

CHAPTER 8

Discussion

'It was a sight on a Sunday morning to see the crowd of diggers waiting to get beef,' wrote one of the diggers. 'George Bradbury [an employee] would be cutting up, and Tom Leslie in an eight by ten tent, with scales, weighing out the gold that was being paid for the beef. A man often waited four or five hours before he could get near the block to get his week's supply.'

'You were not asked what amount you required. *The meat was just cut off the bone* and a junk placed on the scales and the weight called out— twenty or thirty pounds, whatever it might be— and dozens of voices would be heard, 'Give me that.' And so it went on till sixteen or twenty bullocks were killed and all got what they wanted, or came in on Monday to get it. There was no salt to be had on the Palmer and they had to sun dry their meat in the daytime and smoke it at night.'

Palmer River Gold Rush (North Queensland, Australia) 1874.

(Holthouse 1981: 75; emphasis mine)

8.1 Problems with the butchering unit method

The potential of faunal remains to make valid contributions to understanding past human behaviour has not been realised for historical sites in Australia. One of the reasons is that it has not been possible to make inter-site comparisons between faunal assemblages. The manner in which different faunal analysts have quantified their assemblages has not been standardised. The lack of standardisation in quantification procedures, and the resultant constraints that this has on the interpretation of the results of faunal analysis has been recognised by a number of archaeologists (Noddle 1975: 248; Maltby 1985a: 36). Faunal analysts have used a range of methods to quantify their faunal assemblages. These methods have tended to quantify faunal remains in terms of number or weight of fragments, or else they have involved calculation of animal minimum numbers. All these methods have suffered from a range of innate flaws discussed at length in Chapter 4. It is essential that faunal analysts do have a means of presenting the quantification data of the assemblages they study in a manner which permits comparison between sites, and groups of sites. The following presents a discussion, based on the findings of Chapters 5 and 7, which suggests an alternative way to approach faunal analysis and quantification of archaeological sheep bones using butchery analysis for Australian historical archaeological sites. The findings of this discussion have relevance, not only to Australian historical archaeology, but also to world colonial archaeology, to historical archaeology, prehistoric

archaeology, and archaeology in general. This discussion will present a method for quantifying sheep remains, based on generalised patterns of butchery for these animals. It will specify the reasons why the approach, as advocated by Lyman (1979) does not work for cattle and pig remains, and why the method advocated by him needs to be modified for sheep remains.

Lyman's method was outlined in Chapter 1. As stated in Chapter 1, the results that Lyman arrived at using this method are based on a theoretical assumption that you can equate a specific bone or set of bones with a specific butchering unit, and thus meat weight. It is the testing of this assumption that is the concern of this thesis.

Lyman's butchering units will now be tested against the ethnoarchaeological, documentary and archaeological data for sheep butchery (Table 8.1). Cattle and pig butchery data from these three sets were not tested against Lyman's method. Cattle were not tested because of the practice of deboning a carcass with the subsequent disarticulation between bones and meat. Pigs were not tested because of the high degree of variation in butchery method that both the ethnoarchaeological and documentary cases demonstrated. These two points will be elaborated on below.

Table 8.1: Skeletal elements defined in terms of the units into which they were cut for the ethnoarchaeological and documentary models, the St Helena butchery pattern as interpreted from the archaeological specimens, and Lyman's butchering unit method

SKELETAL ELEMENT	ETHNOARCHAEOLOGICAL MODEL	DOCUMENTARY MODEL	ARCHAEOLOGICAL PATTERN	LYMAN'S METHOD
mandibles	Head	Head	Head	?
skull	Head	Head	Head	?
1st cervical vertebra	Neck	Neck	Head Neck	Chuck
2nd cervical vertebra	Neck	Neck	Neck	Chuck
3rd cervical vertebra	Neck	Neck	Neck	Chuck
4th cervical vertebra	Neck	Neck	Neck	Chuck
5th cervical vertebra	Neck	Neck	Neck	Chuck

Table 8-1: Continued

SKELETAL ELEMENT	ETHNOARCHAEOLOGICAL MODEL	DOCUMENTARY MODEL	ARCHAEOLOGICAL PATTERN	LYMAN'S METHOD
6th cervical vertebra	Neck	Neck	Neck	Chuck
7th cervical vertebra	Neck	Neck	Neck	Chuck
1st thoracic vertebra	Rack	Forequarter Rack	Forequarter Rack	Chuck
2nd thoracic vertebra	Rack	Forequarter Rack	Forequarter Rack	Chuck
3rd thoracic vertebra	Rack	Forequarter Rack	Forequarter Rack	Chuck
4th thoracic vertebra	Rack	Forequarter Rack	Forequarter Rack	Chuck
5th thoracic vertebra	Rack	Forequarter Rack	Forequarter Rack	Chuck
6th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
7th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
8th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
9th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
10th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
11th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
12th thoracic vertebra	Rack	Rack	Rack Short Rack	Short/Hotel Rack
13th thoracic vertebra	Rack	Rack	Rack Short Rack	?
1st lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin
2nd lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin
3rd lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin

Table 8-1: Continued

SKELETAL ELEMENT	ETHNOARCHAEOLOGICAL MODEL	DOCUMENTARY MODEL	ARCHAEOLOGICAL PATTERN	LYMAN'S METHOD
4th lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin
5th lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin
6th lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin
7th lumbar vertebra	Loin	Loin	Loin Saddle	Short/Hotel Rack Loin
sacrum	Leg	Chump	Loin Saddle	Leg
coccygeal vertebrae	Leg	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Upper Leg Short Upper Leg Long Chump Hind Chump	?
1st dorsal rib	Rack	Forequarter Rack	Forequarter Rack	Chuck
2nd dorsal rib	Rack	Forequarter Rack	Forequarter Rack	Chuck
3rd dorsal rib	Rack	Forequarter Rack	Forequarter Rack	Chuck
4th dorsal rib	Rack	Forequarter Rack	Forequarter Rack	Chuck
5th dorsal rib	Rack	Forequarter Rack	Forequarter Rack	Chuck
6th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
7th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
8th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
9th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
10th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
11th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
12th dorsal rib	Rack	Rack	Rack Short Rack	Short/Hotel Rack
13th dorsal rib	Rack	Rack	Rack Short Rack	?

Table 8-1: Continued

SKELETAL ELEMENT	ETHNOARCHAEOLOGICAL MODEL	DOCUMENTARY MODEL	ARCHAEOLOGICAL PATTERN	LYMAN'S METHOD
1st ventral rib	Breast	Breast	Breast	Chuck Brisket
2nd ventral rib	Breast	Breast	Breast	Chuck Brisket
3rd ventral rib	Breast	Breast	Breast	Chuck Brisket
4th ventral rib	Breast	Breast	Breast	Chuck Brisket
5th ventral rib	Breast	Breast	Breast	Chuck Brisket
6th ventral rib	Breast	Breast	Breast	Breast
7th ventral rib	Breast	Breast	Breast	Breast
8th ventral rib	Breast	Breast	Breast	Breast
9th ventral rib	Breast	Breast	Breast	Breast
10th ventral rib	Breast	Breast	Breast	Breast
11th ventral rib	Breast	Breast	Breast	Breast
12th ventral rib	Breast	Breast	Breast	Breast
13th ventral rib	Breast	Breast	Breast	?
sternum	Breast	Breast	Breast	Brisket
scapula	Shoulder	Forequarter Shoulder	Forequarter Shoulder	Chuck
proximal humerus	Shoulder	Forequarter Shoulder	Forequarter Shoulder	Chuck
humerus shaft	Shoulder	Forequarter Shoulder	Forequarter Shoulder	Chuck
distal humerus	Shoulder	Forequarter Shoulder	Forequarter Shoulder Fore Shank	Fore Shank
proximal radius/ulna	Shoulder	Forequarter Shoulder	Forequarter Shoulder Fore Shank	Fore Shank
radius/ulna shaft	Shoulder	Forequarter Shoulder	Forequarter Fore Shank	Fore Shank
distal radius/ulna	Shoulder	Forequarter Shoulder	Forequarter Fore Shank	Fore Shank

Table 8-1: Continued

SKELETAL ELEMENT	ETHNOARCHAEOLOGICAL MODEL	DOCUMENTARY MODEL	ARCHAEOLOGICAL PATTERN	LYMAN'S METHOD
carpals	Shoulder Fore Foot	Forequarter Shoulder Fore Foot	Forequarter Fore Shank Fore Foot	?
metacarpal	Fore Foot	Fore Foot	Fore Foot	Fore Shank
fore phalanges	Fore Foot	Fore Foot	Fore Foot	?
ilium	Leg	Chump	Saddle Loin Hind Leg Leg Upper Leg Short Upper Leg Long Chump Fore Chump	Leg
ischium/pubis	Leg	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Upper Leg Short Upper Leg Long Chump Hind Chump	Leg
proximal femur	Leg	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Upper Leg Mid Leg	Leg
femur shaft	Leg	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Upper Leg Short Leg Long Leg Mid Leg	Leg
distal femur	Leg	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Short Leg Long Leg Short Mid Leg Mid Leg Hind Shank	Leg
patella	Leg	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Short Leg Long Leg Short Mid Leg Mid Leg Hind Shank	Leg

Table 8-1: Continued

SKELETAL ELEMENT	ETHNOARCHAEOLOGICAL MODEL	DOCUMENTARY MODEL	ARCHAEOLOGICAL PATTERN	LYMAN'S METHOD
proximal tibia	Hind Shank	Leg	Hind Leg Leg Short Hind Leg Long Upper Leg Short Leg Long Leg Short Mid Leg Mid Leg Hind Shank	Leg
tibia shaft	Hind Shank	Leg	Hind Leg Long Upper Leg Short Leg Long Leg Hind Shank	Leg
distal tibia	Hind Shank	Leg	Hind Leg Long Upper Leg Short Leg Long Leg Hind Shank	Leg
tarsals	Hind Shank	Leg	Hind Leg Long Upper Leg Short Leg Long Leg Hind Shank	Leg
metatarsal	Hind Foot	Hind Foot	Hind Foot	?
hind phalanges	Hind Foot	Hind Foot	Hind Foot	?

What the comparison of Lyman's butchering unit classification to the ethnoarchaeological and documentary data presented in Chapter 5 and the archaeological data presented in Chapter 7 indicate, is that the assumption, that a specific bone or set of bones equate to a specific butchering unit and thus a specific meat weight, is unfounded. What Table 8-1 demonstrates is that there is a fair degree of similarity between Lyman's butchering units, and both the ethnoarchaeological and documentary models and the archaeological pattern. The point to be made, however, is that none of the four patterns of butchery are identical. This is because of the variation in butchery practice between them.

The major problem with Lyman's method is that it is inflexible. It is incapable of taking intra- and inter-site variation in butchery into consideration. This may not matter on sites such as St Helena which evidence whole carcass utilisation, but it has significant ramifications to quantification of sheep faunal remains in terms of consumable meat in those situations, such as domestic urban sites, where this is not the case. Basically Lyman's butchering units for sheep are a single set of primary butchery cuts. They fail to take into

consideration the possibility, as demonstrated by the leg area in Table 8.1 for the archaeological pattern, that a single skeletal element may be representative of differing final butchery products.

The ethnoarchaeological and documentary models are not used to calculate consumable meat weights like the butchering unit method. They are merely used to test against archaeological data to determine points of butchery variation between archaeological bones and the models in order to define and explain butchery patterns in archaeological sheep bone assemblages. The database upon which the models were established can be used, as they were in this study, to explain the pattern of shearfaces evident on archaeological fauna in order to determine the manner in which carcasses were reduced to consumption units, or else to determine the consumption units present on a site. If meat weight calculation is required then this can be determined using the actual consumption units present as defined by comparison between the models and the archaeological data. The models therefore display flexibility that Lyman's method does not, in allowing for variation in butchery practices. Indeed, the models are seeking this variation in order to give a realistic insight into butchery and consumption behaviour. This is where Lyman's method fails because, as Table 8.1 shows there exists marked butchery variation in archaeological samples which Lyman's method does not account for. What Lyman's method does is to impose a set pattern of butchery onto an archaeological sample and then use the results of this to calculate consumable meat weights. The problem is two fold:

1. The method does not take variation of butchery between the method and the archaeological sample into consideration
2. The method implies consumption of primary butchery units, when consumption is of secondary butchery units.

Because in the archaeological record the precise limitations of a secondary butchering unit vary through non-functional variation, the weight of meat on each butchering unit so identified will be so variable as to make meat weight calculations, such as Lyman's, too inaccurate to use.

Overall, what the archaeological data in Table 8.1 demonstrates is that you cannot equate a specific skeletal element with a specific butchering unit and a specific meat weight. Thus, Lyman's basic assumption and premise upon which the method is based is rejected.

The data presented in Chapter 5 relating to the butchery of cattle result in the conclusion that the assigning of cattle bones to specific butchering units (which equate to meat weight, food energy and socio-economic status) is extremely dubious. This is because cattle carcasses these days are boned out, as they were to varying degrees in the past. The bones from cattle are therefore more likely to represent meatless bones procured as beef bones, which have been sawn or chopped randomly into smaller portions, suitable for use in making stock, broths, soups, or for use as marrow bones. This makes the calculation of meat weights, food energy and socio-economic status inaccurate and meaningless for intra- and inter-site comparisons. The problem is threefold. Firstly, it is not possible to calculate how many boneless meat cuts arrived on a site. Secondly, it is not possible to calculate how much meat was adhering to those bones which did arrive. Thirdly, there are the taphonomic factors involved in the disposal and attrition of bones, which mean that a representative sample may not be present.

The problem that boneless cuts of meat pose for dietary reconstruction has been noted in passing by other researchers (Henry 1987: 366; Jolly 1983: 71). Because beef was often sold without bone in the recent historic past, resulting in no evidence being left in the archaeological record at the point of consumption, it is essential that the nature of the meat supply to the point of consumption be determined. However, it is not always possible to determine the nature of meat supplies to specific sites. This can only occur where there is some documentary evidence, which is not always guaranteed for every historical site excavated, and is never the case in prehistoric sites. The bottom line is, that if meat was acquired after it was butchered and deboned, no faunal remains would result at the consumption locality. Consequently, any attempt to calculate the amount of beef consumed would be nonsensical. Because it is not possible to know whether or not boneless beef cuts were arriving at a site, or in what amounts, intra-site comparisons of beef consumption to the consumption of other animal meats, and inter-site comparisons of meat consumption are meaningless, and therefore the use of butchering units to calculate beef weight consumption is invalid.

A relationship between deboning of a carcass and the size of the animal from which it originated has been noted by a number of researchers (Chaplin 1969: 233; Spiess 1979: 24; White 1953b: 160). It would appear that butchery practices do relate to the size of the animal, and that animals the size of cattle or larger are defleshed rather than butchered in a manner whereby bone is left in association with meat. The reason for this would appear to relate to the weight of associated bone in relation to transportation of the butchered animal. Large sized animals have relatively heavy skeletal elements. When the cost, in terms of

energy and difficulty, in transporting bone as well as meat to one's place of dwelling is greater than the return in terms of energy from the consumption of bone products such as bone grease and marrow, then bone is left at the place of slaughter. Such is the case with large sized animals. Also, because of their relatively large skeletal elements and associated muscle bulk, large sized animals lend themselves to the defleshing operation being much simpler and easier to achieve, than is the case for smaller animals. Spiess (1979) has noted this relationship between animal size and defleshing for caribou, and White (1986) has discussed it in relation to the butchery of North American bison.

It would appear that the defleshing of large sized animals, as opposed to their butchery into combined bone and meat units is rooted in our antiquity, with evidence for defleshing of large sized animals going as far back as at least the middle Pleistocene (White 1986). This pattern of defleshing large sized animals is observed in the archaeological record from both prehistoric times and from the recent past in both the Old World and the New World. There are numerous archaeological accounts of Palaeo-Indians in North America utilising this technique in the butchery of bison (Binford 1978; Frison 1974; Kehoe and Kehoe 1960, Wheat 1967; White 1953b). The earliest evidence for defleshing of *Bos* dates back to the early neolithic. Perkins and Daly (1968: 104) describe this pattern of butchery for a wild ox killed by a hunting party from the neolithic village of Suberde in southwestern Turkey.

Evidence presented by Maltby (1985a: 56) indicates that defleshing of cattle was the preferred method in Iron Age Britain. Maltby states that the 'butchery evidence implies that meat from large mammals [cattle] was often stripped from them, whereas meat from sheep and pigs was more often cooked on the bone'. This pattern continued in Britain through the Roman period and in all likelihood the presence of this pattern in contemporary Australian society has its roots in the continuation of an economically efficient practice which dates back to at least the Pleistocene.

It would appear from evidence, from nineteenth-century American Chinese sites, that this pattern of butchery can be applied to smaller-sized animals such as pigs. Analysis of the faunal remains from the Lower China Store site Madera County, California, revealed a pattern of butchery whereby the 'butchered pork remains indicate that much of the carcass had the meat stripped from it and the limb bones shattered for marrow or use as soup bones' (Langenwalter 1980: 107).

Because of the problem of boneless meat cuts associated with the butchery pattern of cattle, it is not possible to quantify cattle remains in terms of butchering units as outlined by Lyman. It may however be possible to grossly quantify sheep remains, and in some circumstances pig remains when they are being butchered for fresh pork in terms of consumable meat weights using not butchering units but what Lyman terms 'skeletal portions'. Lyman defines skeletal portions as being 'some arbitrarily defined part of the body.' The skeletal portions which Lyman defined for sheep, cattle and pigs are set out in Table 8.2. The skeletal portions outlined in Table 8.2, like butchering units, have associated consumable meat weights and can be used to estimate total consumable meat weights for various domesticates.

Table 8.2: Lyman's skeletal portions defined skeletally

SKELETAL PORTION	SKELETAL DEFINITION
FOREQUARTERS	RADIUS-ULNA, HUMERUS, SCAPULA, CARPALS
RIB-VERTEBRAE	THORACIC, LUMBAR, CERVICAL VERTEBRAE, RIBS
HINDQUARTERS	PELVIS, SACRUM, TIBIA, FEMUR, PATELLA, TARSALS

Lyman favours butchering units over skeletal portions. He believes the butchering unit method to be more accurate, stating that 'butchering-unit meat weights are probably the most accurate estimates of the amounts of consumed meat ... because the analytic unit is cultural, it is comparable to a consumption unit, and, assuming a representative sample, it most accurately reflects the bone sample.' If results of analysis are to have any meaningful use the unit chosen for analysis must be able to be compared between sites. It is for this reason that skeletal portions should be favoured over butchering units. Lyman states that 'each butchering unit must be skeletally defined for each different butchering pattern and therefore, very probably, each site and component.' Further to this, Lyman states that 'skeletal portion definitions may be universally applicable.' Clearly, from his own statements, the skeletal portion method is to be favoured over the butchering unit method.

Just how accurate are the results derived from using the butchering unit method? I argue that it is not possible to reconstruct a single butchering unit pattern for sheep and pigs for a single site, let alone a series of sites. I suggest that the results from using the butchering unit method are an inaccurate reflection of the quantity of meat consumed. This

inaccuracy stems from the fact that there is considerable variation, even at the site level as to the manner in which an animal is butchered. It is believed that this is a cross-cultural feature, and that even in the most conservative cultures or situations, variation in the butchery process exists. This variation takes two forms. It may be functional or it may be non-functional, individual variation.

Functional variation results from the reasons why an animal is being butchered. The major reason is the perceived use of the final products for the person who is butchering the carcass. For example, in the case of sheep, is the animal being butchered for breakfast and lunchtime consumption, in which case it is likely to be cut almost exclusively into chops, or is it being butchered for main meals, in which case it is likely to be cut into roasting joints. In the case of pigs, is the animal been butchered for bacon, hams or for fresh pork? The processing of a carcass for each of these three products involves a different butchery pattern. Ashbrook (1955: 127) in a book on the butchering, processing and preservation of meat in contemporary American society, stated concerning the butchery of pigs, that:

There is no "best way" to cut a carcass. The choice depends on how the meat is to be used. If it is to be sold, the cuts should conform to local preferences. If meat is to be preserved by freezing each piece should be of a size and character suitable for convenient cooking.

Compounding this problem for the archaeologist is the fact these different butchery patterns can become inter-mixed in the same deposit or assemblage. Maltby (1985a: 52; 1985 b: 21) is one of several archaeologists who has noted variation in butchery pattern, and has concluded that a significant reason for this variation is the intended end use of butchery products, what we may call the function of carcass treatment. Maltby (1985b: 21) stated in relation to British Iron Age and Roman butchering practices that:

Butchery techniques may have depended on whether meat was for immediate consumption or for storage by means of salting or smoking. The importance of marrow extraction and the boiling of some bones for broth could also have had a bearing on butchery strategies and subsequent fragmentation of the bones.

Maltby (1985a: 52) has further stated concerning differential usage that:

there are many faunal assemblages that can be shown to display significant variability due to differential usage of the carcass. The large-scale processing that took place on urban sites in Britain from the Roman period onwards has produced examples of very distinctive assemblages associated with specific activities.

Non-functional or individual variation also results in inaccuracy in quantifying faunal remains through butchering units. This inaccuracy results from idiosyncratic behaviour on the part of the butcher. The problem is that even highly experienced butchers place cuts in slightly different localities, at different orientations due to a number of factors, such as muscle control, size of carcass, how hurried the butcher is, and so on. The problem becomes one of deciding whether variation in cut placement or orientation results from this idiosyncratic behaviour or whether it results from functionally significant variables, such as differential carcass usage. This brings subjectivity into an area of analysis, which if it is going to produce consistently reliable results, requires at best an attempt at the rigour of objectivity.

The ethnoarchaeological, documentary and archaeological data presented in this thesis, as well as that recorded in the few ethnographic and faunal analyses examining butchery in the archaeological literature indicate considerable variation both within and between different cultural groups and sites, as to the manner and extent to which animal carcasses are broken down during the butchery process. A number of researchers have noted variation in quite different cultural settings. Maltby (1985b: 19) noted that in some periods of British prehistory and history, such as the Romano-British period, 'there was a great deal of variability in butchery practices.' Spiess (1979) noted variation in butchery patterns between different cultural groups which based their economy around caribou hunting. Binford (1978; 1984b) noted variation in butchery pattern amongst a single cultural group utilising caribou, namely the Nunamiut Eskimos. In his analysis of butchering patterns used by these people Binford (1978: 87) concluded that:

I must admit that variability is the name of the game in my Eskimo data ... I find it difficult to provide an "idealized" description of what may be called "the Nunamiut method of butchering".

Even in what appear on the surface to be quite a stylised pattern of butchery, Frison (1974: 35) still detected some variation in the pattern of butchery practiced at an American Palaeo-Indian bison kill site. Even in a culture generally noted for a high degree of conservatism, that of Australian Aborigines, there is evidence that butchery patterns were not fixed, but were open to variation. Binford (1978: 87) noted, in his field work with the Alyawara, extreme conservatism in the butchering procedure for kangaroo. This however may be explained in terms of culinary practices and band size and in terms of the distribution of meat following cooking of the animal whole. Minnegal (1984: 19-20) analysed the butchered remains of dugong killed in the past by Australian Aborigines from Princess Charlotte Bay, Queensland. A number of early European explorers and later ethnographers had described dugong butchery from this area. In all cases they stated that dugong were

regarded with special status and that there existed detailed rules governing all aspects of dugong butchery. They concluded that these rules were normative, that is, the same rules applied to all individual dugongs. Despite this, Minnegal noted that the specimens she was examining, exhibited no consistent pattern of butchery. Minnegal (1984: 19) concluded that:

Although there were some similarities in the way these animals appear to have been butchered, particularly in the way ribs appear to have been removed from the vertebral column, there were also major differences. This does not preclude the existence of normative rules governing the butchering of dugong, but does imply that the same rules do not apply in all cases.

Quantification of the variability in butchery technique within and between different cultural groups and sites may result in the formation of new insights into how carcasses were utilised and their meat processed. The results could have wide implications for the study of the relationship between humans and the animals they hunted, scavenged or raised, and thus implications to our whole understanding of past cultural systems. In order to quantify this variation it is necessary to understand the factors involved in causing the variation in the first place—the taphonomy of butchery. Binford (1978: 48) was one of the first to examine possible reasons for variation in butchery practice to any depth, when he asked 'What determines or conditions the way men dismember animals? Is this an independent variable— a purely cultural bias— or is it conditioned by situational and economic conditions?' The answer to this question would appear to be a complex interplay between cultural factors and situational, economic and idiosyncratic factors.

There is now reliable evidence (Binford 1978, Binford and Bertram 1977, and Yellen 1977) that cultural preferences or traditions do result in butchery variability between different cultural groups. This is a significant finding for historical archaeology in Australia, because of the diverse cultural make up of those peoples who settled this country. It is also equally significant to those other countries, such as Canada, southern and eastern Africa, New Zealand and the United States, which had similar multi-cultural colonial histories. Clearly, cultural factors are one of the reasons for the observed variability in the faunal assemblages of these countries.

Since different parts of a carcass may be valued within a specific cultural group or between cultural groups for a variety of different uses, it is logical to assume that activities involved in butchery should produce distinct patterns in the faunal record (Maltby 1985a: 49). There are however difficulties involved in determining the activities which may have resulted in differing butchery patterns. The primary difficulty is that there is insufficient

knowledge of the types of faunal assemblages which might result from specific activities, and also insufficient knowledge regarding the types of activities that could be responsible for specific sets of bones in the archaeological record. Coupled with this there is the potential that the faunal remains from a number of distinct activities can become mixed into a single assemblage if deposition for differing activities is fixed to one locality. Compounding this even further are the biases created by different sampling strategies and the taphonomic processes which may further complicate the nature of an already complex assemblage. To date, few faunal analyses have taken these difficulties into consideration, despite the work of Binford (1978) and Maltby (1985a) to bring them to the attention of archaeologists. In order to better understand archaeological faunal assemblages, it is essential to improve our understanding of how butchery activities, mixing of different butchery activities, sampling strategies and taphonomic processes affect the final composition of an assemblage as it arrives on the analyst's table.

Economic and situational variables that influence the butchery pattern and thus the nature of the faunal assemblage have been termed contingent variables by Binford (1978). Binford identified five contingent variables which affect the butchery pattern used by Nunamiut Eskimos. Although these are a hunting people, the contingent factors identified by Binford can all be modified to fit the situation in colonial Australia. The five variables which Binford isolated were:

1. Whether the animal killed in hunting was to be immediately transported or cached.
2. The means of transport available to the hunter.
3. The meat supply situation at the hunter's residence; that is, whether or not meat was needed.
4. Anticipated work time; that is, what degree of butchery could be accomplished before darkness, snowfall, arrival of hunting companions, and so on.
5. Intended use of the animal.

The first point relates to storage. In contemporary western societies, this factor could be viewed as whether an animal is being butchered for immediate consumption or for storage in a freezer. For colonial Australia, it can be viewed as relating to whether an animal was being butchered for fresh meat, or whether it was being butchered for salting,

pickling (corning) or smoking. As was recorded in the ethnoarchaeological observations, there are different butchery techniques used depending upon whether an animal is intended for immediate consumption, or for storage.

The means of transporting a carcass appears to have been one of the most important variables in the past and also these days for hunting groups. This is because, a successful large game kill meant these groups were faced with the logistic problem of transporting the carcass, often over significant distances from the kill site to their residential site. The means of transportation, whether the carcass had to be carried by people, or pack animals were available, and the numbers of these available, clearly had an influence on the butchery pattern, and the selection of portions to be taken. Frison (1974: 35) has detailed from historical accounts and archaeological evidence how Plains Indians would vary their butchery pattern in relation to two logistical factors; the distance of a bison kill from one's residence, and the means of transportation available. Two other factors relate to this transportation contingency. These are the size or weight of the animal killed, and the number of animals which have been killed. Means of transportation is not only a factor influencing the nature of the butchery pattern of hunting groups, this is also a contingent factor in contemporary society and in our past colonial society. In Chapter 5 I discussed how the availability of transportation, either in the form of a horse and cart or a utility vehicle could result in different butchery patterns and thus faunal assemblages, between butchery away from a homestead and butchery taking place at the homestead. In a market economy this can also be seen to exist. If we look at the colonial situation, the means of transportation would have been one's own legs, a horse, or a horse and some form of drawn carriage. Depending on the means available, a customer had a choice in purchasing small retail cuts, such as steaks and chops, or larger cuts, which could have included wholesale cuts and even whole or half carcasses. In a situation where deposition often occurred in private backyard middens, prior to large scale organised collection of refuse on a town basis, there could have resulted quite different faunal assemblages which do not necessarily reflect personal preference in cuts, but reflect the means an individual or family had in transporting their purchases to their place of residence. Instead of the situation faced by hunting peoples of having to consider the transport means and distance from kill site to residency, in the colonial urban situation this can be viewed as the factors influencing decision in terms of transporting meat from butcher shop to residency.

The supply of meat or the demand for meat will influence the manner that a carcass is butchered. This factor is particularly relevant to colonial Australia. The history of Australia's past records numerous episodes of food shortages and difficulty in procuring or

raising food crops or animals in an alien environment and that this often influenced the success or failure of a settlement. It makes perfect sense that in situations where stock availability for slaughter was low, then greater utilisation of a carcass would take place. The reverse of this is also true as was evidenced by accounts of cattle butchery recorded in Appendix 1 where only a few prime cuts were taken in situations of meat abundance. In the market economy where storages of meat would have resulted in price rises, individual consumers may have been forced to purchase cheaper cuts, and thus, supply of meat could influence the patterns of variability in the faunal assemblages that we study.

Anticipated work time is not such a significant factor in most colonial situations. It would have influenced the individual in the bush situation who was slaughtering a large animal such as a cattle beast away from the homestead but would have had less of an impact at the level of the individual butchery in the market economy. In situations (such as that described by Holthouse at the beginning of this chapter) where demand was high and a butcher was being forced to reduce as many carcasses as possible into cuts for sale, it is likely that he would have modified his pattern of butchery in order to increase the efficiency of his operations in order to maximise the amount of meat for sale in the shortest time possible. This is also a factor which would have had high priority when the first slaughterhouses and freezing works were established. For these businesses, profit was directly related to processing the maximum number of carcasses in the minimum amount of time. For this reason, these businesses developed streamline butchery techniques which may or may not have differed from those being practised in situations where greater time was available for the reduction of a carcass. This is an area which will require investigation in the future.

The final contingent factor that Binford listed was that of the intended use of the animal. The way that this factor could have influenced butchery pattern variability in the past has been discussed above.

Using his contingent variables, and despite his observations of variability in butchery practice, Binford (1978: 60) defined a set of eight basic sets of anatomical elements into which caribou (the animal upon which the Nunamiut hunters based their subsistence) were broken down. These eight sets were as follows:

1. Antlers, skull, and mandible ?
2. Atlas, axis, and cervical vertebrae
3. Thoracic vertebrae and the first two ribs on both sides

4. Lumbar vertebrae, sacrum, and pelvis
5. Sternum and costal ribs
6. Rib slabs (10 ribs each)
7. Front legs
8. Rear legs

These eight sets can be viewed as representing skeletal portions which have taken the contingent variables and cultural variables of the Nunamiut into consideration. They are equivalent to the skeletal portions devised for sheep based on the ethnoarchaeological data, which are defined in Chapter 5, as these skeletal portions were also based on contingency and cultural variables affecting the sampled group. Binford describes how the eight sets he defined could be further reduced in size. These subsequent reductions are seen as reflecting what Lyman has defined as butchering units. This is because these are the units which will subsequently be used for consumption purposes. The impression gained from Binford's study is that the skeletal portions were a far more useful means of interpreting variability in the faunal assemblages with which he was concerned, than were the butchering units. I suggest that skeletal portions are a more useful means of quantifying faunal remains than butchering units, in all cultural settings. However, like butchering units, skeletal portions will have to be defined for each species that is represented in each different cultural setting.

There are other factors which can cause variability in the butchery pattern, other than those discussed thus far. Both Spiess (1979: 24) and Maltby (1985b: 21) have noted how the technology or tools available can influence butchery. The type of tools available to the person butchering an animal will affect the faunal assemblage not only in terms of the butchery pattern evident, but also in the nature of the fragmentation pattern which it exhibits. Langenwalter (1980) described how the Chinese meat cleaver is less likely to cause fragmentation to skeletal elements than is the European form, due to differences in the shape of the bevel. Modern butchering tools which were likely to have been used in Australia's colonial past fall into three categories. These are cutting implements (which are made up of sharp edged tools, such as knives), sawing implements (these were represented by the hand held meat saw), and chopping implements (which are represented by meat cleavers, tomahawks and axes). The differential use of these tools, either singularly or in differing proportions to one another, by individual butchers would result in different butchery and fragmentation patterns being evident in archaeological deposits. Use of cutting implements as opposed to sawing or chopping implements are likely to leave less evidence on the faunal remains of butchery, whether it be a similar or different pattern. Use of cutting implements selects a pattern of butchery which revolves around disarticulation at

joints, while sawing and chopping implements permit disarticulation to take place at positions between joints. Use of a knife is unlikely to cause fragmentation of a skeletal element at the time of butchery, whilst sawing tools to some extent (if a saw and snap approach is used), and chopping tools to a far greater extent are likely to result in fragmentation of skeletal elements at the time of butchery, as was demonstrated in particular by the spiral fractures evident on the faunal remains from the ERT midden, discussed in the previous chapter.

Another aspect of technology which may have influenced the butchery pattern and subsequent faunal record, is whether gallows were used or not. Maltby (1985b: 21) has pointed out that the 'location of cut marks can be dependent upon whether a carcass was butchered on the ground or hung.' The ethnoarchaeological observations of cattle butchery recorded in Appendix 1 and discussed in Chapter 5, clearly support the contention that butchery varies between those animals which are butchered on the ground, and those which are butchered while being hung from some support such as a set of gallows.

Environmental factors, such as temperature and time of the year or season when an animal was slaughtered may have affected the butchery pattern in Australia's colonial past. Because Australia is a vast continent in terms of its longitudinal and latitudinal range, as well as having differing elevations above sea level throughout this range, it experiences marked regional differences in annual temperature range. In its colonial past, these temperature ranges would have resulted in differing butchery patterns relating to the effects of temperature and climate in general, to the preservation of butchered meat. For example, in the midlands of Tasmania which experienced a relatively cold climate regimen, it was possible to store meat in stone lined cold houses built into the sides of shaded hills (from personal observations). But in north Queensland, which experiences a relatively hot and high humidity environment, especially along the coastal strip, such a storage method was not possible. Here, the climate resulted in rapid deterioration of meat which was not stored using some form of preservation practice such as dry salting, corning, or smoking. The differences in the climatic situation of various locations in Australia resulted in different storage practices being feasible. These different storage methods placed constraints on how an animal was to be butchered, and therefore climatic factors need to be taken into consideration when assessing butchery variability between sites from differing environmental zones.

The time of the year when an animal was butchered could potentially influence the butchery pattern and thus the nature of faunal assemblages from Australian historical

archaeological sites. This is seen to be most relevant in situations where there is marked seasonality in climatic regimens between warm/hot seasons and cool/cold seasons. Dietary patterns alter between the hot and cold seasons. Since meat was an important part of the colonial diet, it is assumed that the type of meat cuts consumed during the warmer months would differ from that consumed during the colder months. Meat dishes such as stews and casseroles are generally more popular during the colder months, than the warmer months when cuts like steaks and chops are more popular. In a commercial situation, it would make logical sense for a butcher to reduce carcasses into those units which were most popular at that time of the year. This is an area which would well benefit from a study into seasonal variation into butchery practices by contemporary butchers.

In explaining the variation she observed in the butchery patterns evidenced on dugong Minnegal (1984: 19-20) cited age at time of slaughter, to be the most likely factor influencing the differential butchery of individuals. She stated that:

One of the effects of rules that govern butchering [in Aboriginal society] is to ensure replication of shares from animals caught at different times— an understandable goal in a system based on generalised reciprocity. This only works, of course, if the animals are, or are deemed to be, roughly equivalent to begin with. Animals that are not considered to be equivalent may be butchered differently. Examination of butchering practices may thus allow archaeologists to glimpse the ways people perceived the animals they ate. All individuals of a species, male and female, young and old, need not be considered equivalent. Perhaps, in some places adult and juvenile dugong were treated as distinct categories, and the 'rules for butchering dugong' reported in the literature were in fact 'rules for butchering adult dugong'— a distinction to which our preconceptions have blinded us.

The documentary evidence presented in Appendix 2 and discussed in Chapter 5 clearly demonstrates that age would have been an important criterion in determining the pattern of butchery practised on sheep, cattle and pigs in colonial Australia. Age criteria were recognised amongst the various cultural groups which settled Australia. Animals were defined on the basis of their age; thus sheep meat was referred to as lamb or mutton, cattle meat was referred to as veal or beef, and pigs were defined as piglets, porkers or hogs. These terms refer firstly to young animals and then to mature animals respectively. Not only were animals classified differentially on the basis of their age, but as the data in Appendix 2 exemplifies, they were butchered differentially. Therefore, it is essential to be able to distinguish the faunal specimens originating from young animals as opposed to those specimens originating from mature animals, when determining butchering patterns for an assemblage. Variability observed in the assemblage as a whole, might merely be reflecting differential treatment of animals of differing age classes, as opposed to the other factors already discussed which can influence variability in faunal assemblages which result from butchery practices.

Another form of butchery variability which is most likely restricted to market economies, and should be taken into consideration for those sites which evidence a considerable temporal component, is that of changing butchery patterns due to market requirements. As has been evidenced in recent times, there has been a change in the pattern of butchery in such a manner as to produce much leaner cuts of meat. This has resulted from a perceptual change by consumers as to what will benefit them most. Butchers will also attempt in the commercial situation to alter the perceptions of their customers. As Johnston (1976: 21) put it the 'progressive butcher continually seeks new ways of cutting up meat with the object of popularising the less saleable cuts.' Detecting this archaeologically is likely to be extremely difficult until such time as we have a substantial number of well analysed faunal assemblages ranging in time span for specific localities. Examination of a series of assemblages which evidenced time depth and originated from a specific locality, in terms of these types of changes could potentially give insights into a society's perceptions on a range of topics (such as health and status), thus giving explanation for the attitudes of a society to different meat cuts.

The factors discussed above which can result in variability to the butchery pattern and the difficulties involved in calculating meat weights when large animals such as cattle are more likely to be defleshed and their faunal remains more likely to represent activities such as marrow extraction or the making of soup rather than representing meat consumption, mean that the butchery unit method is unlikely to produce accurate representation of consumed meat.

Because of variability and defleshing, the results which Lyman obtained for the Fort Walla Walla assemblage are viewed as being inaccurate. This conclusion is supported by evidence Lyman (1977) presented in an earlier paper on the Fort Walla Walla assemblage. In this paper Lyman discussed the results of an in depth analysis on the location of saw and cleaver shearfaces, the results of these butchering tools on bone. In this research, Lyman was attempting to determine the pattern of butchery. He failed in this attempt because he generalised his results to far too high a degree. Lyman stated in the abstract to this paper that 'In-depth analysis of cow, sheep, and pig bones ... reveals non-functional, possibly individual, and functional variation in the butchering pattern.' Lyman went on to state that:

While many saw cuts can be classed ... into a scheme ... nearly as many others do not fit the main categories ... Upon examination of these data, it appears that animals were not always cut up in the same manner.

Having stated this, one wonders how Lyman (1979) could turn around and quantify the Fort Walla Walla assemblage using a standardised set of butchering units for animals 'which were not always cut up in the same manner.'

This discussion on Lyman's butchering unit method has presented evidence which points to a number of potential failings in it. These failings arise from the rigidity of the method which is unable to accurately assess or compensate for the variety of potential sources of butchery variability or boneless cuts of meat. As a method which has been taken up by historical archaeologists (for example Branstner and Martin 1987) for quantifying faunal remains, the validity of the results for specific site studies must be questioned. Its potential use for inter-site comparisons must be rejected because of the likelihood that the factors causing variation in butchery pattern and thus the nature of faunal assemblages could vary markedly between sites, and almost certainly do between different cultural groups. It should be stated that this critical review of Lyman's butchering unit method has been possible because Lyman presented a detailed description of the faunal remains from his Fort Walla Walla site. It is hoped that Australian historical archaeologists will follow this approach of recording their faunal assemblages in detail, in order to allow other researchers to use their results for inter-site comparisons, leading to a clearer picture of Australia's colonial past.

8-2 Butchery analysis: a new method

The ethnoarchaeological and documentary data discussed in Chapter 5 and recorded in Appendices 1 and 2, and the archaeological data presented in Chapter 7 demonstrate considerable variation both within and between them in the manner and extent to which sheep, cattle and pigs are butchered. Pigs also have two major options to begin with; whether they are to be butchered for fresh meat or for cured meats. Because of this variation in the options available to butchers and the many different factors which can lead to this variation, as well as the disarticulation between bones and meat in the case of cattle and pigs, standardised methods for quantifying consumed meat weights for cattle and pigs based on bones will not produce valid results. Standardised methods for quantifying cattle and pig meat weight consumption based butchering units, is not applicable to Australian historical archaeology, and colonial archaeology in general. This is because of the variability which would have existed in the mode of butchery, due to the multi-cultural make up of the population, variation in such factors as climate, mode of transport, form of economy (market or self-help), reason for butchery (fresh or cured meat), supply of meat, the

likelihood of all these being represented in colonial Australia, and the likelihood that cattle were deboned. For these reasons, intra- and inter-site comparison of whole faunal assemblages using butchering units is not possible.

Sheep appear to be less affected by the factors which can result in variation, and are also generally not subject to defleshing. Both of these factors, possibly relate to the size of the carcass. For example, climatic conditions are less likely to influence the pattern of butchery, because a sheep carcass can be consumed in a much shorter period than a beef carcass, possibly before such factors can influence the pattern of butchery. The ethnoarchaeological, documentary and archaeological data demonstrated that considerable variation, both within and between different groups, does exist in the manner in which a sheep carcass is butchered. For this reason, standardised units which imply they represent the manner in which a carcass is always broken down are not applicable. This is the fundamental flaw with Lyman's butchering unit method and why it should be rejected. St Helena demonstrated that even at the single site level there is considerable variation in the butchering process. Lyman (1977) noted this for the Fort Walla Walla site, and it was also noted by other researchers (such as Binford 1978). What this means is that specific subjective, cultural units, that is butchering units are not applicable to quantifying consumed meat weights. There is no single manner to butcher a sheep. What there is, is variation on a theme. That is, sheep are generally broken into certain cuts, but that the exact points of division may vary. For this reason, it is possible to establish models by which to test archaeological sheep bone as to the pattern of butchery and thus consumption units that they are displaying.

This thesis has established a new way to determine the secondary or consumption products of sheep butchery from archaeological sheep bone. This method uses butchery analysis in order to define the units of meat which were consumed on a site. The method requires that during the identification stage of analysis all butchery marks on skeletal elements must be recorded as to their position and orientation. Also, during the identification stage taphonomic factors must be examined, so that upon completing the identification of the faunal remains it is possible to make an informed judgement as to the likely attrition of skeletal elements in the assemblage. That is, the impact of taphonomic variables upon an assemblage must be established. This is a basic requirement of all faunal analysis.

Upon compilation of the primary data, the butchery analysis method used in this thesis and outlined in Chapter 7, requires calculation of the minimum number of each

skeletal element present in the assemblage (MNE). The MNE's along with the recorded butchery marks are the basic requirements for the butchery analysis method.

The butchery analysis method, as used in this thesis tests the location and orientation of butchery marks, specifically shearfaces, against two models based on ethnoarchaeological and documentary data respectively. By comparing the points of where shearfaces are located and the frequency of their occurrence between the models and the archaeological specimens, and then testing this comparison statistically using Chi-square it is possible to determine where there are significant points of difference between the pattern of butchery as displayed by the models to that which results in the presence of the shearfaces on the archaeological specimens. By comparing the butchered and intact non-butchered archaeological specimens to the models it is possible to determine the pattern in which the animals from which the elements derived were butchered.

