Exploiting the potential of the fifth quarter

Ben Stanley

A John Longwill Trust Award (Leicestershire)

Ben Stanley
Spring Barrow Lodge Farm
Swannymote Road
Grace Dieu
Nr Coalville
Leicestershire
LE67 5UT
ben@blackbrook-longhorns.com

‘A man travels the world in search of what he needs and returns home to find it’
George Moore

Contents

List of Figures

List of Appendices

Acknowledgments

To have been given the opportunity to undertake this study I would like to express my gratitude to my sponsors the John Longwill Trust (Leicestershire) for sponsoring my award. I would also like to thank the Nuffield farming trust for giving me the opportunity to travel the world, learn more about farming and the industries that surround it and meet an incredible number of people who challenge the way you think.

My gratitude must also go to John Stones who invariably always sees you right and finally to Victoria my long suffering fiancée. Please find a list of contacts I would like to give special thanks to and the end of this paper. I would also like to thank Monty Panesar and Julia Bradbury for their autographs and encouragement during my Nuffield travels.

Disclaimer

Acronyms

BSE	Bovine Spongieform Encephalopathy
MBM	Meat and Bone Meal
MHS	Meat and Hygiene Service
MLA	Meat and Livestock Australia
OTMS	Over Thirty Month Scheme
SRM	Specified Risk Material
USDA	United States Department of Agriculture

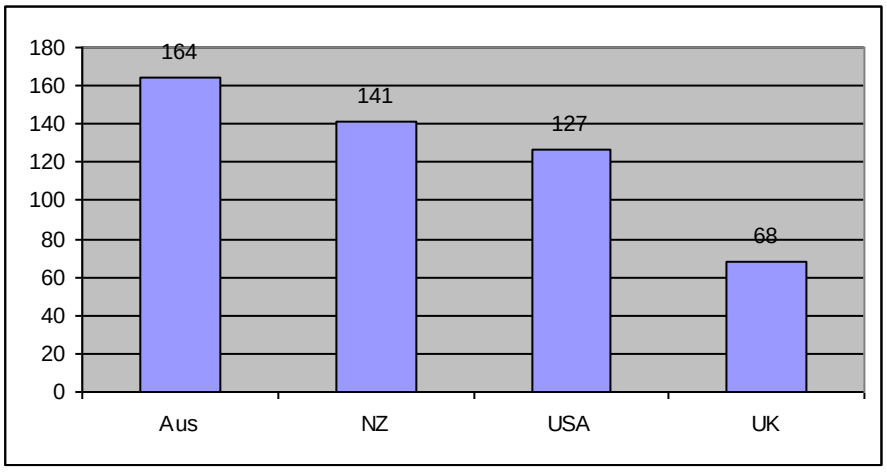
1.0 Executive Summary

'Where there is muck, there is brass'

The main objective for our industry must be to reduce the cost of fifth quarter disposal and improve returns. To regain the historic position when the fifth quarter made a significant contribution to overall operating costs similar to those obtained prior to BSE and as illustrated by my visits to South Africa, New Zealand and Australia and the US.

Due to the scale and centralised nature of processing in New Zealand and Australia the ability to market and exploit new markets for their fifth quarter is far greater than in the UK. Processors are far more likely to be vertically integrated enabling them to progress further up the value chain. This shortened chain lends itself to high-level product traceability and reduces the number of stakeholders requiring their cut. Consequently the fifth quarter is worth more than double in Australia, New Zealand and the US than in the UK as illustrated by figure one.

Figure One. Cattle fifth quarter in selected countries (US $). (EBLEX)



In the UK we have a more fragmented industry with over 190 small or medium sized abattoirs, 50% of abattoirs send offal direct to rendering and are unable to secure higher value markets for their offal because of their low volumes. The industry therefore must move to load volume consolidation as a means for smaller businesses to compete in the international export market.

The reopening of our export markets also means low value items, which would previously have been sold cheaply for rendering or pet food, could be exported for greater returns. My experiences in abattoirs in New Zealand and Australia illustrated the importance of improved and careful harvesting of offal in the UK. In addition each element of further processing strengthens the position of the seller.

Farmers can play an important role in tangibly improving fifth quarter quality for example in reducing liver fluke damage. Producers need to be made aware of problems and any increase in new cases in offal and hide downgrading. If there was a value associated to offal and feedback reports including offal and hide quality, this

would empower producers to think of their livestock as a package of products rather than simply a carcass.

The quality of the tanner's raw material, hides and skins is affected directly by on farm management and production methods. Improving these standards would increase hide quality and result in improvement of value along the chain, improving economic performance of all sectors, producer, processor and tanner. The challenge is to find an improvement scheme that is simple and cost effective, that can possibly be incorporated into existing farm assurance schemes.

There are excellent potential returns available for producers adding value to unique native breed cattle hair–on–hides and sheepskins within the UK. Suitable marketing applications would help generate increased identity for the regional tourism industry, especially within areas of the UK using synonymous regional branding and distinctive sheep breeds, e.g. Herdwick sheep in Cumbria. This can have a great impact not only in promotion of native breeds but also in promoting the differentiation of a region. These products can also help develop a farm brand and establish new income streams.

However it is clear that there is an urgent need to create a sustainable strategy to save the UK tanning sector, or potentially we lose an industry asset and skills forever. The position of the UK sheepskin industry inparticular can only be described as perilous. It is only by supporting these companies that the opportunity will remain open to us in the value added sector. It is vital for agricultural stakeholders to open a dialogue with the hide and skin industry to move the industry forward enabling it to reinvent itself through the creation of modern facilities and regional tanneries.

The marketing of a small number of hides and skins is only part of the story, the vast majority of skins and hides will remain for the foreseeable future a commodity product on a world market. We still have a good high-class product in the UK to market to international tanneries: our cattle are not branded, do not suffer tick problems and many are finished indoors. The quality of hides worldwide appears to be on a downward trend and opportunities are being missed because although the leather market suffers from peaks and troughs, quality will always sell.

Relationships between the various elements of the beef and sheep industry have always been tenuous. There is a disconnection between all stakeholders within our food chain. A system – encompassing farmer, abattoir, hide market, fellmonger, tanner, renderer, etc, all with a myopic approach to their own sectoral profitability has produced an atmosphere of mistrust and self interest where value adding opportunities are lost.

All stakeholders would benefit from forming a working group to help develop better understanding between our symbiotic industries and therefore help enable transparency and increase profitability for the entire industry. Legislation and consumer attitudes must be changed to enhance better understanding of the exciting products that can be efficiently and safely derived from the fifth quarter.

2.0 Introduction

2.1 What is the Fifth Quarter?

Hearts, Liver, Kidneys, Tongue, Skirt, Tripe, Cheek, Tails, Hides, Stomachs & Intestines, Runners, Tallow, Sinews, Pizzles, Bones, Blood, Embryonic Fluids, Heels, Head Mounts, Horns, Rendered Products, Nutraceutical, Bioactives and Pharmaceutical products, hooves, tendons, ears, glands, etc, etc.

Figure Two: Beef Tissues % liveweight

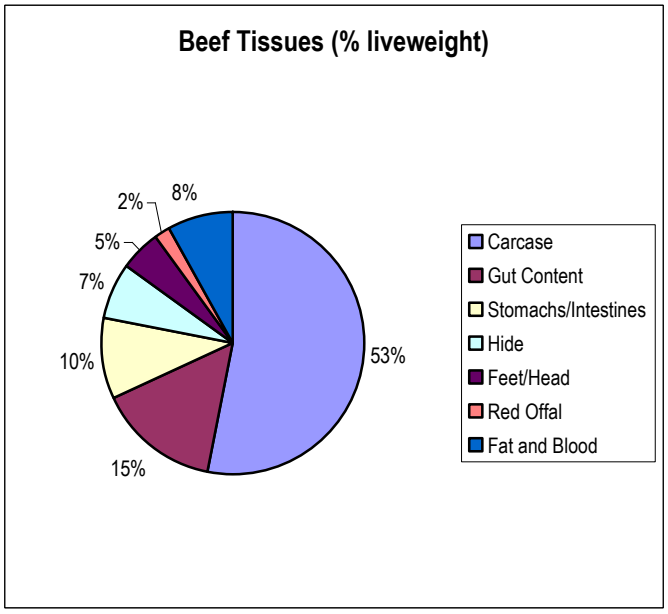
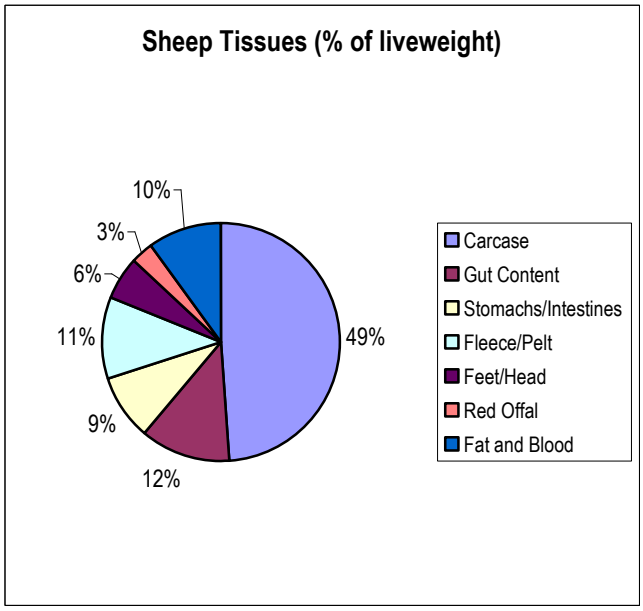


Figure Three: Sheep Tissues % liveweight



The fifth quarter represents an average of 47% in beef tissues and 51% in sheep tissues of total liveweight and yet in the UK only realises 5% of total value (EBLEX 2009). Fifth Quarter tissues are broadly split into two categories edible or co-products (red offal: liver, heart, kidney and tail) and inedible by–products, (green offal: stomach, digestive tract and hide). Yet for both edible and inedible fifth quarter the primary producer receives no tangible value, and the value the processor receives has fallen dramatically over the last two decades.

Before the onset of the BSE crisis and its consequent problems for the UK livestock sector, offal and by–products from animals were still referred to as the 'fifth quarter', as they traditionally provided the operating profit for the slaughterhouse. As a consequence of BSE and subsequently Foot & Mouth Disease (FMD) the available profit from the fifth quarter has been substantially eroded as markets were limited through export bans and much of the material from which value was once derived became no more than waste and a cost to the industry. Independent work commissioned by EBLEX has suggested that adopting fifth quarter practice could change a £100 charge per bovine into a £40 benefit per bovine.

Despite the generic nature of most fifth quarter products and the primary producer having become increasingly disassociated from this market, the producer is able to have an influence on some of its quality both in terms of value added direct and commodity markets, for example in liver quality and hide improvement. Therefore, a potential opportunity now exists to regain and reinvent significant value within our supply chains, especially now that Over Thirty Month Scheme (OTMS) restrictions have been lifted and our export markets are re-opening to the world.

2.2 Background

I graduated from Harper Adams Agricultural College with an agricultural degree in 2002 and the Royal Agricultural College with an Agricultural & Food Marketing MBA in 2006. I now farm with my parents at Spring Barrow Lodge Farm in Leicestershire. The farm is a mixed unit comprising of 750 acres, 500 acres being arable and a further 1200 acres contract farmed. The 250 acres of grassland supports our 200 head herd of pedigree Longhorn cattle and Jacob and Suffolk sheep flocks.

We are passionate about pedigree breeding and promoting our stock through the show ring. Our main route to market for those cattle and lambs not sold for pedigree breeding is through our added value retail business selling our meat direct at farmers markets, events and through our on farm butchery. In 2009 we have sold over 60 bodies of purebred Longhorn beef, 200 lambs and outsourced 150 Rare Breed pigs.

