An Introduction to Whole Beef Carcass Optimisation

An article by Rich Summers, March 2025

At the time of writing (3rd March 2025), the deadweight price for British cattle paid by large processors is at a record high. This price increase is very welcomed by most farmers especially after decades of seeing meagre returns for their efforts. An extra £400 in revenue per carcass (on average, based on R4L prices based on 350kg deadweight carcasses).

At first glance this is a real gamechanger, however it's worth pointing out that the creation of false scarcity and the centralised control of food supply chains by large food processors to increase prices, fuelled by industrialised forms of agriculture, is one of the main reasons we have a planetary climate crisis.

The Case for Direct Sales: More than just Increasing Revenue

As I transition from a freelance butcher to what some would describe as a consultant, when it comes to encouraging primary producers to sell meat produced on their own land directly to consumers I have primarily focused on the increased revenue that can be generated through direct sales compared to selling finished cattle into large processors. There is a potential to double the gross margins when selling beef directly to consumers.



With beef prices being high at the moment, the case for selling directly isn't as strong as it was if we are focussing purely on the increase in revenue as the sole benefit of selling direct to consumers. What this does however is give us an opportunity to shine a light on the peripheral/lesser-known benefits of selling direct to consumer.

The environmentally regenerative benefits of pasture fed livestock as part of agroecological farming systems, the increase in animal welfare, and the benefits to human health when incorporating meat and vegetables produced from regenerative farming systems into human diets are areas which PfL have lots of information on. But what I can offer is the fairly unique perspective of a meat industry veteran originally from a modest, more urban background that has had the opportunity to work directly with farmers for close to 20 years.

For me, direct sales offer greater opportunity to build shorter, more localised, community owned and run supply chains that have the potential to help build and strengthen local communities. Some of the lesser-known benefits of shorter supply chains are:

- Increases UK food security.
- Reduces food miles.
- Keeps money in the local economy
- Creates higher skilled, better paid food production jobs in the local community.
- Increases demand for goods and services for locally based agri-food allied trades along independent high street businesses.
- Creates a fertile environment for the growth of diverse, social ecotones, reconnection of both urban and rural communities.
- Broadens access to the best quality, nutrient dense food to all in society with the adoption of an ethical pricing structure (inclusive, not exclusive)

The Hunter's Moon Whole Carcass System

1. Figure out which sections of the carcass sell easily, and sell them!
2. Figure out which sections of the carcass don't sell so easily, find an alternative, more popular use for these lesser popular sections of carcass.
3. Optimise use of the 5th Quarter; identify a use for what traditionally goes in the bin.

It sounds simple and it is, just think of it as a greatest hits of Butchery and Charcuterie.

I returned to high end retail butchery 20 years ago to assist in setting up an on-farm butchers' shop for a farming business producing Longhorn Beef and Jacob X Lamb, Hogget and Mutton, after an 8-year spell working for a high throughput, meat processing business. My first challenge was not being allowed to buy in supplementary carcass sub-primals to satisfy customer demands. This is a common practice amongst retail butchers and enables them largely to satisfy the high demand for prime steak meat whilst not having to buy extra whole carcasses and risk being left with sections of the carcass that are less desirable to consumers.

It has often been said that a whole carcass butchery system offers more cons than pros, I would argue the opposite, in fact I would say that the art of carcass balance offers more opportunities than it causes problems.



Consumer Demand, Seasonality and Supermarkets

As the post WWII UK adopted more industrialised methods of farming as a country, we also adopted more industrialised methods of food production. This approach along with longer working hours, home economics and cookery being reduced vastly in the national curriculum, and increasing availability of highly convenient ready meals from supermarkets has caused a disconnect between British consumers and the food system. This has led to most British consumers being supermarket conditioned. Understanding this helps us give insight into consumer thinking.

Nothing is ever black and white, and the demand for meat cuts and products varies in different parts of the country for many reasons.

This has the potential to be quite a nuanced subject and after many years of working with clients in many different parts of the country, there isn't a 'one size fits all' cutting spec and product range that fits all, therefore the following cutting specs are merely some examples to demonstrate versatility.