Where points of difference arise between an archaeological sample and the models, this is a flag to investigate those shearfaces causing the difference in more depth. This involves utilising the database collected on butchery practices which is presented in Appendices 1 and 2. Generally, this database, which it is hoped will be enlarged, is able to explain what pattern of butchery those specimens which do not fit the butchery patterns portrayed by the models are representing. This approach to butchery analysis allows not only primary but secondary butchery patterns to be defined, as was done for the St Helena assemblage. Since secondary butchery patterns can be determined, the final products or consumption units of butchery can be defined. This approach can therefore produce behavioural (to be discussed below for St Helena), quantification and nutritional or dietary information.

Quantification and dietary information was not determined for St Helena but can be by using the units of secondary butchery that the method defines. For any one site the sheep faunal remains could be quantified in terms of meat weights if so desired and then this information used in nutritional or dietary studies. The manner in which a more accurate calculation of meat weights could be made than the butchering unit method allows is to use the secondary butchery units defined by the butchery analysis method outlined above. This would involve the following:

1. Calculation of the average consumable meat weight for each of the secondary butchery units. This involves research into the average consumable meat weights of a large range of secondary butchery products which was beyond the scope of this thesis.

2. Determination from the archaeological sample the representation of secondary butchery units. This would involve the calculation of a minimum number for each consumption unit, what will be called a MNCU.
3. Multiply the MNCU's by their average consumable meat weights as calculated in point 1. This would give a total average consumable meat weight figure for each consumption unit.
4. Add the total average consumable meat weight figures for each consumption unit. This would produce a total average consumable meat weight figure for the site.

As outlined in Chapter 4, this total average consumable meat weight figure for the site would only be giving an indication of the amounts of sheep meat being consumed due to the problems (especially taphonomic) associated with the calculation of meat weight figures outlined in that chapter.

At the site level it is possible to determine the primary and secondary butchery patterns present for sheep. This should be done, because consideration of the patterns exhibited at the site level give insights into aspects of meat consumption, culinary methods, the role domestic animals played at that site, and other aspects of animal use. By comparing such results between sites, it is believed that greater insights will be realised as a result of the explanations produced to explain the similarities and differences. These explanations should be formulated as hypotheses, and tested against other aspects of the cultural material recovered from sites, and against subsequently excavated assemblages, modifying the hypotheses until such time as testable models can be formulated to explain the variation and similarities.

8.3 General discussion

The importance of understanding patterns of discard has been brought to the attention of archaeologists by a number of researchers, such as Binford, Gould, Yellen, and Schiffer to name a few. It is important to understand the patterning of discard as it relates to faunal remains, in order to understand the possible function that the assemblage one is examining is representative. Taphonomic factors can influence the final appearance of an assemblage and the discard pattern represented. These factors have already been discussed and will not be repeated here. But their influence on discard patterns and on the

representativeness of an assemblage cannot be overlooked. The pattern of skeletal discard can result in the formation of different sites, which represent different activities. Maltby (1985a; 1985b) has discussed this in reference to Iron Age, Roman and Medieval Britain. In terms of colonial Australia, three distinct types of skeletal discard sites are possible. These result from differing activities related to the breakdown of a carcass. Bones can be discarded from a carcass at four points:

1. At the point of slaughter.
2. At the point of butchery they can be discarded as a result of deboning activities.
3. At the point of cooking they can be discarded as a result of deboning activities in the kitchen, prior to, or following cooking but before the meat is served to the table.
4. At the point of consumption where discard is of those bones which are left following consumption at the table.

These various sources of discard relate to four different process: slaughter, butchery, cooking, and consumption. Thus faunal remains can be defined as representing slaughter waste, butchery waste, culinary waste, and table waste. Since culinary and table waste are likely to be always discarded together in the same deposit, discard patterns can inform us about three types of activity or utilisation of animals. These are slaughter activities, butchery activities and household activities. Slaughter activities are defined as representing the processes operating on an animal from the time it is killed until it is left to set or chill. Butchery activities relate to the processing of a carcass from when it has chilled until the subdivisions made to it are sold for consumption, preserved for subsequent consumption, or utilised for consumption. Household activities refer to any form of processing which takes place in the residency (usually the kitchen) in relation to the preparation for cooking and consumption. It is possible that specific sites exist demonstrating each of these three activities. Since the potential exists for two of the activities, or all three to occur at the same locality, these different activities might be mixed in the same site. Slaughter and butchery can occur, and often do and did, at the same locality. Therefore it is likely that sites will be excavated which will related to slaughter and butchery activities. There is likely to be variation in deposition in the types of activity evidenced by different species. For example, the St Helena assemblage represented slaughter, butchery and household activities for sheep and pigs, but only butchery and household activities for cattle.

An understanding of which skeletal elements are likely to represent which activity is important, in order to understand the processes which may have led to the formation of an assemblage. Far more research is needed in this area than that which has been conducted in this study. What can be said is that the mandibles, facial bones, cranial bones, metapodials, phalanges and possibly the atlas and the carpals represent slaughter waste from sheep and cattle. Because the entire carcass of a pig is utilised, it is likely in many situations, that none of the skeletal elements of a pig will represent slaughter waste. The variation which exists in the removing of skeletal elements during butchery from all three of the domesticates means that it is not possible to define the skeletal elements which represent butchery waste. Distinguishing between butchery and household waste will involve the analysis of the actual butchery marks present or absent on the bones themselves, the nature of the other artefacts present in the assemblage from which the faunal remains derive, and also the setting in which the site is located. Distinguishing between butchery and household waste will be most difficult for cattle and pigs, as they are subject to deboning, the degree of which varies between different individuals and groups, and varying in different situations by the same individual. This is generally not the situation for sheep, which usually undergo nil or negligible deboning during butchery. Thus, with the exception of those bones, already defined as representing slaughter waste, sheep skeletal elements are almost certain to represent household waste.

Variation to the units into which carcasses are cut has already been noted, but variation exists in other areas which relate to butchery. Variation exists in the names or terms which are used to define the cuts, variation exists in tool use and in culinary practices. Considerable variation in the names used to define different cuts was noted in both the ethnoarchaeological and documentary examples recorded in Appendices 1 and 2. This variation reflects the lack of standardisation in butchery practices. The point to be made is that the utilisation of animal carcasses is extremely complex, far more complex than has been recognised by archaeologists dealing with fauna from Australian historical sites in the past. The complexity of the interactions between humans and domestic animals must be tackled in order for a true picture of the past to emerge.

The archaeological record is not going to tell us the terms people used for the cuts they produced when butchering a carcass. Nor will the archaeological record necessarily permit us to define the culinary practices used on those cuts. What is clear though, is that simple explanations of culinary practices are no longer appropriate. The ethnoarchaeological and documentary evidence makes it clear that there is considerable variation in the manner in which a single group can cook various cuts, and that there is

variation between groups. This means, that within a single site, the same butchered unit could be cooked in a variety of ways. There is however, a relationship between butchery and culinary practices. It may indeed be possible to gain some insight into culinary practices from the archaeological record, after a number of assemblages have been examined with this question in mind, and also from evidence relating to the technology which different groups had available to them for cooking meat. Therefore, butchery and culinary practices, to a large extent relate to the technology available to the group being studied.

Variation in tool use, unlike terminology and culinary practices, can easily be determined from the archaeological record, except in those circumstances where taphonomic factors have erased this evidenced. The ethnoarchaeological, documentary and archaeological evidence, outlined in Chapters 5 and 7 indicate that there exists variation between individuals and by the same individual in the use of tools to butcher a carcass. Why this is the case has not yet been determined. It is just one more facet of the overall picture, which portrays variation and not standardisation as the name of the game when it comes to understanding past patterns of animal utilisation for meat.

8.4 Implications of butchery analysis to St Helena

As noted in Chapter 7, there was considerable variation in the manner in which sheep carcasses were butchered on St Helena. Earlier in this chapter a variety of factors were put forward to explain variations in butchery patterning. The majority of these factors would not appear to be able to explain the variability in the ERT midden assemblage. Transportation factors would not have influenced the pattern of butchery, as in all likelihood, animals would have been close to the butcher's shop prior to slaughter, with slaughter taking place at the same locality as the butchery, adjacent to where the meat was to be cooked. Storage and the possibility of curing meats do not enter the equation either. The historical records, indicate that animals were slaughtered as needed. That is approximately three to four animals per day.

Binford (1978) concluded, based on his study of Navajo Indian butchery practises of sheep, and his work in Australia and Yellen's work in southern Africa, that slaughter to meet immediate demands, usually results in standardised butchery practices. Clearly St Helena is at odds with his conclusion. The fact that St Helena was a colonial maximum security penal facility, would tend to suggest that here, more than in other nineteenth-

century situations, standardisation would be the norm, as is evident from the history of the institution which has a strong theme of regimentality. So why the variation in butchery pattern?

The climatic situation was fairly constant throughout the year, with the only notable change being in rainfall. Nor was the age of the animals being slaughtered, or the anticipated time to butchery them likely to have influenced the pattern. What limited historical documentation there is, points to the actual process of butchery being very efficient and well ordered, indicating that the butcher would have been unlikely to have had timing pressures upon him when butchering an animal. The age at slaughter evidence for sheep remains as outlined in Chapter 6 points to the only animals being slaughtered as those having reached maturity, in terms of size. That is, lambs were not slaughtered. This rules out age as a possible criterion for causing the variability in the butchery pattern. The technology available for butchery would have been the same for all carcasses. However, Chapter 7 clearly demonstrates variability, not only in butchery pattern, but also in tool use. It has already been pointed out that differential tool use can result in differential butchery patterns. But why is there differential tool use? Clearly there must have been idiosyncratic differences between different butchers as to tool use preferences. This is clearly one reason why butchery patterns varied on St Helena.

Non-functional variation between different butchers, whether as a result of different cultural backgrounds, different environmental backgrounds, or other reasons, is clearly a factor responsible for variation in butchery pattern. This is supported by the evidence from different tool usage. Tied to this is the possibility of idiosyncratic behaviour of individual butchers. The reasons why cut placement (location and orientation) may differ have already been discussed. The point here is, that the St Helena assemblage indicates variation in butchery by individual butchers and between individual butchers. But why would this be the case?

A reason why variation in butchery practice may have been encouraged, within certain bounds, could have been, that variation in the butchery pattern was designed in such a way as to allow the easy reduction of cooked meats into portions of equivalent size for ease in allocating individual prisoners their correct daily allowance. The division of cooked meat into ration portions would be assisted by cooking method. A variety of cooking methods which hold meat together such as roasting, grilling, broiling and frying would be favoured over those which cause meat to breakdown such as poaching methods like

stewing and casseroles. Therefore it is interpreted that variation in culinary practices took place, which would likely have required variations in the butchery practice.

Variation in the St Helena assemblage is therefore explained as resulting from possibly four factors:

1. Past experience of individual butchers, based on cultural or environmental factors.
2. Idiosyncratic behaviour of individual butchers.
3. Production of standardised consumption portions whatever the part of the skeleton to permit correct daily meat allocation to prisoners.
4. Variation in culinary practices.

The third and fourth factors are ones which could be tested as a result of a study examining the butchery of carcasses inside contemporary prisons, or the nature of cuts supplied to contemporary prisons and the explanations given for any variability which is present.

8.5 Summary

Variation in butchery pattern can result from one or many differing factors. If greater care and more in-depth studies of butchering patterns are made then our knowledge of the relationship between humans and their domesticated animals will be furthered, especially in the area of carcass utilisation. Butchery analysis of faunal assemblages will lead to a better sense of how such assemblages were formed, and thus what they mean, or what they are representing. The analysis of faunal assemblages from a butchering perspective has been rarely conducted, and could be said to be in its infancy, despite the potential rewards of such analysis being known for at least twelve years, as a result of Binford (1978) who wrote the first in-depth publication on this subject.

Butchery analysis needs to develop in two areas. Firstly, we need to understand what the butchery marks and other evidence of butchery such as fragmentation mean. This will require more ethnographic work to take place in observing butchery in practice, and also designed towards explaining and defining the effects that various variables may have on the procedure. The second area of development is in methodology to deal with the

results of analysis. We need to continue to develop reliable techniques to quantify butchery marks and the patterns they represent. Through rigorous recording of butchery patterns, with an attempt to explain variation, coupled with further development in methodology it will be possible to elucidate important information about butchery practices from archaeological assemblages. Maltby (1985b: 27) has argued, that:

the need to investigate butchery practices is as important as the understanding of the effects of post-depositional taphonomic processes that have occupied a much greater amount of archaeozoologists' time in recent years. For without it, assessments of carcass utilisation, activity patterning, and the importance of different species in the diet, and ultimately the accurate interpretation of developments in the pastoral economy may be suspect.

This chapter has pointed out a range of difficulties associated with one method designed to quantify butchery patterning. This was Lyman's (1979) butchering unit method. It was demonstrated that it is not applicable to use a rigid culturally based method, because of the factors which cause variability in butchery practice and because of factors relating to the deboning of carcasses. An alternative method was proposed. Instead of attempting to generalise the butchery patterns observed in a site to a single pattern, it is believed that explanation of the variation observed could lead to more in depth and valid conclusions. Further should meat weights be of importance, then these should be calculated, based on the minimum numbers of the actual butchering units represented by the site, and not by arbitrarily set butchering units, which may not be applicable.

Conclusion

Data on butchery marks have been inconsistently reported and rarely quantified.
(Reitz 1987:108).

The extraction of meaningful data from faunal remains has been at the core of archaeology since its inception. The chief concern of archaeology is the interpretation of human behaviour from the residues of cultural activities. An important human behavioral pattern is eating. Dietary and nutritional information about the past, and human relationships to, and utilisation of, animals in the past, whether from prehistoric cultures or historical cultures has always intrigued archaeologists and the public at large. For this reason, faunal analysis has concentrated on ways and means of extracting information about the meat component of former diets. Advances in faunal analysis theory and method, especially means to quantify the diet have been made in both prehistorical and historical archaeology. As method and theory developed, they tended to build on pre-existing models, almost like building blocks, one upon another. The conclusions being made now about past people's utilisation of animals in terms of diet should be regarded with a fair degree of scepticism. This is because the basic premise, the corner stone of archaeological faunal analysis is not valid. This basic premise is that a bone can be equated to consumption. That is, bone equals meat. This is far too simple. Although bone can equate to meat in many circumstances, it does not always equate to meat and consumption. This depends on two major factors:

1. Whether meat is removed from bone before reaching the consumer.
2. Where bones are deposited at different stages of the slaughter, butchery and consumption sequence.

The last decade has shown that post-depositional factors are capable of biasing faunal assemblages in many different ways which may have caused inaccurate conclusions to be made from assemblages where these factors were not taken into consideration. Because of these factors and the increasing awareness of how butchery practices can influence assemblages, some archaeologists have become aware of just how complex the processes are which eventually lead to the makeup of a faunal assemblage, as it appears in

the analyst's laboratory. What is suggested here is a re-orientation in our thrust to extract information about past human behaviour, away from meat-weight calculations and towards an examination of patterns of human behaviour as evidenced in the bones themselves, namely butchering patterns as evident from marks and fragmentation patterns. This needs to be attempted until such time as we have better means of quantifying the myriad of factors, which result in the final arrangement of faunal remains in a site at the time of excavation. If we cannot come to terms with the factors, both human and non-human, which create an assemblage, we will never be able to make valid interpretations about past human behaviour.

Some researchers have clearly attempted to examine faunal assemblages from a butchery analysis perspective (Binford 1978; Lyman 1977; 1979). However, these analyses have been too simple, tending to generalise results into single overall patterns. The real world situation is just not as simple as has been portrayed. Multiple butchering patterns, and not single butchering patterns, are evident within single sites, as was demonstrated for the ERT midden on St Helena Island, and recorded for other archaeological sites and situations discussed in Chapter 8.

Rather than attempting to elucidate minimum or single patterns of butchery from the sites we analyse, we should be attempting to determine the entire range of patterns present. We must start to define the totality of variation between butchering patterns which exist for single sites. Once we have achieved this, we must interpret and explain why this variation exists, and the only way we are going to achieve this is through ethnoarchaeology, experimental archaeology, comparison of variation in single sites with that of others and ultimately through analysis of faunal remains together with the other artefacts present in whole sites. We need to explain why similarities and differences exist between sites. When we do this, patterns will appear which will allow us to interpret and explain faunal assemblages in new ways. This will produce far more reliable insights into past human behaviour and social systems, than we will ever get from meat-weight calculations.

APPENDIX 1

Contemporary Ethnoarchaeological Data

Information recorded from interviews and observations

A1.1 Sheep

Interview 1 (Fig. A1.1)
Name: Bruce Smith
Occupation: Retired butcher
Location: Cromwell, New Zealand
Interview Date: 12.5.86

Notes from Interview

- All cuts through bone performed with a mechanical meat saw.
- The shoulder unit (scapula, humerus, and proximal half radius/ulna) can be cut off the carcass using a knife once the meat has set (chilled) overnight. This unit would be boiled or roasted. An alternative to this is to leave the shoulder-on and saw the entire forequarter region into shoulder leg chops as indicated in Fig. A1.1. Mutton shoulder chops would be used in stews while lambs and hogget shoulder chops would be roasted or barbecued.
- The neck and breast have little meat and are therefore usually fed to dogs. An alternative is to bone the meat off the breast and roll it with seasonings in the flap. This roll of meat would be roasted. Another alternative is to mince the breast meat and flap in order to make sausage meat. An alternative for the neck is to saw it transversely into neck chops which would be used for stewing.
- The rib loin is sawn transversely into rib loin chops.
- The mid loin is sawn transversely into loin chops.
- The leg can be a combined butt end with leg and shank to be used as a whole roasting unit. An alternative is to divide this whole unit into two roasting units: a butt end, and a leg and shank end. The butt end is sold at a lower price. Another alternative is to saw the whole unit transversely producing chump chops from the butt end and leg chops from the leg and shank end. However this practice of turning the leg into chops is not done often. The butt end can also be cured and made into a mutton ham.
- Mutton and lamb are butchered in the same manner.

Interview 2 (Fig. A1.2)
Name: Brian Williams
Location: Tibooburra, N.S.W.
Interview Date: 4.11.86

Notes from Interview

- The skin is removed from the animal once its throat has been cut, using a closed fist and a punching action between the skin and the flesh.
- The carcass is bisected in half by dividing it longitudinally in half along its mid-line resulting in two sides. This splitting is best done with a mechanical meat saw. If a mechanical meat saw is not available then an axe is used.
- The shoulder unit is cut off with a knife once the carcass has set. This unit is roasted.
- The neck is cut transversely in order to produce neck chops for stewing.
- The thoracic vertebrae and dorsal ribs are marked with a knife and are then cleaved transversely with a cleaver in order to produce chops.
- The lumbar vertebrae make up the loin unit. These vertebrae are cleaved transversely to produce loin chops.
- The ventral ribs are boned out and discarded with the other off-cuts which result at this stage. These bones are usually used as dog food. The meat which is boned off is rolled with seasonings and used for roasting.
- The flap is used as dog food, or else it is seasoned and rolled for roasting.
- The leg is a roasting unit.
- The brains are removed for eating by taking the cranial vault off with a cleaver.
- The liver is saved for consumption. It is either left soaking in water overnight if it is to be used the day after killing the animal, or else it is kept in brine until required.
- There is a lot of variation amongst people as to how they cut up a sheep.

Interview 3 (Fig. A1.3)
Name: David Barlow
Occupation: Retired stockman
Location: Tibooburra, New South Wales
Interview Date: 4.11.86

Notes from Interview

- Uses a mechanical meat saw and a knife when cutting up a carcass.
- By using a mechanical meat saw the entire carcass can be converted into chops.
- Hygiene is very important when cutting up a carcass. If one uses an unhygienic approach there is a risk that the meat will go off.
- Sheep are slaughtered, skinned and gutted at night when it is cooler.
- After the initial slaughtering procedures the carcass is left to hang for about twelve hours in order to give it time to chill.
- The head and feet are removed during the initial slaughtering procedures. These are fed to domestic pets (cats and dogs).
- The hyoid bone is cut in removing the tongue.
- Apart from the tongue, the heart, liver and kidneys are also taken at the initial slaughtering stage.
- Once the carcass has set it is split longitudinally in half along its mid-line using a mechanical meat saw or chain saw in order to produce two sides.
- The shoulders are removed with a knife. The carpals are cut through with a saw to give a shank which is still attached to the shoulder joint by some flesh.
- The shoulder produces the best roast meat, although some people do boil it.
- The rib cage is sawn transversely (across the ribs) in half to give a rib chop section and a brisket.
- The thoracic vertebrae of the rib chop section are sawn transversely in order to produce chops. Sometimes the rib block of this section is sawn transversely (across the ribs) prior to the transverse sawing of the vertebrae in order to produce chops about of 7 cm in length.
- On some occasions the shoulder is left on the rib chop unit in order to give a large forequarter roast.
- The meat on the brisket can be boned off, rolled and baked, or else it can be corned.
- The meat on the neck bones (cervical vertebrae) is boned off. The bones are used as soup bones while the meat is excellent in curries.
- The leg is sawn off from the loin unit.
- The flap which is cut off the loin with a knife goes to the dogs, or else it is rolled for cooking.
- The loin is sawn transversely through the lumbar vertebrae in order to produce loin chops. These can be roasted or used in stews, curries and casseroles.
- The leg maybe roasted, corned, or sawn transversely into leg chops.
- Rib chops and leg chops are usually cut thick in order to produce big chops.
- The four best eating parts are the shanks, neck, loin and tail region.
- In Tibooburra there is very little wastage when a sheep is butchered.

Interview 4 (Fig. A1.4)
Name: Heather Williams
Location: Tibooburra, New South Wales
Interview Date: 4.11.86

Notes from Interview

- There are lots of different ways to butcher sheep.
- There is very little wastage.
- The head and phalanges are discarded in the initial slaughtering procedures.
- The tongue and brains are taken in the initial slaughtering procedures and are fed to domestic pets (cats and dogs).
- The liver is taken for human consumption.
- Once the carcass has chilled it is sawn longitudinally in half along its mid-line to give two sides.
- The shoulders are removed using a knife. This unit is roasted or boiled. Sometimes it is boned out and the meat is then minced.
- Both the fore and hind shanks can be boiled or fed to domestic pets.
- The thoracic vertebrae are sawn transversely in order to produce chops. Sometimes the meat on the thoracic vertebrae and ribs is boned off, seasoned and rolled. This roll would be roasted. Another alternative is to mince the meat taken off these bones.
- The lumbar vertebrae are always sawn transversely to produce chops.
- The flap is turned into mince.
- The leg is roasted or boiled. Sometimes it is cured with quick cure.

Interview 5 (Fig. A1-5)
Name: Dave Falkner
Occupation: Ranger, Sturt National Park
Location: Mount Wood Station, Sturt National Park, near Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- The neck is cut into chops.
- The shoulder or forequarter blade-in is roasted.
- The fore shank can be cut into chops or else left on the forequarter to be roasted with it.
- The thoracic vertebrae and dorsal ribs are sawn into chops.
- The ventral ribs are cut using a knife in order to produce chops. These chops are usually cooked on the baebeque.
- The loin area (lumbar vertebrae) is sawn transversely into chops.
- The tail (sacral region) is sawn transversely into chops.
- A knife is used to cut the femur from the pelvis by cutting through the joint of the acetabulum and femur head. A knife is also used to cut the femur from the tibia by cutting through the joint formed by the distal femur and proximal tibia.
- The hindquarter is roasted.
- The flap can be rolled and then roasted.

Interview 6 (see Fig. A1-6)
Name: Blake Whitehead
Occupation: Storekeeper
Location: Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- Sheep (mutton) are slaughtered in the evening when there are few flies about. Carcasses are hung overnight so that they chill and are easier to cut into joints. Carcasses are butchered early the next morning when, as in the evening there are few flies. Usually some of the meat will be cooked straight away with the rest being put into a kerosene refrigerator. Usually the meat is all used in three or four days.
- Prior to World War II no one in Tibooburra had a refrigerator.
- Nowadays most stations have mechanical meat saws and refrigerators. This means that they can kill and butcher three or four sheep at a time instead of one.
- The animal is killed by cutting its throat and at the same time breaking its neck.
- The metapodials are removed with a knife during the initial slaughtering procedures and are used as dog food.
- The kidneys, brains and heart are fed to dogs.
- The liver might be saved for human consumption.
- Once the carcass has been bisected into two sides, the forequarters are cut up first and then the hindquarters.
- The neck is sawn off from the carcass and can be subsequently sawn transversely into neck chops or else used as dog food.
- The shoulders are cut off using a knife.
- The shoulder shank is cut through at the junction between the distal humerus and the proximal radius/ulna.
- The shoulder is used as a roasting joint.
- When using a mechanical meat saw (particularly when sawing up the loin and cutting the leg from the loin) the meat is first cut down to the bone with a knife so as to give a guide for the saw and to reduce wastage.
- The thoracic vertebrae of the chop joint are sawn transversely into chops using a mechanical meat saw.
- The brisket and flap are fed to dogs.
- The lumbar vertebrae are sawn transversely in order to produce loin chops. These are cut deliberately to result in big thick chops.
- The leg is roasted.
- The hind shank is cut off from the leg unit by cutting through the femur/tibia interface using a knife.

Interview 7 (Fig. A1-7)
Name: Frank Nichols
Occupation: Station Owner
Location: Pindera Downs Station, near Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- Mr Nichols has not taken the tongue or brains during the initial slaughtering procedures in forty years. Believes it to be 'more trouble than worth.'
- When he did remove the brains he used a cleaver or an axe depending on what was at hand and he would chop just caudal to the eye with a lateral blow on the dorsal surface. He would then remove that half of the brain exposed and then repeat the process on the other side in order to remove the other half of the brain.

- The way he use to remove the tongue was by cutting through the muscles which attach the tongue to the base of the mandible. This was done using a knife.
- In the past Mr Nichols used a hand saw to split the carcass longitudinally in order to produce two sides. The rest of the butchering was done using a cleaver. Nowadays he uses a mechanical meat saw for all cuts.
- The reason for using a mechanical meat saw rather than a cleaver is that it is a lot less wasteful. By using a mechanical meat saw about an eighth of a sheep more meat is gained. The reason for this is that when using a cleaver, especially one that is slightly blunt, a clean cut is not always produced. In fact the clean cut is the exception rather than the rule. Waste results because the jagged meat resulting from where successive blows fail to fall exactly where the previous blows fell, have to be trimmed as waste. Another advantage of the mechanical meat saw over the cleaver is that it does not produce bone chips in the meat as a cleaver can.
- The shoulders are cut off the carcass using a knife. Mr Nichols prefers to roast the shoulder but it can be boiled or boned out, seasoned, rolled and then roasted. Some people bone it out and then mince it.
- Another alternative way of using the shoulder is to leave it on the rib cage. In this case the shank is cut off at the humerus/radius/ulna interface instead of part way down the radius/ulna shafts (as in Fig. A1.7). This forequarter unit is then sawn transversely to produce large thick shoulder chops. A single chop has enough meat for a meal for one person. These chops are roasted, fried or grilled. This method of cutting up a shoulder is particularly common on shearing gangs because a shoulder roast is not big enough to feed a team of men.
- Both fore and hind shanks are sawn transversely into pieces to be used in stews.
- The neck is sawn transversely into half inch thick pieces and then each of these pieces are sawn longitudinally to produce neck chops. Neck chops are stewed.
- The rib cage is sawn transversely in half (as in Fig. A1.7). The ventral rib portion is then sawn dorso-ventrally to produce chops.
- The thoracic vertebrae with dorsal ribs attached and the lumbar vertebrae are sawn transversely in order to produce chops.
- The flap is waste and is fed to dogs.
- The leg is roasted or boiled. If it is not eaten as a hot meal then it is eaten cold.

Interview 8 (Fig. A1.8)
Name: Barney Davis
Occupation: Publican, Family Hotel
Location: Tibbooburra, New South Wales
Interview Date: 6.11.86

Notes from Interview and Observations

- The initial slaughtering procedures involve the animal's throat being cut, it being skinned and then gutted.
- The carcass was then left to hang over-night to allow it to chill.
- A mechanical meat saw was used to butcher this animal. Prior to the introduction of mechanical meat saws, the tools used in butchering a sheep carcass were hand saws, cleavers and tomahawks. However the cuts themselves have not changed with the introduction of mechanical meat saws.
- After the carcass had chilled it was trimmed up, especially around the sternum.
- The shoulders were cut off with a knife.
- The shoulders were trimmed up.
- The shoulder 'kernels' (glands) were cut out with a knife.
- The vertebral column was sawn transversely at the thoracic/lumbar interface effectively producing a fore half and a hind half of the carcass.
- The lumbar vertebrae were cut from the sacrum by sawing transversely through the lumbar/sacral interface.
- The flaps were removed as waste.
- The lumbar vertebrae were sawn longitudinally in half.
- Each lumbar side was sawn transversely into seven chops, producing a total of fourteen loin chops.
- The flaps on the rib cage were cut off and discarded as waste.
- The rib cage was sawn transversely into two sections between the 7th and 8th ribs.
- Both rib cage sections were sawn longitudinally in half to produce four sections.
- Each of the four rib sections was sawn transversely one third of the way down the rib shaft from the dorsal end. This produced four vertebrae/rib sections and four rib sections.
- The four vertebrae/rib sections were sawn transversely to produce thirty chops.
- The four rib sections were sawn longitudinally in half to produce eight rib sections.
- The eight rib sections were sawn transversely in half to give sixteen sections.
- The most ventral portion of the ventral rib sections was removed and discarded as it is very fatty.
- For each of the rib sections a cut was placed between the bones with a knife in order to produce 'fingers', which are cooked by grilling.
- The neck was sawn off at the same time as the thoracic vertebrae were being sawn into two sections.
- The cervical vertebrae, with the exception of the atlas (which was discarded), were sawn longitudinally in half and then transversely. This gave rise to twenty neck chops.
- Neck chops are for use in stews.
- The rear leg portion is sawn longitudinally in half through the pelvis and the sacrum.
- The hind legs are sawn in half at the 'knuckle' to give a leg roast with a shank, at the distal end.

- The shoulder is sawn transversely midway through the humerus and transversely midway through the radius/ulna. This produces a shoulder unit and a shank unit.
- The shoulder unit is sawn transversely to produce chops.
- The meat is stored in a cool room.

Interview 9 (See Fig. A1·9)
Name: Bill and Ben
Occupation: Patrol dingo fence and are roo-shooters
Location: Tibooburra, New South Wales
Interview Date: 6.11.86

Notes from Interview

- The neck is fed to their dogs.
- The unit called chops is sawn into breakfast chops.
- The unit called rib bones is either cut using a knife into 'fingers' for barbequing, or else it is fed to their dogs.
- The brisket is fed to their dogs.
- The shoulder is either roasted, or stewed, or has the meat stripped from it and then minced.
- The caudal lumbar vertebrae are sawn transversely producing loin chops.
- The flap is either used for making soup or else it is fed to their dogs.
- The hindquarter is either roasted, or stewed, or has the meat stripped from it and then minced. It is easier to strip meat from the hindquarter for mincing than it is for the shoulder.
- The shanks are either stewed or else fed to their dogs.
- Storage is a problem as they only have an 'eskie' available to store meat in. Therefore there are restrictions as to how long they can preserve meat. The meat must be consumed in a short period following slaughter.

Interview 10 (Fig. A1·10)
Name: Stuart Thompson
Occupation: Stationowner's son, helps run station.
Location: Mount Stuart Station, near Tibooburra, New South Wales
Interview Date: 7.11.86

Observations of a mutton-aged sheep being slaughtered

- The slaughtering began at 6.05 pm.
- The sheep was placed on a concrete block with an open blood drain.
- Its throat was cut with a knife and the blood allowed to flow away from the work area along the drain. The dogs were around this drain lapping at the blood.
- When the throat is cut, the neck is pulled back at the same time and the knife severs the vertebral column and spinal cord at the occipito-atlantal articulation. Sometimes the vertebral column breaks allowing severance of the spinal cord between the atlas and the axis.
- The next step in the initial slaughter procedures is to skin the animal.
- Skinning starts on the medial aspects of the front legs with a cut running from the neck down to the base of the legs.
- The back legs are cut through the skin at the distal end of the tibia. The skin is then pulled down to bare the metatarsals and phalanges. This process is repeated for the front legs as well.
- The skin is pulled off around the neck region.
- The skin is pulled and cut over the sternal area to the base of the sternum and then punched off towards the dorsal surface.
- A cut is made posteriorly from the tarsals to the tail on both the back legs.
- The hind feet are cut off with a knife distal to the tarsals.
- The metatarsals are cut and twisted off the hind legs.
- The carcass is then hung off hooks by the Achilles tendons.
- The skin is cut medial ventral from the belly to the sternum.
- The skin is cut back off the legs and belly 10 to 15 centimetres each side of the mid-line. This means that the medial ventral aspects of the sheep are totally exposed.
- The skin is then pulled transversely across the animal resulting in complete exposure of the ventral area.
- The skin is punched up to remove it from the lateral sides of the animal and then it is punched off the dorsal surface.
- Hands are wetted with water before punching.
- The skin is punched off around the sacral/caudal region.
- The skin is cut off the sacral/caudal region.
- At this stage the skin is only connected to the carcass at the head.
- The head is cut off.
- The skin and the head will be discarded.
- The skin in this case was discarded as it did not have enough wool on it to be worth saving. Sheep are often shorn before slaughter, in order to gain a little money from the wool.
- Sometimes the brains and tongue are taken.

- The tongue is removed by cutting through the attaching muscles. This is done with a knife by running it around the buccal lingual surface of the mandibles.
- The brains are removed by splitting the cranium longitudinally along its mid-line. The blow is directed at the posterior ventral surface with a cleaver or tomahawk, while the skull is in a dorsal surface down position.
- A cut is made from the anal sphincter to the sternum.
- The stomach, intestines, and other viscera fall out.
- The viscera are discarded as waste.
- A mid-line knife cut is made through the sternum to the throat.
- The lungs and trachea are cut out.
- The heart is kept for the dogs.
- The dogs are present at this slaughter lapping up the blood and eating the viscera.
- The carcass is unhooked and allowed to drop onto an old synthetic wool sack.
- The front feet are removed by cutting transversely with a knife at the distal end of the radius/ulna.
- The carcass was then hung overnight to chill. It was to be butchered into units the following morning.
- Offal, skin and metapodials are taken to the station dump. The head is left for the dogs to eat.

Notes from Interview

- The shoulder is removed by cutting away medially any muscle attaching the scapula to the carcass.
- The neck is cut off using a knife at the cervical/thoracic interface.
- The neck is used in stews or else it is used in making soups. It is randomly broken into lengths during the butchering stage. When it comes time to use it, it is cut into suitably sized pieces in the kitchen.
- The fore leg is cut off transversely using a hand saw just distal to the proximal radius/ulna. The fore leg is used in stews.
- The shoulder is used as a roasting joint.
- The carcass is hung by its back legs and is sawn longitudinally in half along its mid-line.
- By using a knife and a hand saw each of the sides is halved transversely to give quarters. The vertebral column is sawn transversely in half between the 12th and 13th thoracic vertebrae. The knife is used to separate the quarters by cutting through the intercostal muscles between the 12th and 13th ribs.
- Each of the rib cage portions is sawn transversely across the ribs into two pieces approximately a third of the way down the rib shaft from the dorsal end. The two dorsal sections containing the thoracic vertebrae are cut into chops when required. At this stage the the vertebrae are split transversely with a tomahawk so as to mark where the chops will be cut from and to make the subsequent cutting up of this unit into easier. The intercostal muscles between the ribs are not cut at this stage. These muscles will be cut resulting in individual chops when they are required. The meat stays fresher by not cutting between the ribs initially.
- The sternum and cartilaginous bones are also marked with an axe transversely. The ventral rib portions may be cut longitudinally with a saw or an axe (dashes on Fig. A1·10) resulting in four ventral rib portions. These units are used in stews, or they can be baked. Another alternative is to bone them out and roll the meat for baking.
- The legs are taken off from the loin using either a saw or an axe to cut transversely through the lumbar/sacral interface.
- The flap is cut off from the loin. It can be rolled for cooking but it is normally used as dog food.
- The loin is cut into chops.
- The shank is cut off at the distal femur/proximal tibia interface. The shank is used in stews.
- The back leg is used as a roasting joint.
- If a ram is slaughtered, then the meat is entirely stripped from the bone and minced.
- Use of a hand saw is preferred over a mechanical meat saw because it takes a long time to clean a mechanical meat saw after use. This preference depends on how many sheep are being butchered. It is quicker to use a hand saw and an axe or a cleaver than a mechanical meat saw when only butchering a few carcasses due to the time needed at the end of the operation to clean the saw, but with a number of carcasses it works out to be quicker to use a mechanical meat saw.
- Use of a cleaver or an axe to split the vertebral column longitudinally is preferred to a saw as it is quicker and easier. Sometimes a saw will be used to butcher the ribs.
- Stuart Thompson's father, however, uses a saw to split the vertebral column longitudinally.

Interview 11	(Fig. A1·11)
Name:	Bill Cox
Occupation:	Retired station owner
Location:	Augathella, Queensland
Interview Date:	3.7.87

Notes from Interview

- Uses a hand saw and a knife to butcher carcasses.
- The metacarpals, fore phalanges, distal tibia, tarsals, metatarsals and hind phalanges are all left on the skin.
- The tongue is removed with a knife by cutting around the buccal lingual surface of the mandibles, thus cutting through the muscles which attach the tongue to the mandible.
- The brains are removed by lifting the cranial vault off with two oblique axe blows, one behind each eye.
- The carcass is split to give two sides by sawing it longitudinally in half.

- Each side is sawn transversely at the thoracic/lumbar interface and at the lumbar/sacral interface, to give a forequarter, mid-section and hindquarter. This is the same procedure Bill Cox uses on cattle.
- The shoulders are cut off using a knife.
- The distal radius/ulna portion goes to his dogs.
- The rest of the shoulder is used as a roasting joint.
- The neck is sawn transversely into chops which are used in stews.
- The thoracic vertebrae and dorsal ribs are sawn transversely to produce chops.
- The ventral rib cage is randomly chopped transversely with a tomahawk and then corned. It is chopped so that it will break up in a stew.
- The flap is fed to his dogs.
- The lumbar vertebrae are sawn transversely to produce loin chops.
- The leg is used as a roasting joint.
- The shank may be boned out or else it is fed to his dogs.
- The sheep selected for butchering must be at least two years old, and preferably older.

Interview 12 (Fig. A1·12)
Name: Wayne Renall
Occupation: Roo and pig-shooter, trained as a butcher in New Zealand
Location: Mauttaburra, Queensland
Interview Date: 5.11.87

Notes from Interview

- Uses a mechanical meat saw to cut up a carcass.
- The carcass is sawn longitudinally in half to give two sides.
- The vertebral column is sawn transversely between the lumbar/sacral interface and between the 6th and 7th thoracic vertebrae to give three portions each side.
- The fore shank is cut off at the distal humerus/proximal radius/ulna interface. This unit is fed to his dogs.
- The neck is cut off and is sawn transversely to give neck chops.
- The remainder of the fore portion can be roasted whole as a shoulder roast, or else the shoulders (scapulae and humeri) can be cut off using a knife while the rib cage is cut transversely in half as indicated by the dashed line in Fig. A1·12. The shoulder is used as a roasting joint while the thoracic vertebrae are sawn transversely to produce chops and the ventral ribs are also turned into chops by cutting with a knife through the intercostal muscles between the rib bones.
- The flap is cut off with a knife and is used as dog food.
- The remaining thoracic vertebrae, ribs and lumbar vertebrae are sawn transversely into chops.
- The hind shank is removed using a saw with a transverse cut at either the distal femur/proximal tibia interface or else at the mid shaft tibia. This unit is fed to his dogs.
- The remaining portion is a leg joint and it is roasted. If it is an exceptionally big leg it may be transversely sawn in half through the acetabulum of the pelvis.

Interview 13 (Fig. A1·13)
Name: Jacko Sims
Occupation: Station Owner
Location: Clyde Park Station, near Hughendon, Queensland
Interview Date: 12.7.87

Notes from Interview

- Bones are cut using an axe or cleaver is used, otherwise all butchery is performed using a knife.
- The brains are extracted using an axe. This is achieved by splitting the cranium longitudinally in its mid-line through the nuchal crest when the head is held dorsal surface down on a block.
- The neck is cut into chops.
- The shoulder is roasted.
- The dorsal rib section is roasted.
- The ventral ribs are boned out. The meat from them is rolled in the flap with stuffing and is roasted.
- The loin is cut into loin chops.
- The leg is cut into two roasting units.

Interview 14 (see Fig. A1·14)
Name: Kevin Wright
Occupation: Butcher/Slaughterman
Location: Hughendon, Queensland
Interview Date: 13.7.87

Notes from Interview

- Uses a knife and a mechanical meat saw.
- The carcass is sawn longitudinally into two sides.
- The shoulder is cut off using a knife.

- The shank is cut off using a mechanical meat saw.
- The scapula and humerus are usually boned out of the shoulder in order to produce a boneless roast.
- The neck is cut off and sawn transversely into neck chops. Neck chops are used in stews.
- The remaining cervical vertebrae and anterior thoracic vertebrae are sawn transversely and longitudinally to produce stewing chops.
- The anterior dorsal ribs are sawn longitudinally to produce stewing chops.
- The meat on the anterior ventral ribs is boned off. This unit is called the brisket and the boned off meat is corned.
- The flap is turned into dog food.
- The loin section is sawn transversely to produce loin chops.
- The chump section is sawn transversely to produce chump chops.
- The leg is used as a roasting unit.

Interview 15 (Fig. A1·15)
Name: Margrett Perkins
Location: On art course at Jowalbinna Station, near Laura, Queensland
Interview Date: 22.7.87

Notes from Interview

- This description is of station kills remembered by Margrett Perkins who worked on a property near Walgett, New South Wales twenty years ago.
- The sheep would be slaughtered in the evening by having its throat cut.
- The animal would then be skinned and then gutted.
- The kidneys would be taken for human consumption.
- The liver would also be taken and cooked with bacon in a thick gravy.
- The heart would only rarely be taken for human consumption, usually being fed to the station dogs.
- No other viscera would be taken for human consumption.
- The metapodials and phalanges were cut transversely off the carcass using a cleaver and subsequently fed to the station dogs.
- The carcass would be left over night hanging by its Achilles tendons in a meat safe (to protect from flies) so as to chill. It would be cut up the following morning.
- The carcass would be split into two sides using a cleaver.
- The head of the femur was cut from the acetabulum using a knife.
- The femur was cleaved transversely to produce leg chops which were eaten at breakfast.
- The thoracic vertebrae and ribs were not used. They were chopped up randomly with a cleaver and fed to the station dogs.
- The lumbar vertebrae were cleaved transversely through the inter-vertebral faces in order to produce very thick loin chops which were eaten at breakfast.
- The cervical vertebrae were cleaved transversely through the inter-vertebral faces to produce very thick neck chops. These chops were used to make mutton stew. The main vegetable in this stew was carrot with potatoes sometimes being added.
- The shoulder was roasted with the fore shank, and sometimes with the leg roast, tail and hind shank. The leg roast and shanks were considered delicacies.
- The flap was usually very fatty and it was either rolled and roasted or else cut into stripes and fried.
- Everyone on the station butchered slightly differently.