Selling direct has allowed us to put a firm base in the price of our pedigree stock and has enabled us to achieve the best margins from our native breeds. Their brand allows us to achieve a premium, selling direct to the consumer and in turn this enables us to counter any loss in performance and carcass yield in comparison to modern commercial and continental breeds.

2.3 Why the Fifth Quarter?

We are a low volume turnover business aiming to achieve the highest value per animal we can through direct marketing. Because of the unique qualities of the native breed cattle and sheep we produce and through having diversified into direct meat sales, I became increasingly interested in the additional value that our fifth quarter products could offer our business. Being a farmer and relatively green to the butchery business I found myself observing the meat chain with a fresh perspective and questioning the level of transparency and efficiency within our supply chains.

Having considered a Nuffield over the years, I was always attracted to do something a bit different and looking at the fifth quarter industry from a farmers perspective has been a rewarding and interesting journey. Learning about the fifth quarter has taken me out of my ‘knowledge zone’ and I have tried to develop an understanding of the symbiotic industries that surround livestock farming and I hope through this study I help raise awareness of the opportunities that are available to our sector. My aim is to highlight areas for discussion and create a wider debate for the opportunities for improvement in returns.

2.4 Objectives

- To help explore and maximise returns from the fifth quarter for producers retailing their beef and lamb direct to achieve the highest possible return per unit.

- To explore the value of Native Breeds and the added contribution they are able to provide to margins through the marketing of their unique fifth quarter (hides and horns).

- To explore and highlight the opportunities to improve returns throughout the beef and sheep industry by increasing the value of the fifth quarter resource to the industry.

To inform my study I travelled to South Africa to understand how a developing country, with a poor population that places a high value on protein uses its fifth quarter. To understand how Australia and New Zealand, two countries with large volume production, uniquely placed to export to the Asian market consolidate and market their fifth quarter for export. Finally to the United States to meet smaller producers and marketing co-operatives marketing fifth quarter for direct sales from native breeds.

3.0 The Leather Industry

3.1 The impact of the producer on Hides and Skins

The value of finished leather is affected by the quality of the grain in the leather and the grain is influenced by farm and abattoir activity and practice. The producer can impact on the quality of the grain by damage from lice, ticks, scratching, barbed wire and dung burn. However farmers are frequently unaware of the value of the hide as a product.

Damage caused by ectoprasite infestation, goads, branding, barbed wire and dung all leave minor scarring on the hide which, while of little significance to the farmer or the animal, significantly reduce the value of the hide to the tanner. The needs of the farmer and the tanner are different at this point. Unless the animal is in distress or its performance condition is suffering, the farmer has little incentive to attempt to rectify problems affecting the hide. For the tanner the damage, which cannot be detected until processing has begun, represents a loss of value on the final product and increased expenditure on additional processing to mask the damage.

The quality of hides is defined by the absence of damage to the grain surface through which, the hair fibres grow. This grain surface is visible only after the hide has been partially processed, with the hair being removed to reveal the surface. The tanner therefore buys blind on weight, which actively discourages quality high payments. This and the inability to trace the hide back to the individual producer severely limits the opportunity to add value and therefore increase quality.

3.2 The Tanning Industry

As a result of intense international competitive pressure a great deal of the UK tanning industry has contracted substantially over the past thirty years, leaving the hide and skin market exposed and largely reliant to the vagaries of the export market. The majority of hides and skins are now collected by 'hide merchants', salted and exported to countries with lower labour costs and environmental disposal costs.

Cattle Hides and Sheepskins in the UK are generally preserved and traded in two forms –

- Salted – salt acts as a preservative of the skin, providing a stable product that can be exported with a medium term shelf life.
- Chilled – the modern alternative to salting, reducing weight in transport and environmental disposal costs.

Over the last decade the country with the largest demand is China, although Italy still imported two thirds of our bovine hides in 2008. Hides and skins are offered to a global market and are subject to fluctuating market prices typified by cyclical peaks and troughs or 'feast and famine'. We are currently in a very low trough, mainly due to the fall in demand for leather in the car manufacturing industry. Hides and skins

are recognised as one of the most volatile commodities in terms of prices and tanners face problems in long term planning because of this price volatility. The key issues are –

- Hides and skin supply is not price elastic: because they are a by-product, the supply is driven by demand for meat and changes in agricultural policy rather than price.
- Rapid changes in fashion.
- The UK market structure has several links in the supply chain (abattoir, hide market, trader and fellmonger/tanner). The demand influence in the supply chain is therefore diminished or lessened by the number of links.
- Tendering systems based on a short term basis intensifies volatility of prices.
- Skins and Hides are a by-product and therefore can be handled poorly as a low value item.

As with most sectors of the meat industry the BSE outbreak caused problems for the hide and skin trade. Many export markets switched to skins from other countries and this trend has remained as further animal health issues have been prevalent and the stigma of BSE remains.

3.3 UK Sheepskin Tanning Industry

- During the 1960's and 70's the sheepskin industry employed around 5'000 people, over 50% of whom were based in the South West.
- The 6 biggest tanneries and manufacturers employed 2140 people with a combined turnover of £30 million per annum.
- UK sheepskins were sourced by these tanneries and manufacturers for clothing, slippers, footwear lining, infant care, seat covers and rugs and many other products retailed comprehensively in every major high street throughout the UK and exported to more than 26 countries.
- By the beginning of the 1990's 2 commercial tanneries remained and employed less than 350 people.
- The annual sheep kill in the UK in 2008 was 15.5 million.
- There remains only a small domestic market for skins being 60,000 tanned primarily by two tanneries in the South West of England, less than 0.5% of the total UK annual kill. Contrast this with the 70's and 80's when up to 2 million sheepskins were tanned in the UK.
- At a notional retail price of £50 per skin the revenue from the UK tanned sheepskins realises in the region of £3 million per annum, retained within the UK economy.
- Within the UK there is only a humble 10,000 sheepskins, which are annually contract tanned for farmers.
- The majority of the rest of the UK skins are salted and exported by hide markets.

(RSA 2004)

Why the decline?

- EC legislation arising from BSE and FMD and Animal By-Product regulations.
- High environmental disposal costs.
- Comparative high labour costs.
- Volatile market.
- Rapid changes in consumer taste and demand in sheepskin products.

Fenland Sheepskin Company is one of the last surviving tanneries in the UK, processing skins for bespoke customers and also offering a contract tanning service for farmers, from £18 per skin. I was lucky enough to meet Andrew Tinnion who has sadly passed away during the writing of this report and I was impressed with his depth of knowledge and enthusiasm for the sector.

The most striking message from Andrew and from Peter Robinson the secretary of the Real Sheepskin Association was that the UK sheepskin tanning industry desperately needs a succession plan. Much of the equipment and machinery used in the remaining sheepskin tanneries is antiquated and many of those who are still employed in the sector are nearly as old as the machines!

Andrew was passionate about sourcing UK sheepskins and their unique selling point in relation to traditional breeds and those with distinctive wool. However many breeders of coloured sheep can often have small quantities of volume, which therefore make it difficult to purchase enough stock to fulfil orders.

When Fenland had been approached by a clothing manufacturer looking to source a large number of Herdwick skins for a luxury clothing range, he felt this might be possible by approaching abattoirs, where there is enough throughput of Herdwick skins in the North of England. This would enable them to build enough stock to enable the clothing manufacturer to publish a catalogue, with confidence that it could fulfil the orders. However enquires simply led to concerned hide and skin merchants in the area, warning them away from attempting to source skins on ‘their patch’. The selection of quality UK skins can therefore be an issue for UK tanneries.

3.4 International Sheepskin Perspective

3.4.1 Australia

Australia is uniquely suited to sheep production, traditionally the most popular breed is Merino, with their distinct characteristic of heavy fleece of fine quality, white and dense wool. Australian pelts are typically poor quality suffering from seediness, ribbiness and general ectoparasite damage.

In comparison to the UK domestic raw material of pelts, Australia’s raw material has historically held more value in the wool, with pure Merino skins being potentially worth less than the wool. Another key difference is volume, slaughter within Australia is on a far larger scale and it is common for abattoirs to process up to 3,000

lambs per day. In many other ways the system of buying and selling sheep skins is similar to the UK, both experiencing common problems. However there are a few fundamental differences –

- Bidding for the raw material occurs on a daily, rather than weekly basis. This is because of the higher output from abattoirs and therefore requires the daily removal of skins.
- Skin buyers will visit the pens at several abattoirs before slaughter and place bids against the skins that he desires. A large degree of grading of skins whilst on the animal will be carried out at this stage and the price placed retrospective of perceived quality.

The Australian sheepskin market structure is similar to the UK, although there are some key differences. The Australian raw material is recognised as holding more value in the wool of the skin and the price is adjusted accordingly, whereas in the UK this is not the situation. The quality judgement is made whilst the skin is on the live animal, although this will not ultimately mean the pelt will be quality. Skin buyers bidding for lots at abattoirs is a more open and transparent system for hide merchants and fellmongers to buy skins, than the closed system in the UK. This method of bidding would allow more opportunity for tanners to source the quality of skins they wanted. It would also potentially overcome the example given regarding Fenland struggling to source Herdwick skins. However because of the smaller volumes of throughput in the UK this system would be hard to achieve.

Figure Four. Summary comparing the UK and Australian Market structure

UK	**Australia**
Various Breeds	Mainly Merino
Significant value of the raw material is the pelt	Value of raw material has traditionally been in the wool
No grading of raw material at all for quality	Grading for wool and pelt quality carried out on live animal
Low slaughter numbers	High volumes of slaughter numbers
Weekly bidding for raw material	Daily open bidding for raw material.

In Australia the skin is a separate line on transaction when selling lambs over hooks, meaning that the producer receives one payment for the skin and one payment for the carcass. Skin prices can vary a great deal and is dependant on the presentation and cleanliness of the animal pre slaughter and the type and length of wool on the animal. Mutton can range from AUS$2.50 up to$30 for Merino sheep. This method of feedback separating the payment helps provide an incentive culture and enables the producer to have a greater understanding of the market.

3.4.2 New Zealand

New Zealand is the world's largest exporter of pickled pelts and despite a slight change in market structure over the last 20 years the number of hide and skin merchants are minimal, thus retaining a relatively short supply chain. Large processors like Alliance have fellmongeries situated on site at the meat works, which receive skins direct from the killing line and are processed immediately. This favours farmer traceability and feedback because a change in supplier can be easily identified on the killing line, through marking the skin or using a tag. However despite the advantage of a short supply chain this was not being exploited and quality improvements were not being conducted.

Figure Five. Summary comparing the UK and New Zealand Market structure.

UK	**New Zealand**
Good quality pelts	Good quality pelts
Skin merchants part of the supply chain	Few skin merchants
Longer supply chain	Short supply chain, abattoirs often linked to fellmongers
Small abattoirs	High volume kill (up to 35,000 per day)
Wool low value	Wool low value

The key to improving quality is pelt traceability and in New Zealand whilst visiting the meat works at Oamaru owned by Alliance I was introduced to a tagging method known as 'Quick Stik', which had been used in skin improvement projects in the past. The principle involves inserting a bar coded plastic strip through the axilla and each end of the tag then sticks together to form a ring. This tag holds a number that relates to farm origin and has been developed to survive the pickled stage where the skins are graded. The grades can then be feedback to farmers, however despite seeing a rise in pelt quality the scheme had been discontinued –

'The trouble is hide improvement technology is simply not value for money, you get a 5% improvement for 100% traceability and that's simply not cost effective.'

General Products Manager (Alliance).