1. Basic Cutting Spec, Whole Beef Carcass Yield and Costing

350 Kg Carcass R4L Grade

Sub-Primal/Cut	Category/ Usage	Weight/Kg	Retail £/Kg	Retail Value £
1. Whole Fillet (Chain off)	Prime Steak	3.80	£55.00	£209.00
2. Strip Sirloin (Chain off) DA	Prime Steak	12.41	£32.00	£397.12
3. Rib-Eye DA	Prime Steak	5.61	£35.00	£196.35
4. Rump DA	Prime Steak	6.46	£19.00	£122.74
5. Hanger Steak	Secondary Prime Steak	1.27	£18.00	£22.86
6. Topside DA	Roasting/Baking	9.35	£14.00	£130.90
7. Silverside and Salmon cut DA	Roasting/Baking	10.13	£12.50	£126.65
8. Brisket (Point End)	Slow Cook/Pot Cook	6.00	£12.50	£75.00
9. Flat Rib (Bone in)	Slow Cook/Pot Cook	11.95	£10.50	£125.47
10. Chuck and Blade	Braise/Stew/Mince	12.69	£12.50	£158.62
11. Bed (Braising Spec)	Braise/Stew/Mince	6.40	£12.50	£80.00
12. Heart Steak	Braise/Stew/Mince	2.06	£10.00	£20.60
13. Ox Cheek (Trimmed)	Braise/Stew/Mince	1.40	£14.00	£19.60
14. Ox Tail	Braise/Stew	1.10	£12.50	£13.75
15. Shin (Hind and Fore)	Braise/Stew/Mince	10.67	£12.50	£133.38
16. Premium Diced (90% VL)	Braise/Stew/Mince	33.70	£12.50	£421.25
17. Steak Mince (90% VL)	Mince	26.40	£12.50	£330.00
18. Beef Mince (50% VL)	Mince	41.60	£10.00	£416.00
19.Liver	Offal	9.40	£12.50	£117.50
20. Kidney	Offal	0.66	£10.00	£6.60
Totals		**213.06**		**£3123.39**

Costings (subject to individual variation)
Animal Rearing Cost - £1,000.00
Transport and Kill - £250.00
Cut and Pack - £500.00
Total Costs - £1,750.00

Revenue - £3,123.39
Gross Margin - £1,373.39

2. Summer Spec, Whole Beef Carcass Yield and Costing

We're calling this a summer cutting spec as traditionally during summer months demand for roasting baking joints for Sunday roasts declines as does the demand for braising / minced meat, however the demand for beef burgers, kebabs and potentially beef sausage may increase which has the potential to utilise braising/minced meat during the summer months. (Note that burgers are not included in this particular table, the comparison between Basic and Summer Cutting Specs in this scenario is intended to highlight the opportunities created by the introduction of secondary prime steaks).

350 Kg Carcass R4L Grade

Sub-Primal/Cut	Category/Usage	Weight/Kg	Retail £/Kg
1. Whole Fillet (Chain off)	Prime Steak	3.800	£55.00
2. Strip Sirloin (Chain off) DA	Prime Steak	12.410	£32.00
3. Rib Eye DA	Prime Steak	5.610	£35.00
4. Rump DA	Prime Steak	6.460	£19.00
5. Hanger Steak	Secondary Prime Steak	1.270	£18.00
6. Chuck-Eye Steak DA	Secondary Prime Steak	2.584	£17.00
7. Denver Steak DA	Secondary Prime Steak	2.210	£17.00
8. Flat Iron Steak DA	Secondary Prime Steak	3.102	£19.00
9. Topside Steak DA	Secondary Prime Steak	7.650	£17.00
10. Frying Steak DA	Secondary Prime Steak	7.586	£16.00
11. Bavette DA	Secondary Prime Steak	2.506	£19.00
12. Tri-Tip DA	Secondary Prime Steak	0.980	£18.00
13. Silverside and Salmon Cut DA	Roast and Bake	10..132	£12.50
14. Brisket (Point End)	Slow Cook/Pot Cook	6.000	£12.50
15. Flat Rib (Bone In)	Slow Cook/Pot Cook	11.950	£10.50
16. Heart Steak	Braise/Stew/Mince	2.060	£10.00
17. Ox Cheek (Trimmed)	Braise/Stew	1.400	£14.00
18. Ox Tail	Braise/Stew	1.100	£12.00
19. Shin (Hind and Fore)	Braise/Stew	10.670	£12.50
20. Premium Diced (90% VL)	Braise/Stew/Minced	32.830	£12.50
21. Steak Mince (90% VL)	Minced	23.400	£12.50
22. Beef Mince(50% VL)	Minced	38.800	£10.00
23. Liver	Offal	9.400	£12.50
24. Kidney	Offal	0.600	£10.00
Total		**204.51 Kg**	