Interview 16 (Fig. A1·16)
Name: Bob Clayton
Occupation: Postgraduate botany student
Location: Annalee Station, Black Mountain, near Armidale, New South Wales
Interview Date: 14.11.87

Observations of a lamb being slaughtered

- The animal being slaughtered and butchered was a fat fourteen month old ram.
- The first step in slaughtering this animal was to make sure that the knives which were going to be used in the initial slaughtering procedures were sharp. Those that were not were sharpened.
- The slaughtering took place in the woolshed.
- At 4.40 pm a set of gallows were set up.
- The animal's throat was cut using a straight bladed knife. This was achieved by straddling the animal, pulling its neck back and slitting its throat. The knife was stabbed into the lateral side of the neck at the cranial end of the atlas. At the same time as the knife was cutting through the neck in a ventral direction the head was pulled back so as to snap the neck at the occipito-atlantal articulation. The blood that resulted from slitting the throat drained through gaps between slats which made up the woolshed floor.
- The head was then cut from the atlas.
- Skinning the animal then began. A range of knives were used in the skinning process.
- An incision was made on the lateral side of the left front leg adjacent to the carpals. A dorsal cut was made through the skin from this incision.

- The skin was worked posteriorly and dorsally from the cut made around the radius/ulna.
- The skin was slowly worked off the leg dorsally to the belly. The skin was worked off the carcass by pushing the skin back with a closed fist but with the thumb extended.
- This process was repeated for the right front leg.
- An incision was made with a knife transversely across the anterior end of the belly.
- The right rear leg had the skin removed from it.
- The testicles were removed.
- The skin on the belly was punched back laterally from the posterior end to the anterior end.
- The left rear leg had the skin removed from it.
- The skin was punched off the left side of the belly from the posterior end (after working around the femoral area) towards the anterior end through to the neck.
- Both left and right rear legs then had the skin removed down to the tarsals.
- An incision was made between the body of the calcanei and the Achilles tendons.
- The metal bar was put through the above incision and the carcass hung from the gallows.
- The metal bar proved to be ineffective as the carcass would slip off the ends of the bar. A wooden cross bar with notches at its ends was substituted for the metal bar. This bar proved to be effective in hanging the carcass from the gallows.
- The skin was pushed down from the posterior end.
- A longitudinal incision was made along the ventral mid-line of the carcass.
- The skin was completely separated from the belly.
- The skin was cut off from its connection to the metatarsals.
- The skin was now only attached to the carcass along the back, neck and metacarpals.
- The skin was separated from its connection to the carcass at the neck.
- The skin was cut off at the metacarpals.
- The skin was separated from the back of the carcass by punching upwards towards the tail.
- The tail was cut off with the skin. This means that the coccygeal vertebrae not removed in docking became part of the initial slaughter waste.
- The skinning process was now completed.
- A circular cut was made around the rectum which was left hanging.
- The penis was cut off.
- The belly was cut open from the pelvic region to the sternum along the mid-line. This was done carefully so as not to rupture any of the internal organs. A hand was kept inside the carcass during this process in order to guide the knife to ensure that none of the viscera were accidentally cut.
- The hands were worked around the organs and mesenteries in order to remove them intact.
- The oesophagus was cut round at the anterior end of the neck and then removed via the abdominal cavity.
- The hands were used to remove the heart and lungs from the pleural cavity.
- The time was now 5.50 pm. The initial slaughtering procedures had so far taken one hour and ten minutes.
- The kidneys along with the suet fat were left in the carcass. All the other organs were discarded.
- The metatarsals were at this stage removed with a knife leaving the tarsals still attached to the carcass. The metatarsals were discarded.
- The metacarpals were removed with a knife along with the distal carpals. The metacarpals and distal carpals were discarded.
- The metapodials were removed by using the knife in conjunction with a bending and twisting off these bones.
- The initial slaughtering procedures were now complete.
- The carcass was wrapped up in an old sheet to keep the flies off and taken up to the house where it was to be butchered on the kitchen table. It was deemed easier to cut up the carcass on the table.
- The metapodials, viscera and head were placed in a sack and dumped in a blackberry bush approximately 100 metres north of the woolshed and 50 metres north of the house.
- It is best to slit the throat, rather than shoot the animal in the head, as the heart continues to pump when the throat is cut and this drains the carcass of blood.
- This was the first sheep that Bob Clayton had butchered since January. Back in January the skinning of the carcass took only half an hour.
- The skin from this kill was saved to be tanned.
- Bob Clayton selects fat sheep for butchery as lean sheep have very 'stringy' meat.
- He usually hangs the carcass overnight to chill, but this time the carcass was butchered straight away. He had heard of other people in the area doing this and so this was a trial to see if this method was easier. It proved not to be.

Observations of Butchering Procedures

- The vertebral column is usually sawn with a hand saw longitudinally along its mid-line to produce two sides. This was not done this time as it is very hard work.
- All sawing performed was done using a hand saw.
- A cut was made using a knife from the posterior ventral end of both flaps towards the pelvis.
- The carcass was divided into two pieces by sawing transversely across the ilium and sacrum.
- The flap was cut off both sides with a knife. It was discarded but can be kept for making sausages.
- The kidneys and suet were removed. The suet is discarded but sometimes a little is saved to put in sausages. A bit of fat in the sausage mix makes for 'better' sausages.
- The loin was sawn transversely off the fore half of the carcass at the thoracic/lumbar interface.

- The loin is usually cut into loin chops by sawing the lumbar vertebrae longitudinally in half along their mid-line and then cleaving them transversely into chops. Sometimes the lumbar vertebrae are not sawn longitudinally but only cleaved transversely to produce 'double' loin chops. This time however the loin section was merely sawn transversely once to produce two loin sections to be used as roasting units.
- The sternum was cleaved longitudinally in half along its mid-line.
- The shoulders were cut off with a knife. They are used as roasting units. They are often boned out and stuffed.
- The diaphragm was removed and saved for making sausages.
- The neck was sawn then cleaved and then sawn again transversely in separating it from the remainder of the fore section. The neck is used in stews and in curries.
- The breast was removed by transversely sawing across the ventral ribs. The meat was trimmed off the bones to be used in sausages.
- The thoracic vertebrae and dorsal ribs were cut into chops. Using a saw and a knife this section was reduced to rib units which were two ribs thick. Each of these was then cut longitudinally in half and then transversely using a combination of a hand saw, a cleaver and a knife to produce single rib chops.
- The hind half of the carcass was cut longitudinally in half along the mid-line of the sacrum and pubis symphysis using a saw and a cleaver.
- The long legs were sawn off and were to be cooked with the loin roasts.
- The rest of the legs were sawn up for chops except the portion called the wedge which is roasted.

Figure A1.1: Sheep butchery pattern Interview 1

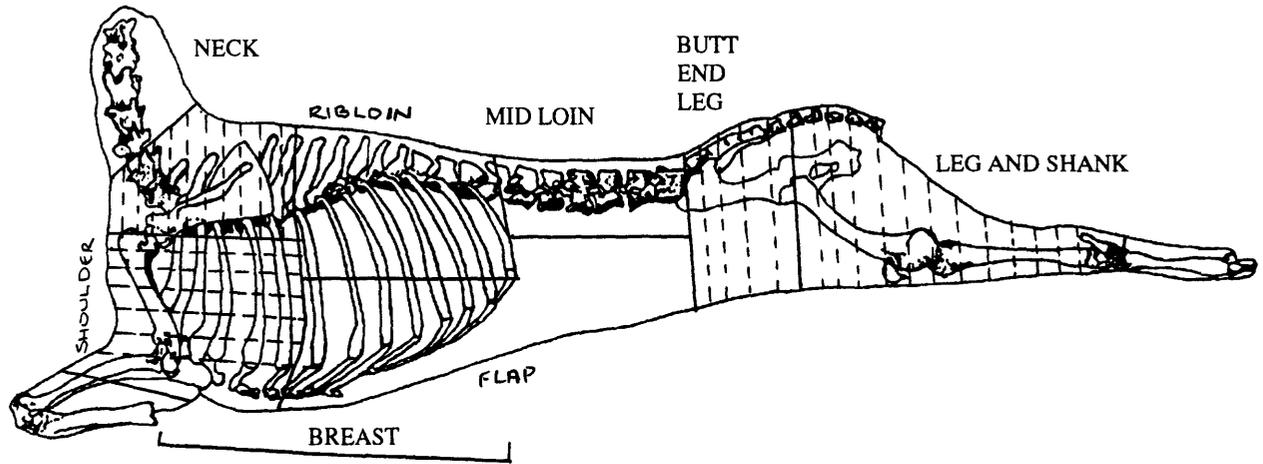


Figure A1.2: Sheep butchery pattern Interview 2

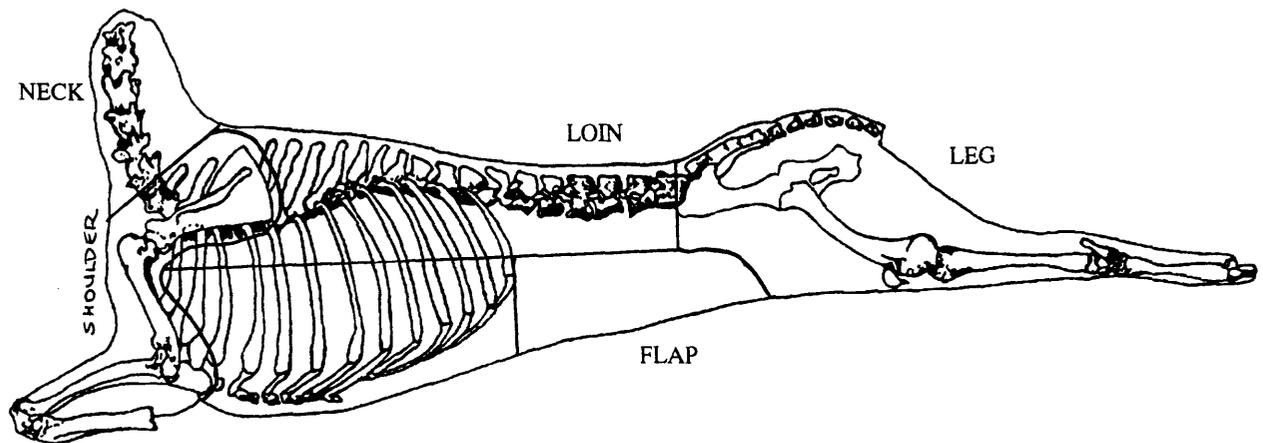


Figure A1.3: Sheep butchery pattern Interview 3

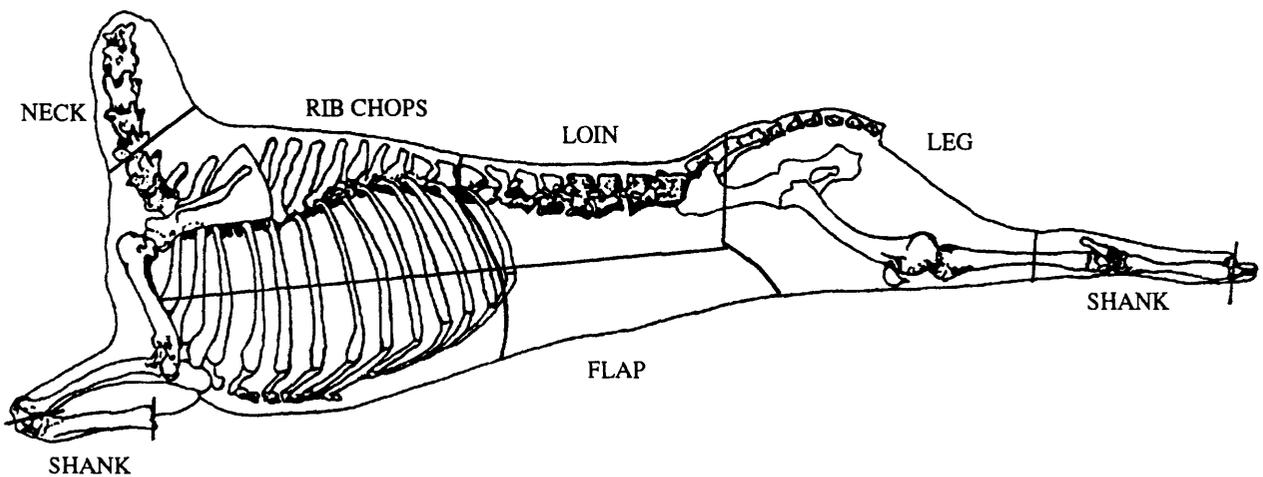


Figure A1.4: Sheep butchery pattern Interview 4

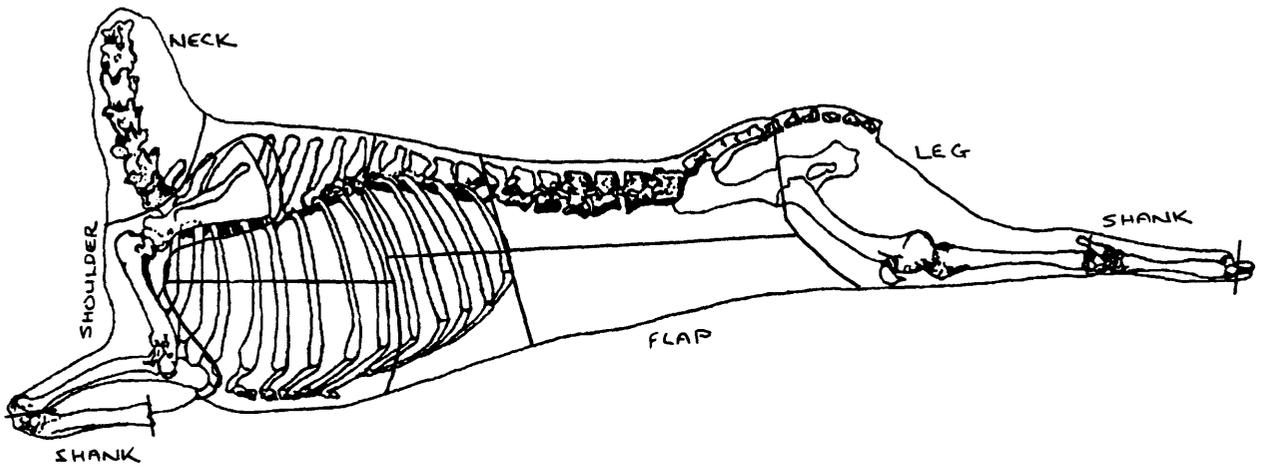


Figure A1.5: Sheep butchery pattern Interview 5

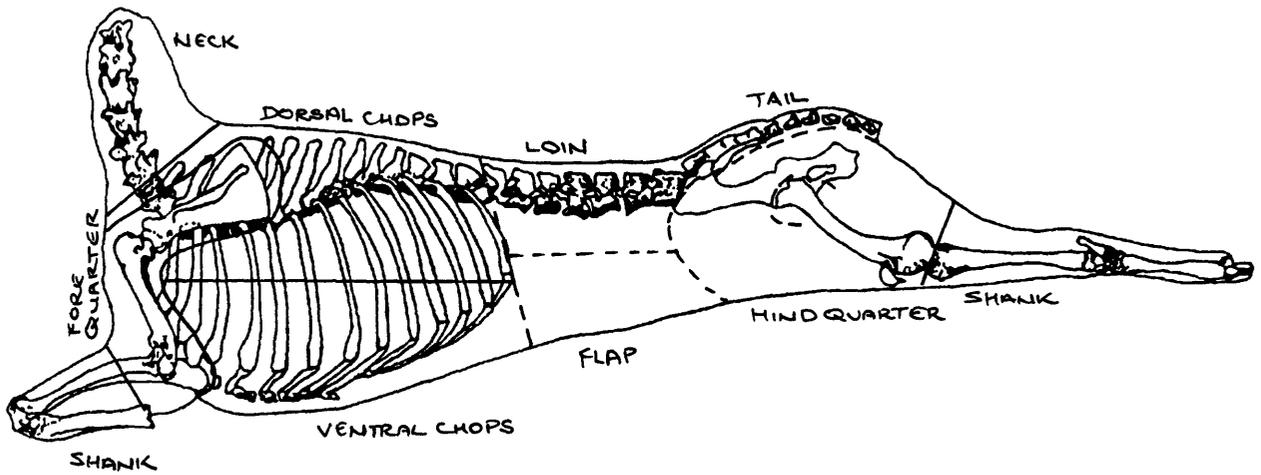


Figure A1.6: Sheep butchery pattern Interview 6

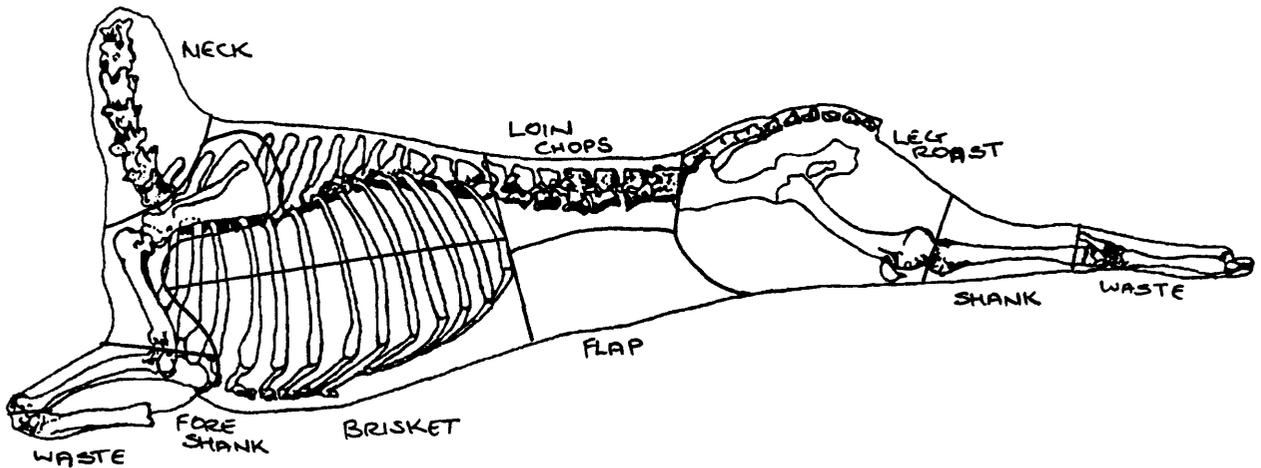


Figure A1.7: Sheep butchery pattern Interview 7

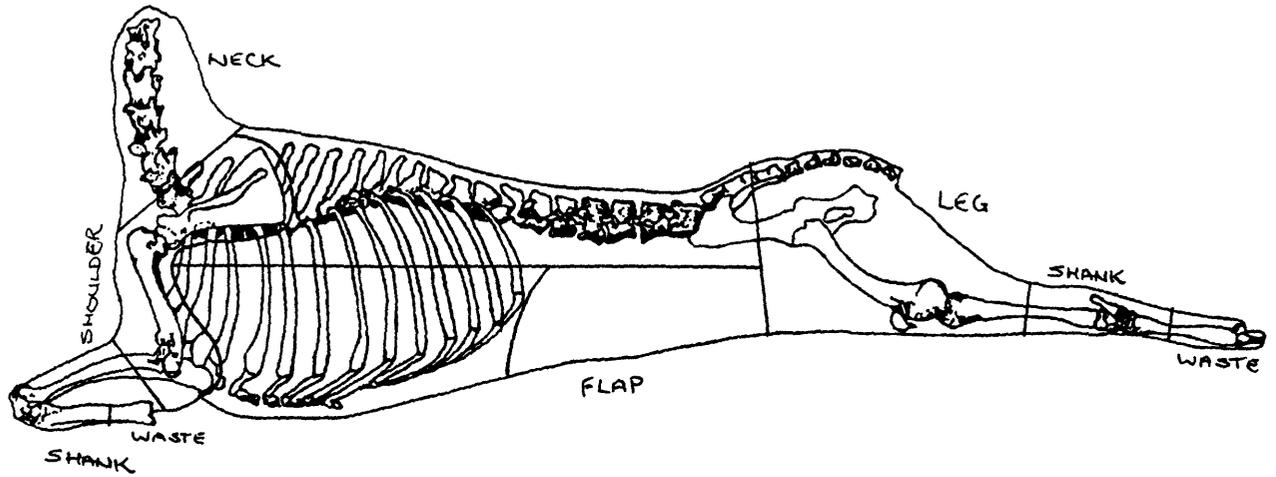


Figure A1.8: Sheep butchery pattern Interview 8

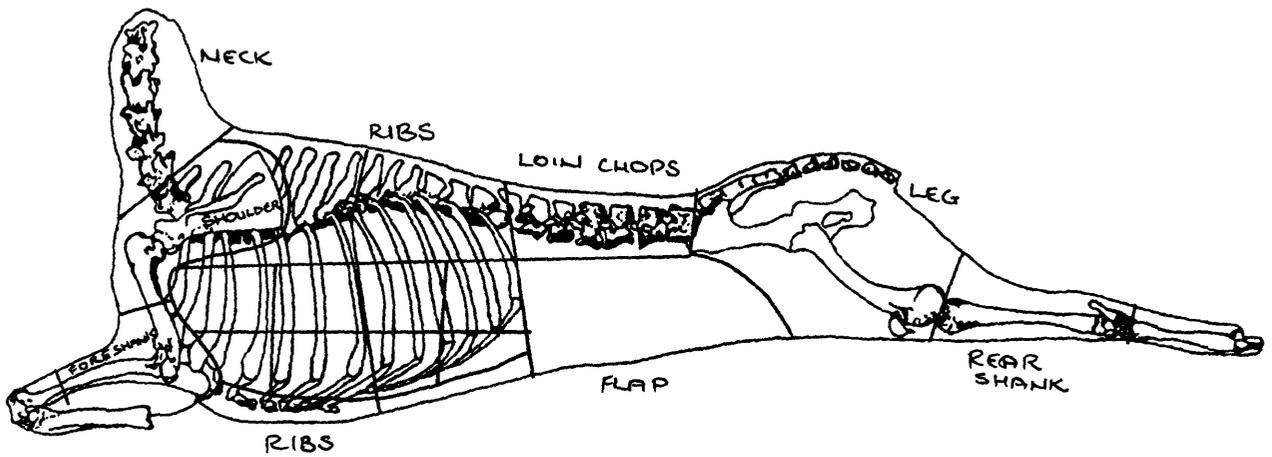


Figure A1.9: Sheep butchery pattern Interview 9

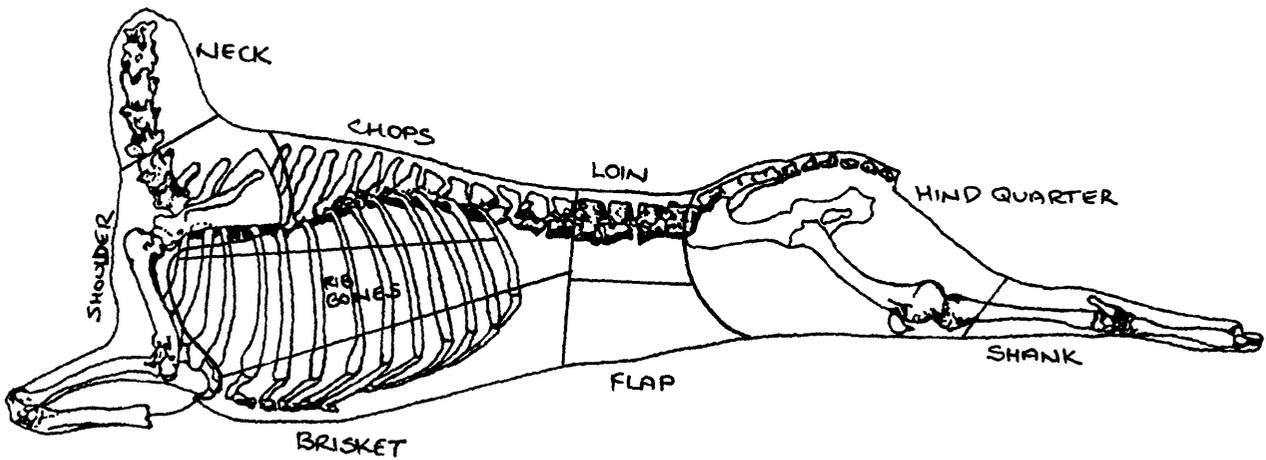


Figure A1.10: Sheep butchery pattern Interview 10

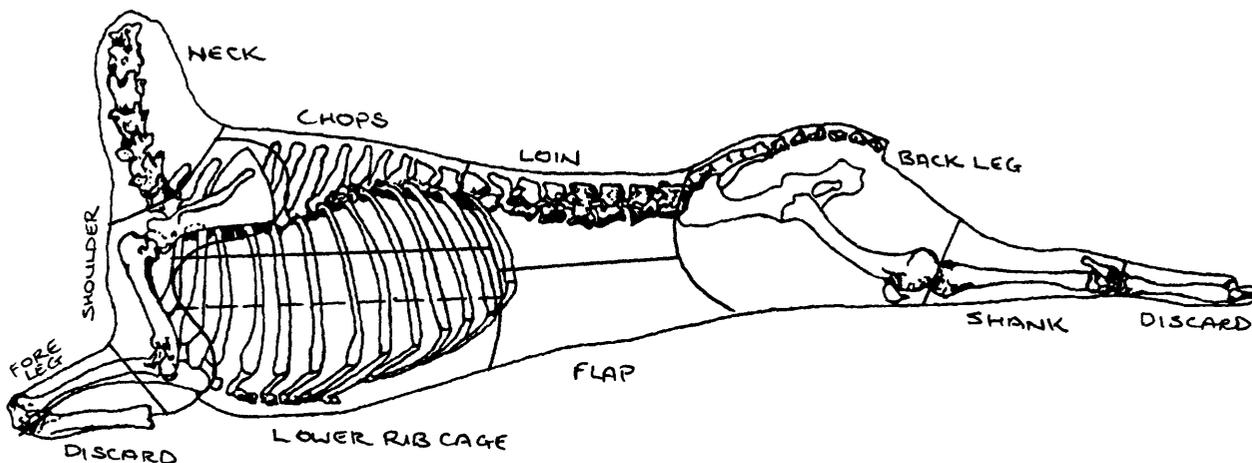


Figure A1.11: Sheep butchery pattern Interview 11

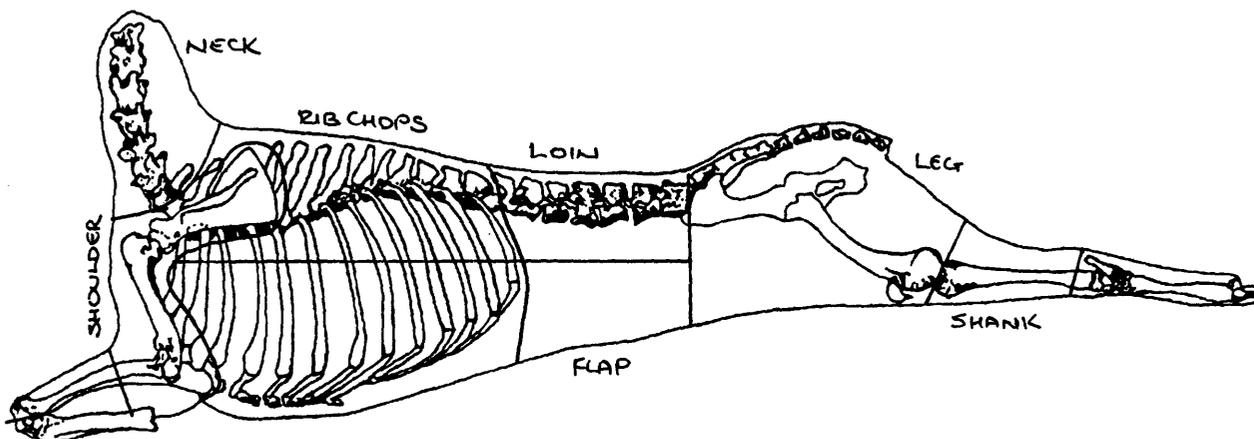


Figure A1.12: Sheep butchery pattern Interview 12

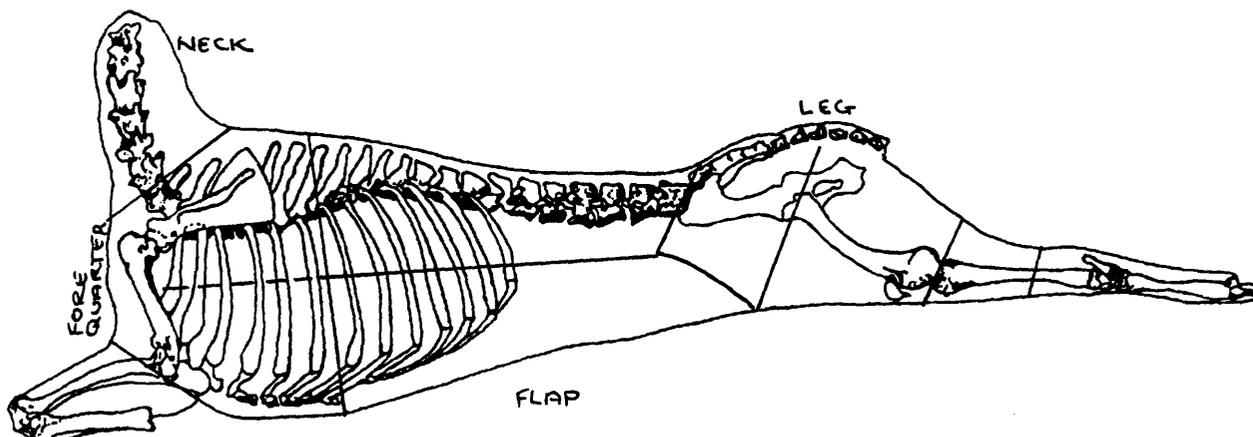


Figure A1.13: Sheep butchery pattern Interview 13

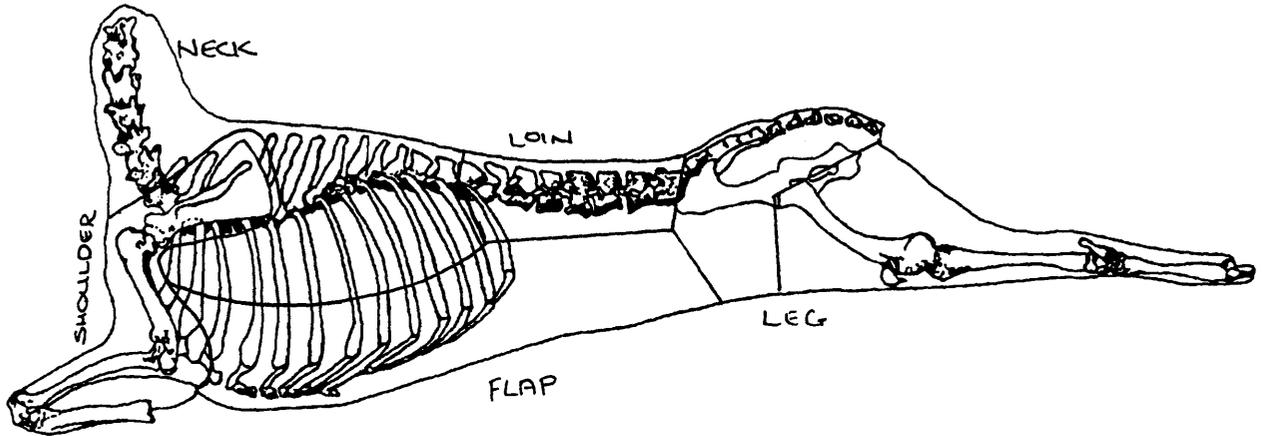


Figure A1.14: Sheep butchery pattern Interview 14

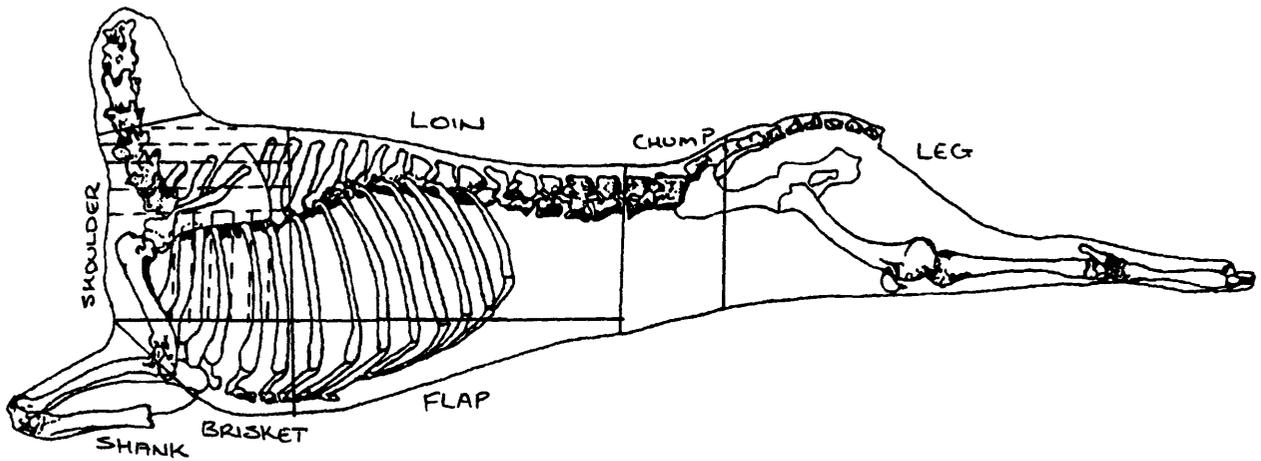


Figure A1.15: Sheep butchery pattern Interview 15

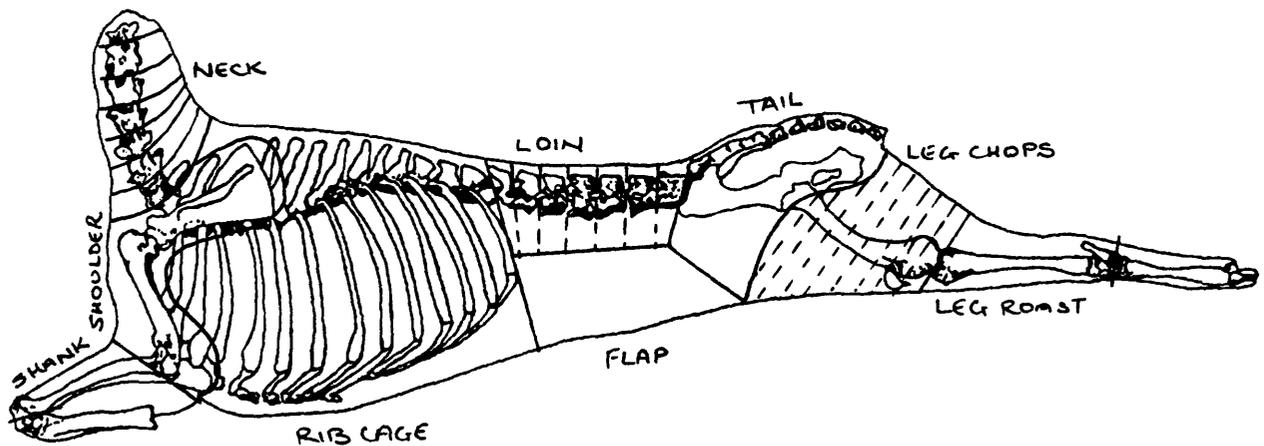
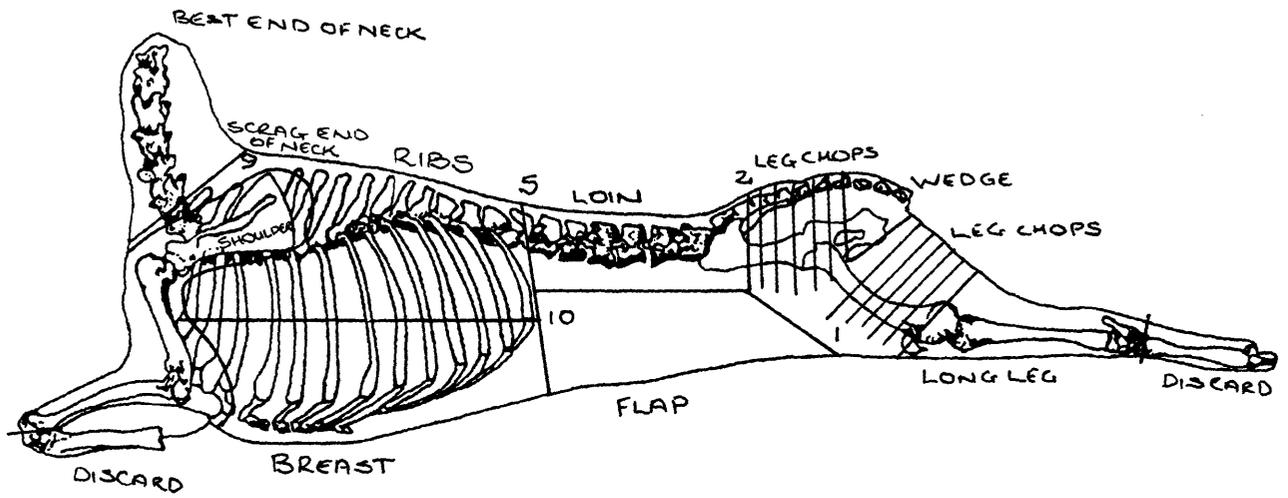


Figure A1.16: Sheep butchery pattern Interview 16



A1.2 Cattle

Interview 1 (Fig. A1.17)
Name: Bruce Smith
Occupation: Retired butcher
Location: Cromwell, New Zealand.
Interview Date: 12.5.86

Notes from Interview

- After the beast is skinned and gutted it is divided into two sides by sawing the carcass longitudinally in half down the mid-line.
- Each side is then sawn into a forequarter, mid-section and hindquarter.
- The forequarter is produced by sawing the vertebral column transversely in half at the interface of the 10th and 11th thoracic vertebrae.
- The hindquarter is removed from the mid-section by cutting through the pelvic/sacral interface with a knife.
- The shoulders are cut off using a knife.
- The scapulae are cut off the shoulders using a knife. These are then boned out to give blade steak. This blade steak can be cut up in different ways to produce bolar steak, trout of bolar steak or cross-cut blade steak.
- The scapulae are then sawn up for soup bones.
- The meat on the clod, fore and hind shins is boned off. The fatty portion of the meat is used to make sausage meat while the leaner meat is minced. In winter the meat on the shins is left on the bone and sold as shin beef or as shin-on-bone for stews.
- The humerus is sawn up for soup bones.
- The meat on the neck is boned off to give chuck or stewing steak.
- The cervical vertebrae make good soup bones.
- The brisket is sawn transversely off the dorsal ribs. The rib cartilage and sternum are boned out. The meat is then taken off the ventral ribs from the dorsal end. This meat is used as sausage meat.
- The meat on the rib roast is boned off, rolled, and used as a roasting unit.
- Scotch fillet is taken from the medial surface of those thoracic vertebrae in the rib roast section. The scotch fillet is also known as the club steak or cube roll.
- The meat from the ventral half of the mid-section is boned off the few posterior ventral ribs which make up this sub-section, and is used for sausage meat.
- The sirloin or porterhouse steak is boned off the lateral side of the sirloin section, while the fillet is boned off the medial side. An alternative is to transversely saw the thoracic and lumbar vertebrae which make up this section in order to produce T-bone steaks.
- The patella is cut out of the hindquarter. Each of the hindquarters are divided into two sub-sections by sawing through the acetabulum. These sub-sections are then boned out. The anterior sub-sections produce rump, while the posterior sub-sections produce from their lateral sides thick flank and topside and from their medial sides they produce silverside.
- Veal is butchered the same way but it is not a popular meat.

Interview 2 (Fig. A1.18)
Name: Blake Whitehead
Occupation: Storekeeper
Location: Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- The beast is killed by shooting it in the field.
- Only the pieces of meat wanted are taken and only the areas where these occur are skinned.
- The implements used to butcher the animal are axes, knives and chain saws.
- The animal is divided into a shoulder, forequarter and hindquarter in the field. These units are taken back home to be boned out in order to give roasts, steaks and meat for corning.
- The hindquarter is taken off with an axe.
- The lumbar region can be turned into T-bone steaks.
- The neck is usually discarded in the field but can be used to make brawn.
- The shoulder is boned out, rolled and then corned.
- The flap is left in the field.
- The hind leg is used to make brawn or potted meats.
- Fifty-five years ago butchers went out from Tibooburra to a property where they would purchase a beast. These animals cost around nine pounds. The animal would be slaughtered on the farm, bled, gutted and then sawn into quarters before being taken back to Tibooburra on the back of a cart. The meat would be sold from the butcher's shop. The meat would be sold either as steaks or as corned rolls. The meat could also be purchased as whole legs or quarters. If meat was purchased this later way then it would be cooked immediately. A lot of meat was discarded.
- Mince was regarded as 'muck'.

- Today beasts are butchered in the field with a chain saw, axe and knife. A lot of meat is left in the field for carnivores to consume. Only the best portions that one wants are taken. A lot of meat may be cut for dog food.
- Nowadays meat is packaged for the freezer. In the past the meat would have been salted in order to store it. Some people still salt their beef in order to preserve it.
- In an abattoirs the butcher turns waste meat such as the flap into sausages but on the station waste such as the flap are left on the land. Landowners take only the steak cuts and roast cuts.
- Before World War II there was no refrigeration in Tibooburra.
- Beasts are killed far less regularly than before because of the fact that today meat can be stored in a freezer.
- Mechanical meat saws were introduced to Tibooburra with refrigerators and freezers after World War II.
- Mechanical meat saws allow cuts to be made that were not done in the past such as those cuts producing T-bone steaks.
- Beef was primarily salted until recently.
- The tripe is not saved.
- In his youth, hand saws were used to split the vertebral column longitudinally in half and cleavers were used for all other bones. Nowadays these tools have been replaced by chain saws and tomahawks respectively.

Interview 3

Name: Dave Falkner
Occupation: Ranger, Sturt National Park
Location: Mount Wood station, Sturt National Park, near Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- Only takes the best cuts from a kill.
- Steak is eaten for nearly ever meal (that is three times a day). Sometimes a roast may be eaten.

Interview 4 (Fig. A1·19)
Name: Frank Nichols
Occupation: Station Owner
Location: Pindera Downs
Interview Date: 5.11.86

Notes from Interview

- The animal is slaughtered in the paddock.
- The animal is skinned and then gutted in the field.
- The vertebral column is sawn longitudinally with a chain saw to produce two halves.
- Using a knife and a chain saw each of the two sides is cut to produce four portions. The shoulder is cut off to produce one portion. The forequarter is taken off at the interface between the 9th and 10th thoracic vertebrae. The mid-portion is removed between the lumbar/sacral interface. This leaves a hindquarter. The exact number of portions made really depends on how many people are present to lift the portions onto a vehicle.
- The head, metapodials and phalanges are left in the field at the kill site.
- The tongue is taken by cutting around the buccal lingual surface of the mandibles in order to sever the muscular connections that hold it in place.
- The portions cut in the field are taken home and hung for at least a day before being boned out.
- An attempt is made to waste as little meat as possible.
- The shoulder is sliced transversely with a mechanical meat saw in order to produce 'Canadian steaks'. Prior to mechanical meat saws all meat was boned out in the field.
- The front leg is boned out to give two or three steaks worth of meat which are used in stews.
- Under-cut steak is taken off with a knife from the medial surface of the thoracic and lumbar (most from the lumbar) vertebrae.
- The meat on the anterior thoracic vertebrae and anterior dorsal ribs of the forequarter is boned off. This meat is rolled and roasted.
- The meat on the ventral ribs is boned off. This meat tends to be 'grissly' and is used in stews.
- The ribs are sawn transversely into lengths suitable for barbequing.
- The meat on the neck is boned off and is either turned into mince or else cut into pieces for stewing.
- The loin portion of the mid-section is these days sawn transversely using a mechanical meat saw in order to produce T-bone steaks.
- The flap is very fatty and is fed to the station dogs.
- The leg is boned out to give rump steak, silverside and round. The round is corned.
- The meat on the leg of a young beast is boned out and used for steak meat.
- The meat on the tibia is boned off and turned into either mince or else cut into pieces for stews.