This view was commonly expressed during my study tour, everyone in the chain from producers to tanners can see the value and importance of hide and skin traceability but for a programme to work it needs a committed relationship between all stakeholders in the supply chain. However the value of the market and nature of its volatility means the continuation of traceability systems becomes vulnerable when the market value is low.

3.5 UK Cattle Hide Tanning Industry

- The UK Bovine Kill in 2008 was around 2.7 million hides over 50% are processed in the UK through one remaining large scale tanner in Scotland.
- There are a handful of other 'bespoke' tanners in the UK who have specialised to survive, in the face of similar circumstances to that of the UK sheepskin sector.

NCT tannery is the largest remaining hide tannery in the UK and processes over 50% of the UK's hides, the plant established in 1936 is one of the most modern tanneries in Europe predominantly marketing graded hides at the primary 'wet blue stage' their sister company Bridge of Weir leather on the same site takes leather to the finished stage for automotive, furniture and the aircraft industries.

I was intrigued to learn how we as a farming industry could have an influence on the final quality of hides and would the development of a traceability programme potentially generate better returns for the industry. I was particularly interested in visiting NCT because of their size and also the fact they have a high emphasis on quality control and have a designated representative to liaise and strengthen relationships with the abattoirs that they source their skins.

This enables them to cut out the 'hide market' and deal direct with around 12 key suppliers across the UK. The advantages of this mean they reduce costs, increase quality and reduce environmental disposal costs of salt by using chilled preservation methods. However in return they have to guarantee to purchase all the abattoirs hides and skins, good or bad. Hides are graded internationally as A (being the best grade), B and C. The aim is to process as many A and B grades, which are more saleable as the remaining C grades (currently 30%) tend not to find a designated market but are sold on the spot market and potentially at a loss.

I was specifically interested in learning how farmers could increase the value within the chain, increasing the number of poorer C grades to more profitable A's and B's. I was lucky enough to spend time in the factory and it was apparent that the majority of damage to poorer quality hides occurs in the abattoir usually leading to holes in the skin, caused by flay damage. Despite having looked at traceability programmes for hides in the past that would lead directly back to the farmer, the view expressed was that any cost of implementation at both the abattoir and tannery would outweigh the potential benefit of hide improvement.

3.6 International Hide Improvement Strategies

The Australian hide improvement programme (H.I.P) was a study that had been funded by the MLA and other industry bodies in Australia, investing AUD$2.6 million into researching activities to improve the quality of Australian cattle hides. The evaluation and research of the hide improvement programme highlighted why hide improvement is difficult in Australia and why it is important to improve quality.

- Hides produced in Australia are often flawed by barbed wire, large scratches, scarred by parasites such as ticks and buffalo fly and branded with large sized fire brands in conspicuous parts of the hide.
- The costs of correcting defects in leather originating from blemishes in the raw hide are borne by the leather manufacturer and this is coupled with a lower selling price of a corrected piece of leather (and hence a lower raw price) in comparison with an unblemished one.
- Users of leather in the footwear and furniture sectors also incur increased costs (decreased cutting yields, wasted cutting time, lost productivity, remakes and rejects and extra inventory) as a result of hide damage caused by producers and meat processors.
- These problems have implications for exports where Australia is perceived as a supplier of poor quality hides and low grade leathers.

Therefore to attempt to improve quality and grading feedback the objectives of H.I.P were pursued through the development of a system to transmit information on hide quality and hide characteristics to the producer from the processors (abattoirs, tanners and hide traders). Under the system where the average market price signals pass through to the producer only broadly as an average price for all hides, there is no provision for feedback on quality of individual hides and hide prices are not separately identified. Without such information the move to a value based marketing system, where better hides achieve a premium and poorer hides are sold at a discount cannot be made.

Therefore in Australia the system developed for the H.I.P was a unique hide identification programme, using a compressed air tattooing stamper. The hide is stamped with a tattoo at the point where the hide is being flayed from the carcass and has an automatic cycle with adjustable timing once the trigger is activated.

When the hide is graded at the wet blue stage, the grades are then entered into the tannery computer system. This system is then able to provide a range of reports on individual hide quality and is a powerful aid to inventory management. This system was designed to also collect both carcass information from the abattoir and grading information from the tannery, this information can then be matched and the feedback process can commence.

The hide feedback information system can be used by abattoirs to achieve premiums and incentive prices for their products with customers as well as introducing an incentives payment programme to reward producers who supply high quality hides.

Despite this apparent panacea and the excellent technology that had been developed, the funding for the hide improvement programme in Australia has stalled. Due to the following weaknesses –

- Cost of technology and implementation of that technology is high and the market potential unclear.

- Meat processors proved reluctant to pass information down the chain to producers.
- Producers in trials were not receiving anything extra for quality hides and therefore there was little incentive for change within the farming system to improve quality.
- Many in the supply chain were happy with the simplicity of the averaging system.
- Lack of processor profits makes them risk averse.

The H.I.P illustrated that one of the key stumbling blocks is the cost and implementation of technology within the abattoir and tanneries. EID for cattle has now been introduced in New South Wales and in the UK sheep sector over the last 12 months and perhaps a potential benefit of EID technology could be that if the mask can remain on the hide and the tag can survive the wet blue stage, feedback could be introduced using an existing system at little extra cost.

Timereau Light Leather in New Zealand processes premium deerskin leather, marketing it to major European fashion houses in Europe, such as Gucci and Prada. Deerskin is used by the top fashion houses because it can be of the highest quality leather available, being light and soft with excellent grain structure. Although individual hide traceability is not necessary, Timereau do work with the abattoir to ensure that each batch of deer from each producer is stamped with a distinguishing mark, for traceability feedback and reward. Due to the nature of the high quality market they supply, for goods that will retail for £1000's, they are able to reward the producer and processor upto an additional NZ$ 30 – 40 per hide supplied if they meet there quality expectations. This example shows that if there is enough value in the chain, traceability systems become very cost effective.

One of the best examples of a quality improvement programme for cattle hides is The Golden Hide Programme in Sweden. The chain in this system is short; involving a co-operative relationship between farmer, abattoir and one central hide distributor. The main trading company for hides and skins in Sweden is Kontrollhudar International (KHI) in Kävlinge. KHI is the sales company of the SCAN Group, which is a producer/farmer owned association of slaughterhouses. The SCAN Group consists of 9 slaugherhouses handling cattle as well as sheep and lambs. Approximately 90% of the hides are chilled at these slaughterhouses and directly transported to KHI warehouse in Varberg during the night after slaughter. At the warehouse all hides are salted and sorted. The system of trading hides and skins is quite concentrated, with four hide markets/collectors, and four tanneries which process raw hides.

In total between 0.4 and 0.5 million bovine hides are produced each year. The structure of the KHI organisation enables payment to farmers of SEK130 (£12) per hide on condition that the following management measures are undertaken by the farmer:

1. Only electric fences are used.
2. Calves are dehorned.

3. Anti-ectoparasitic agents are used.
4. Ringworm vaccination is used if necessary.
5. Animals are kept clean from manure.

The Golden Hide Scheme has resulted in a striking improvement in hide quality and helped generate an international reputation and brand for producing some of the best quality hides in the world. Currently 15,000 farmers are involved in the programme, resulting in the production of 60,000 "Golden Hides" per year. As long as farmers are members of the scheme it guarantees their hide premium and does not involve complicated or expensive traceability expenditure and infrastructure.

Tight policing of this scheme is necessary in order to determine success. Farmers must meet all the criteria consistently to guarantee flawless hides. In the UK we have existing farm assurance in the Farm Assured Beef and Lamb scheme, that could incorporate the management measures required for premium hides and it is important to highlight that in the main these measures are good husbandry requirements that many producers should already include within their management.

During the credit crunch I witnessed during my study tour a lot of tanneries, stockpiling hides mainly because of the decline in demand for leather in automotive production. The key message I took away from all the tanneries I visited was that quality will always sell, even in the bad times. But hide improvement programmes have to be based on simple systems that are cost effective. For the development of quality improvement there must be a simple measure of quality and a means of rewarding quality producers.

3.7 Achieving hair on hide tanning in the UK

When I began my study there was no tannery offering a hair on hide tanning service in the UK. Only one business: Exeter Hide and Skin Company has offered any hair on hide tanning service, exporting in the region of 300 hides to Italy per annum to be sent back tanned at a cost of £150 per skin excluding postage and packaging. Following discussions with the UK Leather Federation I was keen to establish a cheaper UK based alternative. Claytons in Chesterfield have evolved to become a bespoke tannery with a 'will tackle anything' attitude to leather design and service and when I began my study they were keen to look into the possibility of offering a service. This visit helped me establish an understanding of the reasons why there was no service and how these problems could be overcome –

- Specific machinery able to flesh hides (thinning the hide) at full size, where not available in the UK and is very expensive to purchase.
- No one tanner in the UK had the complete equipment for hair on hair on hide tanning, small volumes of processed hides would therefore have to be moved at high cost: farmers wanting hair on products, often only want one or two hides tanning at a time, resulting in it not being cost effective for the tanner.

I was keen to work with Claytons in achieving hair on hide tanning in the UK and I was therefore eager to visit small scale tanneries and discover methods of fleshing hides on a small scale that would overcome this key stumbling block. In South Africa because of the trade in game and hunting there are many small scale taxidermists and micro-tanneries and because labour is cheap, hides are simply fleshed using skilled labour and simple tools, however this is very time consuming and in the UK labour costs and lack of skill would mean this would be prohibitive.

Illustration One. Hand fleshing an Impala skin at a small tannery and taxidermists in South Africa and using small scale tanning drums, and equipment

Greenhalgh Tannery in Victoria is the last remaining small scale tannery able to achieve hair on hide tanning in Australia. The eureka moment that I took from Greenhalgh was that they were able to achieve the fleshing process through using an old fashioned shaving machine, by skilfully working the hide over a fast moving stone. This machine could be imported in to the UK from Eastern Europe at a far cheaper cost than a full size fleshing machine; this would allow Claytons to achieve the process of hair on hide tanning.

By combining their resources during my study I have worked with two UK tanners; Holmes Hall tannery in Hull and Pittards in Somerset, that now offer a completely UK based alternative at a cost of £100 per skin excluding postage and packaging. They have been able to achieve this by working together and bringing two parts of the tanning process together, (one takes the hide to the 'wet blue' stage and one does the finishing using an existing transport link between the two companies).

3.7.1 The potential for marketing hair on hide and sheepskin products and their role in promoting region differentiation.

South Africa's indigenous Nguni cattle, long the mainstay of traditional Zulu farmers are possibly one of the most distinctive cattle in the world and synonymous with Africa. The Nguni has been rediscovered over the last decade as an outstanding beef breed for production under Harsh African conditions: the Nguni is an incredibly

hardy animal and tick resistant. Their resurgence has also been even more commercially viable because of their variously patterned and multicoloured hides, which have found a place in South Africa's booming tourist trade. These hides can retail in excess of ZAR (£420) being sold as an authentic and distinctive product of South Africa. Further value can be added to these hides by further processing that can be found in any airport or tourist shop in Limpopo province, from handbags, cushions, clothing and furniture.

New Zealand is famous for its sheep industry, and therefore home produced sheepskins, baby rugs, slippers and rugs are available in every tourist outlet throughout the country. The skins are supplied by the two main tanneries on the Islands, Bowron Sheepskins and Classic Sheepskins and prices for sheepskin rugs retail around NZ$75 (£30).

4.0 Horns

The potential to adding value to horns either as wall mounts or walking stick handles is severely limited by the legislation that still surrounds the disposal of the head as SRM. Commercial cattle are predominantly polled in the UK for easier management and because modern handling systems and abattoirs do not allow for horned breeds. Those breeders with horned cattle and sheep can potentially obtain horns with agreement from the abattoir by cutting them off at the root post slaughter and can, once boiled and the 'pith' removed be used for stick making or horn craft manufacture. Although stick makers can be found for commission pieces, because of the low volume of product that can be collected and because stick makers are often fulfilling their craft as a past time, there is little opportunity for commercial production in the UK.