Sub-Primal/Cut	Category/Usage	Weight/Kg	Retail £/Kg
Costings (subject to individual variation) Animal Rearing Cost - £1,000.00 Transport and Kill - £250.00 Cut and Pack - £500.00 Total Costs - £1,750.00 Revenue - £3,134.58 **Gross Margin - £1,384.58**			

Please note, the slightly lower total meat volume within the Summer cutting Spec is due to the removal of more connective tissue and fat to increase eating quality when using direct heat cooking methods.

Increase in the volume of secondary prime steak has been achieved by:

1. Preparing sections of Topside and Top rump in a more innovative way to produce steaks that better suit quicker, direct heat cooking methods as opposed to traditional roasting joints.
2. Preparing Sections of the Chuck and Blade also create steaks that better suit direct heat cooking methods with traditional chuck becoming Denver and Cuck Eye steak, and Feather Blade steak becoming the popular flat Iron Steak

Both Flat- Rib and Point-End of Brisket (Slow cook/pot cook category) are equally as popular cooked traditionally in the oven during the colder months of the year, or 'Low and Slow' on the BBQ during the warmer months of the year hence the consistency in the figures.

Optimised Cutting Spec



As the ultimate example of whole carcass optimisation and balance and based on our own anecdotal research carried out on the meat buying habits of a cross section of the British public, we've developed what we're calling our 'Optimised Cutting Spec'.

I'm sure we are all in agreement that we would like to see a return of the consumer back to smaller independent retailers. The reality is that a vast majority of UK meat buyers are largely supermarket conditioned, making them more habitual, predictable shoppers more inclined to buy the same items week after week. The simpler range of products offered here are more familiar to a regular supermarket buyer making them more inclined to buy. Being faced with too much choice of unfamiliar products often leads to lost sales. We've found the simpler range of products alongside more of a traditional range of individual cuts helps attract new customers whilst retaining an existing, loyal customer base.

1. Generally speaking, demand for prime steak cuts is high, and sells well in most direct sales businesses.

2. Directly selling meat in the form of meat boxes is a great way to ensuring all of the carcass is sold, however if demand wains it can often be because customers have used up all of the quicker cooking items first and have been left with a volume of frozen braising and mincing meat in the bottom of the freezer and are reluctant to place to take another box until they

have used up every section. One of the main reasons for this is that the average British household tends to be time poor, often relying on convenience meals to feed the family. By producing and offering simple, nutritionally balanced ready meals such as ragus, chillis, cottage pies etc using the meat from the carcass suitable for braising and mincing we can satisfy consumer demand for ready meals whilst reducing the number of packs of mince and braising meat that sit underutilised in the freezer.

3. Over the last 15 years or so I have noticed British consumers gradually change their eating habits and preferences. Interest in traditional British dishes has gradually declined and staples such as the Great British Sunday roast and the fry-up are now considered as special occasions or every now and again treats. There are several theories as to why this has happened. One of these theories is that the increased access to affordable foreign travel has increased the opportunity for more Brits to enjoy the pleasures of European Salumi and Charcuterie, so much so that the UK has become one of the largest consumers and importers of European Air-Dried meats and salami, it makes sense to produce our own, especially if it creates an opportunity to use traditionally underutilised sections of the carcass.

4. The rise in popularity of specialist diets that major on the consumption of pasture fed meats such as carnivore, Keto and Paleo diets is a great opportunity to generate revenue through the sale of organ meat, bone broths and rendered cooking fats.

Alternative uses for Difficult to Sell Carcasses

I'm a firm believer in "If it isn't broken, there's no need to fix it". If it is the case that every section of the carcass is selling then that's great, however I have noticed an increasing drop in sales for Top-meat derivatives (Topside, silverside flats, Salmon cuts and Top Rumps (AKA Thick-Flanks or beds). Historically Topside and Silverside were used in the traditional Sunday roasts.

Topside (large muscle on inside of the leg) has always been more desirable as its finer meat fibres can be rendered tender whilst being cooked quicker at a higher temperature to a more desirable rare to medium rare finish.