Interview 5 (Fig. A1:20)
Name: Barney Davis
Occupation: Publican, Family Hotel
Location: Tibooburra, New South Wales
Interview Date: 6.11.86

Notes from Interview

- The beast to be slaughtered must be in good condition and is selected in the paddock. The beast selected is preferably not one you own.
- The beast is killed by being shot in the corn (head).
- The jugular is then cut and the animal bled well.
- The beast is then skinned and gutted.
- A knife is used throughout the butchering of a beast.
- The meat is boned off the carcass using a knife leaving the bone as waste in the field. The carcass can be hung (more of a propping up of the carcass than a proper hanging) by putting green saplings in either side of the rib cage.
- The shoulder is cut off first.
- The shoulder is boned out. The meat that comes off the scapulae is called blade. It is either roasted whole or else cut into steaks. Likewise the meat which is boned off the humeri and radii/ulnae is also either roasted whole or cut into steaks.
- If the meat is to be taken home and transport is available then the humeri and radii/ulnae are taken, to be sawn up randomly for use as soup bones. If meat is being taken back to a camp then the bones are not taken.
- The brisket is taken off using a knife to cut through the cartilaginous ribs. These cartilaginous ribs are taken from the kill site. The brisket is grilled.
- The meat under the scapulae and running along the thoracic vertebrae is called the chuck. This meat is taken off the bone and is usually roasted but it can be cut into steaks.
- The ribs are broken backwards off the vertebral column. They are then sawn, cleaved, or chopped (using a tomahawk) into smaller sections, usually three transverse sections each side. These are usually grilled.
- The meat on the lumbar vertebrae is boned off. The meat on the lateral sides of the lumbar vertebrae is used as roast beef, while that on the medial side is used as steak and is known as under-cut steak.
- An alternative to boning out the lumbar vertebrae is to leave the bone in and saw these vertebrae transversely to give T-bone steaks.
- The skirt also goes by the names of belly meat or flap.
- Rump is cut off the pelvis and is cut into steaks.
- Top side of buttock is cut off the femora and is cut into steaks.
- The knuckle or round is also taken off the femora. It is cut into steaks, or salted to produce salt meat. This salting practice was much more common in the past.
- The back joint is boned out to give meat that can be used for roasting or for steak meat. Like the fore limb bones the tibia and tarsals may be used as soup bones depending on the situation. This back joint can also be corned after boning out.
- The meat on the neck is boned off and can be used for mince or else it can be corned.

Interview 6
Name: Stuart Thompsom
Occupation: Stationowner's son, helps run station.
Location: Mt. Stuart Station, near Tibooburra, New South Wales
Interview Date: 7.11.86

Notes from Interview

- Meat is boned off a carcass.
- People in the Tibooburra area only take the cuts of meat that they want from a beast. The bones and the rest of the meat are left in the field.

Interview 7 (Fig. A1:21)
Name: Dan Smith
Occupation: Station hand
Location: Mt. Stuart Station, near Tibooburra, New South Wales
Interview Date: 7.11.86

Notes from Interview

- The beast is first skinned.
- The shoulders are cut off using a knife.
- Blade meat is boned off the scapulae. This meat is good for most uses, such as roasting, frying, mincing and barning (corned), but it makes especially good steak.
- The humeri can be sawn up for soup bones. If there is sufficient meat left adhering to them after boning out then they may be used in stews.
- The meat adhering to the radii/ulnae has too much gristle and sinews for it to be used.

- The neck is taken off between the 5th and the 6th cervical vertebrae. The meat on the neck is boned out but is not good eating. It is used in stews, rissoles and in curries.
- The chuck is also known as scotch fillet.
- The sirlion is cut off the bone using a knife. It is used as a roasting joint.
- The dorsal ribs or spare ribs as they are also known and the thoracic vertebrae can be used for barbequing. If the thoracic vertebrae are going to be used then the spinous processes are chopped off with an axe and it is these which are barbequed. If this is what one is planning to do then more than the usual amount of meat is deliberately left on the bone when defleshing.
- The brisket is boned off the ventral ribs with a knife in three sections known as the first cut, second cut and last cut of the brisket. This meat makes good corned beef. It is taken off in three sections because it is easier to handle and each piece will fit into a pot. The cartilaginous ribs are boned out using a knife.
- The meat on the posterior ventral ribs is taken off the bone and with the flank is corned.
- The loin can be boned out using a knife to give fillet steak and under cut steak, or else it can be sawn transversely into T-bone steaks.
- The rump is taken off the pelvis using a knife.
- The silverside is taken off the femur using a knife and is cut into four sections for ease in handling.
- The knuckle bone meat or top side is cut off the bone using a knife. It is used for steak meat, mincing or corning.
- The meat on the back leg can be used in stews after deboning or else it is fed to the station dogs.
- The scapulae, pelvis, femora and tibiae can be sawn up for soup bones or else they are fed to the station dogs.
- The coccygeal vertebrae are used in soups.
- The tongue is taken by running a knife around the buccal lingual surface of the mandible. The tongue is corned.
- The brains are taken for consumption using a sharp axe to take the top of the cranial vault off posterior to the eyes or posterior to the horns.
- The kidneys and sweetbreads (adrenal glands) are taken for consumption.
- Nearly all meat is cut off the bone. The bones not required are fed to the station dogs.
- Since the introduction of refrigeration there has been less standardisation in cuts.

Interview 8 (Fig. A1-22)
Name: Bill Cox
Occupation: Retired Station Owner
Location: Augathella, Queensland
Interview Date: 3.7.87

Notes from Interview

- In the past only took the best cuts.
- The beast is killed at night.
- The animal is skinned. The metapodials and phalanges are left on the hide.
- The animal is gutted.
- The kidneys, liver, heart, tongue, brains and fillet are taken the night of the kill.
- The tongue is removed using a knife by cutting around the buccal lingual surface of the mandibles, severing the attaching muscular connections of the tongue.
- The brains are removed by two oblique axe blows, one behind each eye followed by the lifting of the cranial vault.
- The vertebral column is sawn (either using a hand saw or a chain saw) longitudinally in half to produce two sides.
- Each side is hung over night by its Achilles tendon.
- The next morning each side is cut into three portions using either a hand saw or a meat cleaver. The forequarter is separated from the mid-section at the interface between the 12th and 13th thoracic vertebrae. The mid-section is separated from the hindquarter at the lumbar/sacral interface. These portions are much easier to handle than whole or halved sides.
- Meat is boned off the three portions using a knife. A knife is also used to sever all articulations which may require separating.
- The shoulder is cut off the forequarter.
- The scapulae are removed from the shoulder and defleshed. The deboned meat is known as blade and is used as steak.
- The humeri are separated from the radii/ulnae. The meat on the humeri is boned off and is used in stews.
- The meat on the fore shank is boned off and turned into mince.
- The meat on the neck is boned off and used as stewing meat or else it is turned into mince.
- The meat on the thoracic vertebrae and dorsal ribs is cut off in strips. These strips are rolled and are cooked by roasting.
- The meat on the ventral ribs or brisket meat is boned off in strips as for the dorsal ribs. These strips are rolled and cooked by roasting. Some of the ventral ribs may be kept in portions two ribs wide, especially the flat wide mid ribs. These are called spare ribs and are cooked on the barbeque.
- The loin section is sawn transversely using a mechanical meat saw in order to produce T-bone steaks.
- The hindquarter is completely boned out.
- The meat on the hind shank is treated the same as for the fore shank.
- The animal is always older than eighteen months of age when slaughtered.

- Bones are fed to his dogs, which are a bull terrier and a blue healer-kelpie-cross cattle dog. These dogs leave no remains even from large long bones which they are fed.

Interview 9 (Fig. A1·23)
Name: Gordon Davidson
Occupation: Station Owner
Location: Cheshire Station, near Tambo, Queensland
Interview Date: 4.7.87

Notes from Interview

- The beast is slaughtered in the evening.
- The metapodials, phalanges and skull are left on the hide.
- The brains and tongue are sometimes taken for consumption.
- The tongue is removed from the ventral surface of the mandibles by cutting through its muscular attachments.
- The brains are removed by splitting with an axe the dorsal surface of the cranium longitudinally along the sagittal suture from the horns to the nuchal crest.
- The vertebral column is split longitudinally in half with an axe in order to produce two sides. Some people use a chain saw.
- Each side is split in half either on the ground or in a set a gallows with a transverse axe blow between the 12th and 13th thoracic vertebrae in order to produce fourquarters.
- The quarters are hung over night and the meat boned off the next morning.
- The carcass is boned out with virtually all the bones going to the station dogs.
- The neck has the meat boned off.
- The scapulae are left in with the meat and are sawn with a mechanical meat saw into Y-bone steaks.
- The lumbar vertebrae are sawn with a mechanical meat saw into T-bone steaks.
- If one is slaughtering a beast alone in the field, then the meat is cut off the carcass in lumps with no bones being cut. This is quite a popular method as these days many people do not know their cuts well.
- In pre-mechanical meat saw days the brisket was taken off with an axe or a cleaver and dry salted. The bones could be left in or boned out.
- These days very little dry salting, corning, or use of brine in a cold room.

Interview 10 (Fig. A1·24)
Name: Jacko Sims
Occupation: Station Owner
Location: Clyde Park Station, near Hughendon, Queensland
Interview Date: 12.7.87

Notes from Interview

- The carcass is cut up on the ground.
- The hide is skinned off one side first and this side is defleshed. The carcass is then rolled over and the skinning and defleshing process repeated on this side.
- Only a knife is used.
- The tongue is removed by cutting along the buccal lingual surface of the mandibles.
- The brains are removed by using an axe to remove the cranial vault.
- The meat on the neck is boned off and is used in stews.
- The shoulder is completely boned out.
- The flap is cut off and rolled for roasting with the boned out shoulder meat inside it, so that there is 'good' meat in the roll.
- The meat cut off the posterior ventral ribs is treated the same way as that meat boned off the shoulder.
- The meat boned off the rest of the rib cage is rolled for roasts. It is sometimes salted.
- The brisket is dry salted. This is still done by many in the bush.
- Some people in the bush still dry salt nearly all the meat cuts from a beast after boning them out, especially the silverside cut. Mr Sims, however, finds salted silverside too dry.
- Meat not salted is cut into meal size chunks and frozen. However, if one does not have a freezer then the meat must be salted.
- Ribs are often snapped off the boned out carcass to be cooked on the barbeque.
- The lumbar vertebrae are not cut into T-bone steaks. The meat is boned off and like the shoulder meat is rolled in with the flap.
- The tail with the coccygeal vertebrae still in is used to make ox tail soup.
- Mr Sims does not kill his young beasts (vealers) for meat because the animals are too small. This is not a question of taste but one of practicalities.

Interview 11 (Fig. A1.25)
Name: Tony Sladden
Occupation: 2nd year Apprentice Butcher
Location: Hughendon, Queensland
Interview Date: 13.7.87

Notes from Interview

- The vertebral column is sawn longitudinally in half using a hand saw in order to produce two sides.
- Each side is halved using a power saw via a transverse cut through the interface of the 12th and 13th thoracic vertebrae in order to produce two forequarters and two hindquarters.
- The carcass is deboned using a knife.
- The brisket, chuck and fillet are sawn off the carcass using a mechanical meat saw before the defleshing process takes place. These cuts are subsequently boned out.

Interview 12
Name: Bruce Butler
Occupation: Aboriginal Ranger, National Parks and Wildlife Service
Location: Cairns, Queensland
Interview Date: 20.7.87

Notes from Interview

- The beast is skinned on one side and the flesh is boned off using a knife. The carcass is then turned over and the process is repeated on the other side. This takes place at the kill site.
- The deboned meat is taken home in the back of a leaf covered 4-wheel drive vehicle.

Interview 13
Name: Percy Trezise
Occupation: Author, Station Owner
Location: Cairns, Queensland
Interview Date: 20.7.87

Notes from Interview

- Never kill one of your own beasts. Always kill a stray. Aboriginal stockman cut the brand off a kill straight away and stick it up the rectum.
- Skinning of the carcass begins with a longitudinal cut along the top of the spinous processes of the vertebral column.
- Most meat is boned off the carcass, especially the meat on the hind leg around the femur and pelvis.
- Often spare ribs (mid to ventral section of mid ribs) chopped off the carcass with an axe are saved to be cooked on the barbeque. This is especially the case in cattle camps.
- There are two types of butchering. One is practiced in stock and mustering camps and the other is practiced at a homestead kill.
- At the stock camp one has restricted transportation and storage problems. Therefore, only that which is immediately needed is taken from the carcass, though some extra may be taken to be salted. The carcass is deboned at the kill site.
- With a homestead kill the carcass may be hung after skinning has taken place and one will take as much meat as possible, but again the carcass is deboned.

Interview 14 (Fig. A1.26)
Name: Tommy George
Occupation: Retired Stockman
Location: Laura, Queensland
Interview Date: 22.7.87

Notes from Interview

- Description of a station slaughter and butchery of a bullock.
- The beast is shot in the head.
- The beast is then bled.
- The beast is laid on its back.
- The beast is then skinned, starting from the breast and then working down both sides and ending with the legs being skinned.
- The hide is saved to be processed into leather so one is careful about not putting any holes in it during skinning.
- A hole is made between the Achilles tendons and the tibiae.
- The beast is hung on a gallows by hooks which pass through the holes made above.
- The vertebral column is split longitudinally in half using an axe to produce two sides.
- Each side is split in half to give two forequarters and two hindquarters. This is achieved using an axe to cut through the interface between the 12th and 13th thoracic vertebrae.

- The hindquarters are boned out to give two major cuts of meat: rump and rump on side. This meat is stored in a refrigerator.
- The shoulder is cut off.
- The scapulae are boned out and the resultant meat used as blade steak.
- The meat associated with the humeri (bolar bones) and radii/ulnae is cut off these bones using a knife. This meat is salted.
- The bolar (humerus) bones, femora and tibiae are cleaved transversely at their mid points with an axe and are then used as soup bones or else fed to pigs.
- The meat adhering to the dorsal ribs and thoracic vertebrae is boned off in strips two to three ribs wide. This meat is rolled and then salted or corned.
- The meat associated with the neck is boned off with a knife and is either salted or corned.
- The brain and the tongue are taken for consumption.
- The tongue is removed using a knife by running it around the buccal lingual surface of the mandibles.
- The brains are removed by hitting each side of the dorsal surface of the skull from the mid point of the eyes back to the ears with an axe and then lifting the cranial vault off.
- Calves are not killed for butchering.
- A yearling would be butchered in the same manner described here.
- The bones can be used for soups or else fed to dogs.
- The ribs can be chopped up with an axe and grilled.

Interview 15 (Fig. A1·27)
Name: Steve Trezise
Occupation: Tourist operator and station manager
Location: Jowalbinna Station, near Laura, Queensland
Interview Date: 22.7.87

Notes from Interview

- The animal is killed in the bush by shooting it, preferably in the head.
- The animal is then placed on a slope so that the blood will drain away when the throat is cut.
- The head is removed using an axe.
- The animal is then skinned, starting from the mid-line of the belly and working upwards and the downwards.
- The metapodials and phalanges are removed from the carcass using an axe.
- The carcass is then gutted.
- The vertebral column is split longitudinally in half using an axe in order to produce two sides.
- The sides are then split transversely in half using an axe at the thoracic/lumbar interface in order to produce two forequarters and two hindquarters.
- These quarters are then taken to a butcher to be further cut up as Mr Trezise does not know enough about how to butcher a carcass.
- The meat that comes back from the butcher is mainly salted.

Interview 16 (Figs A1·28 and A1·29)
Name: Mike Bedillet
Occupation: Station Owner
Location: Louisiana Station, near Cooktown, Queensland
Interview Date: 24.7.87

Notes from Interview

- This is a description of a station bush kill.
- It is not easy to kill a beast.
- In order to kill the beast it must be shot in the head or in the loin. Shooting it in the loin is not a good way.
- The best way to kill a beast is to climb a tree with a rifle and have someone else drive the beast under the tree. This way you get a very good angle on the head with which to shoot the beast.
- Once the beast has been killed you must bleed it by severing its jugular (see Fig. A1·28). It is important to bleed the carcass or else the meat will rot.
- The beast is then skinned as in Fig. A1·28. The numbers on Fig. A1·28 refer to the order in which the cuts are made to the hide in the skinning process.
- The hide is laid out as in Fig. A1·28.
- At this stage one takes ones boots off because they are 'filled with blood, mud and shit'. When butchering the carcass one walks on the hide in bare feet to keep it clean.
- The carcass is boned from one side first.
- The shoulder is taken off using a knife and boned out. You must be careful when removing the shoulder so as not to damage the the roast cuts under it.
- A longitudinal cut is made along the mid-line of the side one is working on (see Fig. A1·29).
- The meat is boned of in strips as indicated in Fig. A1·29.
- The dorsal roast cuts are taken first. These are hung and cooked within a couple of days. There being no refrigeration the other cuts are salted.

- The fillet, skirt, the meat on the medial side of the vertebrae and ribs are cooked on the night of the kill.
- The beast is turned over onto its other side. Twigs are put down to give a clean working surface (see Fig.A1.28). The same process that was carried out on the first side to be butchered is carried out on this side.
- The carcass is now gutted.
- The sterum is split longitudinally in order to take the heart and lungs out of the plueral cavity.
- The tongue, cheek and heart are all salted.
- The brains are not usually taken. Sometimes they are eaten while still fresh.
- The heart is very 'rich'. One can go a long way with a heart and a bag of potatoes at droving time. You can last three to four days on a heart and a bag of potatoes. You do not eat the fat on the heart as it is very dry and sticks to your teeth.
- The bones are left in the bush.
- The cuts that have been taken from the carcass are salted (sometimes even the roast cuts). This salting process begins before the meat cools.
- If there are blow flies about then a smokey fire is made to keep them away.
- When you are in the bush with a pack horse and you are carrying pack meat which you are salting then you must check it daily. Any rotten meat must be thrown away. Any meat that blow flies go to is likely to rot the next day so it must be cook straight away.
- In order to salt beef it is first cut into blocks a little larger than an A4 page. It is then scored longitudinally at about 5 centimetre intervals. Coarse salt is then rubbed into the meat, especially into the scoring. It is important not to use sea salt, as its manganese content will turn the meat black. The meat is piled on top of one another. The next day the meat has to be re-salted, turned and drained.
- The meat must be turned and drained daily.
- Little by little the meat dries to give dry beef.
- The meat which is salted must be completely without bone as it is risky to leave any bone in with the meat when salting. This is because bone tends to cause the meat to rot.
- The bones associated with the carcass are not used at all, they are left at the kill site.
- With a homestead kill you have more time and different facilities, and therefore there are different strategies. The carcass can be hung from a gallows when butchering. The hide can be saved. The carcass can be divided into quarters and a 'better' butchering job can be done. Also, nowadays there is refrigeration so you do not have to salt all the meat. Some of the meat can be stored fresh in a freezer.
- Nowadays not many people salt beef except for when they go into the bush.
- Dry salted beef lasts almost indefinitely.
- Dry beef is cooked by boiling it. As soon as it starts to boil it must be taken off the fire and drained and then cold water must be added to the pot and it is then allowed to boil again. If the dry beef is allowed to boil in the first water then the salt which has come out of the dry beef will go back into the meat.
- If meat is required for a big camp it may be smoked in order to preserve it. This can be done over a fire place or in a smoke house. One way to make a smoke house is to use a water tank with a tarp over the top of it. A hole is made in the base of the water tank and beneath this a hole is dug. A fire is built in the hole under the base of the water tank but as far from the base of the tank as possible. This is because you want to use cool smoke. Hot smoke makes the meat go rotten. Mango or tea tree (meliluka) wood is used for smoking.

Interview 17

Name: Bob Clayton
Occupation: Postgraduate botony student
Location: Annalee Station, Black Mountain, near Armidale New South Wales
Interview Date: 14.11.87

Notes from Interview

- When butchering a beast, the vertebral column is sawn longitudinally in half using a chain saw.

Figure A1.17: Cattle butchery pattern Interview 1

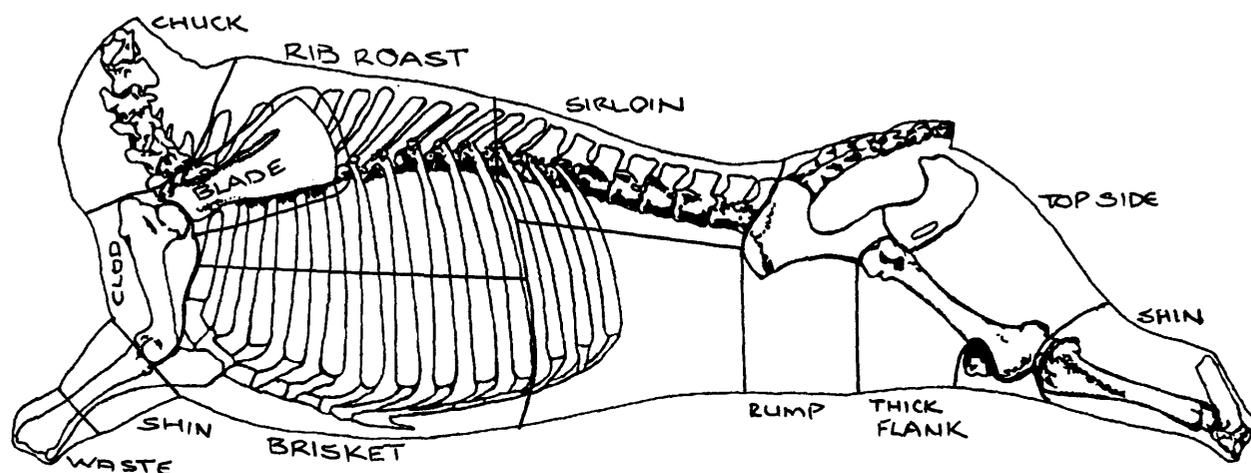


Figure A1.18: Cattle butchery pattern Interview 2

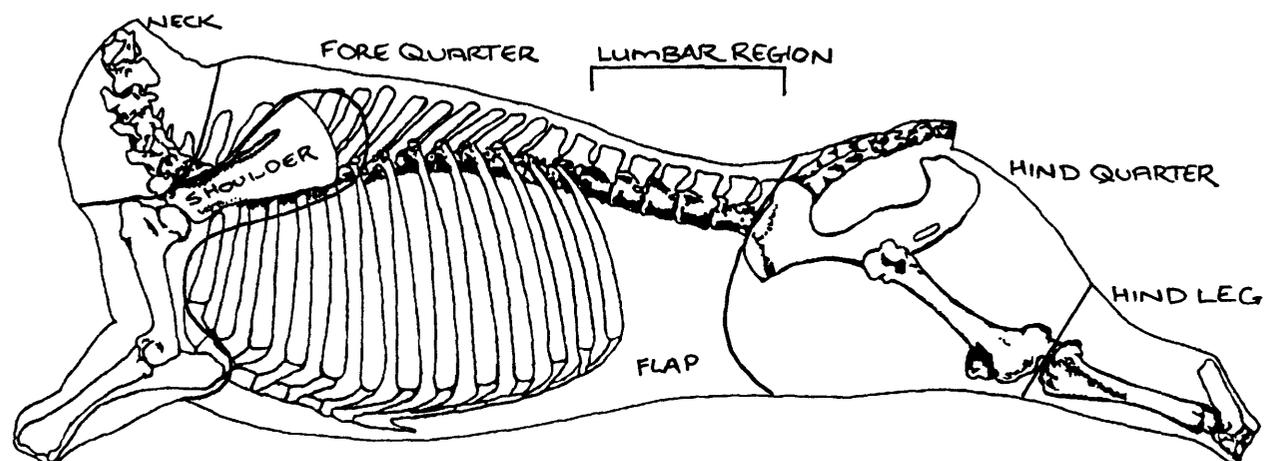


Figure A1.19: Cattle butchery pattern Interview 4

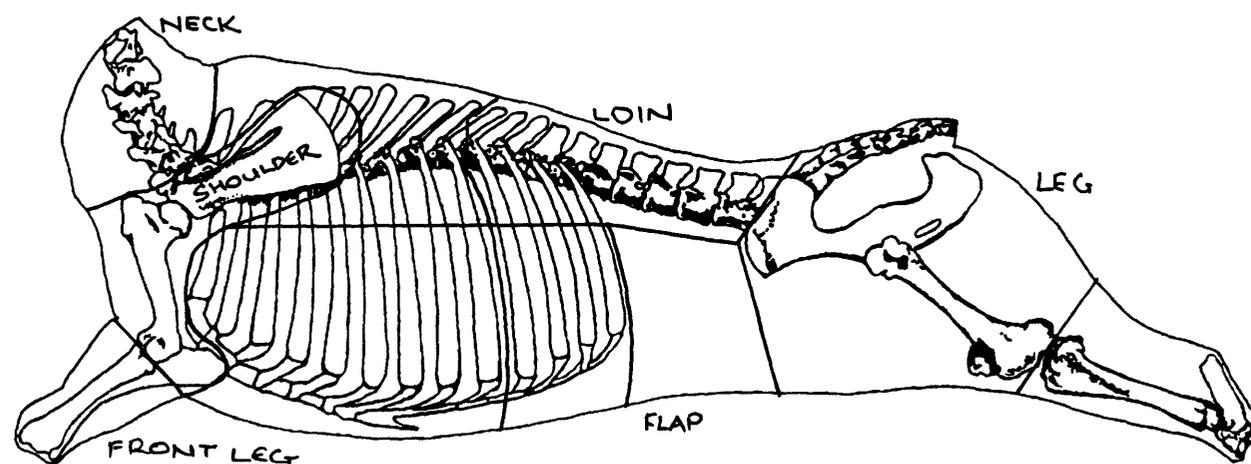


Figure A1.20: Cattle butchery pattern Interview 5

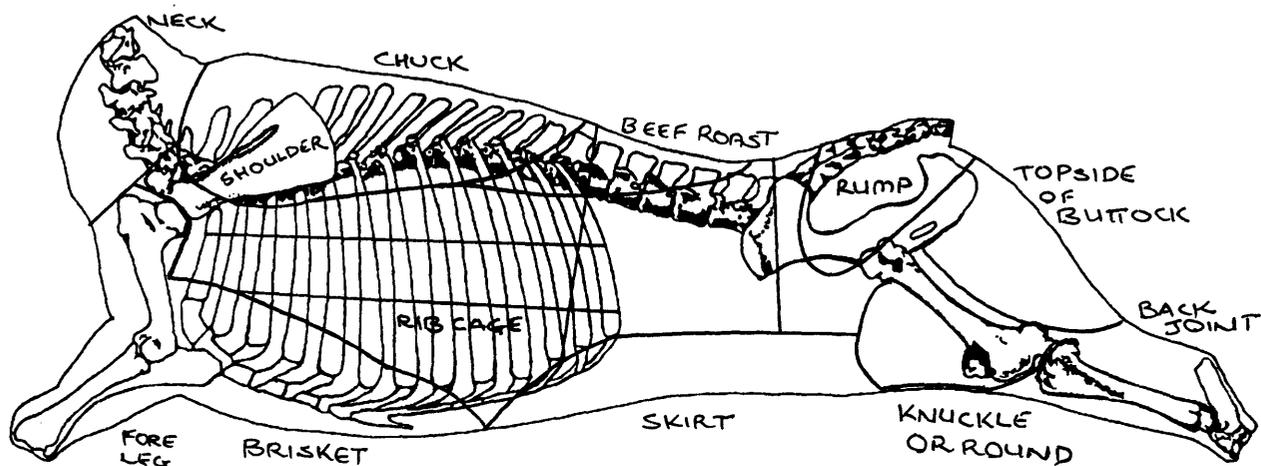


Figure A1.21: Cattle butchery pattern Interview 7

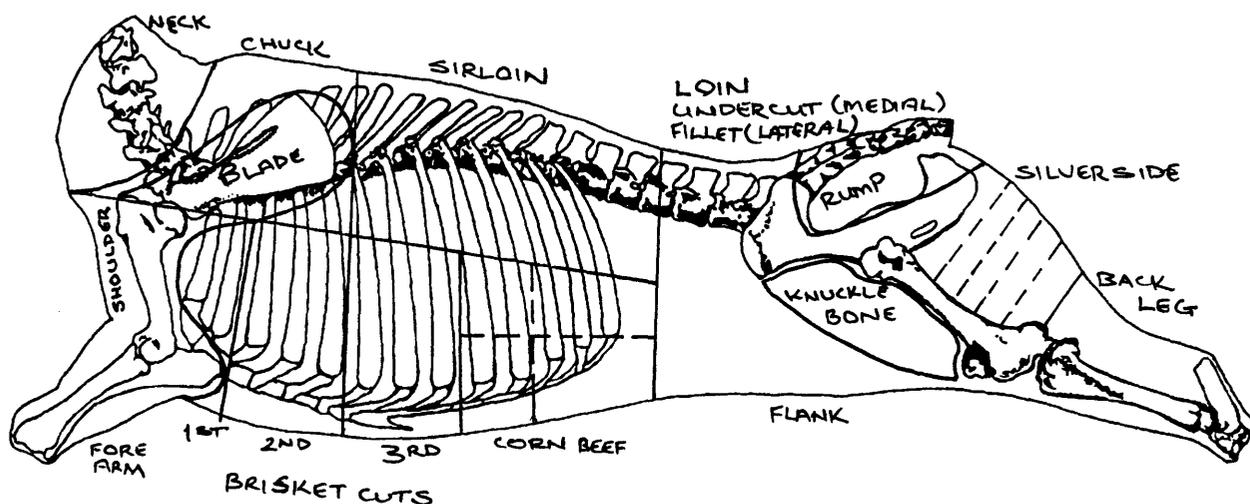


Figure A1.22: Cattle butchery pattern Interview 8

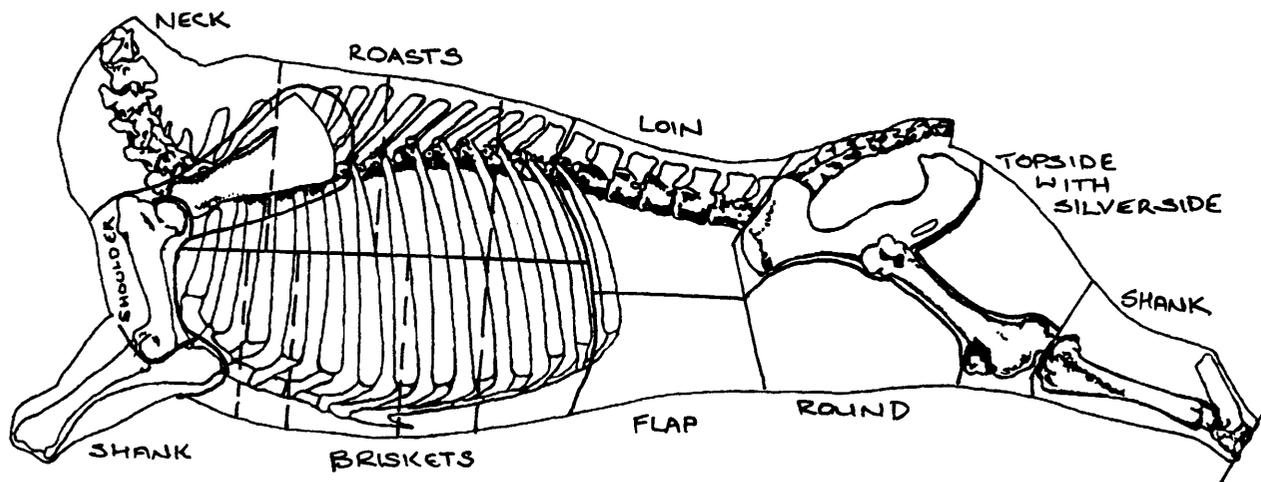


Figure A1.23: Cattle butchery pattern Interview 9

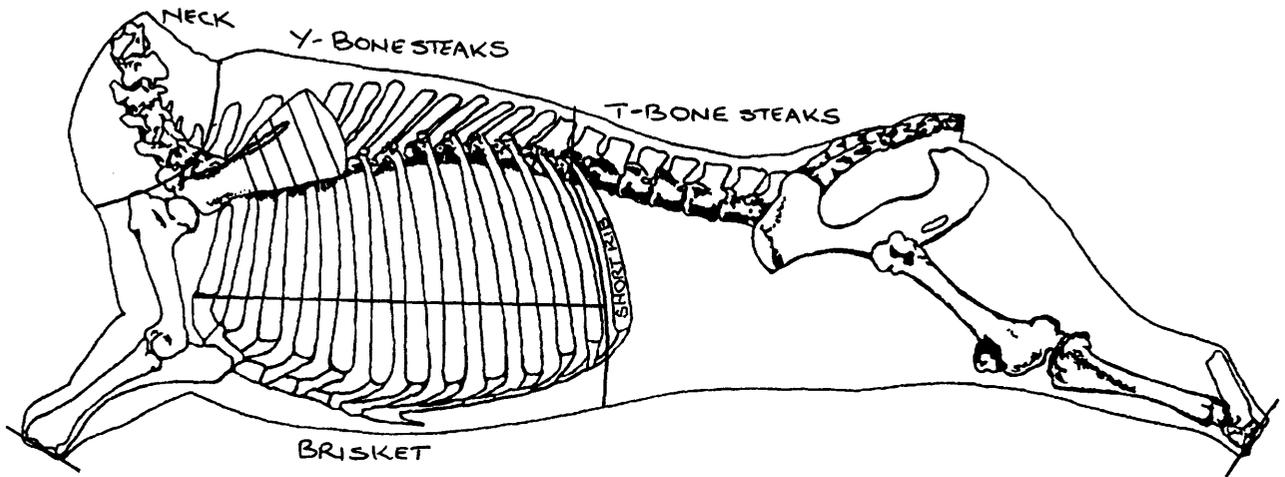


Figure A1.24: Cattle butchery pattern Interview 10

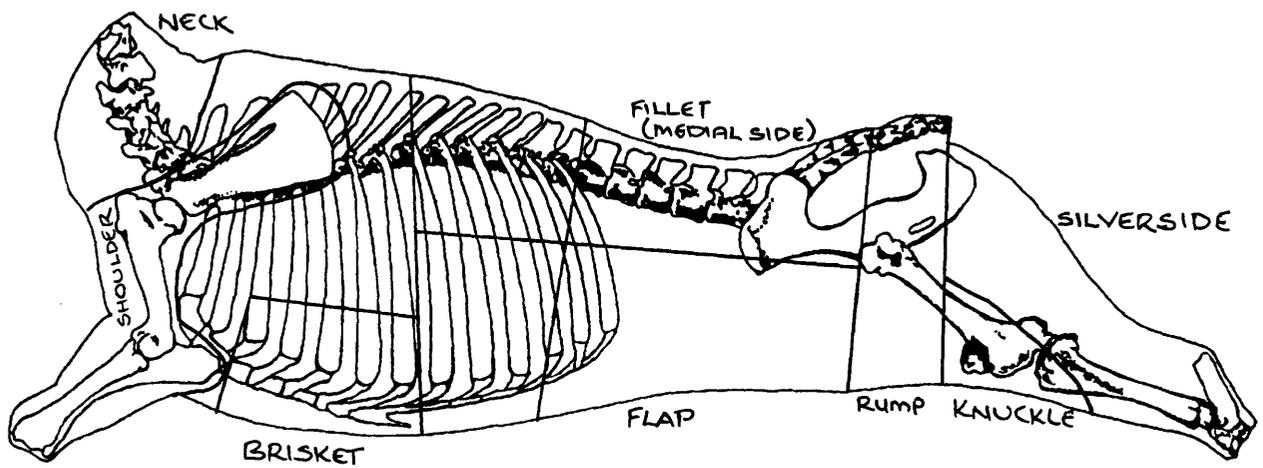


Figure A1.25: Cattle butchery pattern Interview 11

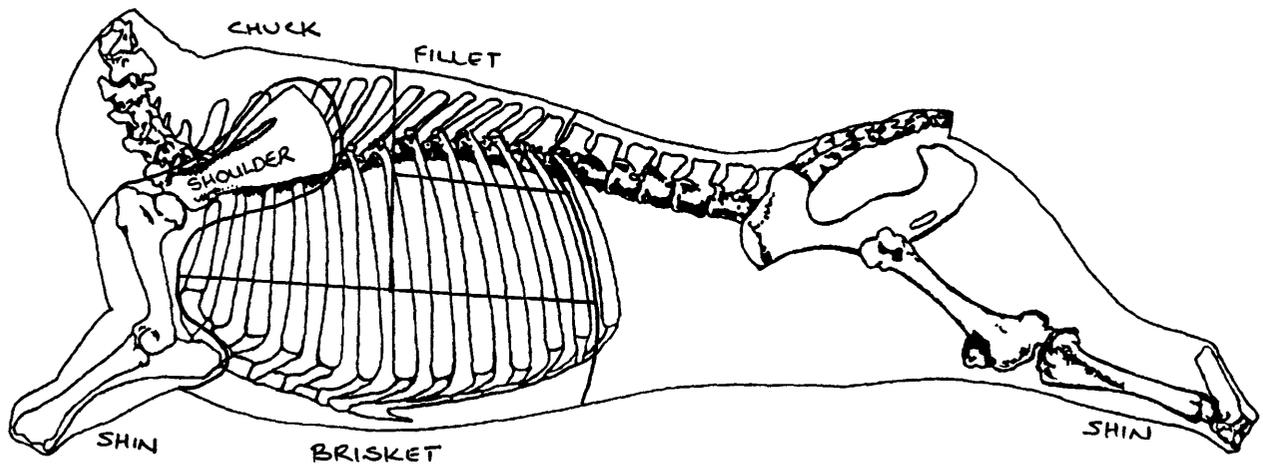


Figure A1.26: Cattle butchery pattern Interview 14

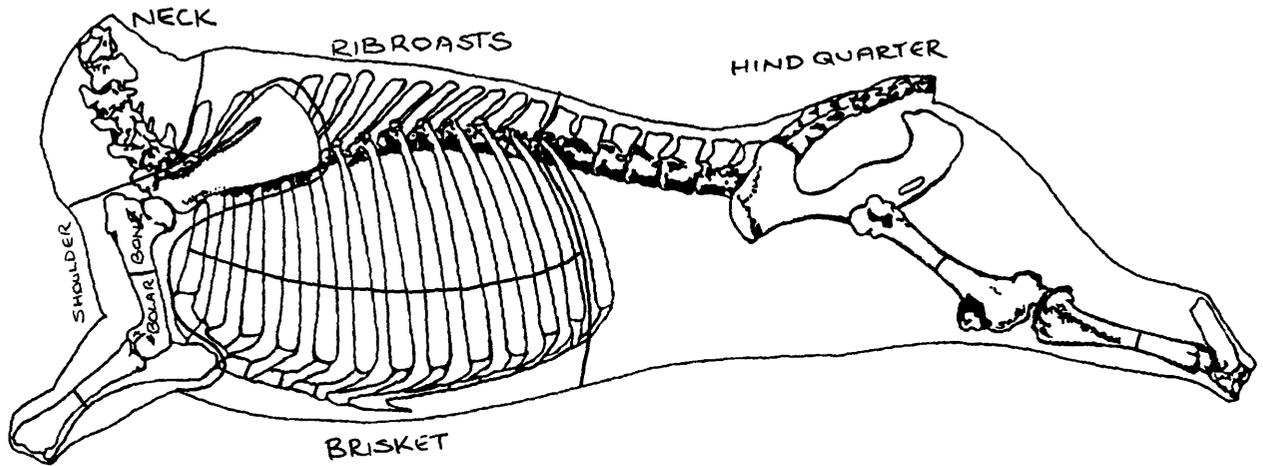


Figure A1.27: Cattle butchery pattern Interview 15

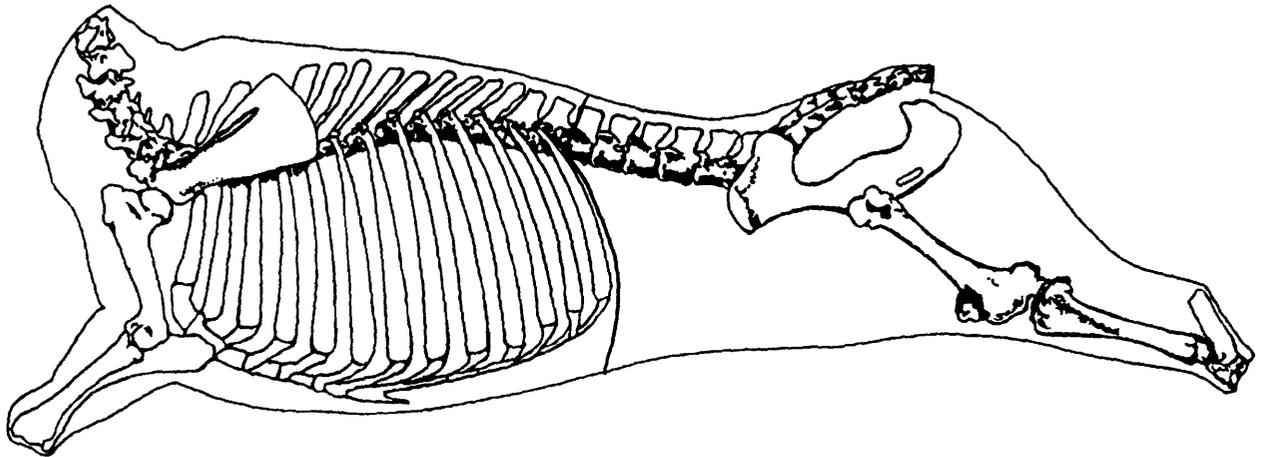


Figure A1.28: Cattle butchery pattern Interview 16

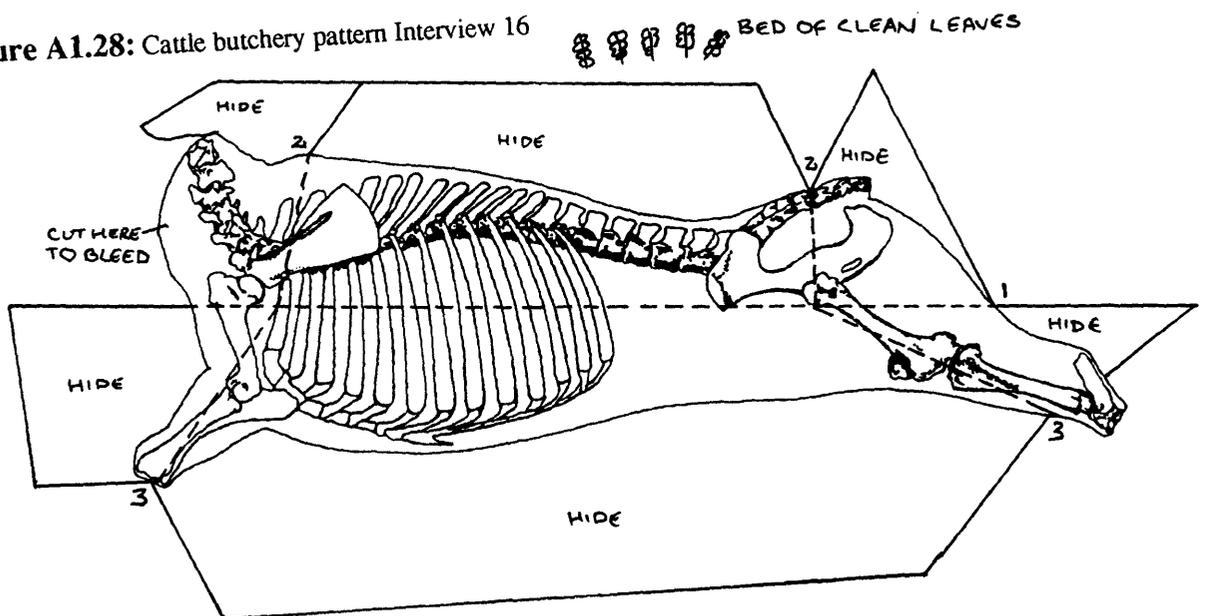
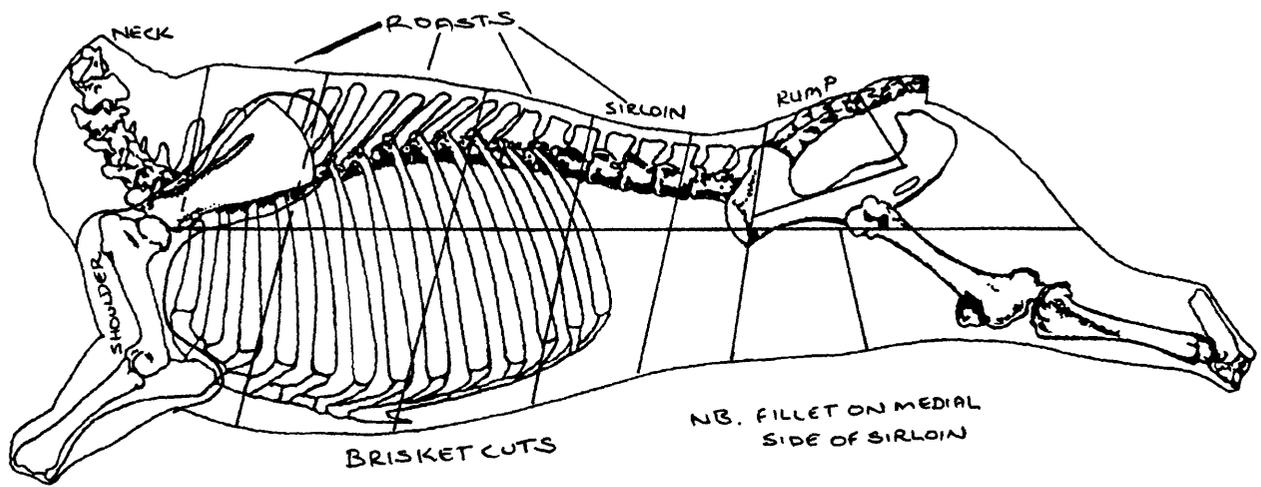


Figure A1.29: Cattle butchery pattern Interview 16



A1.3 Pig

Interview 1 (see Fig. A1.30)
Name: Bruce Smith
Occupation: Retired Butcher
Location: Cromwell, New Zealand
Interview Date: 12.5.86

Notes from Interview

- There are three ways to butcher a pig depending on what you are going to use the meat for. These are:
 1. Ham
 - The carcass is completely boned out if it is going to be used to make ham.
 2. Fresh Pork (Fig. A1.30)
 - The shoulder or forequarter with the distal humerus/proximal radius/ulna sawn transversely in order to give an attached fore shank in a roasting unit. This large roasting unit can also be deboned, seasoned, rolled and then roasted.
 - The rib loin and the mid loin are sawn transversely using a mechanical meat saw in order to produce pork rib loin chops and pork loin chops.
 - The pork flap or belly pork is usually boned out. If this unit is to be used to make pork fingers, then the bones are left in. The pork fingers being produced by either longitudinal sawing or transverse sawing of this unit.
 - The leg of pork is a roasting unit.
 3. Bacon
 - The only bones removed when making bacon are the cranial and facial bones, mandibles, rib cartilages and sternum. All the other bones are left in while making bacon.
 - When making bacon the fore leg is removed at the humerus/radius/ulna interface and the hind leg is removed at the femur/tibia/fibula interface. These fore and hind legs are sold as hocks.
 - Bacon is boned off the rest of the carcass.
 - The scapulae, humeri and femora are discarded. All the other bones are sawn up and sold as bacon or pork bones.