In New Zealand I visited Venison producers that harvesting velvet realising on average 3 kg per animal realising between NZ$60 – 200 per kg, exported to China for medicine. The market is strong for deer velvet and is revered in China for its medicinal purposes. In the UK, harvesting velvet is illegal and therefore New Zealand producers are able to take advantage of this fifth quarter opportunity and supply in large volumes to secure markets. Powdered cattle horn is also popular in China for medicinal purposes and in use as an abrasive but the key to supplying many fifth quarter products is volume supply and therefore there is little realistic opportunity for the UK market.

The Texas Longhorn is a breed of cattle synonymous with Texas and is known for its characteristic horns, which can extend to 7 ft from tip to tip. I was interested in learning more about Texas Longhorns and discovering how US breeders of these distinctive coloured and horned breeds were able to exploit the potential of these unique fifth quarter products.

I was lucky enough to spend time in Fort Worth, Texas with the members of the Texas Longhorn Co-operative, learning about the breed and its marketing and trying to discover if there were any comparable strategies for cattle with similar

characteristics in the UK (e.g. Highland and Longhorn cattle). As with native breeds in the UK, the breeders of Texan Longhorn cattle are typically smallholders or 'hobby' farmers with an average herd size of less than 20 cows.

For Texas Longhorn breeders it is 'all about the horn' and I witnessed a 12 year old Longhorn cow sell for US$29,500 at a prestige breeder's sale at the Fort Worth Stockyards. This particular animal had exceptional horn length and the purchasing and breeding of these cattle is based on horn, rather than confirmation, being kept as a historic breed with value as pedigree breeding animals, rather than commercial beef cattle.

Illustration Two. Texas Longhorns owned by rancher TM Smith.

Despite headline prices obtained in the pedigree market only the very best cattle as in most purebred markets are able to achieve the highest prices and the Longhorn Co-operative was established in 2007 by breeders with a USDA grant to help them sell direct and realise higher prices than the poor prices Longhorns would fetch in the 'sale barn' (live auction market). Texas Longhorns are very lean cattle and therefore are penalised at sale barns. Recognising the potential to add value to their cattle the co-operative has a strategy to –

- Brand their beef as healthy beef: lean, low fat and low in cholesterol.
- Market hides and skins into the tourist shops in Fort Worth.
- Develop distinctive horned products and wall mounts.

By working together to create critical mass and marketing their cattle themselves through the internet and through a small high value supermarket chain they have been able to transform the potential of their cattle, from achieving less than US$500 per animal at the sales barn to a value of US$1400 per animal marketing direct. I was also able to visit a smokehouse where they are hoping to develop a range of lean jerky meat to add further value to the forequarter by producing a range of lean low fat jerky meats.

The added bonus to marketing these cattle directly was being able to market hides and horns under the same brand, mounted horns retailing from $100 - $1750 and hides being able to command $500. At the sales barn horned cattle can be penalised and despite the abattoirs I visited being able to command upwards of $60 for

unprocessed horns the producer would receive nothing for this extra value in the chain.

This embryonic project by Texan cattle breeders highlighted the necessity to ensure that the right breed is produced for the right market. In the case of Texas Longhorns there is incredible additional value in the fifth quarter of the animal and if sold into a fat stock market this value will not be realised by the producer. Some of that value will be realised by the processor and distributor but this margin does not peculate back to the producer.

Challenges that had been faced by the co-operative in realising their ambition included –

- Finding a small processor centrally located for the use of all producers over a large area.
- As in the UK commercial taxidermists and tanning facilities difficult to accrue for commercial production.
- Sourcing enough producer members to obtain critical mass and continuity of supply.
- Producers gaining an understanding of the supply chain, including marketing and retailing their products.

In California I visited a Jacob sheep and Heritage sheep breeder who was aspiring to derive an income from her 20 acre small holding. The business was an incredible example of thrift and branding based on the distinctive horned breeds on the farm. The sale of a breadth of products including, horn buttons (US$5 each), taxidermy heads and skulls (US$ 120+), fibre, yarn, hand woven products and sheepskin rugs (US$100), had resulted in the development of a farm shop. The only difficulty she had was selling the meat or (locker lambs) because in the US all meat must be butchered in USDA approved plants if intended for re-sale. Commonly the USDA plants are too large to be able to handle small volumes from smallholders. Incredibly wethers could be sold into the trophy hunting market to be released onto hunting estates and these animals could fetch up to $200 each.

The main message from this visit that I took away was the aura that was created by adding value to everything possible and the contribution the fifth quarter made to this small business. Horn craft, home taxidermy, tanning and high quality knitted products had led to spin offs including workshops for these skills and a paid membership club for the farm with fees from US$110 – 270, with an excellent following.

5.0 Offal

5.1 Producer impact on offal

Animal health and husbandry can affect offal value and quality, for example liver fluke is a growing problem in the UK especially with increasingly wet summers.

According to EBLEX 2009, Fluke infestation is responsible for the rejection of 50% of cattle livers in the UK, with an estimated cost of £20 – 25 per infected beef animal. Not only does this lead to a reduction of value to the processor, but liver fluke problems will result in poor performance, including reduced weight gain, low feed conversion and anaemia in cattle and sheep. However this can be prevented through greater awareness and treatment but in the UK financial losses are not commonly appreciated by the producer and liver rejection is not reported back.

An example of a hidden opportunity is lamb fries. Recent advice on finishing entire lambs by EBLEX in the Better Returns Publications has suggested to producers considering finishing lambs entire in some market situations for faster growth rates. How many producers realise the additional potential value that lambs finished entire can yield. UK Lamb fries are currently being traded up to £4.40 per kg dressed.

This is an excellent example of hidden value in the UK market. No doubt the processor would correctly put the case that lamb fries can be worth nothing because of fluctuating demand and that they have to secure a market in a very competitive business environment. However in the case of offal, especially with the example of lamb fries, where the producer has direct control over the delivery of the product, is the system where no there is no feedback or reward correct?

5.2 The marketing of offal

Offal is generally referred to as red or green with red being the traditionally consumed products and green those which require further processing such as stomach and intestines. Appendix Two shows a detailed breakdown of the proportions of offal derived from a lamb carcass (EBLEX 2009).

The greatest margin available for the sale of quality edible offal is to domestic consumers, offal is a good low cost nutritional product. The amount of edible offal consumed domestically in the UK is now limited by consumer taste rather than legislative restrictions. The UK consumer no longer has the understanding or appreciation of offal that may have existed a generation ago.

Despite this the UK has seen a revival in the consumption of offal in the domestic market over the last ten years by 67%. This has been exacerbated by the credit crunch as consumers seek to trade down, the work of celebrity chefs, such as Fergus Henderson promoting the concept of 'Nose to Tail Eating' and the increase in UK ethnic populations. However this is still to a relatively modest value of £62 million and accounted for only 3.6% of all fresh and frozen meat sales in England in 2007.

5.3 Understanding culture to understand the market

Our appetite and understanding of offal is far less than that of developing and Eastern European countries where offal is an intrinsic part of culture and due to there being only a small domestic market for offal, combined with sustained export bans, most offal in recent history has either been sold cheaply for use in pet food

production or treated as waste. 50% of abattoirs sell edible offal direct to the rendering industry cheaply as pet food.

Figure Six. The opportunity of exporting the fifth quarter, market price comparison between UK & French offal (EBLEX)

Bovine	UK abattoir (£)	UK retail (£)	Rungis (Euro)	Fr Retail (Euro)
Liver	0.2	1.64	1.10	3.30
Heart	0.82	n/a	0.70	4.20
Kidney	0.75	n/a	1.0	5.50
Tail	2.2	5.49	4.50	5.85
Thin skirt	3	n/a	4.50	13.50
Tongue	2.75	n/a	4.50	6.75

Figure Four represents how a greater demand for offal in France (because it is an intrinsic part of national culture and cuisine), therefore demands far higher prices. This then represents an exciting opportunity for exporters in the UK.

The culture of offal being a disposable waste product has also led to the issue of offal being downgraded due to abattoir damage and 'over enthusiastic' meat inspection. Not surprisingly meat inspection has become less focused on quality preservation when handling offal due to perceived low value. The meat inspectors job is to find a problem, so the more they cut, the more they are likely to find. This represents a real problem when trying to market the product for export.

Illustration Three. Incision extended through apex into opposite myocardium, unlikely to meet export specification. This heart would be very difficult to eat stuffed!!

Adapting to meet customer demand is a part of business and therefore we require a change of culture in the UK regarding our offal specifications and presentation. Processors that I visited in Queensland are uniquely positioned close to the Chinese market where a variety of offal's are readily consumed. China consumes the widest variety of offal's in the world and some offal items are so prized they are more expensive than primal cuts of meat. To gain entry to this market a lot of research had to be undertaken to overcome a lack of understanding of the Chinese market specifications, since most offal recovery was traditionally for European and Japanese markets.

As the lifting of the export ban on beef now enables offal to be exported again, the export market appears the greatest opportunity to increase margins from edible

offal (as was found in Ireland after their ban was lifted). However there continues to be a stigma attached to UK offal because of concerns over BSE and offal abattoir damage, it is likely that export potential will be greatly influenced by public opinion in target countries.

To obtain the highest margins for edible offal it is important to understand the culture and need of the target market. In South Africa for example there is a large domestic market for offal. At the abattoirs I visited in South Africa, sales of the fifth quarter not only covered the cost of slaughter but also provided a modest profit. Offal represents high value cheap protein as in most developing countries with a very poor population and offal is a staple to many diets.

Figure Seven. Ex abattoir retail prices for offal at the LTT Abattoir, Makhado, South Africa (January 2009).

	ZAR/kg	£/kg
Cows Heels	14.95	1.25
Cows Stomach	13.68	1.15
Abattoir 'sweepings'*	12.99	1.08
Pork Knuckles	25.98	2.17
Cow Liver	12.50	1
Soya sausage with abattoir 'sweepings'*	8.95	0.75

*Abattoir sweepings refers to mixed meat and bone trim from the butchery process.

Illustration Four. Dressed cow heels In South Africa.

LTT abattoir is located in a relatively rural location in the Limpopo Province of South Africa with a poor population that will spend upwards of 40% of disposable income on food, in comparison to the UK and US where less than 10% is spent on food. Despite this, prices for dressed cow heals for example retail around £1.25 per kg, an incredible amount of added value per animal, in the UK cow heels are most likely sent to rendering at cost.

This illustrates the potential opportunity for the fifth quarter where there is a need and demand for cheap sources of protein. The challenge is being able to supply enough volume cost effectively to make the opportunity worthwhile.

There are 195 mostly small and medium sized abattoirs in the UK. St Merryn Meats abattoir in South Wales owned by Vion is the largest abattoir in the UK and services Tesco through a centrally prepared meat route. The abattoir employs 1000 people over a 14 acre site and processes 450 cattle and 2500 sheep per day. One of the most interesting observations during this visit was that over 40% of livers are rejected with fluke damage every day, a figure, which is not untypical for the UK.

The plant at St Merryn potentially represents one of our most up to date processing plants and the fifth quarter only represents 5% of sales. The plant was built and modified when fifth quarter was of very little value, there is only a small offal room and there is little room or flexibility on the line to be able to take advantage of new market opportunities as with many abattoirs in the UK. Co-products are sent for rendering off site to an independent rendering company.

Work undertaken by Peter Allen in the RAC publication 'The full utilisation of the sheep.. to add value' tangibly illustrates the opportunity for export potential, when large enough product volume can be achieved at an abattoir of similar size to the processing plant at St Merryn.