Silverside and Salmon (Buttock section) cut due to their coarser meat fibres require a longer cooking time at a lower temperature to render them tender which leaves a well-done finish. These can be difficult to cook, for a relatively inexperienced cook, as it tends to dry if it isn't covered during the cooking process, in fact these cuts tend to lend themselves better to steam cooking or slow pot cooked in a liquid.



Top-Rump (Quadricep section) if prepared correctly can produce a premium roasting joint that can be rendered tender and served medium-rare in a shorter period of time at a higher temperature just as a topside, however this can been considered too labour intensive by some butchers as it involves more seem butchery techniques to remove the high level of connective tissues that sit between the muscles, in fact in a lot of cases the whole Top-Rump is sliced and used as a braising steak.

Both Topside and Top-Rump can also be used as thinly sliced steak that suits shallow pan frying. Sometimes known as frying steak or minute steaks both the topside and top-rump are stripped down to individual muscles, sliced thinly 90 degrees against the grain and quickly cooked at high heat to medium-rare, suitable for Sandwich steaks, Philly Cheese steaks, Stir-Fry, Stroganoff.

Alternatively, the large, highly trimmed, lean, sinew free muscles of all these sub-primals are a perfect fit for a range of charcuterie products:

Cut of meat	Traditional fresh meat usage	Alternative Charcuterie Usage
Topside	Roasting beef, Topside steak	Biltong, Bresaola, Cecina, Salami, Droewors
Silverside and Salmon cut	Roasting beef	Biltong, Bresaola, Salt beef, Pastrami, Droewors, Salami
Top-Rump	Roasting beef/Brais steak, Frying steak	Bresaola, Biltong, Salami, Droewors

Correct meat selection, Product suitability

As we move on, you'll notice that there is more than one use for any one particular section of a carcass, there is no such thing as an undesirable piece of meat from a well reared and ethically dispatched animal, we just need to match the cooking method best suited to each particular carcass section to maximise the eating quality.

Observing the way that a quadruped mammal moves, how each part of the animal's body operates, which muscles are under the most load and how frequently each of the body sections/individual muscles are used, give an indication as to the density of muscle fibre and volume of connective tissue. I am not a vet nor have I had any formal veterinary training, my theories are based on my observations of live animal behaviour both in fields as well as in the abattoir, analysing the texture and composition of multiple carcass sections whilst preparing animal carcases, inferring the cooking medium best suited to each specific carcass section, cooking and eating lots of meat.

Beef Trim Grades

The following grades of beef trim and their applications have been developed to ensure consistency of product whilst showing their practical application.

Grade 1 **(Frying/Minute steaks or tender strips).**	• Whole muscle sections large enough to slice into thin steaks • Finer grained with naturally softer texture, • large enough to be sliced into thin steaks • 90 % Visual lean • Free of connective tissue. Derived from but not exclusive to: • Topside • Top-Rump • LMC • Under Blade • Teres Major Uses Include but not limited to: • Sandwich Steaks • Philly Cheese Steaks • Stir Fry • Beef Olives • Stroganoff • Salami
Grade 2 **(Premium Diced)**	• Smaller and medium sized whole meat pieces, suitable for 25mm diced sections • 90% Visual lean, • Low level of connective tissue Derived from: • Anywhere the suits spec. Uses include but not limited to: • Braised, Casserole dishes • Pie Fillings • Salami
Grade 3 **(Premium Mince)**	• Small meat sections not suitable for 25mm diced sections • 85 % Visual lean • Low level of connective tissue • Suitable for minced/ground beef Derived from: • anywhere that suits spec. Uses included but not limited to: • Cottage pie, Chilli, Bolognese • Burgers, Sausage, Meat balls and other forcemeat products with the exception of salami
Grade 4 **(Shin and shin like)**	• High volume of internal connective tissue • 85 % Visual lean Derived from: • fore and hind shin, inside heel muscle, inside clod (shoulder sub-primal). Uses include but are not limited to: • Pulled beef dishes • Pressed beef terrine (Corned beef)