Interview 2
Name: Blake Whitehead
Occupation: Storekeeper
Location: Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- The animal is killed by shooting it in the head.
- It is then place in boiling water, removed and has its body hair removed by scrapping the hide.
- The animal is then gutted.
- Only takes the shoulder and leg hams.
- German settlers took great care when butchering pigs in order to waste as little as possible. But British settlers only took the best cuts such as the hams.

Interview 3 (Fig. A1.31)
Name: Frank Nichols
Occupation: Station Owner
Location: Pindera Downs Station, near Tibooburra, New South Wales
Interview Date: 5.11.86

Notes from Interview

- Nowadays a mechanical meat saw is used in butchering a pig but in the past a cleaver was used.
- The neck has the fat cut off and is then corned.
- The corning process is done with quick cure.
- The vertebral column is sawn longitudinally in half to produce two sides.
- The shoulders are taken off as one unit been sawn transversely off the carcass immediately posterior to the scapulae.
- The cut containing the radius/ulna, carpals and proximal ends of the metacarpals is corned.
- The trotters are boiled.
- The thoracic vertebrae and dorsal ribs not part of the shoulder units are sawn transversely to produce chops.
- The ventral ribs not in the shoulder units have very little meat on them. They have the fat on them trimmed off and then these portions are corned.
- The loin is sawn transversely in order to produce pork chops.
- The flaps are wasted.
- The legs are used as roasting units.
- The units containing the distal tibiae/fibulae and shafts, and the proximal tarsals are corned.

Interview 4 (Fig. A1-32)
Name: Barney Davis
Occupation: Publican, Family Hotel
Location: Tibooburra, New South Wales
Interview Date: 6.11.86

Notes from Interview

- In butchering a pig bones are cut using a mechanical meat saw. In the past bones were cut using a hand saw, meat or tomahawk.
- The bones are left in association with the meat when a pig is butchered for fresh pork.
- The head is not used.
- The neck fat is trimmed off.
- The vertebral column is sawn longitudinally in half in order to produce two sides.
- The shoulders are used as roasting units. Transverse saw cuts are made between the thoracic vertebrae and across the ribs which are part of the shoulder unit in order to make carving of the roast easier.
- The knuckles are roasted with the shoulder roasts.
- The pork chop unit is sawn transversely in order to produce chops.
- The belly is sawn transversely into chops. These are marinated and cooked on a bareque.
- The roast legs of pork are used as roasting units.
- The hocks are roasted with the roast legs of pork.

Interview 5 (Fig. A1-33)
Name: Dan Smith
Occupation: Station Hand
Location: Mount Stuart Station, near Tibooburra, New South Wales
Interview Date: 7.11.86

Notes from Interview

- The head is cut off the carcass using a knife. It makes a 'good' soup.
- The head is split longitudinally in half by an axe blow to the ventral surface. The brains are removed.
- The nostrils are also removed and the nasal area cleaned out due to the 'snot box'.
- The head can also be cured in brine or dry salted.
- The head is dry salted by rubbing it has dry coarse salt and some quick cure into it.
- To brine cure the head it is place in a solution of sugar, cloves, quick cure, and salt mixed with warm water. This solution has to be stirred every so often.
- After the initial slaughtering procedures have taken place it is best to leave the carcass to chill in a cold room. The carcass is much easier to work when chilled. If it is not left to chill then the flesh is very 'wobbly' when butchering it.
- The main tools used to butcher a pig are hand saws and knives.
- The vertebral column is sawn longitudinally in half with a hand saw in order to produce two sides.
- The shoulder is also known as the shoulder of pork, shoulder of bacon, forequarter or chump. It is removed from the rest of the carcass using a hand saw. The shoulders are preserved in brine. They are cooked in a caudron or copper.
- The pork chops unit is sawn transversely off the carcass with a hand saw and then sawn transversely into chops. The length of the chops is up to the person doing the butchering. A hand saw is used to cut up the chops rather than a cleaver or an axe because there is less trimming to do when using a saw and therefore less waste. Nowadays a mechanical meat saw would do the best job.
- The loin is sawn transversely into chops.
- The spare ribs are cut with a knife and a saw into the sizes one desires. Spare ribs can be pickled, cured in brine, corned, boiled, roasted or turned into 'good' bacon.
- The flank like the spare ribs is also cut up into pieces of desired size. These pieces are used for bacon or pickling. They can also be cured using salt and quick cure.
- The hams or hindquarters are cured or slow boiled.
- The hocks are sawn of the back legs at a higher position than the trotters.
- The hoof nails are taken of the trotters with a tool known as the dew claws. The trotters are cured using salt and quick cure, or they are boiled.

Interview 6 (Fig. A1-34)
Name: Bill Cox
Occupation: Retired Station Owner
Location: Augathella, Queensland
Interview Date: 3.7.87

Notes from Interview

- Pork is a very expensive meat. It is much more expensive than all other domestic animal meats.

- After slaughter the carcass is usually hung in a cold house for about ten days, by the pelvis rather than by the Achilles tendon in the hock. The reason for this is that it produces a more 'tender' hind leg if this unit is going to be roasted.
- An attempt is made to use all the meat on the carcass.
- The thoracic and lumbar vertebrae and dorsal ribs are cut into chops.
- The flap can be used to make bacon in your own smoke house, otherwise it is minced along with other scraps of the carcass to make sausages.
- The trotters are boiled.
- Carcasses (especially baconers and porkers) are usually sent to a butcher to be cured. If this is the case then the meat on the thoracic vertebrae and rib cage is boned off before it is sent. The loin, which is made up of the lumbar vertebrae is however retained and cut into fresh pork chops.
- Mr Cox's dogs will not eat pig meat or pig bones.

Interview 7 (Fig. A1:35)
Name: Gordon Davidson
Occupation: Station Owner
Location: Cheshire Station, near Tambo, Queensland
Interview Date: 4.7.87

Notes from Interview

- The type of butchery practice used depends on what the carcass is being butchered for, whether for pork or for bacon.
- When butchering for pork the vertebral column is sawn longitudinally in half using either a hand saw or a mechanical meat saw in order to produce two sides.
- When butchering for bacon the entire vertebral column is removed whole by sawing transversely across the dorsal angle of the ribs close to the vertebral column with a hand saw. The reason for this is that when curing bacon the meat next to the bones does not cure well and can go off.
- The carcass sides are cut into three sections as in Fig. A1:35.
- When butchering for pork the meat on the rib cut is boned off and rolled for roasting.

Interview 8
Name: Wayne Renall
Occupation: Roo and pig-shooter, trained as a butcher in New Zealand
Location: Mauttabuu, Queensland
Interview Date: 5.7.87

Notes from Interview

- When butchering a pig it is completely boned out.

Interview 9 (Fig. A1:36)
Name: Jacko Sims
Occupation: Station Owner
Location: Clyde Park Station, near Hughendon, Queensland
Interview Date: 12.7.87

Notes from Interview

- An axe or a cleaver is used to cut bones, otherwise a knife is used for all butchery.
- Mr. Sims is of German ancestry. Uses all of the meat on the carcass.
- The head is used for fresh pork and is roasted or it is turned into brawn with the trotters.
- The meat on the neck is boned off and used in sweet and sour dishes.
- The shoulder is roasted.
- The meat associated with the thoracic and lumbar vertebrae and the ribs is boned off and used to make bacon. It is cured in a 44-gallon drum.
- An alternative to making bacon is to chop the thoracic and lumbar vertebrae, and dorsal ribs transversely in order to produce chops.
- The leg is used as a fresh pork roast.
- The ham unit is cured to make ham. The hip joint is chopped out. This is a point where the meat will go bad if this joint is left in. If the meat looks as if it may go off then it is boned out. This is especially the case in warm weather.
- An alternative to the above making of ham is to leave the ham and leg units together as a single hind quarter roast.

Interview 10

Name: Bruce Butler
Occupation: Aboriginal Ranger, National Parks and Wildlife Service
Location: Cairns, Queensland
Interview Date: 20.7.87

Notes from Interview

- Description of butchering a feral bush pig.
- The animal is skinned on one side and then defleshed using a knife in the bush or where the kill takes place. The carcass is then turned over and the process repeated on the other side.
- The deboned meat is taken back home in the back of a leaf covered 4-wheel drive vehicle.
- You can tell if the animal is diseased or not by running your knife across its adrenal glands. If these glands have a rough feel to them then the animal is likely to be diseased.

Interview 11

(Fig. A1-37)
Name: Percy Trezise
Occupation: Author, Station Owner
Location: Cairns, Queensland
Interview Date: 20.7.87

Notes from Interview

- The fore leg is cut off using a knife.
- The hind leg is cut off using an axe.
- The hind leg is cut into two pieces with a knife at the knee joint.
- Both the fore and hind legs are cooked in an earth oven after skinning.

Interview 12

(Fig. A1-38)
Name: Tommy George
Occupation: Retired Stockman
Location: Laura, Queensland
Interview Date: 22.7.87

Notes from Interview

- The carcass is butchered using a hand saw and a knife.
- The bone is left in.
- There is very little waste.
- The head is boiled.
- The vertebral column is sawn longitudinally to produce two sides.
- The shoulder is cut off using a knife.
- The shoulder (humerus and scapula) is sawn transversely into chops.
- The fore leg and hind leg are roasted.
- The leg (pelvis and femur) is sawn transversely into chops.
- The rest of the carcass (vertebral column and ribs) is sawn into chops.

Interview 13

(Fig. A1-39)
Name: Mike Bedillet
Occupation: Station Owner
Location: Louisiana Station
Interview Date: 24.7.87

Notes from Interview

- The animal can be skinned or else it can be scolded and the hair scrapped off.
- The shoulder is cut off.
- The cuts made are as they appear on Fig. A1-39. The longitudinal cut being made first.
- The cuts are salted in a cask. The mixture used is salt, salt peter, bay leaves, herbs and black pepper. All the blood must be massaged out of the meat first or else it will go off. The meat is placed at the bottom of the cask. After a couple of weeks the meat is taken out and poked with little sharp sticks and the sticks smelt. The sticks tell you the condition of the meat. If they smell 'clammy' then the meat must be cooked then. If they do not smell 'clammy' then the meat is smoked.
- The head is used and boiled for a long time. The bones are then removed and the meat put in a dish to cool. This makes brawn.
- The blood and guts are boiled with apples in order to make black pudding.

Figure A1.30: Pig butchery pattern Interview 1

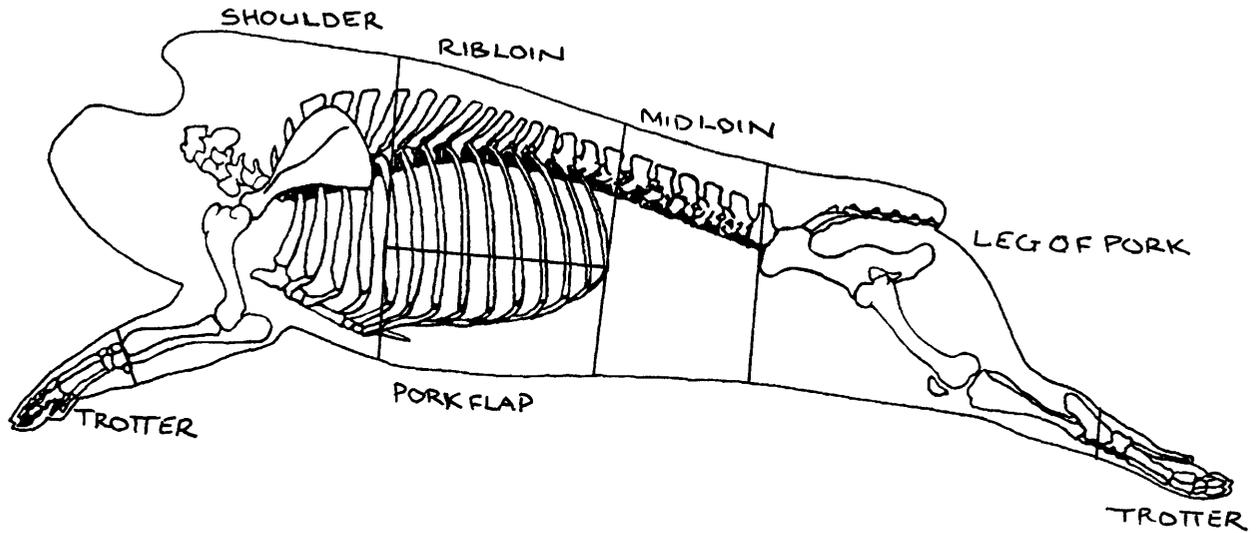


Figure A1.31: Pig butchery pattern Interview 3

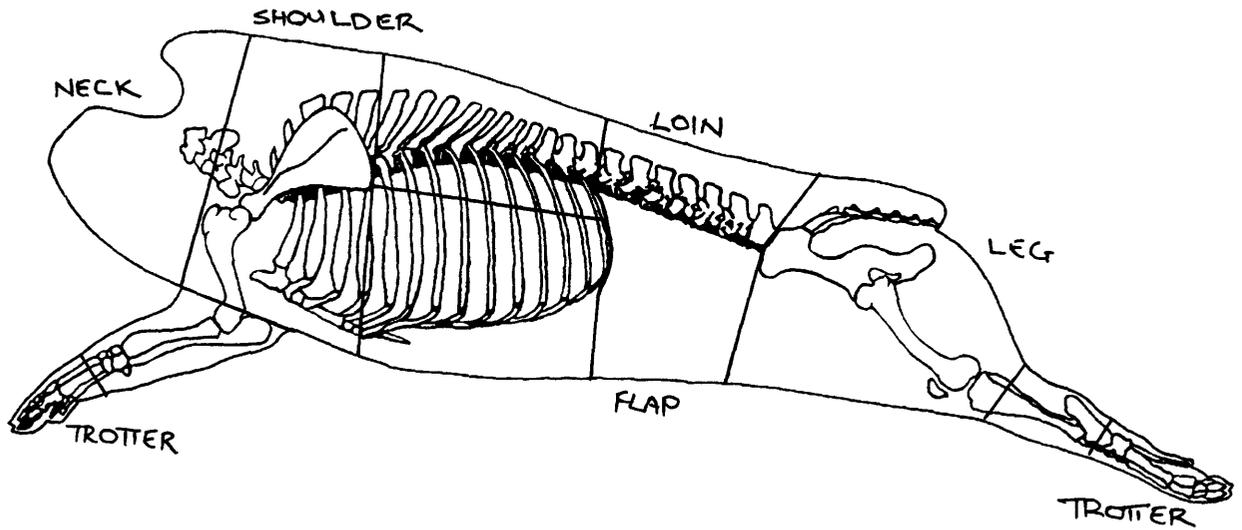


Figure A1.32: Pig butchery pattern Interview 4

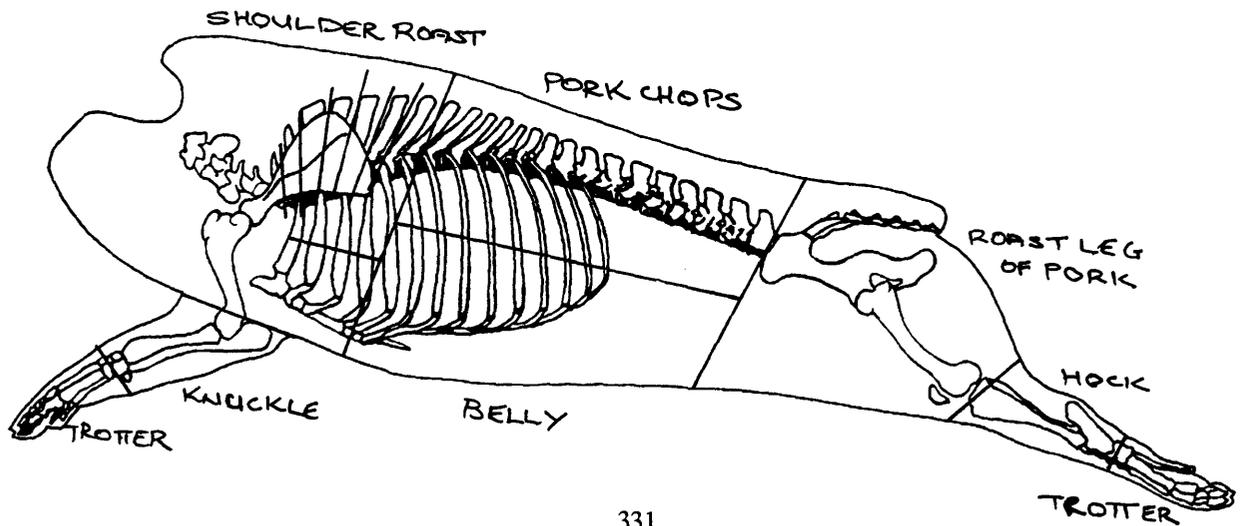


Figure A1.33: Pig butchery pattern Interview 5

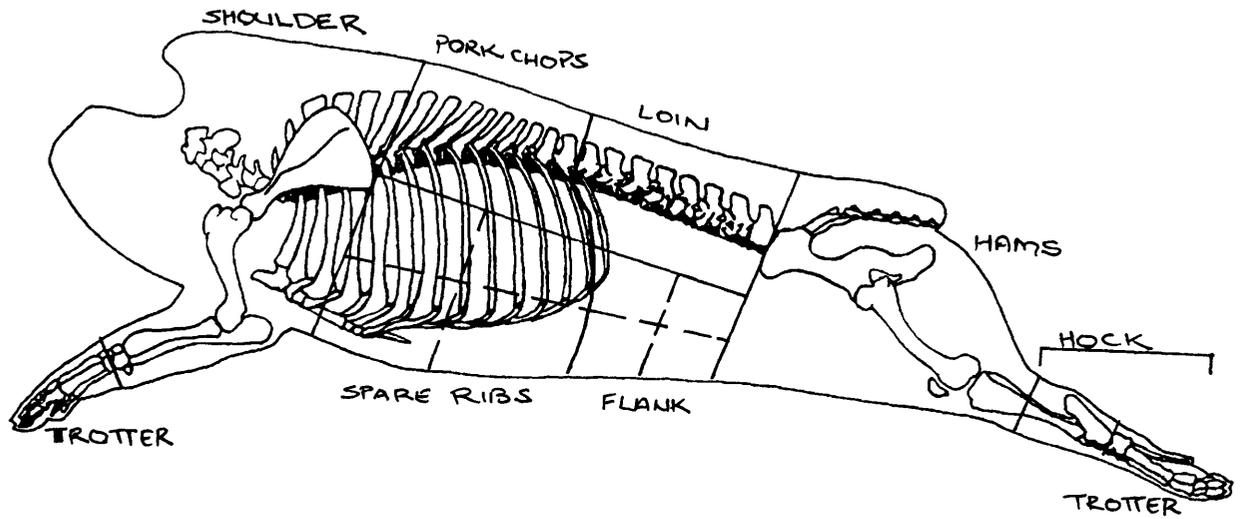


Figure A1.34: Pig butchery pattern Interview 6

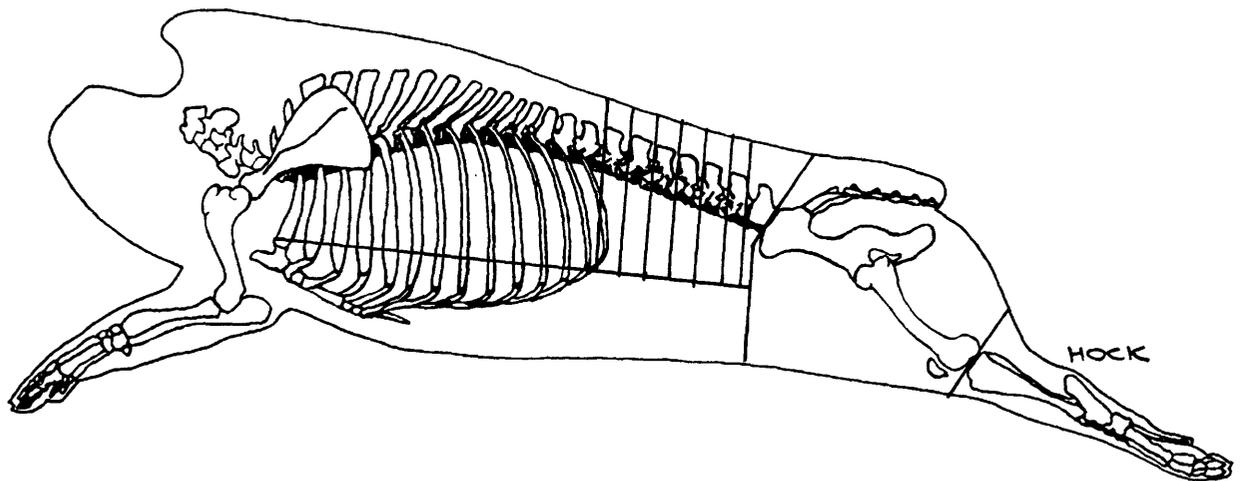


Figure A1.35: Pig butchery pattern Interview 7

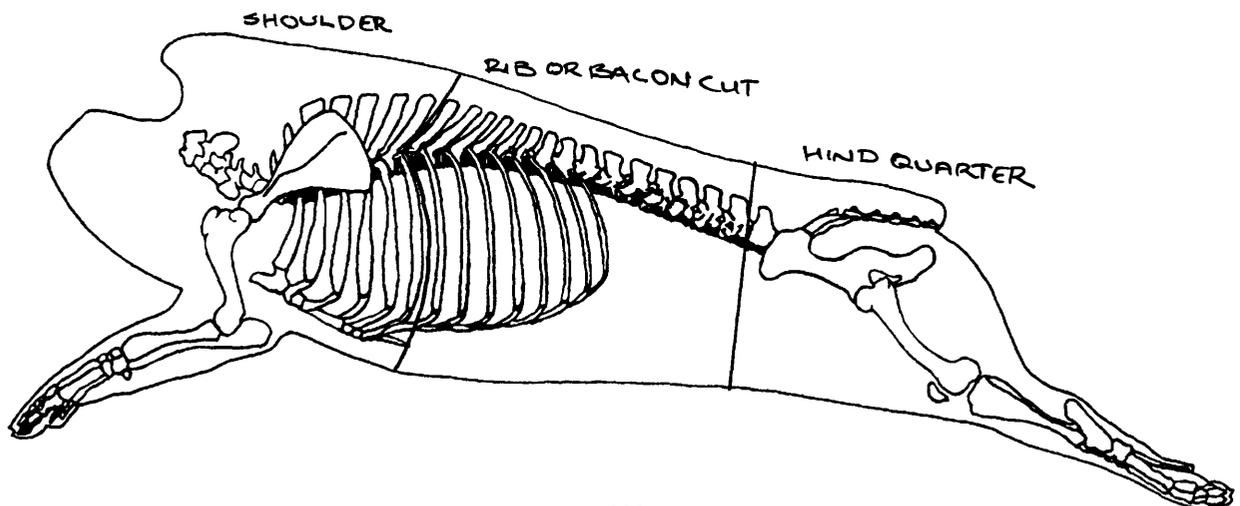


Figure A1.36: Pig butchery pattern Interview 9

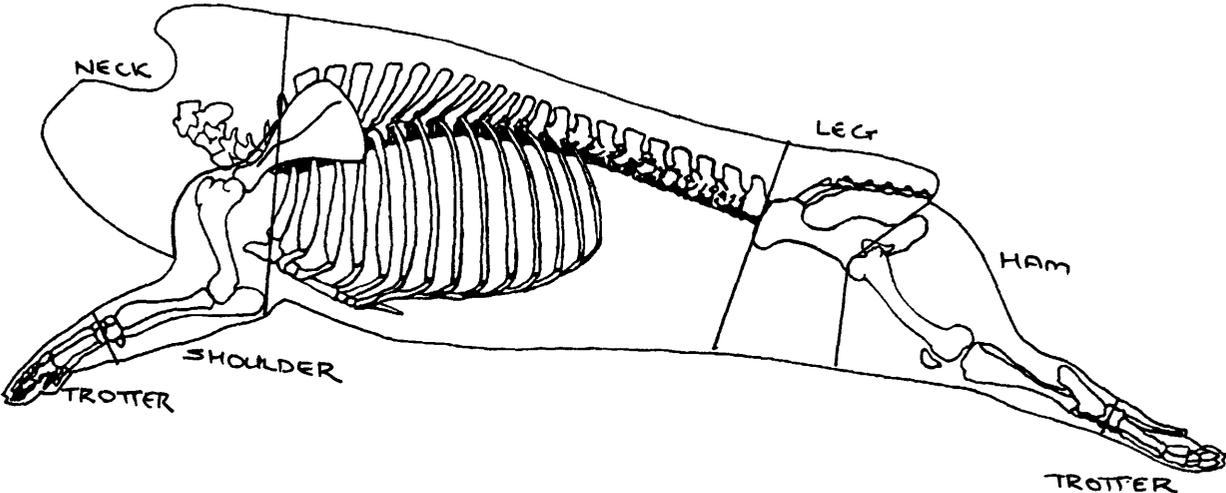


Figure A1.37: Pig butchery pattern Interview 11

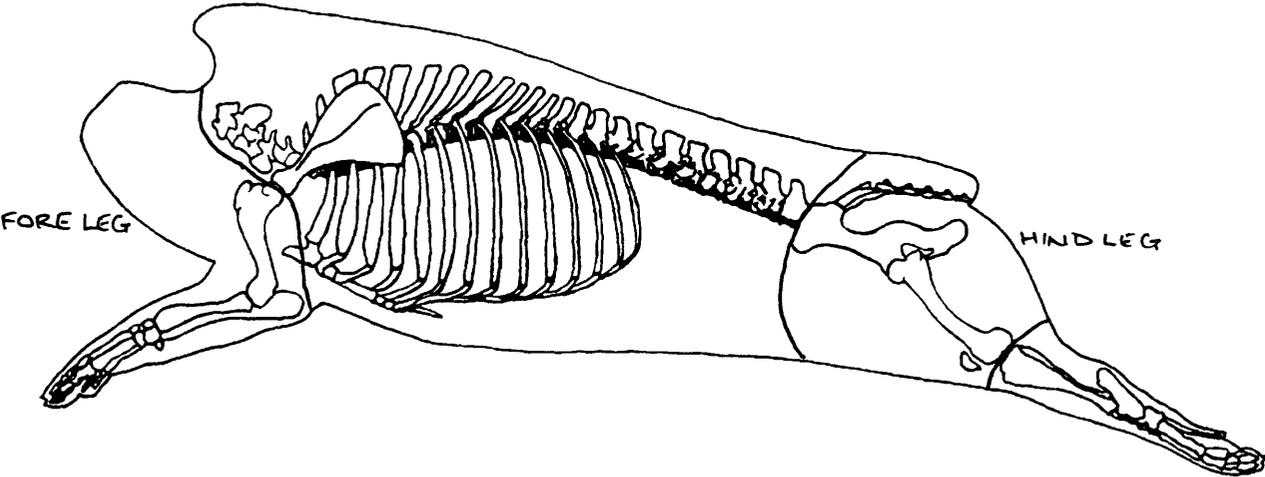


Figure A1.38: Pig butchery pattern Interview 12

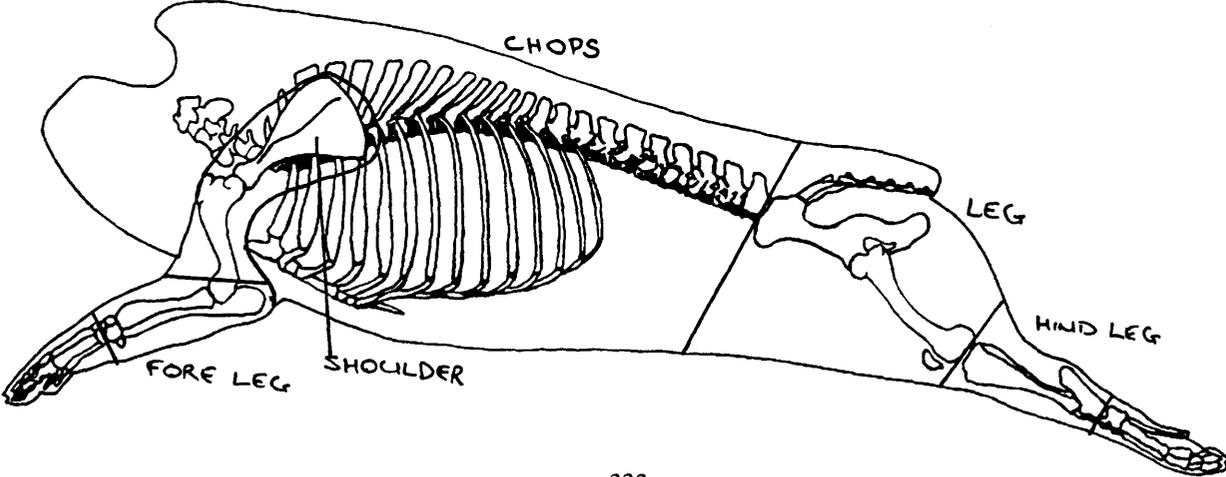
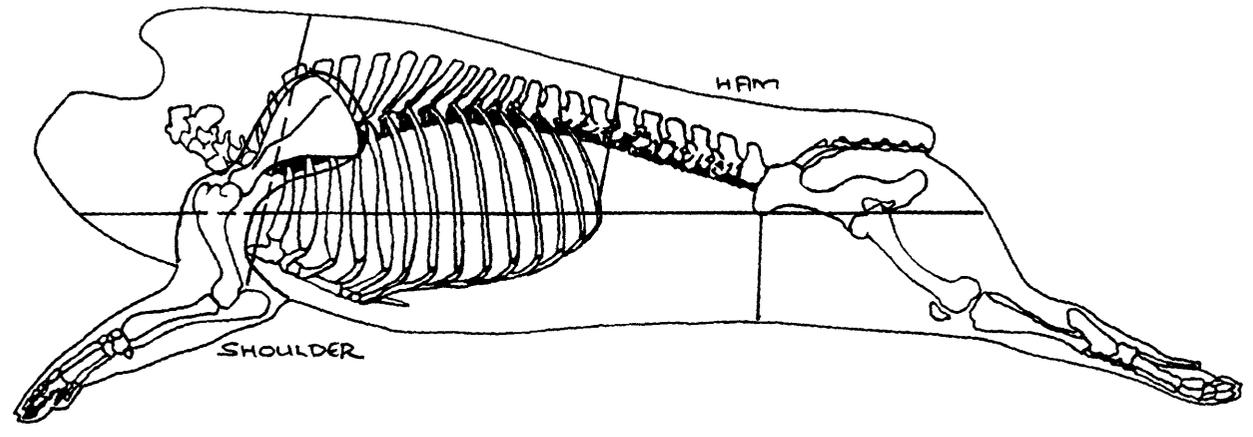


Figure A1.39: Pig butchery pattern Interview 13



APPENDIX 2

Documentary Data

A2.1 Sheep

A2.1.1 Mutton and Lamb

Example 1 (Fig. A2:1)
Reference: L toile et al. (1985)
Nationality: American

Notes from reference

- The neck is cut into chops by transversely bisecting the cervical vertebrae. These chops are either braised or stewed.
- The shoulder contains the first five thoracic vertebrae and associated dorsal ribs, scapula, humerus, and proximal radius/ulna. It is used as a roasting unit. If it is deboned before roasting then it is known as a rolled shoulder. It can also be cut into chops which can be broiled, fried, braised or stewed.
- The shank is either braised or stewed.
- Two racks are produced by longitudinal mid-line bisection of the thoracic vertebrae. This is used as a roasting unit. The racks can be cut into rib chops which are either broiled or fried.
- The breast can be cooked by either braising or stewing it whole or it can be cut into riblets which are cooked using the same methods.
- The saddle is the term given to the loin when the cut takes in both left and right side loins. It is used as a roasting unit. If it is cut into center loin or loin chops then these are broiled or fried.
- The leg is used as a roasting unit. However the dorsal portion can be cut into sirloin chops and the middle portion can be cut into leg chops or steaks. These chops or steaks are either broiled or fried.

Example 2 (Fig. A2:2)
Reference: L toile et al. (1985)
Nationality: British

Notes from reference

- The scrag end of neck is used in stews.
- The shoulder contains the first five thoracic vertebrae and associated dorsal ribs, plus the scapula, humerus and proximal half radius/ulna. The first five thoracic vertebrae and the most dorsal portion of their associated ribs make up a separate unit which may be removed from the shoulder unit. This is known as the middle neck chops unit.
- The shoulder is either roasted or braised.
- The middle neck chops or cutlets as they are sometimes called or gigot chops in Ireland are either braised or stewed.
- The best end (or fair end in Ireland) of the neck is used as a roasting unit or it is cut into chops which are either grilled or fried.
- The breast is braised.
- The saddle is the term given to the loin when the cut takes in both left and right side loins. This unit is roasted. It can however be cut into loin or centerloin chops which are grilled, fried or braised. The loin can alternatively be boned out and turned into steaks known as rosettes which are grilled or fried.
- The whole leg (shank, leg and fillet) can be roasted as a single unit. The smaller leg unit which is known as the gigot in Scotland is braised and for lambs only this unit is cut into 'lamb steaks' which are grilled or fried. If not included in a roasting unit then the fillet end is cut into chump chops which are either grilled, fried or braised.

Example 3 (Fig. A2:3)
Reference: L toile et al. (1985)
Nationality: French

Notes from reference

- The collet is turned into chops which can be used in stews and casseroles, or for braising and poaching.
- The  paule or shoulder is made up of the carr  (breast), c telettes d couvertes (exposed chops) and the upper foreleg. The carr  is made up of the posterior thoracic vertebrae and associated dorsal ribs and the c telettes d couvertes with the anterior thoracic vertebrae and associated dorsal ribs, associated with the shoulder cut. This unit may be roasted or poached or cut into chops which can be broiled or fried.
- The c telettes premi re (first ribs) can be roasted as a whole unit or if cut into chops they can be poached.
- The haute de c telette (short or spare ribs) is cut into chops which are braised.

- The poitrine (belly or brisket) is either roasted, poached or braised.
- The loin (unit 4 in Fig. A2:3) has two parts. The dorsal half is called the filet and the ventral half is called the côte de filet. These units may be roasted or braised.
- The anterior portion of the hind leg is known as the selle d'agneau when it includes both sides of the back. It can be roasted or poached as part of the leg or cut into chops which are braised.
- The gigot and the selle d'agneau sold as a single unit are known as the baron d'agneau.
- The leg is made up of the selle d'agneau, gigot and pied. This unit can be roasted or poached.

Example 4 (Fig. A2:4)
Reference: Glasse 1751
Nationality: English

Notes from reference

- The carcass of both mutton-aged sheep and lambs were butchered virtually the same way. The carcasses were divided into two forequarters and two hindquarters. This meant that the carcass must have been split longitudinally in half along its mid-line.
- A forequarter of mutton (sheep aged two years old or more at slaughter) was divided into a shoulder, neck and breast. The only difference between mutton and lamb butchery was that the neck and breast were not separated when butchering a lamb.
- The hindquarter for both mutton and lamb carcasses were divided into a loin and a leg.
- Combined loins (that is the vertebrae had not been split longitudinally) of mutton were known as the saddle of mutton.
- Combined necks (that is the vertebrae had not been split longitudinally) of mutton were known as the chine.
- The different cuts of mutton and lamb were all roasted.
- Some people preferred to leave the shin on the loin when roasting it.

Example 5 (Fig. A2:5)
Reference: Lee Decker et al. (1987)
Nationality: American (1940s New York or Eastern method)

Notes from reference

- The cuts in Fig. A2:5 are those used in an archaeological model to examine socio-economic status of mammalian faunal remains from nineteenth-century historical archaeological sites. The cuts were derived from butchery methods practiced during the late 1940s in the north-eastern states of the United States of America.

Example 6 (Fig. A2:6)
Reference: Lyman (1979)
Nationality: American (1920s)

Notes from reference

- The units shown in Fig. A2:6 are based on the work of Eakins (1924).
- The combined short rack and loin unit was known as the hotel rack.

Example 7 (Fig. A2:7)
Reference: Lyman (1977)
Nationality: American

Notes from reference

- This pattern of carcass division was interpreted for the military of Fort Walla Walla (Washington) dated to 1903, from archaeological remains.
- Once slaughtered animals were gutted and skinned. The cranial and facial bones, metapodials and phalanges were discarded.
- The carcass was then split longitudinally in half along its mid-line.
- The carcass was then subdivided into the units shown in Fig. A2:7.

A2.1.2 Mutton

Example 1 (Fig. A2:8)
Reference: Johnston (1976)
Nationality: Australian and New Zealand (trade method, but also intended for farmers)

Notes from reference

- These notes describe the trade method for cutting up a dressed carcass. Dressed means that the carcass has been skinned, gutted (leaving only the kidneys and suet fat associated with the carcass), the head (cranium and mandibles) removed at the occipito-atlantal articulation, and the feet (metapodials and phalanges) removed.

- The carcass is hung by a 'W' shaped hook called a gambriel through the Achilles tendons.
- After the carcass has set the butchering procedure begins.
- Firstly, the legs are opened up by cutting longitudinally through the flesh of the crutch with a knife. Then using a cleaver the carcass is split into two sides by chopping with light but firm blows along the longitudinal mid-line axis of the entire vertebral column.
- The shoulders are cut off using a knife.
- The leg is removed from the chump by first cutting with a knife through the the flesh and then using a hand saw to cut through the acetabulum of the pelvis.
- The chump and the short loin are collectively known as the loin. They are separated from one another using a knife and a hand saw at the sacral/lumbar interface in the same manner as the chump is separated from the leg. The chump is cut into chops.
- The rib chop section may have the vertebrae removed and the ribs which are left are cut into rib cutlets, or this unit is cut into standard chops which are sold as 'best' neck chops. These cutlets and chops are cut using a cleaver and a knife.
- The breast is removed by either using a hand saw or a cleaver.
- The neck chops unit as its name suggests is cut into chops using a cleaver and knife.

Example 2 (Fig. A2-9)
Reference: Beeton (1986)
Nationality: English (1860s London method)

Notes from reference

- Almost every city had its own particular way of dressing (cutting up) a carcass.
- Once the animal had been slaughtered, it was flayed (skinned), gutted, and the feet (metapodials and phalanges) and the head (cranium and mandibles) were removed. The carcass was then hung.
- The carcass was split longitudinally in half along its mid-line.
- Each side was divided into a fore and a hindquarter by splitting the side transversely at the interface of the 11th and 12th thoracic vertebrae.
- The forequarter was subsequently divided into three units. These were the shoulder, neck and breast.
- The neck was a very large unit, too large for most practical uses in the kitchen. Also the cultural perception of the quality of the meat varies along the length of this unit. This unit in all likelihood would have been subdivided further prior to sale. It would most likely have been subdivided into three sub-units known as the scrag end of neck, middle end of neck and best end of neck.
- The hindquarter was divided into two units. These were the leg and the loin.
- The leg could be roasted, either with or without the lower leg portion or shank attached. The shank which incorporates the tibia had little meat adhering and was often used as a base to make gravies.
- The remains of a cold roast leg could be used to produce a dish called hashed mutton. This involved the meat remaining on the bone being sliced off and the bones themselves being subsequently chopped up and stewed.
- The leg could be boned out at home and stuffed prior to roasting.
- Apart from roasting, a leg could be boiled or boned out at home and turned into mince.
- If both loins were cut as one then they were known as a saddle. The saddle was roasted.
- Loins were roasted. If cut into chops they were broiled. The loin could be boned out at home, rolled and roasted, or the meat minus the bone could be cut into small pieces and these used to make pies. Alternatively the deboned loin could be ground into mince.
- Sometimes, especially at public dinners or on special occasions the leg would be combined with the loin. This combined hindquarter unit was known as a haunch and was roasted. When a haunch was cut from a carcass the subdivision between the fore and hindquarters took place at the thoracic/lumbar interface instead of between the 11th and 12th thoracic vertebrae.
- The shoulder was used as a roasting joint. Like the leg a cold roast shoulder could be used to make hashed mutton, which would involve the chopping up of the shoulder bones which were subsequent stewed.
- The neck joint as stated above was really three cuts. The whole unit could be deboned at home and the resultant meat either cut into pieces for pie-making or else minced.
- The scrag end of neck was used to make stock for soups.
- The middle and best end of neck were either roasted or boiled.
- The breast could be boned out in the home and subsequently boiled.
- Sheep heads were sometimes eaten as were the feet. If the feet or trotters as they were known were consumed then the metapodials were removed. The cleaning of the feet and removal of the metapodials was done by the butcher upon request.