Figure Eight. The profits that could be added to the value sheep production at slaughter if the feet and tongues were salvaged (RAC 2009).

Tongues	
Cost of lamb tongues per kg	£9.60
Average number of lambs tongues per kg	13
Cost per lamb tongue	£0.74
Av. Number of lambs killed per week by large abattoir	10,000
Potential revenue per week	£7,385
Missed revenue per year	£384,000
Feet	
Cost of feet (each)	£0.15
Av. Number of lambs killed per week by large abattoir	10,000
Potential revenue per week	£6,000
Missed revenue per year	£312,000
Total missed revenue	£696,000

5.4 Vertically integrated large scale processing in New Zealand and Australia.

Alliance group is a producer owned co-operative with 6'500 shareholders and is the largest processor in New Zealand with annual sales around NZ$1.1 billion (including 27% of New Zealand's sheep and lamb output). Alliance is a vertically integrated processor in that it processes an extensive array of chilled and frozen meat but also all co-products in house, including wool, pelts, casings, finished leather and a variety of other products. The group has eight processing plants and processes more than 7 million lambs and sheep, 140,000 cattle and 100,000 deer per annum.

During my visit to New Zealand's South Island I spent time at the Alliance processing facility at Lorneville, Invercargill. The Lorneville site processes 35'000 lambs per day during its peak season. This critical mass enables the processing of all co-products on site, centralised processing included -

- Automated collection of offal from the cutting line to the processing and packaging room.
- Spacious and modern offal rooms.
- All casings processed on site into salted sausage skins.
- Sheepskins graded and pickled, with best 20% being preserved 'wool-on' for domestic sheepskin wool sales.
- All waste products rendered and processed on site to customer requirements, from beef stock soups through to rendered lamb bone meal for pet food for the US market.
- Modern flexible killing line has been built to allow space for the removal of specialist by-products, dependant on market opportunity e.g. cartilage or sinews.

Illustration Five. Modern, spacious and automated offal rooms harvesting the fifth quarter at Lorneville meat works. This picture shows the grading of diaphragm material.

This modern large scale abattoir is designed to harvest all fifth quarter efficiently and market it competitively into high value markets and a meeting with the Alliances co-product marketing manager revealed that over 20% of total revenue is generated by sales of the fifth quarter. The shortened chain at Lorneville also illustrated that by reducing the number of stakeholders requiring their cut, the additional revenue that can be obtained and how market opportunities can be more readily taken advantage of. This shortened supply chain and a modern flexible killing line means that Alliance is able to take advantage of every market opportunity in the sector including Nutrceaticals and Biocatives.

5.5 Nutraceaticals and Bioactives: The Australian Market

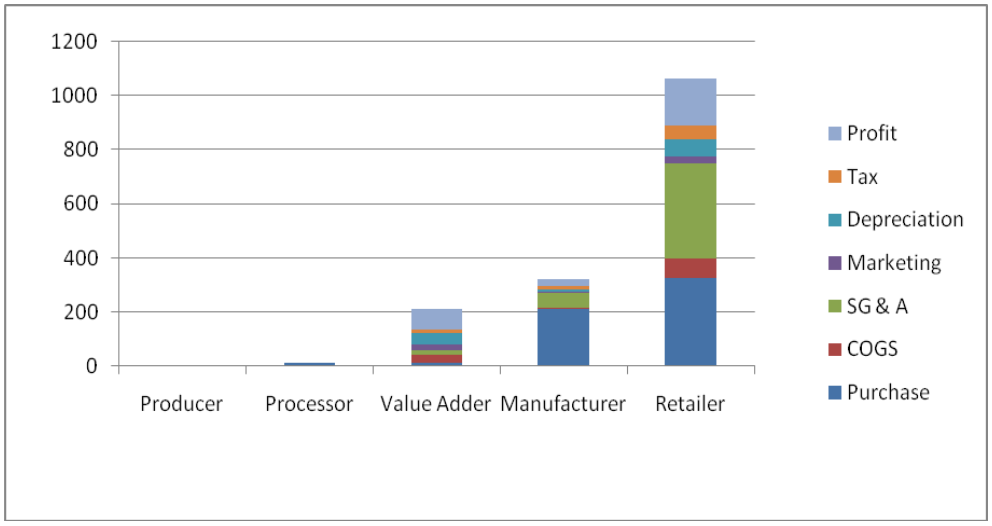
An excellent example of further opportunity presented by large scale and vertically integrated processing is the capture of dietary ingredients from co-products. Co products for use in biopharmaceutical manufacture and extracted bioactives are sold into a competitive global market. Australian products are able to compete through comparative advantage of BSE fee status and through the ability to be able to supply high volumes of product, due to the nature of Australia's modern large scale abattoirs.

Many traditional food and plant products contain active components that provide a functional or health benefit. Protein peptides, fat fractions, enzymes, plant stanol esters and isoflavones all have numerous applications in the promotion of health and the reduction of diseases.

Increasingly these high value bioactive components derived from food and plant products are being used in functional foods, pharmaceuticals for humans and animals, nutraceuticals and as functional ingredients. Red meat and its associated co-products such as blood, cartilage and organs are an excellent source of many of these biocatives.

Nutraceauticals are nutrients and non-nutrient compounds in food that have health promoting, disease preventative medical properties and can be taken as a dietary supplement or added to food to increase the amount of those substances in the diet. The market for nutaceuticals or 'functional foods' in Australia, the US and Europe has experienced strong growth of 10 – 15% per annum and is perceived to be a healthy customer driven market. The value of the US nutraceutical and functional food market was estimated to be worth US$ 21 billion in 2005 (MLA 2006).

Figure Nine. Example of Nutraceutical value chain, based on chondroitin sulphate food grade AUD$ per kg of retail finished product. (MLA 2006).



Few bioactives can be collected and marketed without further processing. In assessing the market opportunity it is important to be aware of the supply chain leading to the market, because it will determine the share of the market value that is likely to flow back to the processor or producer.

Figure seven shows the example of beef trachea as the raw material for chondroitin sulphate and the growing value of the product as it flows down the chain. AUD$12 worth of trachea at the abattoir can be estimated to grow (after purification and packaging) to be worth AUD$1,063 per kg of retail chondroitin sulphate tablets per bottle. In this example most value is added by the retailer, but the largest proportional profit is accrued by the value adder. The value adder is only one step forward from the abattoir illustrating that with only one step up the chain through vertical integration into the value adding sector the abattoir potentially is able to increase profit margin by 700%. If the abattoir or co-operative of abattoirs are able to supply enough volume, the potential profit margin that can be obtained by taking one step up the value chain developing additional revenue streams and adding profits from existing low value by-products.

Examples of unique and innovative added value livestock products

- Essence of Kangaroo (3000 mg: 100 tablets) Meat powdered food supplement: AUS$29.95.

- Purely Merino Lanolin skincare, based on Lanolin extract from washed Merino wool, separated at abattoirs and tanneries.

6.0 Rendering

The parts of sheep and cattle not required for human consumption are collected by licensed renderers, usually on the day of slaughter. The UK has twelve rendering companies operating from twenty sites and they perform a valuable service in recycling by-product material.

The rendering process is the crushing and grinding of animal by-products followed by heat treatment to reduce the moisture content and kill micro-organisms. Melted fat or tallow is then separated from the solid bone and protein through a process of spinning and pressing.

The outbreak of BSE and the controls introduced to control it from 1988 onwards greatly increased the cost and complexity of the disposal of animal by-products, necessitating the separation and destruction of SRM. Some of the main impacts of the controls resulted in:

- A severe limitation in the sales of tallow.
- A complete ban on use of meat and bone meal for animal feed, therefore becoming a waste product.
- Prohibition on sale for human consumption of cattle over thirty months old.

- The creation of a new category of waste in SRM.

Rendered Products are classified in the UK in three main ways:

Category 1:	Animal By-Products containing specified risk material
Category 2:	Animal By-Products from animals not slaughtered in a slaughterhouse or from those condemned as presenting a risk to animal and human health
Category 3:	Animal By Products from sheep and cattle slaughtered: Fit for human consumption (including Red Offal)

In 2007 C1 and C2 resulted in the processing of 1,360,000 metric tonnes of material used in varying ways as fuel, cement and bio diesel. C3 resulted in the processing of 865,000 metric tonnes, mainly for use in the pet food industry but also for fertiliser and animal feed.

Meat and bone meal (MBM), although still used in some parts of the world as a pig and poultry feed has since 1997 has been landfilled or incinerated because of the link with BSE. However the government is aiming to reduce the amount of waste that is landfilled and has set very challenging targets to get substantial reductions by 2010.

Prosper de Mulder (PDM group) renderers In the UK have developed a number of potential innovative and sustainable new uses for MBM. In the UK because of the historic constraint on the use of MBM from a position of adversity the UK rendering industry has been able to make significant strides in researching uses for C1 and 2 material such as being burnt as fuel, cement production and fertiliser. However none of these are widely used in the UK currently because of environmental, legislative constraints and consumer misconceptions.

The technology does exist for tallow to be refined into bio-diesel in the UK, however there is only one commercial plant producing any volume in Scotland and therefore as an industry it is still in its infancy. Progress has been stagnated by mixed consumer feelings on bio-fuels and a lack of clear government direction, due to the bio-fuel perhaps hot being the panacea it was considered to be, 'robbing Peter to pay Paul' in terms of energy consumption for production.

Prosper de Mulder have built two purpose built combined heat and power plant at two of their sites and are currently building a third to generate power from MBM and other waste for the rendering plant and sell electricity back to the grid. This will help create a tangible value for these products delivering heat and power and reducing their carbon footprint.

6.1 Innovation in the UK Processing and Rendering Industries: Anglo Beef Processors, Elesmere Port.

One of the most exciting opportunities presented by rendering the fifth quarter in the UK at the moment is the planned 'project 0' by ABP. With the increasing pressure on carbon neutral business, they are planning to build a bio-mass power plant at the processing plant at Elesmere Port. The plant produces 1'500 tonnes of tallow from a kill of over 50,000 cattle annually and the hope is to feed this product into an on site power plant to create energy self sufficiency at the abattoir. This will be a first for the UK processing industry and will mean 6000 tonnes of carbon are abated, a first for the UK food industry meaning that the plant will be a carbon neutral site.

6.2 Bio – Diesel from tallow, the Midfield, Australia

MLA has partnered with industry to launch the Midfield Bio-diesel project, aimed at developing a solution to waste that's good for business while reducing environmental impact. Bio-diesel has potentially significant advantages for the red meat industry in terms of long-term sustainability for the environment and increased profitability. The bio-diesel project is one of MLA's Plant Initiated Projects. The project is underway at The Midfield Group one of the largest capacity meat processing plants in Australia. The Midfield group also operate a rendering plant, a pastoral company, and a transport business.

The project is investigating opportunities for value adding to its rendered products and opportunities to restructure its energy usage. It is investing in renewable energies including bio-diesel from their own tallow and possible co-generation using this bio-diesel as a fuel source. The opportunities to fit bio-diesel production with the existing rendering plant provides benefits in terms of shared facilities, labour and resources.

The Australian rendering industry suffers from the instability of tallow prices. Ongoing uncertainty of tallow prices makes some rendering operations of marginal viability and prevents many from forward planning for investment in the industry. A tallow-based value-added commodity of high value linked to international pricing structures would provide the necessary stability. The production of bio-diesel from tallow would not only link the value of tallow to international oil prices but also give a financial return greater than current average prices. In addition it would give energy positive, environmental benefits to the Australian fuel industry. There is a long-term demand for bio-diesel. The Australian diesel market is approximately 12 billion litres/year. If 50% could be sold as B20 bio-diesel blend (20% bio-diesel 80% fossil fuel diesel) then the market is 1.2 billion litres per year of tallow based bio-diesel.