Grade 5	● Low level of connective tissue ● 50 % Visual lean ● Suitable for minced/ground beef Derived from: ● anywhere that suits spec. Uses include but not limited to: ● Combining with leaner grades of mince/ground meat trim.
Grade 6	● All removed connective tissue including large tendons Derived from: ● anywhere that suits spec Uses include but not limited to ● Bone Broth ● Meat Stocks
Grade 7	● Small pieces of removed fat ● Minimal level of connective tissue Derived from: ● anywhere that suits spec Uses include but not limited to: ● Rendered cooking fat
Grade 8	● Large sections of fat suitable for slicing ● Minimal levels of connective tissue Derived from: ● Cod or udder fat deposits and flank plate Uses include but not limited to: ● Barding ● Rendered cooking fat

Offal and Bone	<u>Heart</u> Uses include but not limited to: ● Braising Steak ● Minced/ground meat ● Fortified Mince <u>Liver</u> Uses include but not limited to: ● Liver dishes ● Fortified Mince <u>Kidney</u> Uses include but not limited to: ● Stews, Casseroles ● Fortified Mince <u>Marrow bones</u> Uses include but not limited to: ● Split marrow bone canoes ● Marrow bone butter ● Bone broth ● Beef Stocks <u>All other bones</u> Uses include but not limited to: ● Bone broth ● Beef Stocks

Forcemeat Products, Keep it Clean.

I'm regularly asked to visit established meat retail businesses, some high street butcher's shops, some medium sized meat processors and some direct sales businesses to offer development advice. A reoccurring theme that I have noticed is a lack of attention to detail given to the ingredients of the Forcemeat products (minced/comminuted meat products, sausages, burgers etc) available for sale.

Historically many British Butchers have relied on mass manufactured packet seasonings, many containing artificial colourings and preservatives whilst adding wheat/cereal-based rusks to hold extra water into forcemeat products, or even soya-based protein binding agents to help products hold together to compensate for the small amount of meat protein contained within the product, all of which are completely unnecessary and in my opinion compromise the integrity of the meat.

Why allow all the care and attention required in the production of pasture fed meat be compromised after ensuring beneficial exclusion of cereals and soya in the animal's diet, are cereals, soya (artificial colours and preservatives) added by some butchers and processors, compromising human health by adding all the above to forcemeat products?

The answer is a lack of awareness rather than negligence. Another casualty of the industrialisation of our food system is the loss of human connection to real food itself, combined with the incorrect nutritional advice supplied to the British public for the last 60 years.

Opportunity through adversity, keep it simple, keep it clean

Can the humble sausage save the health of the British public? Can a burger reverse the tide of chronic metabolic disease in humans? Probably not on its own but it can help. By reverse engineering how we make our forcemeat products, we have the opportunity to increase the volume of meat protein

making each uniting more satiating whilst replacing the artificial colourings and preservatives with natural plant-based derivatives sourced from agroecological farming systems. Could humble forcemeat products and nutritionally balanced, clean label convenience meals act as a tasty and affordable nutrition delivery system? I think so.

Specialist diets



As interest in moving back to healthier whole food-based diets increases, so does the demand for wholly pasture fed meat and meat products. Sections of the carcass that have for the last 30 odd years been considered undesirable (unthinkable up until the late 1970s, early 1980s) have begun to see a renaissance. Products such as lard from pastured/woodland reared pigs, rendered beef tallow or beef dripping from pasture fed cattle, fortified mince (beef minced fortified by adding a proportion of minced offal) along with bone broth have found their way back into the common vernacular.

Better nutritionally informed GPs prescribing pasture fed liver to patients with chronic diseases along with high profile personalities expelling the virtues of whole food and meat based ancestral diets such as paleo, keto and carnivore has created an opportunity for pasture fed meat companies to increase their revenue and reduce the cost of the specialist remove of carcass by products and reduce waste. Directly targeting advertising towards these special interest groups for these highly desirable products has been incredibly successful over the last 12 months with demand often outstripping supply, retailers have increased revenue generated (combined revenue of sales from beef offal, rendered cooking fat and bone broth approx. £1,200.00 from 1 x 350kg beef carcass) without the need to increase retail prices with the potential to make pasture fed meat accessible to all in society.

Looking forward

With a focus on multiple incremental improvements along the length of the supply chain from reduced rearing costs to efficient meat processing techniques and automation that don't compromise integrity, along with many opportunities for intelligent use of the 5th quarter when combined with community owned and operated processing facilities for both pasture fed food and fibre, is the way that we reduce operating costs whilst keeping the cost of essential products accessible to all.

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Funding for this resource was provided by North Pasture and Profit Programme March 2025.