Example 3 (Fig. A2-10)
Reference: Beeton (1899)
Nationality: English (1890s London method)

Notes from reference

- Almost every city had its own particular way of dressing (cutting up) a carcass.
- Once the animal had been slaughtered it was flayed (skinned), gutted, and the feet (metapodials and phalanges) and the head (cranium and mandibles) were removed. The carcass was then hung.

- The carcass was split longitudinally in half along its mid-line.
- Each side was divided into a fore and a hindquarter by transverse bisection at the interface between the 11th and 12th thoracic vertebrae.
- The forequarter was subsequently divided into four units. These were the shoulder, the scrag end of neck, the best end of neck, and the breast.
- The hindquarter was divided into three units. These were the leg, the chump end of leg, and the loin.
- The leg was either roasted or boiled. Mutton steaks were cut from this joint.
- The chump end of the loin was left attached to the loin when both left and right loins were left together to make a saddle joint which was cooked by roasting. The chump end could be cut into chops which were either grilled or broiled.
- The loin was used as a roasting unit. The loin when cut from the thoracic/lumbar interface, with the chump and leg was known as the haunch. This joint was roasted. The loin could also be cut into chops which were grilled.
- The best end of neck was boiled, roasted or cut into mutton cutlets. Cutlets differ from chops in that the vertebrae are boned out.
- The breast could be roasted, boiled, or used in stews.
- The shoulder was roasted.
- The scrag end of neck could be boiled or used to make broths and stews.
- The head could be boiled, used to make broths, or else braised.
- The feet or trotters were boiled. These were generally not eaten in the south of England except by the poor. The feet contained the distal half of the metapodials and the phalanges.
- The tongue, kidneys and pluck (liver, lights (lungs) and heart) were also eaten.

Example 4 (Fig. A2:11)
Reference: Beeton (n.d.)
Nationality: English (post World War I)

Notes from reference

- The preferred animal to eat was between four and five years of age at its time of slaughter.
- The leg was either roasted or boiled or cut into steaks.
- The loin was roasted.
- Both loins together in a pair were known as a saddle. This was a roasting joint.
- A leg, chump end of loin and the posterior half of the best end of loin was known as a haunch. This was a roasting joint.
- The shoulder was a roasting joint.
- The scrag end of neck was either boiled or turned into cutlets.
- The breast was either stewed, boiled or roasted.
- The head was either braised, boiled, or used to make broth.

Example 5 (Fig. A2:12)
Reference: Henry (1987)
Nationality: American

Notes from reference

- Figure A2:12 is not a reliable indicator of the units used by Henry in her study of socio-economic status of faunal remains from urban historical sites. This is because she did not skeletally define the units used in her study. She merely uses butchering unit terms which she assumes the reader will know. From the above examples it is clear that the skeletal definitions of the terms used to describe cuts of meat vary with different authors. Using Henry's terms in conjunction with the other data collected on American butchering techniques Fig. A2:12 portrays what is suspected to be her skeletal definitions.

Example 6 (Fig. A2:13)
Reference: Binford and Bertram (1977)
Nationality: American (Navajo Indian)

Notes from reference

- These notes are taken from ethnoarchaeological observations of Navajo sheep butchering practices
- Navajo butchering of sheep would appear to be an 'extremely regular and patterned procedure.'
- There were three main criteria used by the Navajo in selecting a sheep for slaughter. These were that it be fat, that it was not too young, and that it was past its prime reproductive years. Of these, fatness was considered to be the most important.
- Once a sheep had been selected for slaughter it was taken to have its throat cut. This took place in front of a butchering rack. This consisted of two vertical poles with a horizontal member approximately 1.8 metres off the ground.
- The sheep's legs were all tied together so that it could not move. The throat was cut using a sharp knife. The head was held back and an assistant helped to hold back the wool around the neck so that the blood could be collected in a bowl or pan.
- After the animal had bled the legs were untied.

- The skinning process then began with the skin being removed from the legs, belly, neck and sides.
- During the skinning process the front lower legs were cut off at the carpal/metacarpal interface and the back lower legs were cut off at the tarsal/metatarsal interface. These lower legs were left attached to the skin.
- At this point in the skinning process, when the skin was only attached to the carcass along the vertebral column, the skinning process stopped temporarily.
- The esophagus was pulled out of a cut made in the throat and tied.
- The head may be cut off at this stage at the occipito-atlantal articulation.
- Cuts were made between the Achilles tendons and the associated tibia and calcaneum.
- A rope was placed through the above made cuts and the carcass was then hung from the butchering rack.
- The skin was then pulled down and off the back. The carcass was then completely skinned and the skin was placed on the ground wool side down.
- If the head had not already been cut off, then it was at this stage.
- Butchering or dressing of the carcass took place immediately. The carcass was not left to set.
- The forequarters (shoulders) were removed first. They were taken off using a knife, cutting away the muscular attachments beneath the trapezius muscle on both sides. Careful use of the knife meant that both shoulders could be taken off as a single unit attached to one another by the trapezius muscle. This unit was then hung over a nearby line or else placed on the skin.
- At the same time as the forequarters were being removed the meat on the neck (cervical vertebrae) was cut off.
- The breast fat was then cut off the carcass down towards the brisket.
- Cuts were then made posterior to the diaphragm extending to the crotch. The abdominal contents were removed and placed on the skin.
- The contents of the pleural cavity or thorax were removed next and also placed on the skin.
- The kidneys were left attached to the vertebrae and were the only body organs left in the carcass.
- Of the organs and viscera removed, only the gall bladder and urinary bladder were discarded.
- An assistant cleaned the organs and viscera while the dressing of the carcass continued.
- A cut was next made along the dorsal vertebral spines enabling the removal of the tenderloin.
- One of the Achilles tendons was severed so that the carcass hung by only one leg.
- An axe was used to longitudinally split the ilium from the sacrum and the pubic symphysis on the side for which the Achilles tendon was cut. The axe was further used to chop 'along the edge of the vertebrae, breaking off the transverse processes of the lumbar vertebrae down to the ribs.' This cut was continued, chopping off the heads of the ribs from the thoracic vertebrae from inside the thoracic cavity until the entire rib slab was removed from the vertebrae. This procedure results in the removal of an entire side. Once removed, this side was either hung over a nearby line or placed on the skin.
- The axe was then used to cut the sacrum and coccygeal vertebrae from the other half of the pelvis.
- The entire vertebral column was next removed by chopping with the axe through the transverse processes of the lumbar vertebrae and the rib heads.
- The other side was left hanging. It is the mirror image of the one previously removed. It was then taken down from the butchering rack. The primary butchering procedures were now completed.
- Alternatives in butchering a carcass by Navajo were noted by Binford and Bertram.
- A knife may be used instead of an axe to cut the legs and rib slabs from the vertebrae.
- The degree to which secondary butchering may be done by an assistant concurrently with primary butchering depends on a number of factors.
- 'If butchering is being done in anticipation of entertaining guests, the vertebrae may be cut [using an axe] into three or four sections depending upon the size of the cooking pots.' In general these sections consist of a cervical unit, an upper thoracic unit, a lower thoracic/upper lumbar unit, and a lower lumbar/sacral unit.
- The rib slabs were usually cut into three pieces per slab depending on the size of the cooking pots.
- The legs were reduced in size by breaking the shafts of the long bones.
- It was common to store the blood, collected when cutting the sheep's throat, in the cleaned stomach of the sheep. It was later used to make blood porridge.
- 'The Navajo no longer crack long bones for the removal and consumption of bone marrow.'
- The usual culinary practice applied to sheep meat was to strip meat off the bones. This meat could then be cut into chunks for use in stews or whole muscles could be fried or roasted on the coals of a fire. The long bones of both the forequarters (shoulders) and legs were broken in half mid shaft after they have been stripped of meat. These bones were used in stews or soups.
- Ribs were usually just roasted as is. 'Alternatively, they may be broken into half slabs and cut into units of three half ribs and placed in a soup.'
- The vertebral sections were used to make soups.
- The head was consumed. The most common method used to cook it was to singe the wool and then to wrap it in aluminium foil prior to roasting it in a small earth-oven. It was during consumption of the head that the tongue was removed and eaten and also the cranium split in order for the brains to be extracted for consumption.
- An alternative method for cooking the head was to skin it first and then either steam it in a sealed bucket or else boil it in a bucket.
- In the past the lower legs were consumed using the same culinary method as for roasting the head. These days the bones of the lower legs (metapodials and phalanges) are the only bones to leave the site, with the exception of bones attached to meat which are given to relatives or used to pay debts. Metapodials and phalanges leave the site attached to the skin. Skins are sold these days to a local tanner who prepares them for sleeping mats or for the tourist market. The tanner requires that the feet are still attached to the skin when he receives it as he uses the 'foot grease' in the feet in the tanning process.

- Dogs eventually have access to all but the lower leg bones.

A2.1.3 Lamb

Example 1 (Fig. A2.14)
Reference: Dolowich (1976)
Nationality: American

Notes from reference

- The United States Department of Agriculture has three grades for lamb; Prime, Choice and Good. Prime is the 'best', most expensive and most popular. The grading system is based upon the age of the lamb at slaughter.
- There are three different types of lamb sold and these are based on age classes. Firstly, there is hot house lamb, which is between one and two weeks old, weighs approximately twelve pounds, and has been raised solely on its mother's milk. Because of its small size, this lamb may be cooked whole, in halves or in quarters. Secondly, there is baby lamb, which is no more than six weeks of age, weighs approximately fifteen pounds, and has been raised on a bottle. The third type is the most common. It is called regular lamb. This animal is slaughtered before it reaches one year of age. After that the animal is called a yearling.
- Lamb can be cooked by roasting, broiling, panfrying or braising the meat.
- A lamb carcass may not necessarily be split longitudinally in half along its mid-line.
- Lamb is butchered firstly into wholesale cuts. These wholesale cuts may subsequently be further butchered into retail cuts which may also undergo further butchery.
- The shoulder wholesale unit is usually broken down into two retail units: a neck, and a blade and arm unit.
- The neck is cut into neck chops which can be used in stews, or braised. An alternative is to debone the neck and subsequently turn the meat into mince to be used to make 'burgers'.
- The blade and arm of both sides are usually sold together. That is, the thoracic vertebrae present in this unit are not split mid-line to give two shoulder units. The unit may be roasted with the bones in (square shoulder), or it can be deboned and roasted as is (cushion shoulder), or else deboned, rolled, and roasted (boneless shoulder).
- The blade portion can be cut into either boneless blade chops (Saratoga) or chops with the bone in. The arm portion can be cut into chops with the bone in. Boneless blade chops, blade chops and arm chops are cooked by broiling, panbroiling, or panfrying.
- The foreshanks can be braised, cut up for stewing, or deboned, minced and made into 'burgers'.
- The hotel rack or rack of lamb as it is also known, is split longitudinally in half along the mid-line of the thoracic vertebrae. Each of these sides may be roasted (rib roast) or they can be further reduced into rib chops which are broiled, panbroiled or panfried.
- The breast can be roasted or braised whole or deboned and rolled. It can be cut into individual riblets with the bone either in or out and cooked by braising or barbecuing. Sections of riblets (spare ribs) can be cut from the breast and these can be roasted or braised. Individual 'chops' can be cut from a stuffed breast and these are either broiled, panbroiled or panfried.
- The loin trimmed joint may be sold as a whole unit known as a saddle of lamb or double loin. It may be cut into two loin roasts by splitting the lumbar vertebrae longitudinally along their mid-line. Another alternative is to have the whole saddle of lamb deboned and rolled to give a boneless double loin roast. All these units are for roasting as their names suggest. The loin can however be cut into loin chops, either single (one side), double (both sides) known as English lamb chops, or boneless double (both sides). These chops are either broiled, panbroiled or panfried.
- The leg can be sold as a variety of different roasting units as a result of different combinations of its sub-units (see Fig. A2.14). It can be sold as a combination leg roast made up of all the sub-units; a boneless rolled leg of lamb (sub-units 1, 2, 3 and 4); sirloin off leg (sub-units 2, 3 and 4); a sirloin half of leg (sub-units 1 and 2); a shank half of leg (sub-units 3 and 4); a center leg (sub-units 2 and 3); a sirloin roast (sub-unit 1); and as a boneless sirloin roast (sub-unit 1). Both the center leg and sirloin can be cut into chops producing leg chops and sirloin chops respectively. These can be broiled, panbroiled or panfried.

Example 2 (Fig. A2.15)
Reference: Johnston (1976)
Nationality: Australian and New Zealand (trade method, but also intended for farmers).

Notes from reference

- These notes describe the trade method for cutting up a dressed carcass. Dressed means that the carcass has been skinned, gutted (leaving only the kidney and suet fat), the head (cranium and mandibles) removed at the occipito-atlantal articulation and the feet (metapodials and phalanges) removed.
- A prime dressed carcass should weigh around 36 lbs.
- The carcass is hung by a 'W' shaped hook called a gambriel through the Achilles tendons.
- After the carcass has set the butchering process begins.
- A variety of tools can be used depending on how the lamb is butchered. The lamb can be butchered a variety of ways resulting in similar final products.
- Firstly, the carcass may or may not be split longitudinally in half along its mid-line. If it is split into two sides then this is achieved by first crutching the carcass. Crutching refers to the mid-line longitudinal splitting

of the pubic symphysis with a knife. The vertebrae are then either cleaved or hand sawn along their longitudinal mid-line in order to produce two sides.

- An alternative to this splitting of the carcass longitudinally is to cut it transversely into three sections (forequarter, saddle and leg) using a mechanical meat saw.
- If a mechanical meat saw is used to subdivide the carcass before further butchery then the practice in Victoria, South Australia and New Zealand is to cut a long leg. That is, a leg with the chump as part of the leg unit rather than as part of the saddle unit.
- Australian butchers were a lot quicker at adopting the mechanical meat saw than New Zealand butchers. Nowadays, mechanical meat saws have virtually replaced hand saws in Australian butcher shops.
- The carcass can also be split into the same three sections that the mechanical meat saw produces using a hand saw.
- The forequarter of lamb can be butchered in a variety of different ways.
- In Victoria and South Australia the forequarter is cut and sawn into 'Spanish chops'.
- The shoulders can be cut off the forequarters with a knife. The remaining rib cage section has the sternum cut out and is marked using a knife about mid rib point. It is then chopped using a cleaver into neck chops.
- The most popular approach to the butchery of the forequarter is to convert it into chops. Firstly the shanks are sawn off. Next the neck is sawn off. It is best if the neck has not been split longitudinally in half. The remaining unit, if not already split longitudinally in half along its mid-line is then sawn in half. Each forequarter is then cut into shoulder and forequarter or lamb barbeque chops. Forequarter and shoulder chops differ from neck chops in that the later run parallel with the ribs while the former run perpendicular and in fact transversely cut the ribs.
- The sternal area in the forequarter cut equates with the breast in the saddle cut and can be corned or boned out for sausage meat.
- The shanks can be used for making soups and stews, or boned out for sausage meat.
- The whole neck can be sawn transversely into rosettes using a mechanical meat saw. The reason why use of a mechanical meat saw or hand saw is preferred to a cleaver is that the rosettes they cut have a better appearance and therefore sell for a higher price.
- The breast is removed using first a knife to cut a guide line and then a hand saw. The breast can be deboned and then rolled.
- The kidneys and surrounding fat are removed from the saddle. If this unit has not already been split into sides then this is now done using a cleaver. This unit can be butchered into a variety of different lamb cuts. The fore portion of this unit, the ribs may have the thoracic vertebrae deboned and the ribs cut into cutlets.
- The legs are removed using a knife and then a hand saw. Legs may be cut into lamb leg chops by sawing them transversely with a mechanical meat saw. These chops can be grilled, fried, barbequed or braised.

Example 3 (Fig. A2.16)
Reference: Beeton (1986)
Nationality: English (London method)

Notes from reference

- As there was no refrigeration available in the 1860s, fresh lamb could only be purchased as it was slaughtered. This meant that as the season when lamb was available progressed, so the size of the lamb available for sale increased, meaning that lambs were butchered differently as the season progressed. Basically the units used at the beginning of the season were further subdivided as the lambs brought forward for slaughter and sale increased in size.
- At the beginning of the season (not only in London, but in most English cities) lambs were sold in quarters. This meant the carcass was first halved by longitudinally splitting the carcass along its mid-line. Each of these sides was then halved to produce a quartered carcass. The sides were halved transversely between the 11th and 12th thoracic vertebrae.
- These quarters would have been used as roasting joints.
- In larger sized lambs the forequarter was subdivided into three cuts. These cuts were the shoulder, rib (or neck) and breast. The hindquarter was subdivided into two cuts. These cuts were the loin and the leg.
- The leg was roasted.
- The loin (or saddle if both loins cut as one) was usually roasted. It could however be deboned and braised, or it could be cut into lamb loin chops.
- The shoulder was roasted. A cold roast shoulder could have any remaining meat on it stripped off and used in a dish called hashed lamb which was served with the scapula broiled. The scapula could also be boned out before roasting and the space filled with stuffing.
- The portion of rib or neck cut which contained the thoracic vertebrae and associated ribs could be cut into cutlets.

Example 4 (see Fig. A2:17)
Reference: Beeton (1899)
Nationality: English (1890s London method)

Notes from reference

- As there was no readily available effective refrigeration available in the 1890s fresh lamb could only be purchased as it was slaughtered. This meant that as the season when lamb was available progressed, the size of the lamb available for sale increased. Because of this lambs were butchered differently as the season progressed. Basically, the units used at the beginning of the season were further subdivided as the lambs brought forward for slaughter and sale increased in size.
- At the beginning of the season (not only in London, but in most English cities) lambs were sold in quarters. This meant that the carcass was first halved by longitudinally splitting it along its mid-line. Each of these sides was then halved to produce a quartered carcass. The sides were halved transversely between the 11th and 12th thoracic vertebrae.
- These quarters would have been used as roasting joints.
- As the season advanced and the lambs available to butchers became larger, and the quarters were further subdivided into two cuts. The forequarter was cut into a shoulder, breast and neck cut. The hindquarter was cut into a leg and a loin.
- As lambs continued to grow in size, the forequarter was further subdivided into a neck, shoulder and breast cut. Exceptionally large lambs had the neck cut subdivided into a scrag end of neck cut and a best end of neck cut.
- The leg was roasted.
- The loin (or saddle if both loins were cut as one) was roasted.
- The shoulder was roasted.
- The best end of neck could be cut into cutlets which were fried.
- The breast was stewed.
- The scrag end of neck was stewed.

Example 5 (Fig. A2:18)
Reference: Beeton (n.d.)
Nationality: English (post World War I)

Notes from reference

- Small sized lambs were quartered into two forequarters (containing neck, shoulder and breast joints) and two hindquarters (containing loin and leg joints). These quarters were used as roasting joints.
- Large sized lambs were cut into the joints shown in Fig. A2:18.
- The leg, loin and shoulder were used as roasting joints.
- The scrag end of neck was either roasted or cut into cutlets which were fried.
- The breast was either stewed or boiled.

Example 6 (Fig. A2:19)
Reference: Ashbrook (1955)
Nationality: American.

Notes from reference

- Butchering and preserving meat and meat products on the American farm constituted a major home industry. During the mid 1950s over half-a-million sheep and lambs were butchered on farms for home use.
- Lambs can be dressed with relative ease.
- The desired lamb carcass is one weighing between 11 and 20 kg. A carcass of this size 'is small enough so that with home refrigeration a family can consume the meat before spoilage occurs.'
- The meat can be preserved either by freezing, canning or curing.
- A lamb carcass chills or sets quickly and cures easily.
- A lamb carcass usually dresses out to 50% of the live weight.
- Lambs from sheep breeds raised for meat rather than wool produce a higher proportion of dressed carcass weight to live weight and yield 'meatier' roasts and chops.
- 'Twenty-four hours before they are killed, lambs should be penned up in order that the fleece will dry. It is difficult to keep the wool from touching the carcass at times during dressing, but the drier the fleece the cleaner the carcass will be. During this penned period, no feed but plenty of clean fresh water should be available. A lamb with a full stomach is harder to butcher than one with an empty stomach.'
- Lambs should always be handled with care before slaughtering them. Rough treatment will result in a bruised carcass, which will not only be unattractive in appearance but more importantly will have poor keeping qualities.
- In slaughtering the animal the first step is to cut its throat severing the main arteries and veins with a sharp knife taking care that the blood does not run into the fleece.
- Once the throat has been cut the neck is broken at the occipito-atlantal articulation. It is a good idea to let the dead animal struggle as a result of nervous reactions. This struggling promotes bleeding.
- After the animal is well-bled, it is skinned. For a detailed description of this process see Ashbrook (1955: 109-114).

- 'Young, well-fattened lambs are skinned more easily than older, thinner sheep.'
- It is during the skinning process that the feet (metapodials and phalanges) and the head (cranium and mandibles) are removed.
- The carcass is next gutted. In order to remove the pluck (heart and lungs), the sternum is cut either using a knife or a hand saw in a longitudinal direction along its mid-line.
- The kidneys, heart and liver are taken for consumption.
- The intestines can be used for sausage casings after cleaning and the caul fat which surrounds them can be used to make soap.
- The tongue is cut out of the head for consumption and then the cranium is split and the brains extracted.
- The carcass should at this stage be chilled in order to assist it setting. It should be chilled at 4° C.
- 'There are many different ways of cutting the lamb carcass. The cuts depend a great deal on the uses to be made of the meat, whether most of it is to be used fresh, canned, or cured.'
- The carcass is usually not split longitudinally along its mid-line, though it can be in some instances.
- The shoulder cut is removed first by transversely sawing between the interface of the 5th and 6th thoracic vertebrae with a hand saw. If a narrower shoulder is required then this is obtained by sawing between the interface of the 3rd and 4th thoracic vertebrae.
- Once this cut has been made the neck is sawn transversely off using a hand saw.
- The shanks are next sawn off leaving two shoulders joined by the thoracic vertebrae. These vertebrae are sawn longitudinally in half along their mid-line to produce two shoulders.
- The shoulders are good cuts for curing. They can be roasted either with the bones in or out. Boneless rolled shoulder roasts can be braised rather than roasted. The shoulder can be cut into a number of different chops. These are arm chops, blade chops, Saratoga chops and boneless shoulder chops. These different types of chops can all be cooked by either broiling, panbroiling, panfrying or else by braising.
- The shanks can be preserved through corning or else eaten fresh after braising them or poaching them.
- The neck is cut into neck slices which are braised or poached.
- The breast is the next unit to be sawn from the carcass. The exact position where one places this cut is determined by personal preference. If one prefers short chops and a wide breast then this cut will be high. But if one prefers long chops and a narrow breast then this cut will be made lower. Like the shanks the breast is an easy cut to corn. It can be roasted, braised, poached or cut into riblets. It can be deboned and the resultant meat cut into pieces to be used in stews.
- The rack is the next unit to be cut from the carcass. A knife is used at first in order to cut the meat rather than saw it and to act as a guide for the saw. This unit is then sawn longitudinally along its mid-line into two rack units. The rack can be used to make a crown roast or else it is cut into chops which are broiled, panbroiled or panfried.
- The loins are cut next by sawing transversely from the long legs through the lumbar/sacral interface. These are then sawn longitudinally along the mid-line of the lumbar vertebrae resulting in two loin units. These loins can be boned, rolled and roasted, or cut into loin chops which can be broiled, panbroiled or panfried.
- The sirloin is sawn transversely from the long leg and then sawn longitudinally the same as the loin resulting in two sirloins and two legs. The thickness of the sirloin is left up to personal preference. The position indicated in Fig.A2:19 is the standard.
- The sirloin can be roasted either with the bones in or boned out. It can also be sawn into sirloin chops.
- The leg units can be roasted whole, or else chops can be cut from the proximal half which are broiled, panbroiled or panfried, while the distal half is either roasted or braised. The leg is highly suited to curing.
- The trimmings produced from dressing the carcass can be minced and used to make sausages.
- Lamb is easily and quickly preserved by curing. It can be cured using either a brine or a dry-cure method.
- Brine-curing of lamb uses a mixture of salt, white or brown sugar and saltpeter dissolved in water. The lamb cuts to be cured are submerged in this brine for up to three weeks. After they have cured they may be stored in a cold room or else they can be smoked.
- Dry-curing of lamb again uses a mixture of salt, sugar and saltpeter. This mixture is rubbed into the meat with more being added as needed. The meat may be left in the cure until required, or else, once cured it may be removed for smoking.
- Lamb cuts usually take two days to smoke using a hardwood smoke. The cuts should be removed from the cure two to three days before being smoked. There is a disadvantage to smoking lamb in that the meat tends to dry out rapidly after smoking and it develops a much stronger flavour. This strong flavour may be preferred by some, but the dryness is unlikely to appeal to many. A solution to this problem is to debone the freshly smoked lamb and then can the meat using a pressure cooker.