6.3 Sacramento Rendering Company

In the US I visited the Sacramento Rendering Company in California, like the PDM group this company operates independently and as such they believed this allows them to take advantage of new market opportunities far better than being part of a centralised abattoir system. One such market opportunity had been to diversify into

processing their own grades of pet food and I witnessed containers arriving from Alliance in New Zealand containing lamb meat bone meal for use in these products, (containers, which I had seen being loaded three weeks previously).

Rendering waste products from the meat industry is only part of an independent renderers business and at Sacramento Rendering Company they were collecting cooking fat and grease from over 3,500 restaurants and supermarkets. The business had restructured its production to focus on producing fuel grade bio-diesel from tallows and kitchen waste. Its company logo and transport livery all included the green logo *'French fries to fuel'* and one could see that this could help provide a clean and green image for this company in an industry that can suffer consumer misconceptions. However on a commercial level the management stressed to me that the production of bio-diesel and its future as a renewable fuel would only be sustainable in the US with government subsidies and a continued rise in crude oil prices.

Illustration Six. The re branded Sacramento Rendering Company Livery

Despite the contrasting opinions on the sustainability of bio-fuel, the use of tallow and fats in the production of bio-fuel does not require swathes of land to be forfeited from food production to fuel. It is an existing waste product that can be used for a sustainable purpose and therefore this distinction needs to be made, the production of green fuel from our industry from a waste source can be used as a tool in the promotion of our industries improving green credentials.

7.0 Conclusion

7.1 SWOT Analysis of the UK fifth quarter potential

Strengths

- Good quality standards of production and existing assurance schemes, that could incorporate hide and skin assurance.

- Increasing domestic market for offal, where the returns are greatest.

- Innovative rendering sector, leading the world, with the potential to use rendered waste for bio-fuel and fertiliser.

- Viable processing routes exist in the UK for both hair on hide and sheepskin tanning. Diverse native breeds within the UK can offer added value potential through the sale of distinctive hair on cattle hides and sheep skins. They can also assist in the promotion of regional differentiation on the tourism industry.

Weaknesses

- The consequences of animal disease, high labour costs, regulation and sophisticated eating has devastated our fifth quarter industries over the last twenty years.

- 195 mostly small and medium sized abattoirs in the UK. Abattoirs have struggled to market edible offal domestically within the UK. 50% of abattoirs sell edible offal direct to the rendering industry cheaply as pet food.

- Because of the low value of offal in the UK meat inspectors have developed a culture where required incisions into hearts and livers destroy the value of the product. The MHS does not work closely enough with processors to be able to offer quality feedback on the fifth quarter.

- As a nation we are no longer willing to accept offal as part of our diet. Despite seeing a modest increase in our national offal consumption because of immigration, the credit crunch and celebrity chef: nose to tail eating.

- As farmers we can have a large impact on the quality of the fifth quarter. Yet for both edible and inedible fifth quarter the farmer receives no tangible value. Ectoparasites, contamination, scratches, branding and injections all can have a detrimental effect on hide quality and EBLEX estimates 50% of UK Livers are rejected with Liver fluke damage.

- As middlemen between the producer (farmers and abattoirs) and the customer (leather and sheepskin tanner), hide markets can be perceived as an unnecessary cost layer preventing the 'customer' being able to deal with the 'producers' in attempting to fulfil demand for uniquely British products.

Opportunities

- With the reopening of our export markets and the growing ethnic diversity in the UK we now have the opportunity to market our fifth quarter to achieve the highest margins were offal is still an intrinsic part of national culture. We can only understand the market by understanding these cultural differences.

- Ultimately there is huge potential market both at home and abroad for co-products and for abattoirs it is a real opportunity to reduce disposal costs while gaining income.

- Farm assured beef and lamb scheme is an existing vehicle that could help deliver, higher quality fifth quarter. However producers must see a tangible benefit and premium for increased value.

- Building relationships to try and reduce volatility within fifth quarter markets and enable a more long term view. Shortened supply chains will also lead to improved profitability and increased transparency.

- Moving to load consolidation will help improve returns from the sale of the fifth quarter.

Threats

- There are a handful of remaining tanneries in the UK processing less than 1% of sheepskins and less than 50% of cattle hides. Added value producers do have a route to process their skins and hides, however this chain is fragile.

- Animal disease past and present. There is still a stigma attached to the UK because of BSE and the export of UK offal will be limited by what the consumer is willing to accept in the target country. Therefore investment must continue to be made in mitigating this stigma.

- Volatility of the markets for by-products means that there will always be companies looking to make quick short term gain from the market.

7.2 Recommendations

- The supply chain for the fifth quarter should be as short as practically possible. If possible the supply chain should be as integrated as possible in terms of ownership, joint ventures and communication must be effective.

- The panacea would be to remove volatility from the market place for hides and skins. Agreements between abattoirs and suppliers should be long term and stable. Longer term agreements would be more possible if payment was based on quality rather than on an average weight basis.

- Incentives based on quality using 'carrots rather than sticks' help relationships develop by encouraging added value throughout the chain.

- A number of quality improvement hide improvement strategies have been trialled throughout the world, the key to success as illustrated by the golden hide scheme in Sweden is to produce a simple system with tangible rewards and goals. But the reward must be stable and therefore success is dependant on the establishment of long term relationships.

- The rendering industry can offer innovative and sustainable uses from MBM. For the public to embrace these innovations it is important that the industry promotes itself and the potential of these products.

- In the UK we have a more fragmented industry with over 190 small or medium sized abattoirs, 50% of abattoirs send offal direct to rendering and are unable to secure higher value markets for their offal because of their low volumes. It is difficult for these businesses to secure markets due to the nature of fifth quarter as a commodity. The industry therefore must move to load volume consolidation as a means for smaller businesses to compete in the international export market.

- All stakeholders would benefit from forming a working group to help develop better understanding between our symbiotic industries and therefore help enable transparency and increase profitability for the entire industry.

- It is clear that there is an urgent need to create a sustainable strategy to save the UK tanning sector, or potentially we lose an industry asset and skills forever. The position of the UK sheepskin industry inparticular can only be described as perilous. It is only by supporting these companies that the opportunity will remain open to us in the value added sector.

7.3 How do we market our fifth quarter?

Opportunities for Farmers Selling Direct to retain value from the fifth quarter

The greatest current opportunity for livestock producers whom add value I believe is through the sale of hides and skins. Following a decision by DEFRA and work undertaken by the Real Sheepskin Association, producers are able to receive and salt the hides and skins from animals derived from that holding, following slaughter in licensed premises as long as the carcase is passed as fit for human consumption. Once the hide or skins have been salted, they can be sent for processing at an approved tannery prior to sale.

You will need to buy back your skin from the abattoir, EBLEX provide regular updates on their website as to the current market prices. Therefore with this industry guidance you are able to make an informed decision as to where to negotiate and are not reliant on the price the abattoir may set. I have found it far easier dealing with smaller abattoirs, where your business is more valuable and they are less likely to have an intensive production line and therefore are more likely to be able to separate and identify your skins.

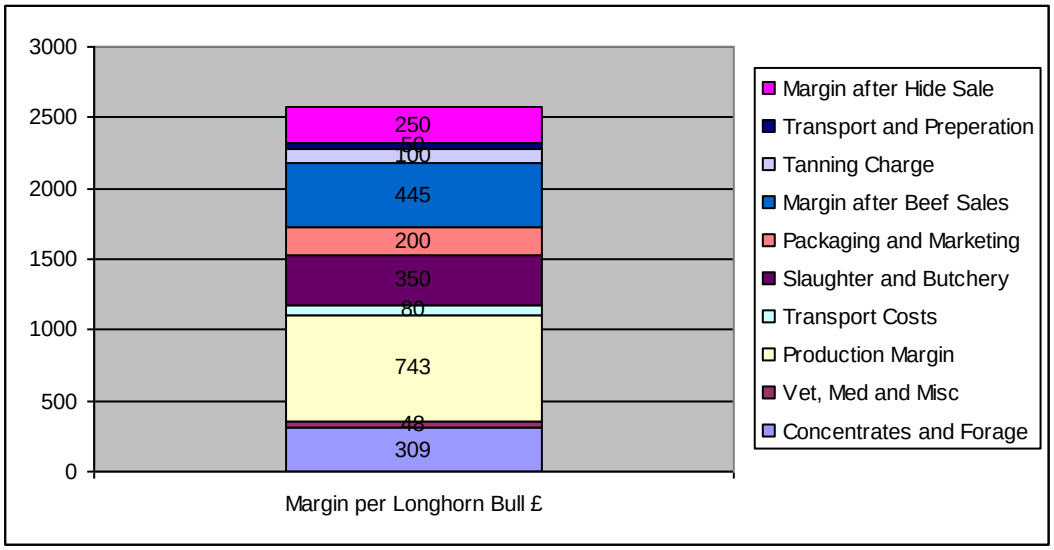
When selling into the commodity market there is more likely to be growing potential opportunity in the chain with larger more vertically integrated processors, however for the value adder it is important to try and build strong relationships with smaller processors. The success of being able to add value to your fifth quarter selling direct is based on a close personal relationship with an abattoir.

For guidelines on salting and sending your hides and skins for tanning I have enclosed copies of hide and skin preparation methods, current legislation and all relevant paperwork in appendices 3 -7.

Figure Ten. Gross margin of a 23 kg d/w Suffolk lamb and a 19 kg d/w Jacob lamb, both born at the start of April 2009 and finished at the same time in November 2009, carcass and skin marketed through Blackbrook Traditional Meat.

Collecting, salting and sending hides and skins can be very time consuming, although very rewarding when your luxury skins are returned from the tanners and it will be important to recognise labour cost in any true costing. However as a small volume producer we aim to maximise the value of our livestock and through marketing the fifth quarter of our lambs we are able to achieve an additional 15% turnover from our Suffolk lambs per head and an additional 28% from our Jacob lambs. Selling the fifth quarter from our Jacob lambs means that output per head is £16 higher than from our Suffolk lambs and generates an additional 175% profit margin per head, marketing the skin at £90, whereas the mark up for a Suffolk skin is more in the region of £55.

Figure Eleven. shows the gross margin for a Longhorn Bull sold direct, including sale of 'hair on hide rug', adding an additional 15% to total turnover of sales and an additional 34% profit margin per head.



Now we have been able to process a larger number of our home produced hides and because we have a market for our added value products at farmers markets, we have commissioned hair on hand bags, gun slips and furniture that we will hope to be marketing later this year. All these products I hope will allow us to obtain further value from each individual hide.

Illustration Seven. Longhorn Hair on hide furniture and rug.

7.4 Self Reflection

The Nuffield study experience is an incredible one that opens many doors that would normally be shut and getting the opportunity to meet some incredible people who put you through your paces and challenge your preconceived ideas and misconceptions.

My Nuffield has allowed me to develop a far better understanding of global agriculture and in some instance this can be very humbling, when you find yourself walking through an 80,000 acre ranch in Texas with a man who started with leasing a 100 acre feedlot and now finishes 250,000 head of cattle a year.

Nuffield also allows you to explore much further than the remits of your topic and as an aspiring pedigree livestock breeder I was able to have incredible opportunities to visit some of the top pedigree cattle breeders in the world. Develop an understanding of breeding cattle to suit different climates, conditions and markets and developing an understanding of alien breeds such as Waggu (the ultimate fifth quarter animal: selling fat at a premium!)

My thanks must go to the following individuals and companies for their time, expertise and patience in trying to enable a simple farmer understand their industries.

