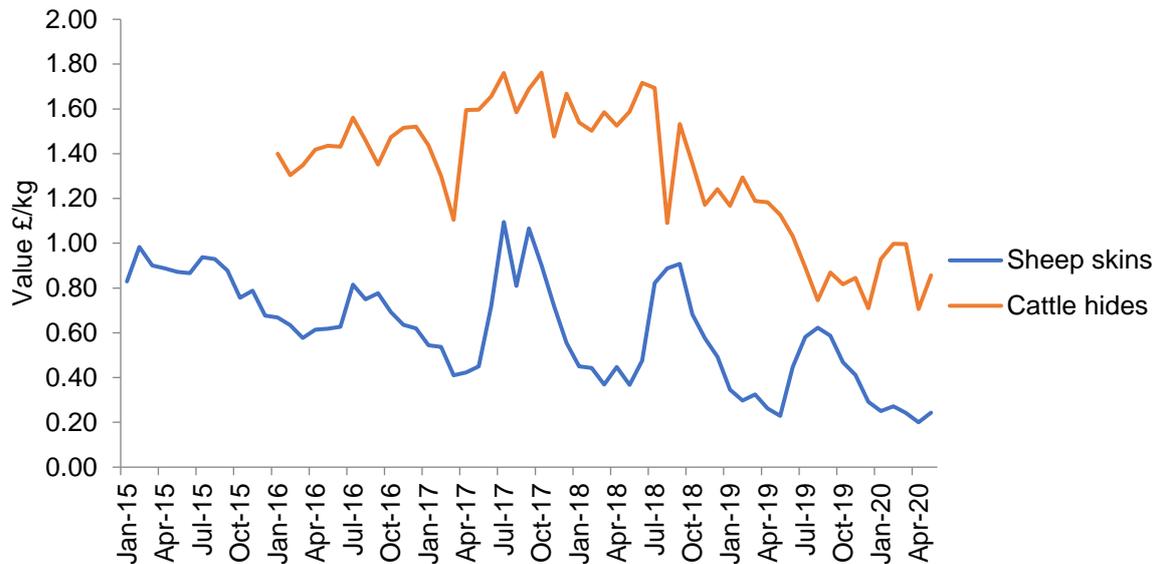
Demand for hides and fleeces in the UK has fallen because health and safety regulations have been tightened and because these natural products have been replaced by new products (Osborne, 2018). Therefore, between 70-89% of UK hides are exported to EU countries, predominately Italy, and most sheepskins are also exported, but to non-EU countries (APGAW, 2020: p 37). Prices for hides has been further adversely affected by COVID-19 (Wyatt, 2020). The lockdown in Northern Italy closed tanning factories and effectively closed this export market.

The fall in global demand resulted in a fall in UK hides exports, from some 12,000 tonnes a month in 2015 to some 6,000 tonnes in the first months of 2019, and to 3,000 tonnes in August 2019. The tonnage of sheepskins exported has also fallen in recent years, from about 5,500 tonnes a month in 2015 to around 4,500 tonnes a month in the early part of 2019 (AHDB, 2019c).

The fall in demand resulted in an oversupply of the market and a collapse in their value (Condon, 2018a, Condon, 2018b) (Figure S5.2). In January 2015 hides were worth between £80 and £90, by August 2019 they had fallen to £30-£35, and it is reported that by the end of 2019 they had fallen to £5 (AHDB, 2019b). Prices for sheepskins have also declined since 2015 (AHDB, 2019c). In March 2017 skins were worth £2.18, compared to £2.86 a year earlier, and £4.49 in March 2015 (AHDB, 2017).²

² AHDB assume a typical hide weights 45kgs and a sheepskin 4.4kgs. However, weights vary with the age and breed of the slaughtered animal, and their value varies with their quality.

Figure S5.2 Timeline of the value (£/kg) of cattle hides between January 2016 and May 2020 and the value (£/kg) of sheep skins between January 2015 and April 2020.



(Source: based on data supplied by AHDB).

The fall in demand led to the “unmanageable build-up of hides” (Wyatt, 2020) so abattoirs have to choose between low returns from the market, or storing the hides in the hope of better prices in the future, or disposing of them as an animal by-product. Preparing and storing hides and skins incurs costs, and many smaller abattoirs do not have the space to store hides or skins. Therefore, they have little alternative to disposing of them as animal by-produce waste, which incurs an additional costs rather than contributing to revenues (APGAW, 2020: p 37).

This point was made at the Oxford Real Farming Conference in January 2019 by President of National Craft Butchers and small abattoir owner, John Mettrick, who said,

“Recently we slaughtered 89 lambs but received only 10 pence each for their skins, in addition to being charged £1 for 12 that were damaged. This resulted in us actually making a loss for something that in my Father’s Day would have generated about £500 in profit. On top of this loss, small abattoirs must pay £800-£1,000 per month to have their [animal by-produce] waste taken away. This has a knock on effect for farmers and retailers as abattoirs have no choice but to pass on these costs” (Perry, 2019).

Supplementary information for Appendix 1

SA1 Selected awards made under the Food Processing, Marketing and Co-operation grants scheme to meat processing businesses.

This grant scheme spent its £66m budget in the first quarter of 2019, having supported 119 projects spanning all eligible award categories (Halliday, 2019: p 11). Some of the schemes it supported in the red meat sector are listed in Table SA1.1. The scheme offered variable rate of grant support as set out in Table SA1.2.

Table SA1.1 Selected awards made through the Scottish Government's Food Processing, Marketing and Co-operation awards (excludes awards made to meat processing businesses).

Funding round	Business applying for a FP, M&C grant	Value of award made
8	Millers of Speyside Limited (the construction of a new multi-functional building).	37,374.80
	Quality Pork Processors Limited (QPP) (first stage investment in 5 key elements at its Brechin abattoir site).	£558,965.40
7	Scotbeef Inverurie Ltd (to construct a state-of-the-art abattoir at Inverurie).	£4,000,000
5	Border Meats Limited (to centralise location and create a more efficient and sustainable abattoir, butchery and sales facility).	£305,000
	Scottish Island and Abattoir Association (feasibility study).	£43,400
4	ABP Perth (to double its cooling capacity).	£518,779.80
	Sandyford Abattoir (upgrading and expansion of the offal processing room and parts of the cattle slaughtering area).	£100,171.08
3	Highland Game Ltd (building extension, increase refrigeration area and plant and equipment for butchery and primary processing area and a packing line)	£327,417.48
2	Pork Scotland Ltd (build a new state-of-the-art pork abattoir and processing plant in Livingstone, West Lothian).	£1,948,634

(Source: (Scottish Government, undated)).

Table SA1.2 Percentage of grant awarded under the FPMC (Source: Halliday (2019: p 11)).

Project type	Business/enterprise size		
	Large	Medium	Small/micro
Capital			
Annex 1 output	40%	40%	40%
Non-Annex 1 output	ineligible	10%	20%
Non-Capital			
Co-operation	40%	50%	60%
Feasibility	50%	60%	70%
Consultancy	-	50%	50%
Fairs/shows (national events)	-	50%	50%
Innovation	15%	50%	50%
Training	50%	60%	70%