Example 7 (Fig. A2:20)
Reference: Davis (1987)
Nationality: British

Figure A2.1: Sheep (mutton and lamb) butchery pattern Example 1

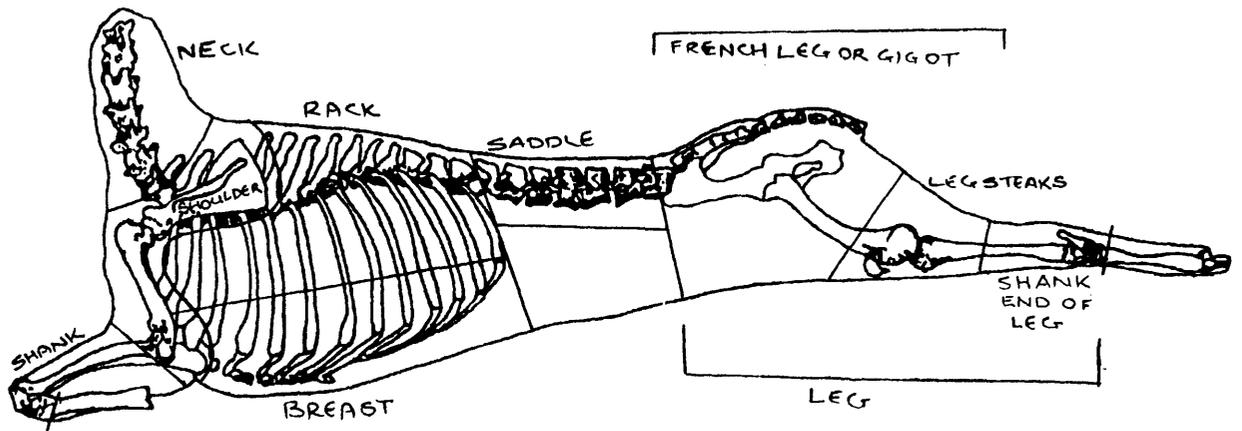


Figure A2.2: Sheep (mutton and lamb) butchery pattern Example 2

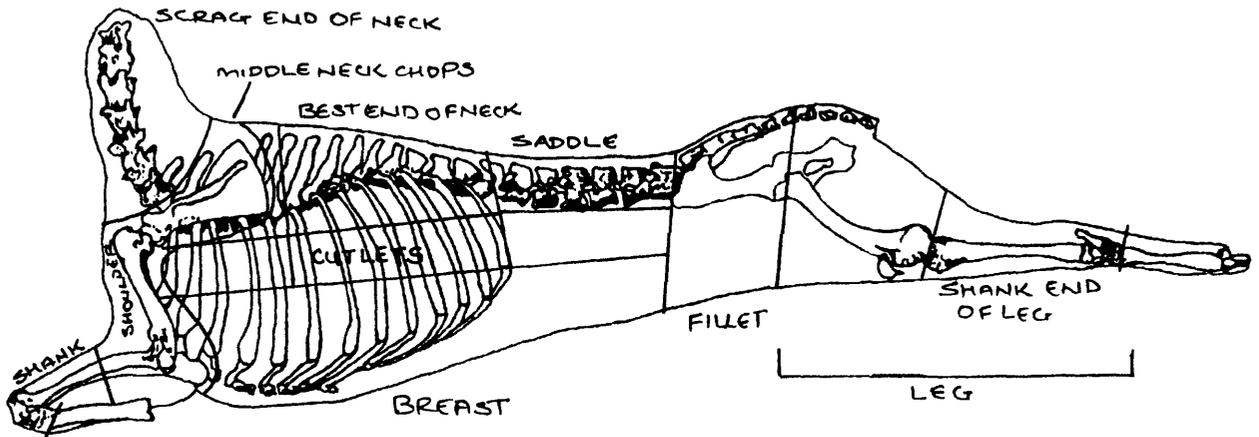


Figure A2.3: Sheep (mutton and lamb) butchery pattern Example 3

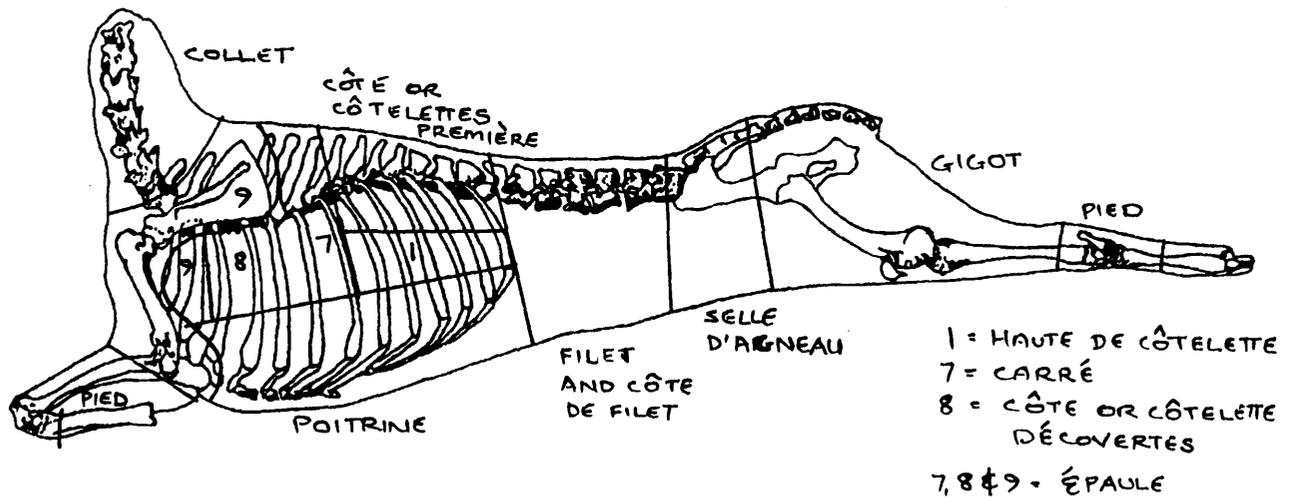


Figure A2.4: Sheep (mutton and lamb) butchery pattern Example 4

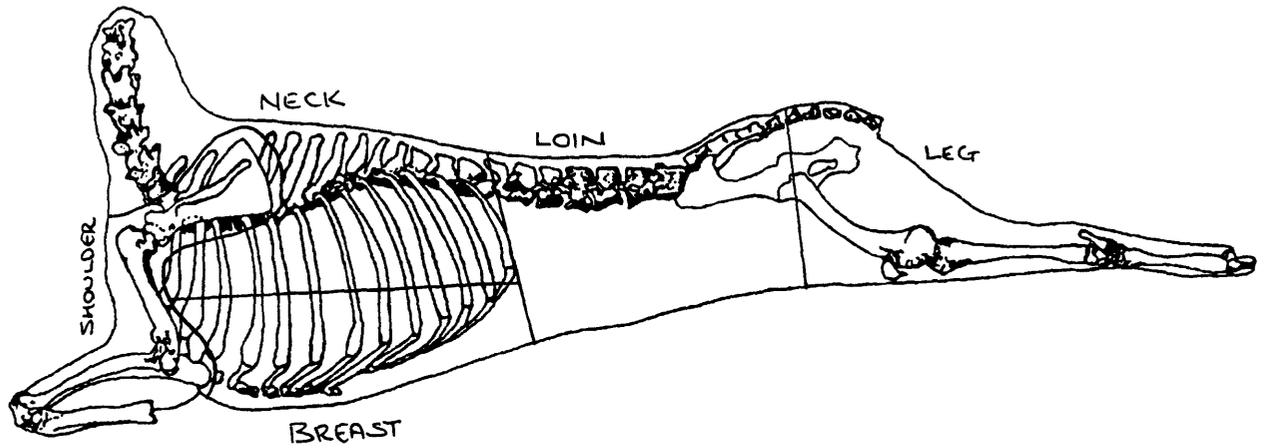


Figure A2.5: Sheep (mutton and lamb) butchery pattern Example 5

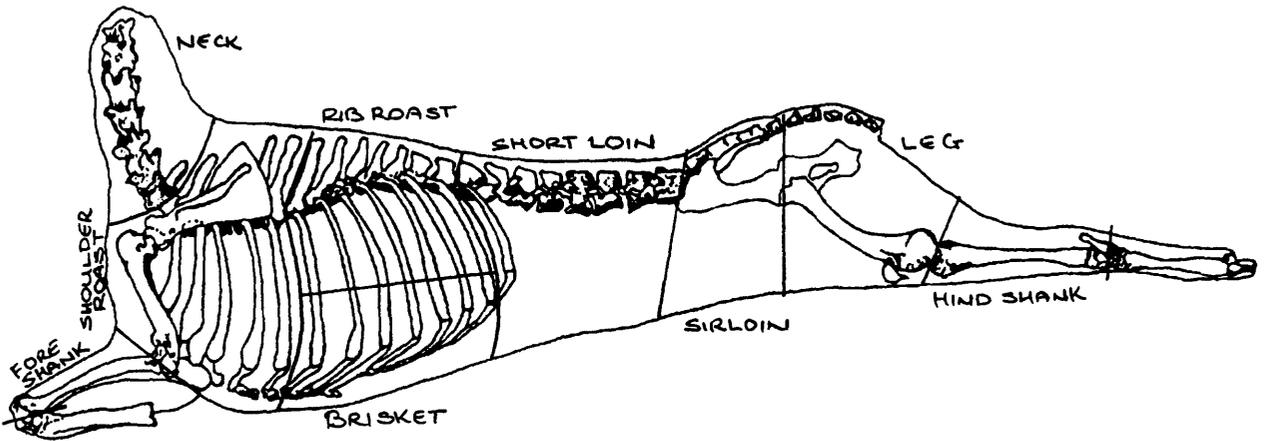


Figure A2.6: Sheep (mutton and lamb) butchery pattern Example 6

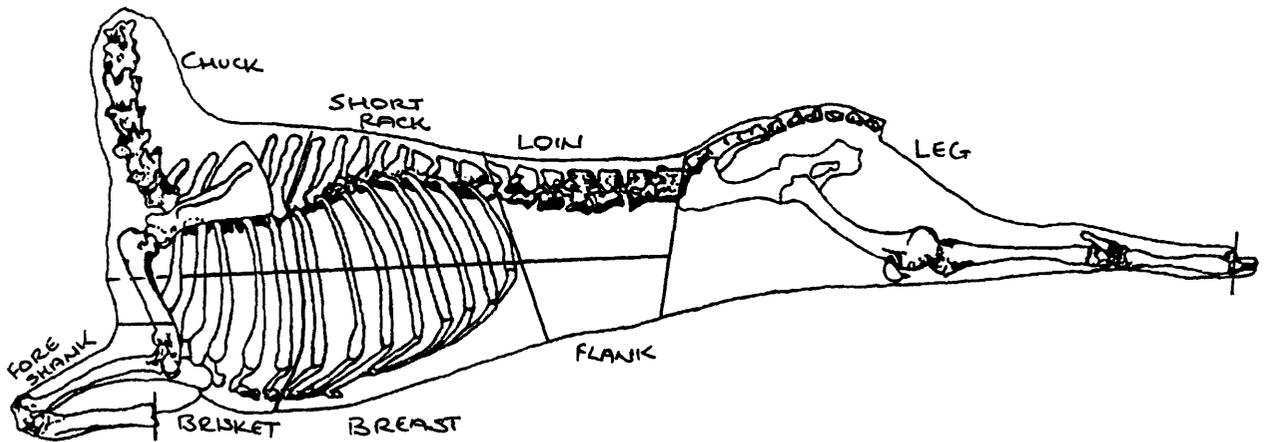


Figure A2.7: Sheep (mutton and lamb) butchery pattern Example 7

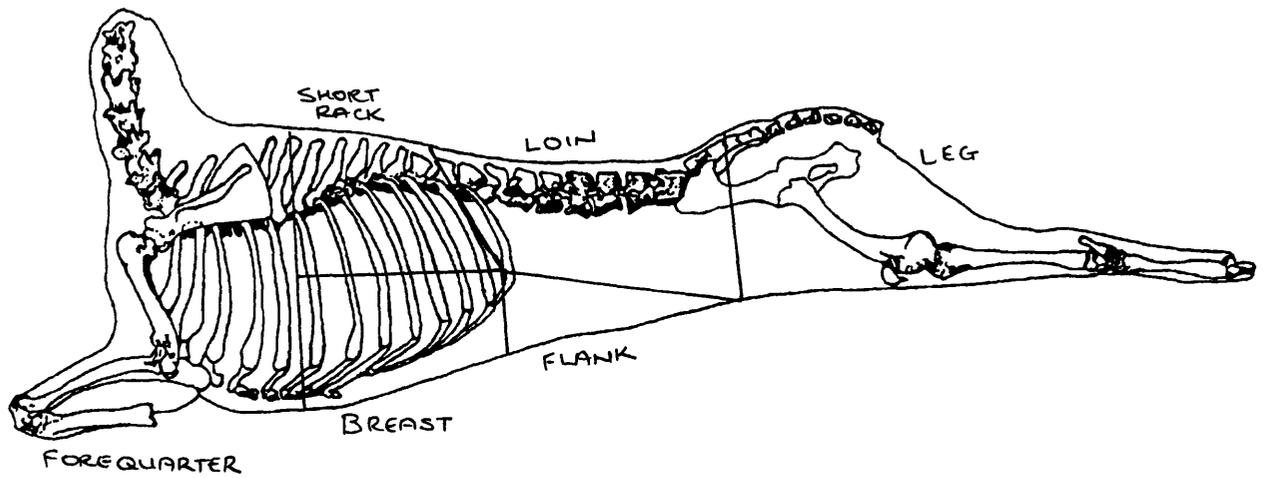


Figure A2.8: Sheep (mutton) butchery pattern Example 1

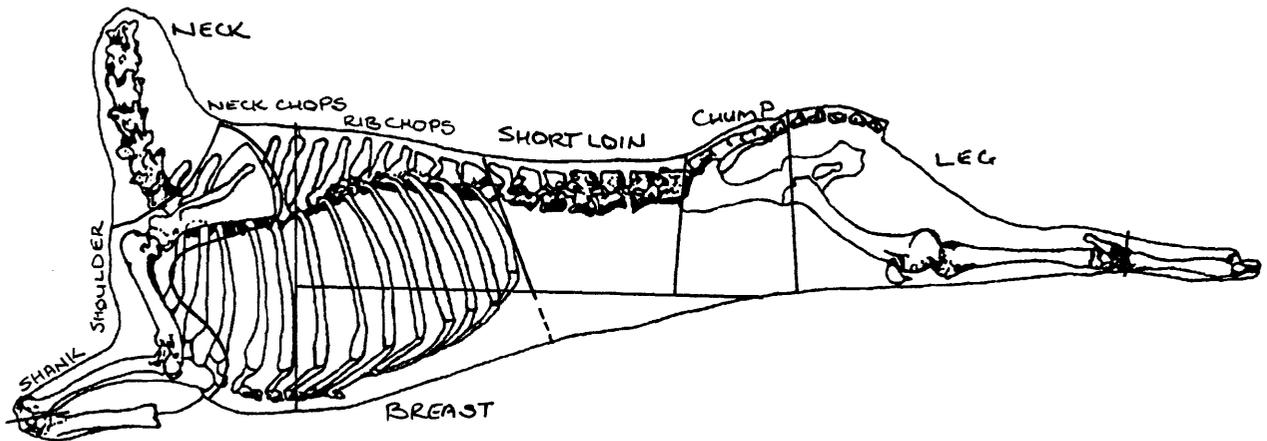


Figure A2.9: Sheep (mutton) butchery pattern Example 2

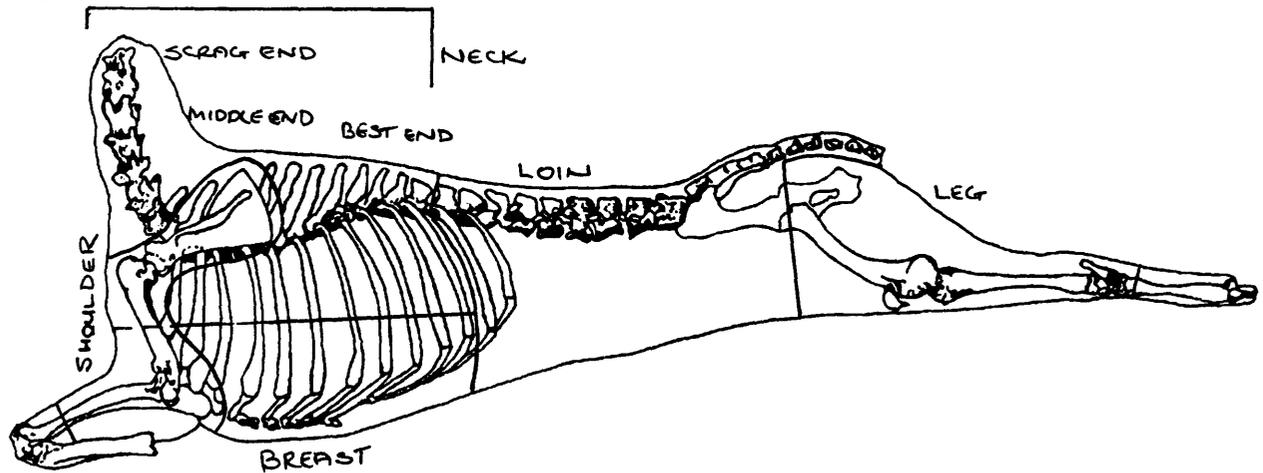


Figure A2.10: Sheep (mutton) butchery pattern Example 3

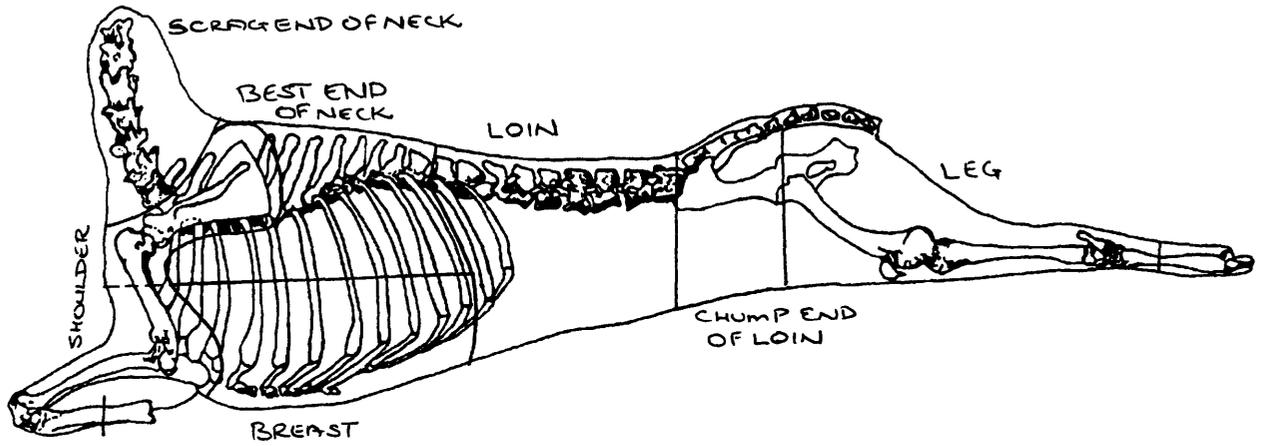


Figure A2.11: Sheep (mutton) butchery pattern Example 4

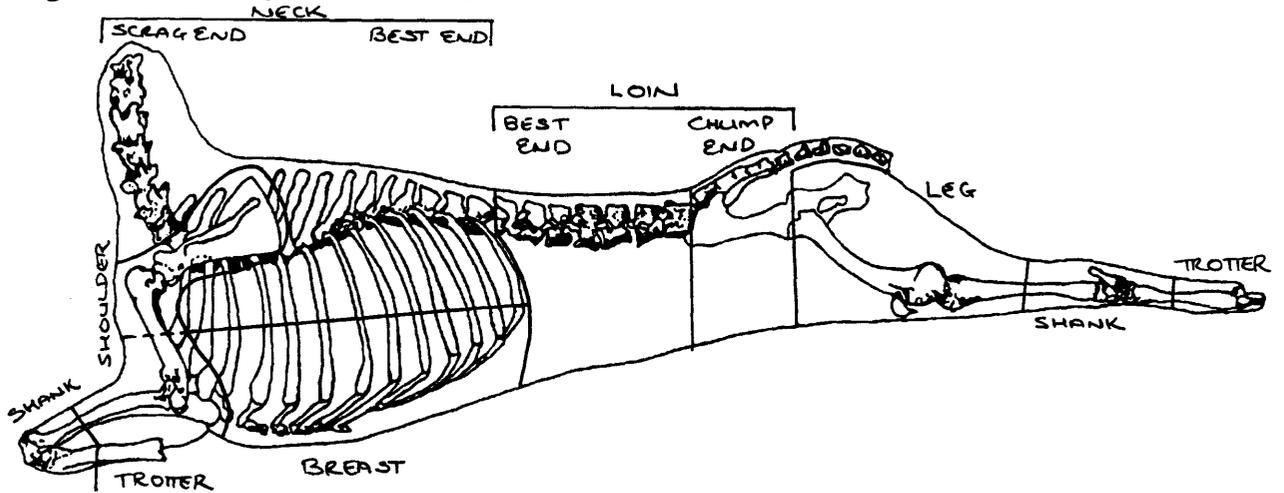


Figure A2.12: Sheep (mutton) butchery pattern Example 5

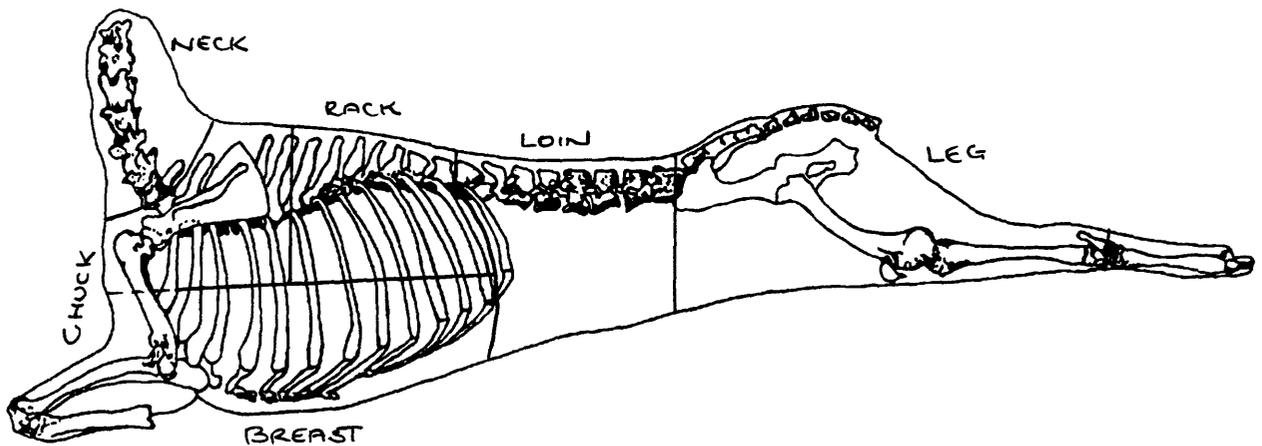


Figure A2.13: Sheep (mutton) butchery pattern Example 6

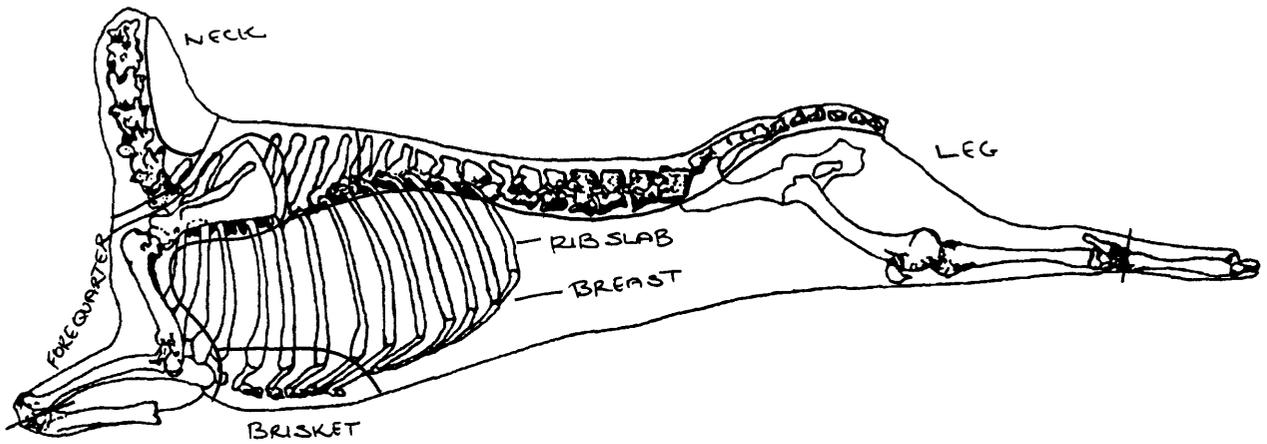


Figure A2.14: Sheep (lamb) butchery pattern Example 1

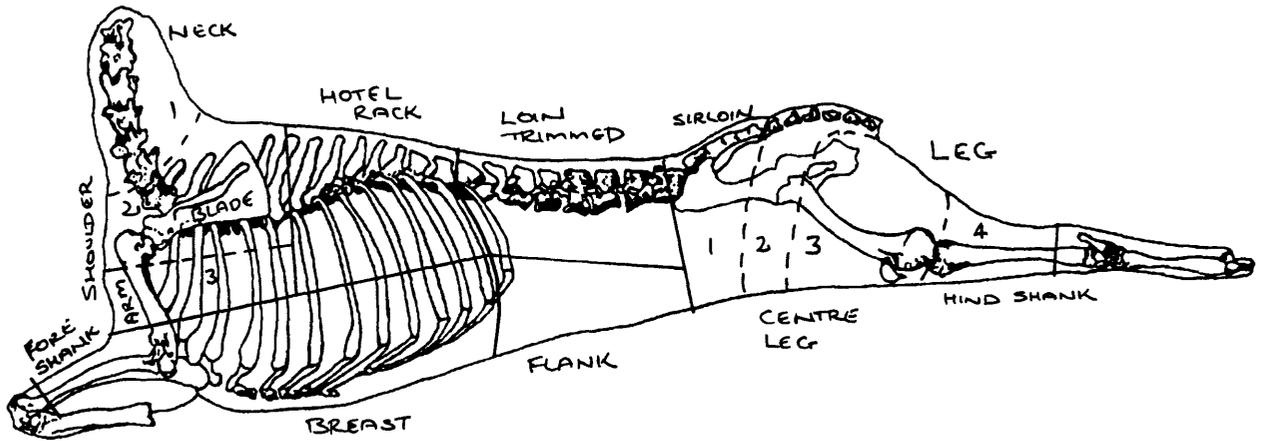


Figure A2.15: Sheep (lamb) butchery pattern Example 2

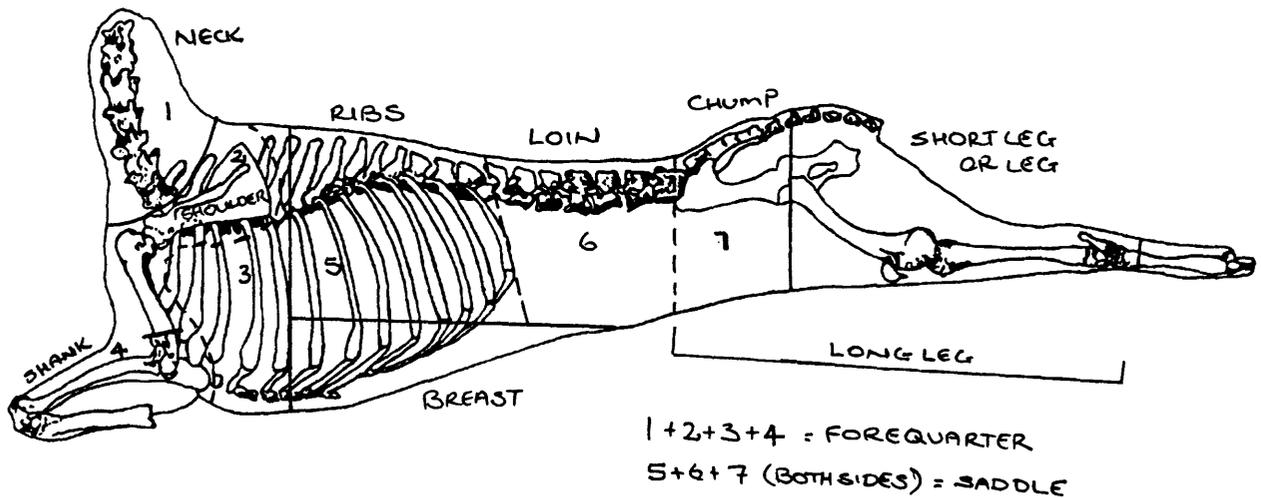


Figure A2.16: Sheep (lamb) butchery pattern Example 3

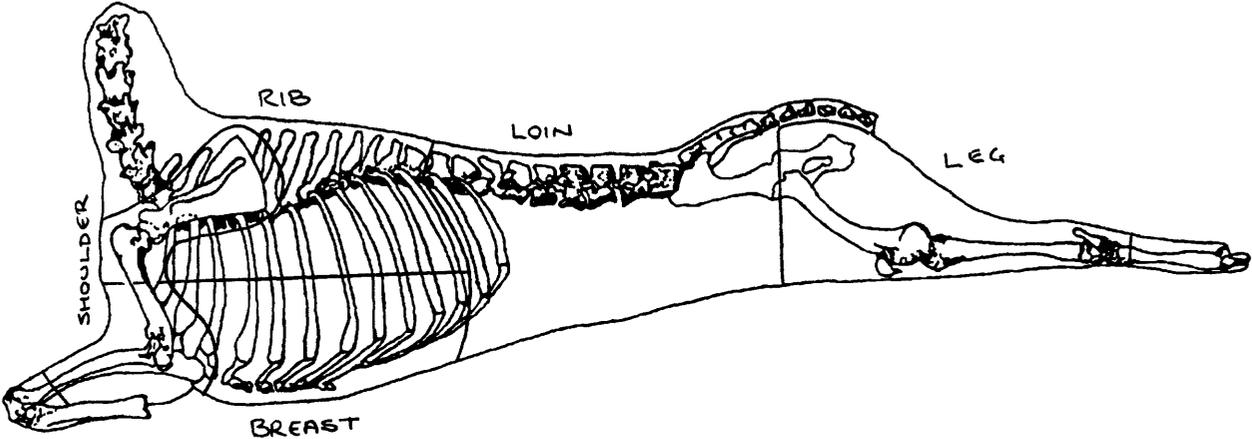


Figure A2.17: Sheep (lamb) butchery pattern Example 4

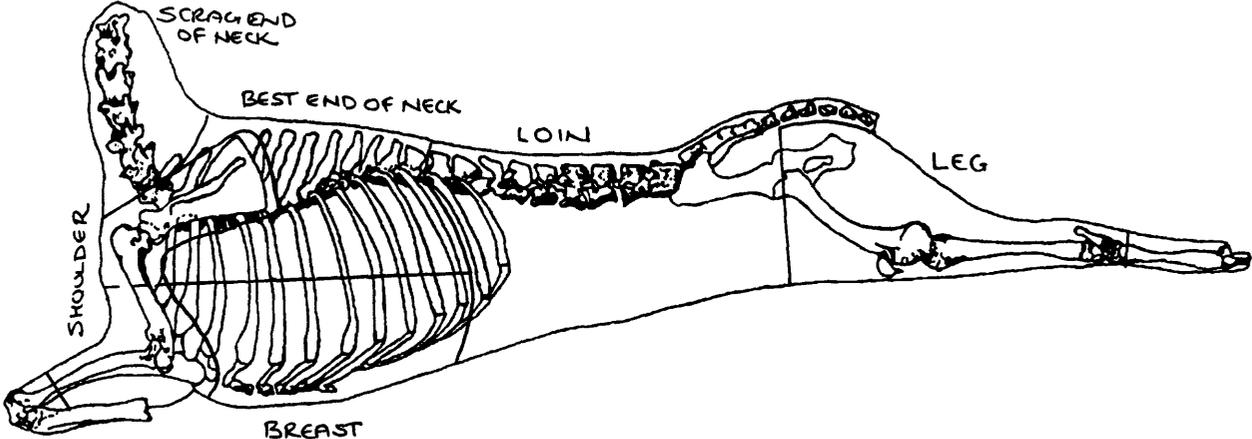


Figure A2.18: Sheep (lamb) butchery pattern Example 5

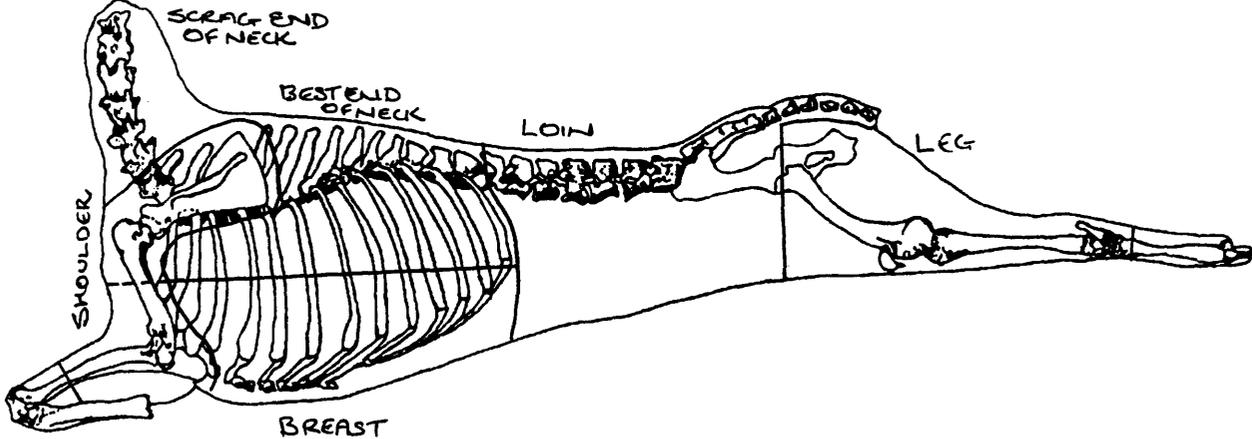


Figure A2.19: Sheep (lamb) butchery pattern Example 6

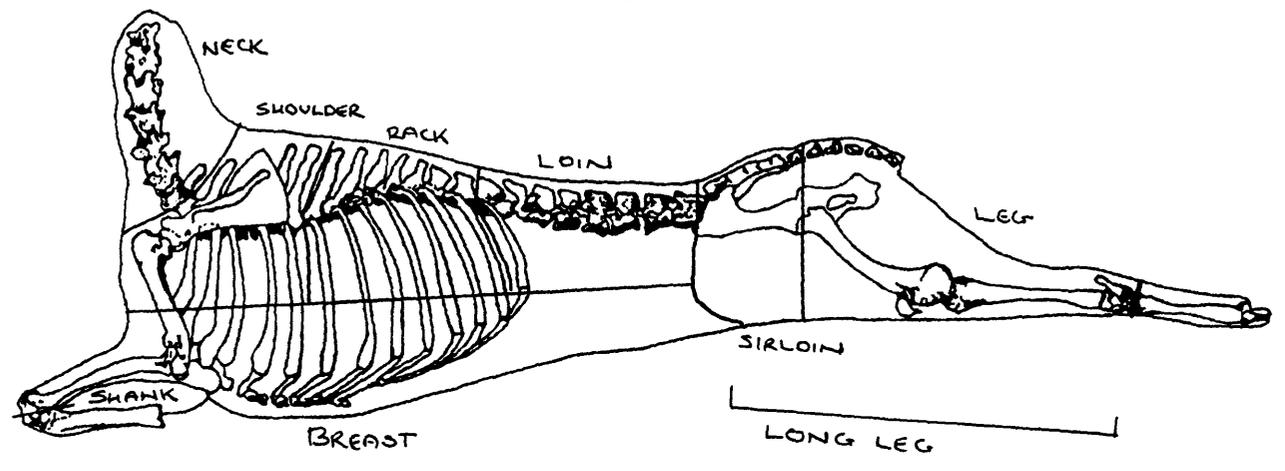
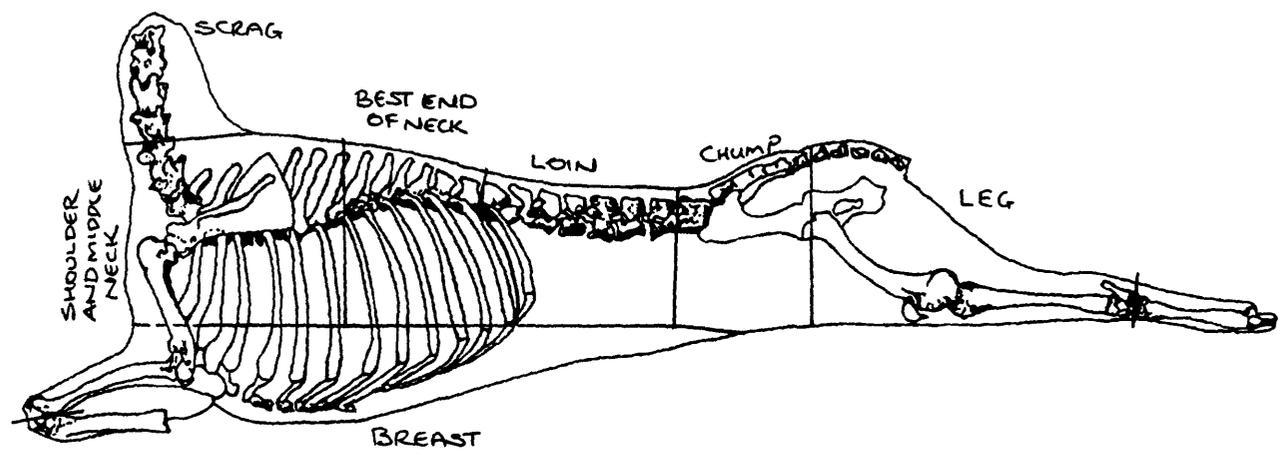


Figure A2.20: Sheep (lamb) butchery pattern Example 7



A2.2 Cattle

A2.2.1 Beef

Example 1	(Fig. A2.21)
Reference:	Dolowich (1976)
Nationality:	American

Notes from reference

- Retailers of meat (butchers) purchase sides of beef from wholesalers or packers. This means that the carcasses arrive already split longitudinally down their mid-line. The cranial and facial, mandibular, carpal, metapodial and phalange bones have all been removed before carcasses arrive at the butcher's shop.
- The carcass is hung by a 'V' hook through the Achilles tendon in a cooler until it has aged. It is then cut into a forequarter and a hindquarter by transversely splitting the carcass between the 12th and 13th thoracic vertebrae.
- The forequarter is then divided into four sections. These are the chuck, rib, plate, and brisket and foreshank.
- Firstly, the forequarter is halved by a transverse cut being made between the 5th and 6th ribs.
- The plate is next cut by transversely cutting across ribs 6 to 12.
- Next the foreshank and brisket are taken transversely off the fore portion leaving the chuck.
- The chuck is subdivided into four cuts which are usually braised or poached, though they may be cooked in alternative ways (see below).
- The meat on the cervical vertebrae (cut 1 on Fig. A2.21) is boned off. This meat can be cut into pieces for stewing, or else minced and subsequently roasted, broiled, panbroiled or panfried.
- The blade unit (cut 2 on Fig. A2.21) is known as the blade roast, blade steak, chuck steak or blade chuck. This unit can be roasted or pot roasted either with the bones in or else boned out. It is more usual to purchase this unit with the bones still in. When boned the unit is often called a boneless chuck eye roast. This unit is either roasted, broiled, panbroiled or panfried. The whole unit can also be turned into chops (with the bone in) which can be barbecued, braised or stewed.
- The arm unit (cut 3 on Fig. A2.21) is known as arm pot roast, arm steak, chuck arm steak, shoulder roast or arm bone roast. This unit can be roasted, pot roasted or braised. It may be boned out but it is usual for the humerus to be left in. If boned out it is known as boneless shoulder roast, or boneless shoulder steak if cut into steaks.
- The rib unit (cut 4 on Fig. A2.21) is known as the cross rib pot roast if it is purchased as a single unit. As its name suggests it is pot roasted. It is sold with its associated ribs. It can also be sold subdivided into bone bearing transverse strips of this unit called chuck short ribs.
- The foreshank is divided into two cuts. Cut 1 (on Fig. A2.21) is cut into shank cross cuts. This section of the foreshank is transversely cut into pieces which are either braised or poached.
- The upper portion of the foreshank is deboned and the meat cut into pieces for braising, poaching, or stewing.
- The brisket can be consumed as fresh meat or it can be corned. Brisket may be pot roasted but it is more likely to be either braised or poached. It is not clear whether it is boned out or not.
- The rib cut is either roasted, broiled, panbroiled or panfried. The last two methods apply if the unit is cut into rib steaks (chops) which may retain their associated bones or may be boneless. The unit as a whole (both cuts 1 and 2 on Fig. A2.21) is roasted or broiled and is known as a standing rib roast. It may be deboned to give rolled rib roast. If the rib cut is divided into two parts then cut 1 is known as a half standing rib roast (which may be with or without bone) and cut 2 is known as the short ribs.
- The dorsal aspect of the plate is also known as the short ribs. These are cut transversely across the ribs and longitudinally between the ribs to give cubes of meat and rib bone which are known as flanken. These are either boiled, used to make soup, or pot roasted.
- The plate or short plate as a whole (cuts 1 and 2 on Fig. A2.21) can be slowly simmered for use as a stock, for making soups, or braised. It can be deboned and cut into pieces for stewing, or minced for roasting, broiling, panbroiling, or panfrying.
- In dressing the hindquarter, the flank is first removed using a knife. Next the short loin is separated from the sirloin. The sirloin is then separated from the round. The round then has the rump and hindshank cut from it.
- The flank is minced and cooked by either roasting, broiling, panbroiling or panfrying.
- The short loin is usually cut into steaks. Cut 1 (on Fig. A2.21) is cut into club or Delmonico steaks which are broiled, panbroiled or panfried.
- Cut 2 (on Fig. A2.21) is cut into T-bone steaks which are also broiled, panbroiled or panfried.
- Cut 3 (on Fig. A2.21) is the porterhouse. This cut can be broiled whole or cut into steaks which are broiled or panfried.
- All the above short loin steaks are sold with the bone in.
- The tenderloin can be cut from the porterhouse and T-bone sections and sold separately as fillet mignon. This can be roasted whole or else it can be cut into steaks.
- The shell is the term given to the porterhouse and T-bone section if the tenderloin is removed. It can be roasted whole with the bone in or boned out. It can also be cut into shell steaks which are sold with the bone in. These shell steaks are broiled and also go by the names plain strip steak, Kansas strip or New York strip.
- Cut 4 (on Fig. A2.21) from the short loin is known as flank steak. It is broiled.

- The sirloin can be roasted whole, or else it can be cut into steaks: pin bone (or hip bone) sirloin (cut 1 on Fig. A2:21), flat bone and round bone (cut 2 on Fig. A2:21), and wedge bone (cut 3 on Fig. A2:21). These steaks can be sold with either the bone in or else the bone removed. They are broiled, panbroiled, barbequed or panfried.
- Cut 4 (on Fig. A2:21) of the sirloin is a boneless cut which may be roasted whole (tip roast) or else cut into steaks, known as sirloin tip steaks. These steaks are usually braised, though they can be roasted, broiled, panbroiled or panfried.
- The rump can be roasted or pot roasted with the bone in or with the bone removed. If removed, then it is usually rolled and known as a rolled rump. Rolled rumps are sometimes cut into steaks which are roasted, broiled, panbroiled or panfried.
- The round is subdivided into three cuts (see Fig. A2:21). Cut 1 can be roasted whole or minced. Minced round is roasted, broiled, panbroiled or panfried. It can also be cut into steaks which are usually boned and braised.
- Cut 2 is known as the heel of round and it is braised.
- Cut 3 is known as top sirloin. It is usually braised, though it can be roasted or cut into steaks which are roasted, broiled, panbroiled or panfried.
- The hindshank is usually stewed.

Example 2 (Fig. A2:22)
Reference: L toile et al. (1985)
Nationality: American

Notes from reference

- Figure A2:22 may not be an accurate reflection of what the editors intended with their cuts, as it was difficult to interpret their diagram. This was due to quite erroneous use of terms in relation to meat cuts, especially in the pelvic and rear leg region, such as the use of the term 'aitchbone'. Figure A2:22 and the following notes are my interpretation of the data provided, and are therefore subject to error.
- There was no indication as to whether or not meat was sold with bone or without. Only where this was made clear in the text have I stated this in these notes.
- The butt end is also known as the knuckle bone.
- The shank is stewed.
- The top round can be cut into round steak. As a whole unit it is pot roasted, and as steaks it is braised. The distal aspects of this cut (heel of round) are stewed.
- The bottom round is stewed.
- The rump roast as its name suggests is roasted. If the meat is of high quality then this joint is boned out and rolled before roasting. The ventral portion of the rump roast unit is known as tip. This can be roasted, pot roasted or braised.
- The sirloin tip is cut into steak and either broiled or fried.
- The flank or skirt steak is either braised or pot roasted.
- From the lumbar portion rib or club steaks are cut from the anterior end, porterhouse and T-bone steaks from the middle, and sirloin steaks from the posterior end. The tenderloin can be cut from the porterhouse and roasted or else cut into tenderloin steak (filet mignon) which are braised or fried as are the other steaks cut from this unit.
- The rib roast as its name suggests is roasted.
- The chuck roast as its name suggests is roasted. This cut can be boned out to give a boneless chuck eye roast which is braised or pot roasted. Boneless chuck is generally used as stewing meat especially that from the neck (cervical vertebrae), while high quality chuck can be cut into steaks which are broiled or fried.
- The meat associated with the scapulae in the chuck is often pot roasted as blade roast or else cut into blade steak which is braised.
- The brisket is stewed.
- The short ribs are either braised or pot roasted.
- The tail (coccygeal vertebrae) is stewed.

Example 3 (Fig. A2:23)
Reference: L toile et al. (1985)
Nationality: English

Notes from reference

- Figure A2:23 may not be an accurate reflection of what bones the editors intended to be associated with their cuts, as it was difficult to interpret their diagram. This was due to quite erroneous use of terms in relation to meat cuts. Figure A2:23 and the following notes are my interpretation of the data provided, and are therefore subject to error.
- There was no indication as to whether or not meat was sold with bone or without. Only where this was made clear in the text have I stated this in these notes.
- The shins are used in stews.
- The round has several cuts of meat associated with it. From the dorsal end silverside and rump are cut. From the ventral end round steak and topside are cut. The rump and topside are roasted. Top side can also be braised or stewed. Silverside is either braised or stewed.
- The aitchbone is either braised or stewed.

- Rump steak is cut from the posterior end of the unit called rump in Fig. A2:23, while sirloin steak is cut from the anterior end. Rump steak is either grilled or fried. Whole sirloin may be roasted.
- The flank or skirt is either braised or stewed.
- The short ribs are also known as the rolled ribs.
- The baron is the term given to the whole lumbar section when both sides are present together. This section of the carcass is usually cut into sirloin, porterhouse, T-bone and rib steaks (from the posterior end to anterior end respectively). The tenderloin can also be cut from the lumbar section and it is cut into fillet steak. These steaks are grilled or fried.
- The rib roast as its name suggests is roasted.
- The chuck is either braised or stewed.
- The neck is also called the clod or sticking. It is used in stews.
- The brisket is either braised or stewed.
- The tail (coccygeal vertebrae) is stewed.

Example 4 (Fig. A2:24)
Reference: L toile et al. (1985)
Nationality: French

Notes from reference

- Figure A2:24 may not be an accurate reflection of what bones the editors intended to be associated with their cuts, as it was difficult to interpret their diagram.
- There was insufficient indication of whether most meat was sold with bone or without to comment upon this. This was also true of variation in culinary techniques and terms given to cuts. The next example, however demonstrates that variability exists in French beef butchering.

Example 5 (Fig. A2:25)
Reference: Bar (1977)
Nationality: French

Notes from reference

- Figure A2:25 may not be an accurate reflection of what bones were intended to be associated with the cuts, as it was difficult to interpret the diagram.
- There was insufficient indication of whether meat was sold on the bone or off the bone to make accurate statements. What can be said is that there was the impression that considerable deboning or defleshing took place prior to sale of meat.
- The text indicated that there were a variety of acceptable means to cook each cut.

Example 6 (Fig. A2:26)
Reference: Johnston (1976)
Nationality: Australian and New Zealand (trade method, but also intended for farmers)

Notes from reference

- These describe the trade method for cutting up a dressed carcass. Dressed means that the carcass has been skinned, gutted (leaving only the kidneys and suet fat, the head (cranial and facial bones) removed at the occipito-atlantal articulation, and the feet (metapodials and phalanges) removed).
- The dressed weight of a young beef steer is approximately 550 lbs (i.e. approximately 60% of its live weight).
- The animal is generally slaughtered at an abattoir and supplied to the butcher as quarters. These arise from mid-line longitudinal bisection of the carcass to produce two sides, followed by transverse bisection of each of these sides at the thoracic/lumbar interface. This results in two forequarters and two hindquarters.
- The hindquarters are the most important part of the carcass in the commercial situation, because the most valuable steak cuts come from it.
- Trade practices in butchering a carcass do vary, but the standard manner taught is to divide the hindquarter into five portions: a leg, a butt, a rump, and a thin flank, and a loin.
- The 'Bark' is first removed from the thin flank using a knife. This is a piece of thick hard muscular sheeting which is used in making small goods such as sausages.
- The cod fat or udder is removed next from the thin flank using a knife and is processed latter into tallow.
- The thin flank which is also known as the skirt is removed next.
- The hindquarter is then divided into two portions: the rump and loin, and the butt and leg. This is achieved by using a knife to cut through the meat and a saw to cut through the acetabulum and the ischium.
- The rump and the loin are separated from one another by cutting through the flesh using a knife, and then using a saw to cut through the sixth lumbar vertebrae.
- The choicest steak comes from the rump and the loin.
- The kidney is encased in thick kidney suet. This is removed from the loin, with the suet. The suet is later sold as cooking suet.
- The sirloin is then boned out to produce two cuts from which steaks can may be cut. These are the eye of the fillet (from the medial surface of the lumbar vertebrae) and the sirloin (from the lateral surface of the lumbar vertebrae).

- From the rump, the pelvic suet is removed first using a knife. This is later rendered for dripping.
- The fillet steak, also known as the short or butt fillet (if cut prior to division of the rump and loin with the eye fillet, then it is known as the long fillet), is cut from the medial surface of the rump as a boneless cut using a knife.
- The rump is then cut into steaks.
- Four meat cuts are taken from the butt. These are the topside or buttock steak (which yields good steaks for grilling or frying), the silverside, the thick flank or round, and the leg of beef.
- The round or thick flank is cut off this joint using a knife. It is a boneless cut and its location is shown on Fig. A2:26 as area 2 in the butt end.
- The topside and silverside are then cut using a knife from the femoral region, represented by area 1 in the butt cut on Fig. A2:26. The silverside is cut from the outer or lateral surface of the femur. Both these cuts are boneless.
- The femur is then separated from the tibia and the leg cut using a knife to sever the adjoining tendons.
- The only cut from the hindquarter to be sold with bone is the leg of beef cut consisting of the tibia and the tarsals.
- The first cut to be made on the forequarter, is that of removing the thin skirt from the inner medial side of the posterior ribs. In general practice the middle skirt is removed at the abattoir.
- The forequarter is generally divided into five major cuts. These are the ribs, brisket, chuck, blade and shin.
- The correct procedure once the skirt has been removed is to remove the brisket cut. This is achieved using a knife and a saw. The reference does not elaborate as to what butchering practices may subsequently take place on the brisket. What the reference does state is that the width and size of the brisket cut is determined by the weight of the carcass.
- The shin is then removed using a knife to separate the radius/ulna from the humerus at their interface. This can then be boned out to produce gravy beef.
- The chuck is then removed by dividing the remaining forequarter transversely using a knife and a saw between the fourth and fifth rib or the fifth and sixth rib.
- The blade cut is then removed using a knife to cut between the muscular seam between those muscles adhering to the scapula and those to the ribs and thoracic vertebrae.
- There are variations on this sequence of breaking down a forequarter into its cuts. In Victoria and South Australia, the blade and shin are first removed as one piece, followed by the brisket and the chuck. Another variation in New Zealand is to bone out the humerus, radius and ulna, leaving the meat on the forequarter.
- The blade cut is further subdivided by using a knife to separate the humerus from the scapula.
- The meat adhering to the chuck is cut off the bone using a knife and sold as chuck steak.
- The meat on the scapula boned from the lateral surface is called blade or blade bone steak.
- Exactly what happens to the meat coming from the humerus was not made clear.
- The meat adhering to the rib or rib roast cuts is taken off the bone using a knife and cut into boneless roasting cuts. The roast taken from the posterior end of this cut is termed a wide rib (see sub-cut 1 on the rib cut in Fig. A2:26). The roast taken from the dorsal aspect of this cut (see position 2 on the rib cut in Fig. A2:26) is known as scotch fillet or cube roll. Prime rib roasts are cut from the ventral aspect of this cut (see position 3 on the rib cut in Fig. A2:26).

Example 7 (Fig. A2:27)
Reference: Glasse 1751
Nationality: English

Notes from reference

- It was not easy to convert the terms used in this text to cuts of meat represented by bones. This was because the terms in many cases are no longer in use or they apply to cuts no longer made. This may relate to the mode of cooking. The text infers that all cuts were roasted and garnished with 'nothing but horse-raddish' (p. 2). Figure A2:27 represents my interpretation of the cuts referred to in the text. The text did not make it clear whether or not cuts were sold with bones or they had been boned out. It did however indicate that the humerus was sold as a marrow bone as part of the haunch. Also sold was the ventral portion of the scapula as part of the leg of mutton-piece. The text also states that the chuck bone was sold. This may refer to the femur after the buttock had been deboned, as this bone has the highest marrow content.
- The heart was considered an edible portion as were the sweet breads, kidneys, shirts and tripe. The tripe being divided into three kinds: the double, the roll and the reed-tripe.
- Carcasses were bisected along their longitudinal mid-line into two sides.
- Each side was bisected transversely, most probably at the interface of the 12th and 13th thoracic vertebrae to give a fore and a hindquarter.
- The forequarter was subdivided into six portions; the haunch, leg of mutton-piece, the chuck-piece, the brisket, the four ribs and the middle ribs.
- The haunch which was also referred to as the neck end, included the clod, marrow bone, shin, and sticking-piece.
- The leg of mutton-piece contained those thorax muscles which attach the scapula to the body, and this cut contained part of the scapula (or blade-bone as referred to in the text).
- The chuck rib was also referred to as the middle rib (the term which by the nineteenth-century [Beeton 1986], had come to dominate).

- The term four ribs most probably does not relate to four ribs in the cut, but to the fore ribs. These were the most posterior ribs, which were generally regarded as having the best rib cuts. The terminology is very back to front, but the term fore ribs was used in the nineteenth-century (Beeton 1899; 1986) as were other terms which although implying a set number of ribs to a cut, in fact contained a differing number of ribs.
- The hindquarter was divided into a sirloin, rump, thin flank, thick flank, veiny-piece, the chuck bone, buttock, and leg.
- As stated earlier the chuck bone is interpreted as representing the femur. If meat was still adhering to this bone, and if so, how much, is not made clear in the text.

Example 8 (Fig. A2·28)
Reference: Beeton (1986)
Nationality: English (1860s London method)

Notes from reference

- The animal was slaughtered by striking the head just above the eyes with a smart blow from a hammer or poleaxe followed by the insertion of a cane by which the spinal cord was perforated.
- In Spain and some other continental countries, cattle were slaughtered by pithing or dividing the spinal cord in the neck close to the back of the head.
- Once slaughtered, the head was removed as were the carpals, metapodials and phalanges. These may, or may not have been discarded. The tongue was removed for sale and ox-head, ox-feet, and cow-heel were also used in some culinary practices.
- The animal would have been gutted. The kidneys were left adhering to the medial lumbar region. The organs which were eaten were not given but it was stated that tripe was used in some culinary practices.
- Carcasses were bisected along their mid-line longitudinally in order to produce two sides.
- Carcasses were transversely bisected in order to produce a forequarter and a hindquarter. The exact position of this is unclear but from descriptions in the text on the number of ribs present in certain forequarter cuts, it probably occurred between the 11th and 12th thoracic vertebrae. This is because the forequarter accounted for eleven ribs, there being thirteen ribs present on each side.
- The sirloin appears to have been sold with its associated bone as a roasting unit. It was also sometimes butchered as a double unit (that is not bisected mid way through the longitudinal line). The indication is that this cut referred to as a baron was more popular in earlier times being restricted to special occasions at the time this book was published.
- The rump could be sold with the bone in, or else boned out, either by the butcher or the consumer for conversion into steaks.
- The aitchbone cut was sold with the bone and was used as a boiling piece.
- The buttock was possibly sold with or without a bone, though this is not clear. It was regarded as a prime boiling piece.
- The mouse-round would have been sold without its associated bone and was used as a boiling or stewing cut.
- The hock would have been sold with the bone and used in the making of stews.
- The thick flank was a boneless cut which was sold with the udder-fat. It was regarded as the best boiling piece.
- The thin flank was sold without bone and was used as a boiling piece.
- The fore limb consisted of five ribs. It would have been sold with its associated bone but these may have been boned out in the kitchen before cooking. This cut was regarded as the best roasting piece.
- The middle rib consisted of four ribs and would have sold with its associated bone which may or may not have been boned out in the kitchen prior to cooking. This cut was regarded as the most economical joint for roasting.
- The chuck rib consisted of two ribs. This cut would have been boned out in the butchers shop and used for second quality steak meat.
- The leg of mutton-piece consisted of muscles from the shoulder (scapula), cut from the breast.
- The brisket or breast would have been sold with its associated bone. It was used for boiling after being salted.
- The neck, clod and sticking piece would have been boned out by the butcher, with the meat being sold for the making of soups, gravies, stocks, pies, and sausages (after being minced).
- The shin would have been sold with its associated bone for use in making stews.
- (p.317) 'All joints of roasted beef should be cut in even thin slices. Horseraddish, finely scrapped, may be served as garnish; but horseraddish sauce is preferable for eating with beef.'
- Bones removed in the kitchen, prior to the cooking of a unit, or bones retained after consumption of a roast cut which still retained its bones could be used in preparing other dishes.
- Bones removed by the butcher in defleshing some cuts were subsequently sold in some instances to be used for stews, soups, broths and the like. Trimmings made to cuts in the butcher's shop were also sold for the same purposes as bones.
- The tail of a cattle beast was sold with the coccygeal vertebrae for use in making of ox-tail soup.
- Five classes of cuts were recognised on their perceived quality. These were:

First Class:	The sirloin with kidney suet, rump steak-piece, and the fore rib.
Second Class:	The buttock, the thick flank, the middle rib.

Third Class:	The aitchbone, the mouse round, the thin flank, the chuck rib, the leg of mutton-piece, and the brisket.
Fourth Class:	The neck, clod, and sticking-piece.
Fifth Class:	The hock, and the shin.

Example 9 (Fig. A2·29 and A2·30)
Reference: Beeton (1899)
Nationality: English

Notes from reference

- Price of beef varied little with season.
- Beef was not popular in spring and summer when it was considered to be not as good as in autumn and winter.
- The method for butchering in London was the same as that outlined in Example 8.
- Two other methods of butchering cattle were offered. The first is shown in Fig. A2·29 and the second in Figure A2·30. The first is described below.
- The carcass was reduced to sides, with the head removed as well as the fore heels or feet (carpals, metacarpals and phalanges) and the hind heels or feet (metatarsals and phalanges).
- The following were all sold for consumption: the check, suet, shirts, heart, melt (spleen), tongue, liver, lights (lungs), brains, kidneys, tail, tripe, and cow-heels or ox-feet.
- In this case the carcass was divided into a fore and a hindquarter as a result of a transverse cut bisecting the 7th and 8th thoracic vertebrae. The cuts which were then made to each of these can be seen on Fig. A2·29.
- A double sirloin was known as a baron.
- The buttock was usually sold with the bone as were most of the other cuts but when boned out it was called a round.
- The rump could be boned out and cut into steaks for sale.
- The second method is now described. The cuts represented by this second method can be seen in Fig. A2·30.
- The carcass was divided longitudinally along its mid-line in order to produce two sides which were then transversely cut into a fore and a hindquarter at the interface of the 12th and 13th thoracic vertebrae.
- The heads of cattle were sometimes sold. Ox check was used in making soups or prepared for consumption through slow stewing. The head was regarded as being too boney to be a very economical joint, although it was sold at a low price.
- Brains, well soaked and boiled or fried, were regarded as a good dish.
- Cow-heels were sold by butchers with the skin on, and by tripe dressers with the skin off. The former was the most economical way to buy them, but they were troublesome to clean.
- Ox-tails were sold for soups and stews but since they were considered a delicacy they were not cheap.
- The heart was an economical organ which was generally roasted.
- The tongue could be purchased fresh or salted. It was considered a delicacy which was usually eaten cold after being boiled. It could also be stewed.
- The liver was priced cheaply and usually purchased by the poor. A food known as 'faggots' was sometimes made of the liver and lights (lungs) of sheep and bullocks mixed with fat.
- The lights or lungs were only sometimes sold for human consumption. They were only eaten by the very poor.
- The kidneys were relatively cheap and were sold for puddings, pies and stews.
- Tripe was sold partially cleaned by tripe dressers. It was known by a variety of names: blanket tripe, honey comb tripe, and book tripe.
- The pancreas or sweet bread was sold for consumption.
- The white internal fat of a carcass was sold as suet, with that surrounding the kidneys regarded as the best. It was used for many purposes, such as making puddings.
- The spleen or milt was sold for food. It was generally stuffed and roasted, or stewed, or boiled for stock.
- The sirloin could be sold as a double sirloin known as a baron but this was relatively rare. The sirloin was generally sold with the bone in and roasted, and for that purpose was regarded as the best joint. Some suet fat was always sold with the sirloin. The under cut or roll (fillet) was rarely sold separate from the sirloin, but some people did cut this out themselves and roasted it separately.
- The rump was generally sold with the bone and roasted. It could however be boned out in the butcher's shop and sold as steaks which were usually broiled but could be stewed.
- The aitchbone cut was sold with the bone and was often salted and cooked by boiling.
- The buttock was generally boned out and turned into steaks which were stewed. It could also be cut into a round, which lacked bone and was generally baked, and a silverside cut which contained the femur and was boiled. If sold whole with the bone it was usually roasted.
- The mouse round was sold with the bone and was usually used for soups, stews or puddings.
- The veiny-piece was used as stewing steak.
- The thick flank contained no bone and was used for pies, puddings, roasting or boiling. It was regarded as a very economical cut.
- The thin flank was regarded as being very economical and was priced low. It could be used for stews but was rather fatty for this purpose. Its best use was when salted and pickled, when it was consumed cold.
- The leg was only purchased for making soups or possibly stews.