United Kingdom

Mr Paul Pearson	UK Leather Federation	
Mr Peter Robinson	Real Sheepskin Association	
Mr Barry Knight	Claytons of Chesterfield	
Mr Andrew Tinnion	Fenland Sheepskin Company	
Mr Phil Hadley	EBLEX	
Mr John Dracup	St Merryn Meat Ltd	
Mr Stephen Woodgate	Foodchain & Biomass Renewables Association	
Mrs Alice Swift	Tesco	
Mr Gareth Scott	NCT Leather Ltd	
Mr Robert Painter	Pittards Plc	

South Africa

Mr Ian Macdonald		
Mr Gavin Bristow	Bristow Bonsmara	
Mr and Mrs A White		
Mr Peter Menne	Nguni Cattle Breeder	Louis Trichardt

Australia

Mr Will English	Dept Primary Industries	Victoria
	Greenhalgh Tannery	
Mr Ian Curley	European Restaurant	

Mr Rod Polkinghorne	'Polkinghornes'	
Mr John Buxton		
Mr Jay Stottelaar	Geelong Leather Pty Ltd	NSW
Mr Matt Spry	Spry's Shorthorns	
Mr Dallas Schuller	Waggu Feedlot	
Mr Murray Scholz	Dunoon Farm	
Dr Philip Franks	MLA	
Mr Joe Gibson	Gibson Management	Queensland
Mr Scott Glasser	Yagaburne Beef	
Mr Warren Isaac	Murgon Leather Pty	
Mr Clark – Dickson	Darling Downs Dorpers	
Mr Gary Foster	Teys Brothers Pty	

New Zealand

South Island

Mr Craige Mackenzie	Greenvale Farms
Mr Mark Hawkins	Pleasant Point Farm
Mr Richard Harper	Alliance Group Ltd
Mr Carl Alsweiler	Alliance Group Ltd
Mr Shane Gerken	Canterbury Meat Packers
Mr David Morgan	Raincliff Station
Mr Dan Perriam	Bendigo Station
Mr James Fraser	Stern Angus
	5* Feedlot
Mr Neil Dickson	New Zealand Light Leather

US

California

Mr Nori Kanda	Masami Cattle Ranch Inc
Mrs Robin Lynde	Merdian Jacobs
Mrs Lynette Frick	Ideal Jacobs
Mr Michael Koweler	President US Rendering As
Mr Bill Eckstein	Sacramento Rendering

Texas

Mr Bill O'Brian	Texas Beef & LTT Ranch
Mrs Sandy Martin	Running Arrow Farm
Mr TM Smith	Smith Longhorns
Mr Randy Robertson	Texas Smokehouse
Mr George Slayton	Texas Longhorn Co-op

8.0 Bibliography

Garwood, Pearson and Wood (1997) Current Worldwide marketing for raw sheepskin material and quality. (BLC, leather technology centre)

Hadley, P. (2009) Fifth Quarter Opportunites (EBLEX)

Hadley, P. (2008) Leather from Beast to Beuaty (EBLEX)

Hadley, P. (2000) Development of Strategies for improving the quality of raw hides and skins, the raw material of the leather industry (BLC, leather technology centre)

MLA (1999) Evaluation of the hide improvement programme

MLC Consulting. (2006) A review of the red meat offal and by-products industry.

Royal Agricultural College (2009) The full utilisation of the sheep.. to add value.

The Real Sheepskin Association (2006) The Great Sheep Industry & its Juicy Fifth Quarter:

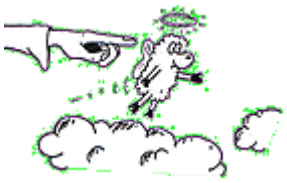
Websites

http://www.defra.gov.uk/animalh/by-prods/guidance/index.htm

Appendix One
A simple illustrated guide to the tanning process.
www.classicsheepskins.co.nz

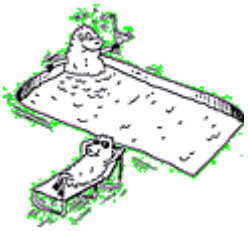
The Sheepskin Story

New Zealand Sheep



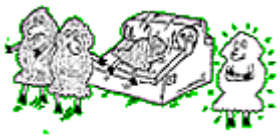
Tour Starts Here

1. Washing and Fleshing

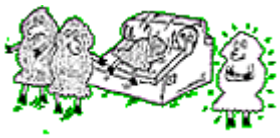


2. Pickled and Tanned

3. Shaped and Dried



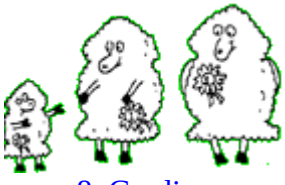
4. Combed and Fluffed



5. Ironed and Polished

6. Cutting

7. Sewing



8. Grading

9. Shop

Appendix Two

The average proportions of offal derived from a sheep carcass –

	kg	%
Lamb Carcass (l/w)	37.10	100
Category		
Carcass	17.60	47.44
KKCF	0.60	1.62
Kidneys	0.10	0.27
Gut Content	4.50	12.13
Intestinal Fat	0.50	1.35
Caul Fat	0.65	1.75
Intestines	1.20	3.23
Stomachs	1.00	2.70
Heart, lungs, trachea	1.00	2.70
Liver, gall bladder	0.65	1.75
Pancreas	0.10	0.27
Spleen	0.10	0.27
Fleece and pelt	4.10	11.05
Feet	0.72	1.94
Head and Tongue	1.50	4.04
Blood	1.70	4.58
Cerebro – spinal fluid skirt	0.20	0.54
Reproductive Organs	0.13	0.35
Lymph nodes waste and tail	0.75	2.02

Appendix Three

Beef action for Profit, better returns from salting cattle hides (published by EBLEX).

Boost returns by on farm salting of hides from native breeds or unusually coloured cattle, as they may have higher value. Following the decision from DEFRA, producers can receive and salt the hides from animals derived from that holding, following slaughter in a licensed premises and the carcase being passed as fit for human consumption. Once the hide has been salted, it can be processed at an approved tannery prior to sale.

- Evaluate if salting hides is appropriate for the business
- Establish contacts within approved abattoirs and tanneries
- Understand the regulations and conditions covering the process

Management Guidelines

- Be aware that hides are fragile commodities and begin to deteriorate following slaughter and try and minimise the time from slaughter to tanning to prevent degradation.
- Ensure that the hides are salted as soon as possible: on the day of slaughter.
- Remember to salt the hides again the next day with fresh salt.
- Appreciate that re-using salt will affect the length of preservation and subsequent quality of the hides.
- Contact the abattoir as some offer a salting service, which is a good option if the hides cannot be picked up on the day of slaughter.
- Know the hides need to be transported from the abattoir to the farm of origin in sealed new packaging or in leak proof containers labelled 'category 3 animal by-products – not fit for human consumption'.
- Realise that hides must not be accessible to livestock or vermin and must not contaminate feedstuffs.
- Understand that hides must be salted and stored in a weather proof building with an easily cleaned impervious floor.
- Be aware that salting only provides temporary preservation and should not be considered a long term method.
- Hides dispatched to an approved tannery must be accompanied with a commercial document.
- Contact the local animal health office if further information is needed on salting hides.

Guidelines for salting hides

1. Lay the hide, hair side down, on a clean, non-metal surface. The fluids should be allowed to drain on to an absorbent material or into a collecting area for disposal.
2. Apply fresh pure vacuum (PDV) salt, available from local agricultural merchants, to all fresh, raw surfaces by rubbing in with hands – use suitable protective gloves and clothing. Be careful to avoid making folds and creases in the hide.
3. Use approximately 10 kg of salt per hide for the initial salting. Remember inadequate salt will result in a poor product.
4. Repeat the salting process the following day using similar quantities of fresh salt.
5. Following salting and draining, hides may be sent to the tannery, adequately packaged with salt and accompanied by the commercial document, from day 3 onwards.

Appendix Four

Fenland Sheepskin salting & transport instructions for contract tanning for farmers (published by Fenland Sheepskins)

MST – Contract Sheepskin Tanning

Contact Information

June Tinnion c/o Fenland Sheepskin, Bridgewater, Somerset, TA6 5LN. 01278 444165

Introduction

- Fenland Sheepskin provides personal wool on tanning and finishing service to farmers encouraging the maximisation of financial value. In addition we hope to demonstrate the awareness of skin values and quality as the major by-product from your flock. You can expect to get up to £50 per skin for the finished product.
- To start with you will probably find that you have to buy your skin back from the abattoir. The charge should reflect the current industry value on a worldwide basis. Over the last 5 years the price has fluctuated from £10 to nothing. It is thus an unstable industry which perhaps explains why there are only 2 commercial tanneries left in the UK.

Skin Selection

- The quality of the finished product will be influenced by the condition of the raw skin. Examine the following check list before choosing skins for processing.

Wool

- Length – Sheep and spring lambs preferably no more than 3 inches, alternatively shear the late autumn lambs and slaughter as shorn lambs when they have a good quality re-growth.
- Quality – avoid wool break or second growth, this will cause felting and often breaks away in patches during finishing.
- Contamination – do not send skins in with brambles or extensive vegetable matter in the fleece as lumps of felt will develop during washing causing holes to be cut in the pelt when we machine flesh them.
- Dye Markers – increasing use of insoluble markers, particularly by abattoirs is resulting in many stained rug skins.
- Disease – watch out for stunted wool growth and adverse reaction to systemic treatments – what you see is what you will get.

Skin

- Flay – check for cuts and scoring which will produce a misshapen skin and increase the risk of damage during processing.
- Trimming – it helps if extensive pieces (legs, bony tails, mask and ears) are removed before salting. Also open up ‘cased’ back legs (skin inside out) and cut straight through the bung hole, this flattens the skin out.
- Axilla – where possible please ask slaughtermen to leave the bare armpits intact (most breeds have hair not wool) as we code your skins by ‘prick marking’ to identify them during the process.
- Fat – large lumps of fat may prevent adequate salt penetration.

Preservation

The correct timing and procedure for double salting skins is essential to prevent wool slip, which can develop in the first few hours after slaughter (green condition). Allow at least 1 kg of salt per skin, per salting – preferably fine salt (PDV = Pure Dried Vacuum).

- Cooling – skins must not be left in a pile while warm from body heat. Ideally spread them in the shade, wool down, until cooler (no more than 30 mins) – if this is not possible salt them quickly, certainly within 4 hours, i.e. salt warm rather than late.
- Salting – choose a flat surface, table or pallet, laying the first skin wool down and pelt up. Check that there are no cuts or folds, particularly bellies, neck and butt. Take a double handful of salt and rub from spine to extremities. Most skins will require a second double handful to achieve full covering. Place the skin on top of the first wool down and in the same alignment, repeat the salting and then the cycle with further skins. Between 5 and 10 skins can be piled in this way without the stack becoming unstable. The effect of the pile is to allow body fluids to drain away (avoiding pools) as they turn to brine. The next day repeat salting but the skins can now be folded in, one at a time, preferably belly to belly (along the spine), flesh to flesh, entrapping the second application.
- Storage – the folded skins can be left singly or stacked in piles while drying continues. Keep them away from farm animals and rodents, in a cool dry place. They will stay in good condition for some weeks. The first sign of problems will be 'red heat' a pink bacterium building up in the flesh, later turning purple. Try picking skins up by the wool – if wool comes out your to late.
- Drying – if you want to build up numbers over a month or more it will help preservation to leave the skins open to dry out – inspect them regularly, until dry, before piling them either flat or folded.

Transport

If you can deliver the skins to the tannery we will by arrangement check the skins on receipt. Most customers will have to use commercial carriers. To avoid problems it is important the skins are dry and double wrapped in plastic bags and packed in a strong box with an outer cover. Larger quantities can be palletised or shrink wrapped. Accompany with a copy of the completed commercial document during transport.

Important Considerations

- Plan ahead, don't leave the skins until the last minute and find you have no salt.
- Ask for help or advice is unclear.
- Remember a finished sheepskin rug weighs 1 kg and is worth from £50 retail, how does this compare with the meat?

Appendix Five

Guidance for on-farm Intermediate Plants salting hides and skins which originate from the same premises.
28 September 2005
Legislation

The Animal By-Products Regulation (EC) 1774/2002 controls the collection, transport, storage, handling, processing and use or disposal of animal by-products (ABPs). Animal by-products may only be transported to premises which have been approved under the Regulation. In the case of hides and skins this will generally mean transport to an approved tannery (technical plant), or to an approved intermediate plant such as a hide market.

The Animal By-Products Regulations 2005 (ABPR 2005) provide for the application of the EU Regulation in England. Under regulation 11(3) of the ABPR 2005, Category 3 hides and skins may be brought onto livestock premises providing it is done in accordance with an approval and the occupier of the premises and the person in control of the hides or skins ensure that livestock do not have access to them.

Transport of Hides & Skins from Abattoir to On-Farm Intermediate Plant

A general approval has been issued which allows hides and skins to be returned from the slaughterhouse to the premises of origin, or a non-livestock premises under the same ownership, subject to compliance with certain conditions. Providing the following conditions are met the owner does not require an individual approval under the Animal By-Products Regulation:

• It is a condition of the approval that the hides or skins **must** be from animals that have been slaughtered in a licensed slaughterhouse and passed as fit for human consumption.

• It is a condition of the approval that hides and skins are not brought onto any livestock premises other than the one on which the animal from which they were taken had been kept immediately prior to transport to the slaughterhouse.

• The Regulation requires that a Commercial Document must be completed **in full** before the hides or skins are transported from the slaughterhouse (Consignor) to the on-farm intermediate plant (Receiver). An example template for the commercial document is attached, which you may use if you wish. A copy of the completed form must accompany the hides or skins during transit. All documents must be retained for at least two years.

• The Regulation requires that hides and skins are transported in sealed new packaging or covered, leak-proof containers (or vehicles), which must be labelled “Category 3 animal by-products – not for human consumption”. The containers may be reused, providing they are fully cleansed and disinfected after each use. In addition, we recommend that if possible, the hides or skins are salted or chilled prior to dispatch from the slaughterhouse, in accordance with industry best practice. If done properly, this will help to keep the skins in good condition. Hides from bovine animals that have been tested for TSEs must remain under official control until the test results have been received. Only hides which have received a negative test result (i.e. clear of TSEs) may be returned to the intermediate plant. Hides with positive or “no test” results must be consigned for destruction. **Handling of Hides & Skins at On-Farm Intermediate Plant**

Once on the intermediate plant premises (e.g. farm of origin) the following conditions must be met:

• Under the Animal By-Products Regulations 2005, it is a requirement that livestock do not have access to the hides and skins. Hides and skins must be kept completely separate from livestock and feedingstuffs at all times.

• The on-farm intermediate plant may only be used for handling hides and skins from one livestock premises. Any premises handling hides or skins from more than one livestock premises requires an individual approval - please contact your local Animal Health Office for details.

• Hides and skins must be stored and salted in a building that is weatherproof and has suitable pest control measures in place to ensure that vermin do not have access.

• Hides and skins may be salted and sorted, but other treatments such as curing or tanning require an individual approval – please contact your local Animal Health Office for details.
• Hides and skins must not be trimmed on the premises – this should only be
done at the abattoir, or at an individually approved intermediate plant or technical plant.
• The building must have an impervious floor that is easy to clean and disinfect.
As salt can block the drains, paper or other absorbent material should be laid down to soak up any excess liquid from the skins and to contain the salt (we recommend you do not use sawdust or straw, as this can become trapped in the wool).
• If hides or skins are unsuitable for tanning for any reason, they should be disposed of without undue delay by rendering or incineration. For advice on local disposal routes, please contact your local Animal Health Office.

Transport of Hides & Skins from On-Farm Intermediate Plant to Tannery

When the hides or skins are dispatched from the intermediate plant, the following conditions must be met:
• The hides or skins may only be consigned to an approved Technical Plant for tanning, or to an approved rendering or incineration plant for disposal
• A Commercial Document must be completed **in full** before the hides or skins are transported from the on-farm intermediate plant (Consignor) to the next destination (Receiver), e.g. tannery. All documents must be retained for at least two years.
• The hides or skins must be transported in sealed new packaging or covered,
leak-proof containers or vehicles, which must be labelled “Category 3 animal by-products – not for human consumption”

Enforcement

Enforcement authorities may wish to visit the premises to ensure compliance with the Regulation. The general approval is not valid for any premises that do not comply with all of the above requirements. Any such premises receiving hides or skins and not complying with the above requirements is therefore in breach of the Regulations, which is a criminal offence. Local authorities are the statutory enforcement body for the Animal By-Product Regulations, and utilise advice and education as the foundation of effective enforcement. Any subsequent action will be taken in a considered and staged approach, ultimately resulting in prosecution only where appropriate.

Appendix Six

Guidance on Commercial Documents (CD) in relation to the Animal By- Products Regulations 2003

A CD must accompany by-products during transportation

1. If a farmer transports a carcase, it is up to him to provide the CD. He should leave a copy of the CD for your records. If he does not you must keep a record of the date it arrived, where it came from and who brought it.
2. If you pick up a hide/skin, including horse carcases, you must have a CD during transportation. The easiest way is for you to have a duplicate book and write in the date, what sort of by-product it is, how much eg 3 sheep carcasses, where you picked it up from and the name of the carrier and destination. If it is picked up and taken it to the kennels then this only needs to be written once. You must keep the top sheet and give the copy to the farmer/owner.
3. When other companies come and take away waste from the kennels normally they will give you the CD. If they do not you should give them one with the information as at 2 above.

Commercial Document in accordance with EC 1774/2002
Carrier
Collection Date
Collected From
Address
Quantity
Description
Ear Tag No's
Category Receiver (3)
Farmer to keep a copy (receiver and carrier) second copy to producer

Appendix Seven

GUIDANCE NOTE: REQUIREMENTS FOR INTERMEDIATE PLANTS

17 December 2004

What is a covered space?

1. The requirements for intermediate plants are set down in Articles 10 and 25 of, and Annex III to, Regulation (EC) No 1774/2002. These require intermediate plants to comply with the structural and hygiene requirements of Annex III and be approved to receive animal by-products (Article 10) and have a HACCP plan (Article 25).

2. Annex III, Chapter I, paragraphs 1(b) and (c) require the plant to have a covered space to receive animal by-products, be constructed in such a way that it is easy to clean and disinfect, and have floors that are laid down in such a way as to facilitate the draining of liquids. Annex III, Chapter I, paragraph 1(e) also requires that intermediate plants must have appropriate arrangements for protection against pests such as insects, rodents and birds.

3. In our view, the combination of these requirements is such that it is necessary for a plant to have a roof, walls and a floor and to be a permanent, weather-proof, vermin-proof structure. Thus it should be of solid construction and constructed and operated in a way that prevents the entry of birds, rats, mice and flies.

4. Standard reefer boxes and shipping containers do not meet these requirements and we consider that they must be located within a building if they are to be used to hold animal by-products. However, if containers can be constructed and operated in such a way that they meet these requirements, they could be located outside. Such a container would need to comply with the following requirements -

• it must be a **fixed** feature of the plant (ie wheeled/mobile trailers cannot be used);

• the container(s) must be of a suitable size to cope with the quantity of by-products that the plant receives;

• all animal by-products must be received directly into the container;

• animal by-products must be kept securely within the container (so that birds and vermin cannot have access to them and they are protected from the elements);

• cleansing and disinfection of the container must be possible; and

• spillages and the washings from cleansing and disinfection must be contained and collected within the container or drained away from the container in a controlled manner, in the same way as would be expected for a building; draining out of the container onto the ground surrounding the container is not acceptable.

Must all operations be carried out within the covered space?

5. All animal by-products must be received into the covered space, and the covered space must be large enough to permit this. Ideally, all other operations at the intermediate plant should also be carried out in the covered space.

6. Where unloading or loading is a major hazard (eg the tipping of slaughterhouse waste), then it must be undertaken within the covered space. However, where the inspecting officer is satisfied that the unloading or loading is not a major hazard (eg transfer of carcases at “skin and bin” plants), the officer may agree to either unloading or loading taking place outside, in limited and tightly controlled circumstances. In such cases, suitable procedures must be in place to ensure that it can be done without significant risk to public or animal health, and Defra’s guidance on unloading and loading procedures must be followed.

7. These issues would need to be addressed in the SOP/HACCP plan and would need to take into account the operation of the individual plant, including the ability of the operator to routinely follow the agreed procedures.

Separation of Category 1 and Category 2 material from Category 3 material

8. Annex III to Regulation (EC) No 1774/2002 requires that -

(a) the layout of intermediate plants must ensure total separation of category 1 and category 2 material from category 3 material from reception until dispatch;

(b) category 3 intermediate plants must not engage in activities other than the importation, collection, sorting, cutting, chilling, freezing into blocks, temporary storage and dispatching of category 3 material; and
(c) category 1 or category 2 intermediate plants must not engage in activities other than the collection, handling, temporary storage and dispatching of category 1 or category 2 material.
9. The structure and operation of the plant should ensure that the necessary separation is achieved and the HACCP plan should address the hazards and risks associated with the operation. The exact requirements will depend on the individual operation and the type of material handled, but in general we would expect the level of separation described below to be necessary.
10. Category 1 and 2 plants may be located on the same site and, subject to adequate controls, could be in different parts of the same building. We would consider that they could be adequately separated within a building by a dividing wall from floor to ceiling or by dividing partitions. The operations must remain separate and there must be no access from one operation to another. There must be no possible seepage, splash or spray drift (from washing) from one side to the other. Alternatively, categories 1 and 2 could be mixed, and everything classified as category 1.
11. The material from a category 3 intermediate plant will usually be consigned to a category 3 rendering plant or to another permitted destination for category 3 material where there will be no category 1 or 2 material. Thus category 3 plants should, preferably, be located on a separate site or in a separate building from plants handling category 1 or 2 material. However, if a category 3 intermediate plant is to form part of a divided building handling more than one category of material, that part of the building should be structurally and functionally equivalent to a separate building.

Products of animal origin which are intended for human consumption

12. Although not desirable, it is possible for raw material of animal origin which is intended for the manufacture of products for human consumption ("food material") to be consigned to a site on which an intermediate plant is situated, before being consigned to the manufacturing premises, but strict conditions apply. These include:
(a) the intermediate plant and the food plant must be demonstrably separate;
(b) food material cannot under any circumstances be taken into the intermediate plant;
(c) the food plant must be registered under the Food Premises (Registration) Regulations 1991; and
(d) the food plant must also observe the requirements of the Food Safety (General Food Hygiene) Regulations 1995. Certain conditions set out in Schedule 5 to the Meat Products (Hygiene) Regulations 1994 may also apply e.g. temperature controls.

Labelling of products of animal origin intended for human consumption

13. Do not label products of animal origin that you want to go into the food chain as animal by-products. If you do, they will be treated as animal byproducts for enforcement purposes, other than in the most exceptional cases. Products of animal origin become animal by-products when they are no longer *intended* for human consumption. If you label material as animal by-products, that is clear evidence of your intention.

Transport of products of animal origin intended for human consumption

14. If animal by-products and food material are transported in the same vehicle, they must be kept separate and identifiable during transport. Animal by-products must be transported in sealed new packaging or covered leakproof containers. The food material must be transported under satisfactory hygiene conditions and at the temperature required for that material by the food hygiene legislation. Category 3 animal by-products destined for the production of animal feed or petfood must also be transported chilled or frozen unless processed within 24 hours of departure