- The fore rib was regarded as the best cut for any purpose, though it was generally roasted. The cut could be purchased in smaller portions. That is, the whole cut was not always purchased by the same person. The meat would be rolled into a roast, and the bones would subsequently be used by the purchaser in making soup.
- The middle rib was purchased with the bones in and was used as a roasting joint.
- The chuck rib could be roasted or else deboned and cut into steak.
- The leg of mutton-piece was generally sold without bone (scapula) and was regarded as an economical roasting cut. It was also regarded as the best cut for pies and puddings. It could also be boned out and cut into steaks.
- The brisket or breast was sold with its associated bone in. It was a cheap cut which was usually salted and used in stews. It was also cooked by boiling.
- The clod was regarded as an economical cut best suited to stewing. Most likely it was sold without bone. The meat was also used in making soups and for pie and puddings, following stewing.
- The neck was used in the same manner as the clod.
- The shin could be purchased boned out or else with the bone in. It was used for making soups, gravies and cheap stews.

Example 10

(Fig. A2:31)

Reference:

Ashbrook (1955)

Nationality:

American

Notes from reference

- Home dressing and cutting up of beef allows financial savings in the procurement of meat.
- The best animals for this purpose are yearlings because they produce light carcasses, light cuts, chill easily, and have tender meat.
- The animal should be killed where it is to be hoisted for skinning and gutting.
- The animal is stunned using an axe or sledge hammer blow just above the centre of the forehead.
- The animal should be bled by severing the arteries and veins in the neck.
- The animal should be hoisted as soon as possible as this will facilitate the bleeding of the carcass.
- The animal is then skinned.
- During skinning the head is removed at the occipito-atlantal articulation, the lower fore legs are removed at the carpal/metacarpal interface, and the lower hind legs are removed at the tarsal/metatarsal interface.
- The ventral mid-line of the carcass is then cut longitudinally to open the abdominal cavity. The pelvic bone is bisected longitudinally through the pubic symphysis using a saw or a cleaver as is the sternum. The caul fat is removed at this stage.
- If not already done so, the carcass should be hoisted by a beef tree or spreader placed between cuts made to each of the hind legs between the Achillies tendon and the distal tibia.
- The tail is removed at this stage.
- The offal and body organs are removed at this stage with the exception of the kidneys and the fat which surrounds them.
- The heart and the liver are taken for consumption.
- The diaphragm muscles are cut but left adhering to the carcass.
- The carcass is then split down the vertebral column. A saw is recommended to do this even though a cleaver is used in the commercial slaughter houses. This is because most amateurs can produce a better smoother cut using a saw.
- The two sides are then washed and a complete drainage of blood as possible made sure of. Any ragged edges are also trimmed at this stage.
- The two sides are then left to cool and chill for approximately 12 to 24 hours. Quick and complete removal of animal heat is essential to prevent spoilage. The carcass should be thoroughly chilled before it is cut up as it is impossible to make attractive cuts where the meat is not thoroughly chilled.
- The tongue is removed from the head by either severing its ventral-posterior connections or by using a hacket or cleaver to cut through the ramus of the mandibles.
- The brains are removed by using a saw or chopping tool to split the skull longitudinally along its mid-line.
- The trimmed fat from the intestines and paunch can be rendered and used in making soap or sold as tallow.
- The stomachs can be cleaned and processed into food known as tripe.
- There are different methods of cutting up a beef carcass. The one described below and shown in Fig. A2:31 is designed to give cuts suitable for curing, cooking and canning.
- Firstly the side of beef is transversely divided between the 12th and 13th thoracic vertebrae and the 12th and 13th ribs using a knife and a saw. This produces a forequarter and a hindquarter.
- A saw rather than an axe or cleaver should be used for cutting bones as this avoids bone splinters which may result in meat wastage.
- The plate (brisket) is removed first followed by the foreshank. This is achieved by using a knife to first cut through the flesh and then a saw to cut through the bone. The plate can be cut into small boiling pieces called short ribs, or else deboned with the meat being ground into mince.
- A transverse cut is made using a knife and a saw between the 5th and 6th ribs to produce a rib cut and the chuck.
- The rib cut can be further divided into two or three smaller rib roasts. These roasts may be boned out and rolled or else the bone may be left in.
- The chuck may be cut into roasts, but it is better suited for pot roasts, corning or deboning and the flesh ground into mince meat.

- From the chuck a two rib bone pot roast can be removed by cutting transversely across the humerus. Additional chuck roasts are then cut parallel to the ribs (see Fig. A2:31). The remainder of the chuck, the neck and shoulder, may be cut into suitable sized pieces for stewing or boned out with the meat being ground into mince.
- The first cut made to the hindquarter uses a saw and a knife to remove the flank. This cut also contains the flank steak which is pulled out by hand. The rest of the flank can be used for boiling or ground for mince meat.
- The kidney and the fat in which it is imbedded in is now trimmed out leaving enough fat on the back bone to cover the tenderloin.
- The loin is now cut using a knife and a saw from the rump and the round, and by cutting through the acetabulum. The loin may be further divided by a cut through the sixth and seventh lumbar vertebrae in order to produce a sirloin or loin end and a porterhouse or short loin.
- Steaks from the short loin are good eating.
- In the commercial situation three types of steak are cut from the short loin. These are from the posterior end moving towards the anterior end; porterhouse steaks, T-bone steaks, club steaks.
- In the commercial situation sirloin steaks are cut from the loin end.
- The rump is the next cut removed, by sawing across the ventral surface of the pubic and ischium.
- The rump makes a good roasting joint or it can be used to make choice corn beef.
- The pubis and ischium can be trimmed out of the rump cut.
- The hind shank is removed using a knife to sever the adjoining tendons between the distal femur and the proximal tibia. This produces a hind shank and a round joint.
- Both fore and hind shanks are used for making soups.
- The round is usually cut into round steaks with its ventral portion called the heel of round used as a pot roast cut.
- Ashbrook produces a beef chart (p. 124) showing commercial retail cuts and how to cook them. The pattern of butchery into the primary cuts as shown in Fig. A2:31 is the same as for the commercial situation. What varies is the manner in which these primary cuts or wholesale cuts are broken down into retail cuts. What this chart indicates is a range of potential cooking methods for each of the retail cuts available.

Example 11 (Fig. A2:32)
Reference: Lee Decker et al. (1987)
Nationality: American

Notes from reference

- The cuts in Fig. A2:32 are those used in an archaeological model to examine socio-economic status of mammalian faunal remains from nineteenth century historical archaeological sites. The cuts were derived from butchery methods practiced during the late 1940s in the north-eastern states of the United States of America.
- T-bone and porterhouse steaks were cut from the short loin.
- The rump was cooked by using it as a pot roast cut.
- The impression given is that with the exception of cranial and facial, metapodial and phalanx bones, bones were sold with meat.

Example 12 (Fig. A2:33)
Reference: Davies (1987)
Nationality: British (contemporary)

Example 13 (Fig. A2:34)
Reference: Lyman (1979)
Nationality: American

Notes from reference

- The units shown in Fig. A2:34 are based on the work of Eakins (1924).

Example 14 (Fig. A2:35)
Reference: Lyman (1977)
Nationality: American

Notes from reference

- The pattern of carcass division shown in Fig. A2:35 was interpreted from archaeological remains by Lyman for the military site Fort Walla Walla (Washington) dated to 1903.
- Once slaughtered animals were gutted and skinned. The cranio-facial bones, metapodials and phalanges were discarded.
- The carcass was then split longitudinally in half along its mid-line.
- The carcass was subdivided into units shown in Fig. A2:35.

A2.2.2 veal

Example 1 (Fig. A2:36)
Reference: Dolowich (1976)
Nationality: American

Notes from reference

- Veal is the meat of calves that are less than a year old when slaughtered.
- Vealer is the term applied to a cut that is slaughtered at approximately 12 weeks of age, after subsisting solely on its mother's milk. They weigh up to 250 pounds.
- Calf veal usually comes from animals aged five months when slaughtered, after having been fed on grass or grain for two months. They can weigh up to 400 pounds.
- Bob veal comes from animals aged only one to five days when slaughtered. The carcasses of such animals are completely boned out and processed into baby food, frozen or canned meats, patties or breaded cutlets.
- The carcass of veal is divided into two parts. They are the hind saddle and the fore saddle.
- The hind saddle is more expensive because it is perceived to produce better cuts.
- The hind saddle is divided into four major cuts: the leg, the hind shank, the flank, and the loin.
- The fore saddle is divided into four major cuts: the rack (or hotel rack), the shoulder, the breast, and the fore shank.
- The leg cut is usually broken down into three sub units: the sirloin, rump and round. The round can further be subdivided into two units. These roasting joints can be purchased either with the bone in or else with it boned out.
- The sirloin can be cut into chops.
- The round can be deboned and turned into a variety of cuts, such as veal cutlets, veal scallopini, veal birds.
- The hind shank is sold with the bone in and is usually roasted.
- The loin of veal sometimes referred to as the porterhouse of veal is the most expensive and most popular cut. It is used as a roasting unit. It can be purchased either with the bone in or else boned out.
- The loin is also cut into loin veal chops.
- The rack is sold with the bone in as a roasting unit. It is also sold after subdivision into chops with or without the bone in.
- The breast can be sold with or without the bone in as a roasting or braising cut. It can also be cut into boneless riblets or bone in riblets.
- The shoulder is often subdivided into three cuts: the neck, the blade, and the arm.
- The arm and blade are sold as roasting units, either with the bone in or boned out. They are also cut into chops which are sold with the bone in. These cuts are less expensive.
- The neck is generally boned out and the meat diced and sold for stewing (as can the meat from the arm and blade), or it is ground for mince meat (as can the meat from the arm and blade).
- The fore shank is often cross cut transversely and sold with the bone and usually cooked by braising.
- Veal should not be broiled. It is best suited to roasting, sauteeing, stewing and braising.

Example 2 (Fig. A2:37)
Reference: Létoile et al. (1985)
Nationality: American

Notes from reference

- The carcass is bisected longitudinally along its mid-line in order to produce two sides.
- The leg is a roasting joint which can be sold boned out. Veal birds are cut from this joint.
- The round is cut into steaks which are broilled or fried.
- The rump is roasted.
- The loin is used as a roasting joint though it can also be cut into loin chops or loin steaks which may be broiled, fried or braised.
- The centre ribs can be roasted as a rack or else cut into chops which can be broiled, fried or braised.
- The shoulder chop cut as its name suggests is cut into chops which can be broiled, fried or braised.
- The shoulder can be roasted with either the bone in or out.
- The neck is deboned and cut into cubes known as city chicken. These can be broiled, fried, or stewed.
- The shank is usually braised.
- The breast is usually braised.

Example 3 (Fig. A2:38)
Reference: Létoile et al. (1985)
Nationality: English

Notes from reference

- The carcass is bisected longitudinally along its mid-line.
- The shin is used for stews.
- The leg (including the topside or cushion) is roasted.
- The escallops or scallops are cut from the femoral shaft. These are grilled or fried.

- The fillet is cut into steaks or boned and sliced into escallops. Both are fried or grilled
- The rump of loin can be cut into chump chops which are grilled or fried.
- The loin is roasted or cut into loin cutlets or loin chops which are grilled or fried. A double loin is called a saddle.
- If boned out the middle neck is roasted. Otherwise it is cut into cutlets which are braised.
- The scrag end of neck is deboned and used in stews.
- The shoulder or oyster cut is used as a roasting unit.
- The knuckle is usually braised.
- The breast is usually braised or cut into riblets which are also braised.

Example 4 (Fig. A2:39)
Reference: Johnston (1976)
Nationality: Australian and New Zealand (trade method, but also intended for farmers)

Notes from reference

- Veal must always be kept in a properly chilled condition to prevent deterioration.
- Carcasses are normally delivered to the wholesalers in their skin.
- Veal carcasses produce a relatively high proportion of meat.
- Off-cuts can be used for manufacturing purposes.
- Many portions can be retailed bone out and rolled.
- The carcass is split longitudinally in half along its mid-line in order to produce two sides.
- The breast is removed first by using a knife and saw. The width of the breast is determined by the size of the carcass. It can be boned out and sold after being rolled by the butcher as a roasting cut. It is also excellent for braising and stewing. It can also be cut into veal chops or cutlets.
- The knuckle is removed first using a knife. It can be used by the butcher to make brawn meats or small goods as it is rich in gelatine. It can be boned out and the meat minced or diced for use in curries. It can also be sold without being deboned for use in soup making.
- The neck is removed using a knife at the interface of the 5th and 6th cervical vertebrae. Like the knuckle it is sold for soup making or else deboned and either diced or ground for sale as mince.
- The forequarter is removed using a knife and a saw at the interface of the 5th and 6th ribs and 5th and 6th thoracic vertebrae. In Victoria and South Australia the general practice is to remove the forequarter at the interface of the 4th and 5th ribs. It is then boned and rolled, being sold as a boneless roasting cut. Elsewhere it is also boned and rolled for sale as a boneless roasting joint. A joint boned by a butcher may also be diced into pieces for casseroles or ground into mince meat, or even sliced into continental-style cuts. The bones can be sold for making soups.
- The loin is removed by cutting with a knife through the first inter-lumbar joint anterior to the ilium crest. This cut is cut into fourteen to sixteen choice chops or cutlets.
- The leg can be subdivided into smaller units such as a long leg, short leg, butt and shank. The text, however, does not clearly indicate where these cuts take place. The impression given is that the short leg includes pelvic bones and is sold as a roasting cut. With the exception of the shank which is mainly used for soup and brawn, the leg can be deboned and cut into various veal steaks such as fillet steaks and leg steaks.
- The general practice in South Australia and New Zealand is for veal joints to be sold after deboning.

Example 5 (Fig. A2:40)
Reference: Beeton (1986)
Nationality: English (1860s)

Notes from reference

- The flesh of a calf was called veal. When young (under two months) it yielded a large quantity of soluble extract and was therefore much employed for soups and broths.
- The practice of slaughtering calves immediately following birth or within a few days of birth had ceased by the time this book was first published.
- It was the authors opinion that calves should not be slaughtered before 4 weeks of age. In France there was a law forbidding the slaughter of calves prior to six weeks of age. A calf was considered in prime condition at ten weeks of age when it would weigh sixteen to eighteen stone and sometimes twenty stone.
- Animals use to be slaughtered by bleeding them daily until such time as they could not stand. The practice when this book was published was to cut their throats severing the large arteries and veins.
- The skin was then taken off to the knees which were then disjointed. The feet were sold for consumption.
- The head was then removed. The heads were sold. These were boiled and the bones removed during cooking. The brain and tongue were consumed.
- Once skinned the carcass was gutted and kept apart by stretchers. The thin membrane (the caul) which surrounds the organs was left in the carcass as were the kidneys and sweet breads. The carcass was then left to cool and set before being butchered into cuts for sale.
- The portions that a carcass was broken into can be seen in Fig. A2:40.
- The carcass was split longitudinally along its mid-line to produce two sides. Each side was then transversely bisected between the 11th and 12th ribs in order to produce a forequarter and a hindquarter.

- Cuts were sold with bone, but could be later boned out in the kitchen, with the bones being used to produce stock, gravies, soups and the like.
- Knuckles were generally boiled or stewed.
- The fore knuckle was likely to be sold with the shoulder cut which was often stewed.
- The breast could be roasted or stewed.
- The loin was often cooked with the kidney and some kidney fat, and could be stewed or roasted.
- The fillet could be stewed or roasted.

Example 6 (Fig. A2·40)
Reference: Beeton (1899)
Nationality: English (1890s)

Notes from reference

- The manner in which the carcass was butchered was the same as that described in Example 5. The cuts were the same, so refer to Fig. A2·40 to see what these were.
- The head was cooked by boiling and eaten hot or cold in a variety of ways. Brains were often served as an entrée. The tongue was prepared by boiling.
- The sweet breads (pancreas and thymus glands) were considered a delicacy. They were cooked in a variety of ways, but usually fried and served as an entrée.
- The liver was often sold with the fry and cooked with it. Because it was very lean it was often cooked by frying with fat or bacon.
- The feet were popular with the poor. They were sold by tripe dressers and by butchers for use in making jelly in the place of prepared gelatine. They could also be stewed or fried.
- The heart was used as a small roasting cut which was relatively popular and economical. It could be purchased separately or with the pluck and fry.
- Veal suet was regarded as being better than that of beef and was used in making puddings and forcemeats.
- The kidney of a calf was preferred to a beef kidney.
- The loin was regarded as a prime roasting joint.
- The chump or chump end of loin was roasted or cut into cutlets which were fried.
- The fillet was regarded as the most economical and least boney roasting joint. The best cutlets were cut from this joint and prepared by frying.
- The hind knuckle was low priced and used for boiling, stewing or making stock.
- The fore knuckle was usually prepared by boiling or stewing though it was occasionally roasted.
- The neck was usually cut into two portions. The posterior end being referred to as the best end of neck. It was regarded as having too large a proportion of bone to be an economic cut. It could be roasted or cut into chops. The anterior end of the neck was regarded as being more suitable for stewing.
- The shoulder or blade bone was often sold in halves for roasting or stewing. It was sometimes cut into cutlets.
- The breast was regarded as a cheap cut which was sometimes roasted but better braised or stewed. Veal tendons which were served as an entrée were cut from this joint.

Example 7 (Fig. A2·41)
Reference: Glasse 1751
Nationality: English (1751)

Notes from reference

- The head and innards were called the pluck, and these were eaten after broiling. The pluck consisted of the heart, liver, lights (lungs), melt (spleen), skirts, throat sweet bread, and the wind pipe sweet bread (which was regarded as the finest).
- The carcass was split longitudinally along its mid-line in order to produce two sides.
- Each side was then transversely bisected in order to produce a forequarter and a hindquarter. The exact position of this cut is unclear, but it has been position on Fig. A2·41 between the 11th and 12th ribs as was the practice in the nineteenth-century.
- The forequarter was divided into a shoulder, neck and breast.
- The hindquarter was divided into a loin and a leg. The leg contained both the knuckle and the fillet.
- Cuts of veal were prepared by roasting.

Example 8 (Fig. A2·42)
Reference: Ashbrook (1955)
Nationality: American

Notes from reference

- Veal is the dressed carcass of a calf aged between one and three months when slaughtered and weighing 75 to 150 pounds.
- The animal is killed by first stunning it and then bleeding it.
- Skinning the animal is made easier by hoisting it.
- If the carcass is to be cut up at home the hide can be removed at once as it is easier to skin the animal while it is still warm.

- If the carcass is to be transported any distance the hide should not be removed for it preserves the light colour and prevents the carcass from drying out.
- The carcass is at this stage eviscerated and the pubic symphysis and sternum are split longitudinally.
- The head and feet are removed at this stage.
- The brains are extracted and along with the liver and sweetbreads are eaten fresh.
- The carcass has to be chilled thoroughly before it can be cut up.
- The same general pattern followed for butchering a beef carcass can be applied to veal.
- The butchery of the carcass is completed using a knife.
- The carcass is split longitudinally in half along its mid-line in order to produce two sides.
- Next the carcass is divided into a fore and hindquarter by a transverse cut made between the 12th and 13th ribs.
- The carcass can then be cut into the major and minor cuts shown on Fig. A2·42. The major cuts refer to wholesale cuts, and the minor to retail cuts.
- The neck is usually cut into chunks for use in stews and soups. It is not made clear whether the cervical vertebrae are boned out or not. The neck can also be cut into cubes without bone to be braised or panfried.
- The arm can be used as a roasting or braising joint with the bone in or cut into arm steaks with the bone in. These steaks are braised or panfried.
- The blade can be used as a roasting or braising joint with the bone in or cut into blade steaks with the bone in. These steaks are braised or panfried.
- The whole shoulder can be boned out and rolled to make a joint which can be roasted or braised.
- The fore shank can be deboned and cut into chunks for use in stews and soups. It can be cooked whole with the bone in by poaching or by braising. It can also be deboned and the meat ground to make patties which are either braised or panfried.
- The breast can be roasted, braised or poached whole retaining the ventral ribs but with the sternum and rib cartilages boned out. It can be boned out and cut into stewing meat or cut into riblets with the bone in which are braised or poached. The meat can also be cut off the bone, ground and made into mock chicken legs which are braised or panfried, or else the ground meat can be used to make a veal meat loaf which is baked.
- The rib cut can be roasted whole with the bone in or cut into rib chops (with bone in) which are cooked by braising or panfrying.
- The loin is cut into three smaller products which have the bone in, and are cooked by braising or panfrying. These are sirloin steaks, loin chops, and kidney chops.
- The flank and indeed any other trimmings are ground for making veal meat loaf.
- The rump can be sold whole with the bone in or braising, or it can be boned out and rolled. Both ways it is sold for roasting or braising.
- The round can be sold whole with the bone in as a leg (round) centre-cut roast for braising or roasting. It can be cut with the bone in into steaks (which are also known as cutlets) which are braised or panfried. It can also be deboned and cut into thin strips which are pounded and known as scallops or cut and rolled into boneless noisettes. Both these boneless cuts are braised or panfried.
- The heel of round is a boneless cut which is either poached or braised as is the hind shank which is sold with the bone in.

Example 9 (Fig. A2·43)
Reference: Richardson (1971)
Nationality: American

Notes from reference

- There are two types of calves: vealers and calves. The difference is in their age at slaughter and weight. These are factors which affect the appearance and tenderness of the meat.
- Vealers are slaughtered at eight to twelve weeks of age when they weigh 150 to 200 pounds.
- Calves are slaughtered at around five months of age when they weigh 350 to 400 pounds.
- Complete whole carcasses are purchased and hung in a cooler for less than a week before they are cut lengthwise along their mid-line and then quartered prior to cutting into units.
- The cuts which vealers and calves are divided into can be seen in Fig. A2·43.
- The rump or leg is regarded as the tenderest portion. It can be cooked as a roast with the bone in or boned out and rolled. It can also be cut into veal cutlets (also called round steak) with the bone in or boned out and cut into thin slices for scaloppine.
- The rump or leg can also be divided into a rump and a leg. The leg can be sold with the bone in as a center leg roast or the femoral shaft can be boned out and the flesh rolled to give a rolled leg roast. Veal birds also called fillet of veal are another boneless cut which comes from the leg.
- The hind shank is sold with the bone in as a roasting joint.
- The rump is sold with the bone in as a roasting joint.
- The sirloin is usually not cut from the leg but when it is it can be cut into two types of roast or into chops.
- Sometimes the sirloin and rump are cut as one double unit. They are then deboned and rolled and sold as a roasting joint.
- The loin is also sometimes referred to as the portehouse of veal. As the kidney is located on the medial side of this cut it is often part of the various retail cuts. The loin can be sold whole with the bone in as a loin roast of veal or it can be deboned and rolled possibly with the kidney and sold as a rolled loin roast. The loin can also

be cut into chops. There are two types: loin veal chops and kidney veal chops (which include a slice of kidney when sold).

- The rib of veal is also known as the rack. It is sold as a roasting unit with the bone in or it is cut into chops which retain their associated bone.
- The shoulder is usually cut into smaller units for roasting which can be purchased with the bone in or out.
- The neck is a relatively inexpensive cut which is sold for stewing. It can also be boned out and the meat ground into mince.
- The impression given is that the foreshank is sold on the bone.
- The breast is sold as a long cooking roasting cut either with the bones in, or else boned out. It can also be cut into riblets which are also known as veal spare ribs.

Figure A2.21: Cattle (beef) butchery pattern Example 1

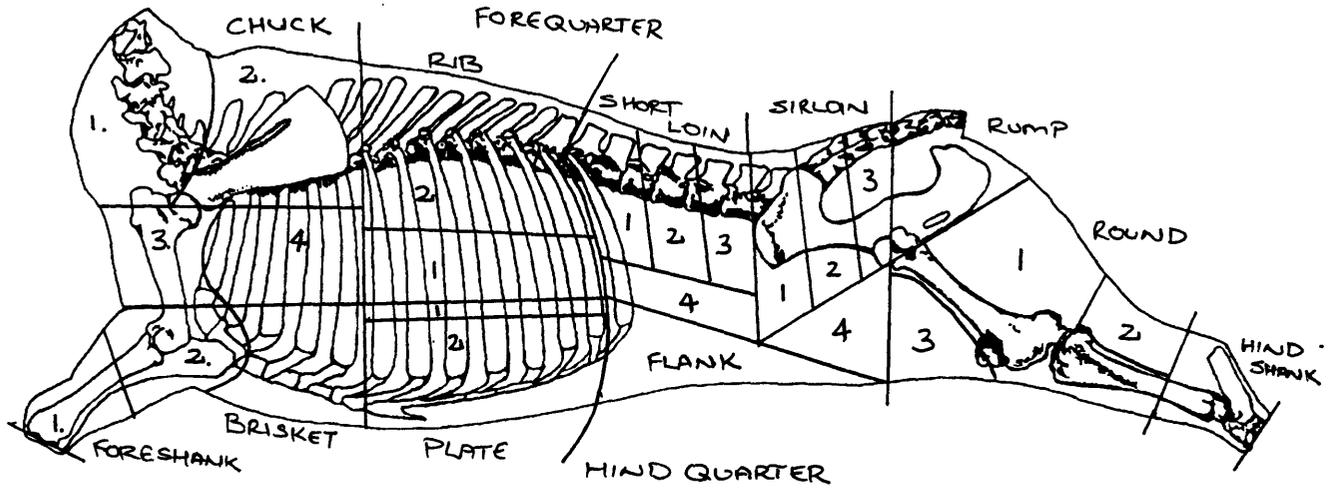


Figure A2.22: Cattle (beef) butchery pattern Example 2

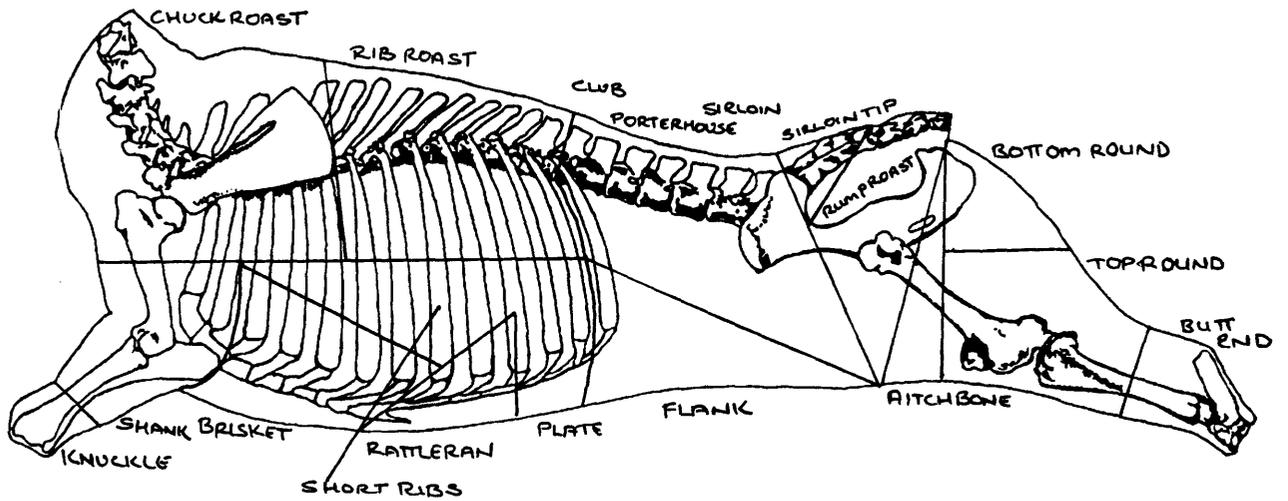


Figure A2.23: Cattle (beef) butchery pattern Example 3

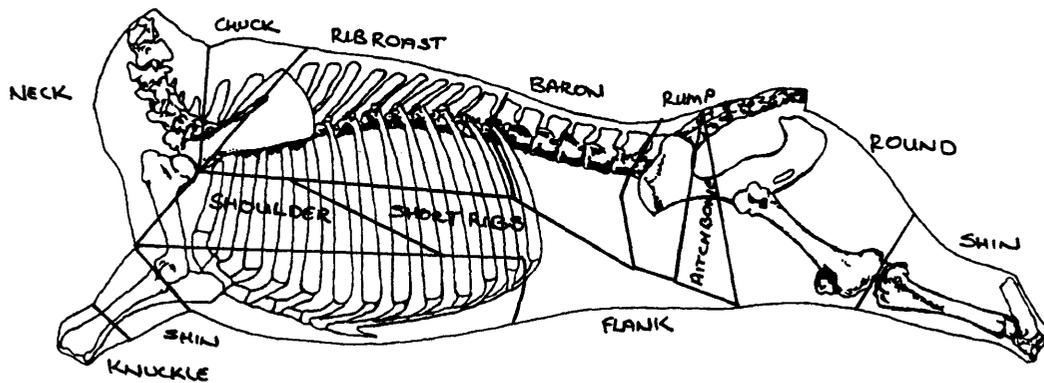


Figure A2.24: Cattle (beef) butchery pattern Example 4

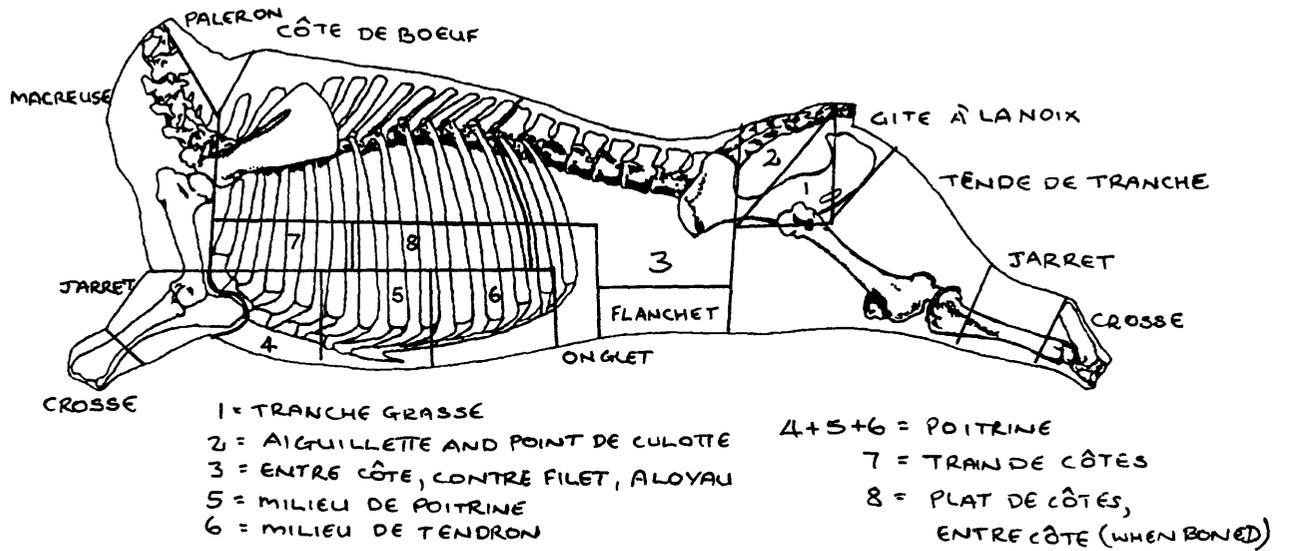


Figure A2.25: Cattle (beef) butchery pattern Example 5

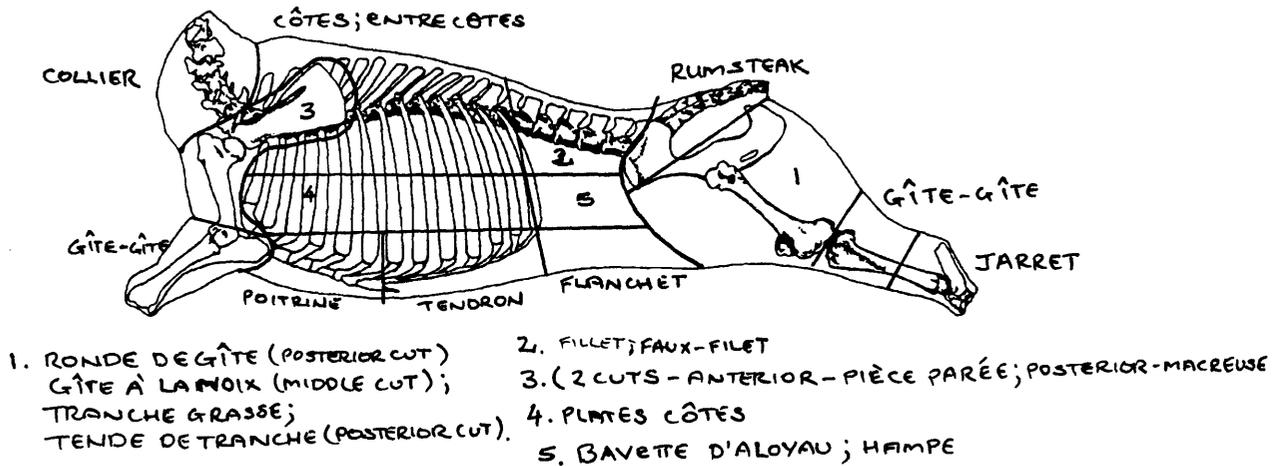


Figure A2.26: Cattle (beef) butchery pattern Example 6

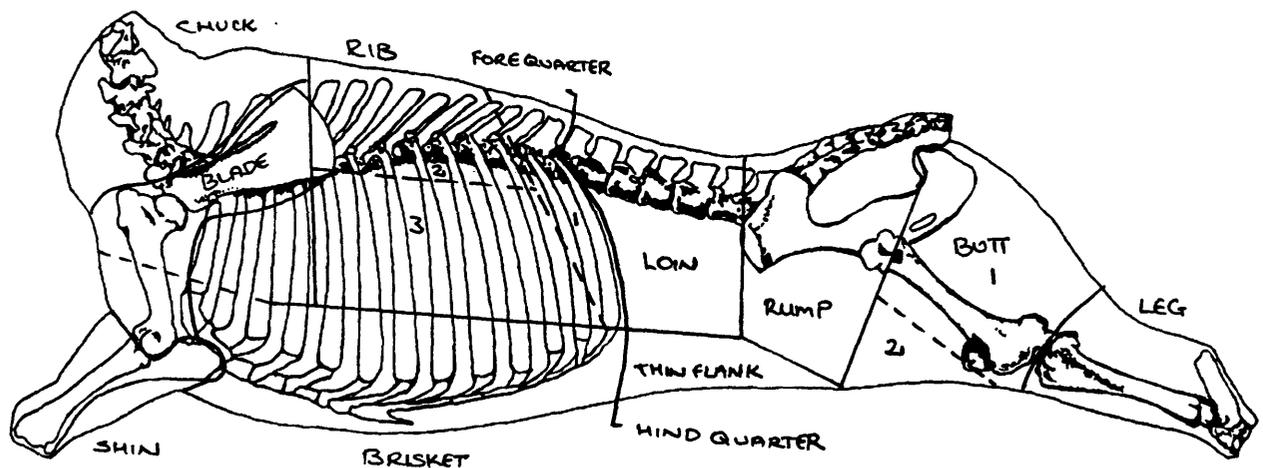


Figure A2.27: Cattle (beef) butchery pattern Example 7

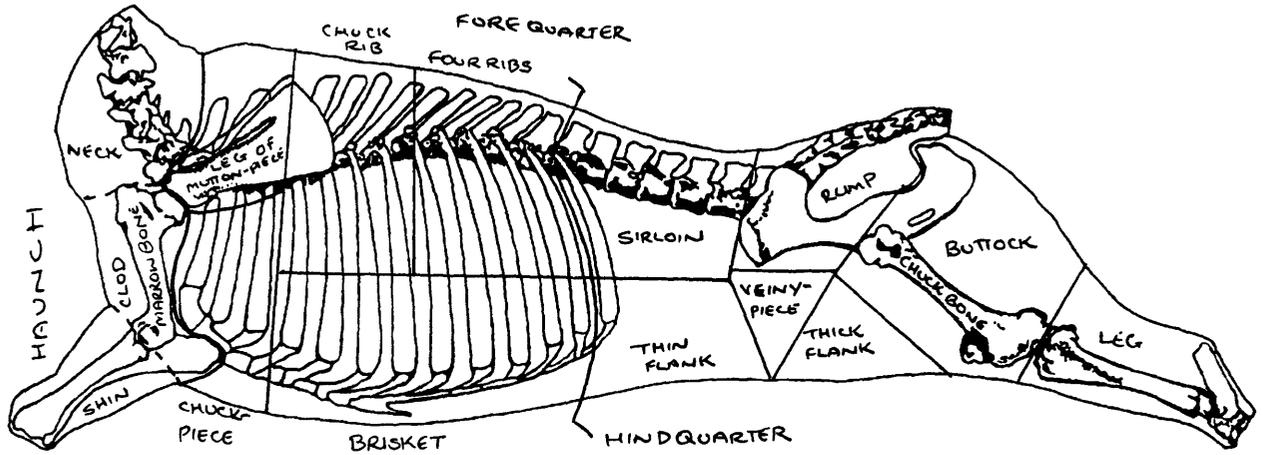


Figure A2.28: Cattle (beef) butchery pattern Example 8

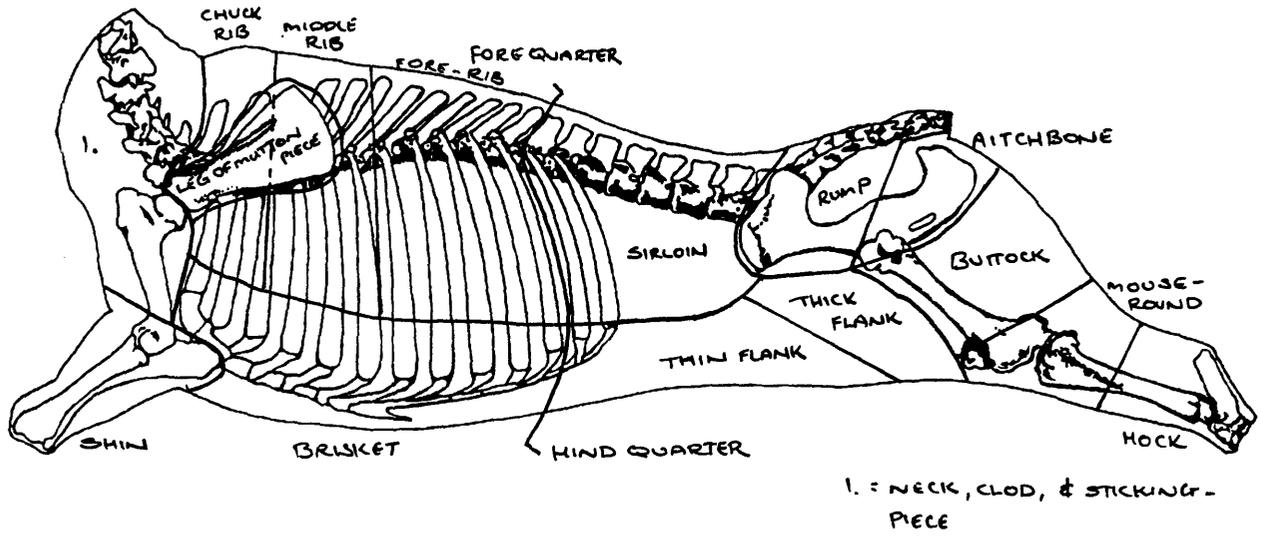


Figure A2.29: Cattle (beef) butchery pattern Example 9

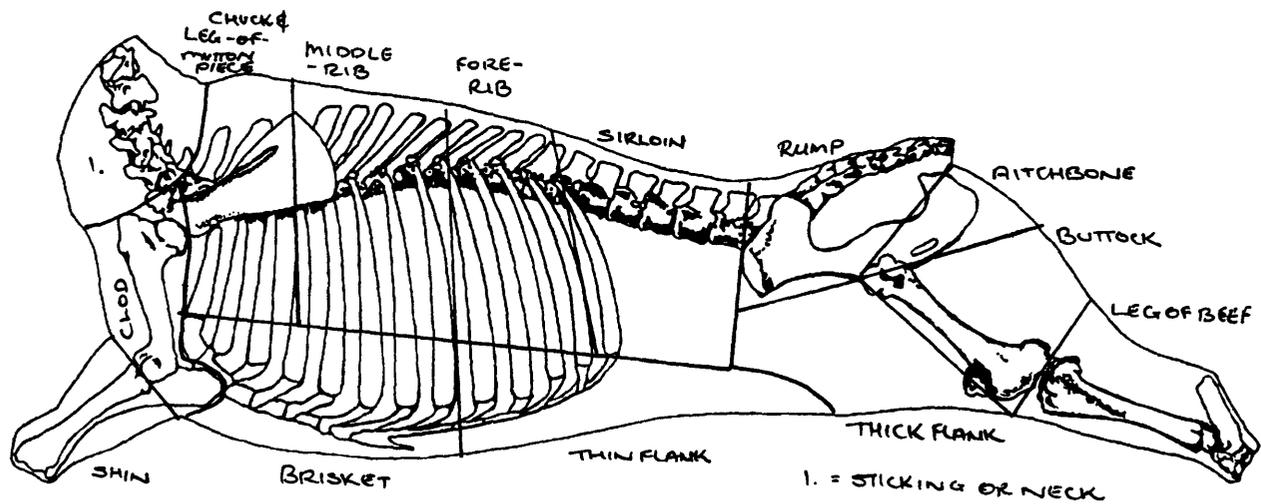


Figure A2.30: Cattle (beef) butchery pattern Example 9

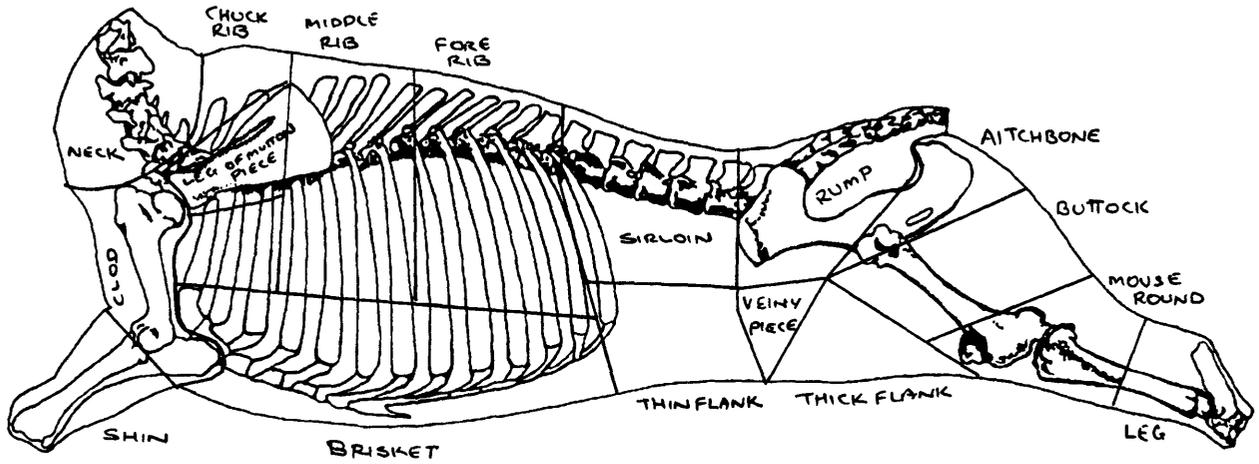


Figure A2.31: Cattle (beef) butchery pattern Example 10

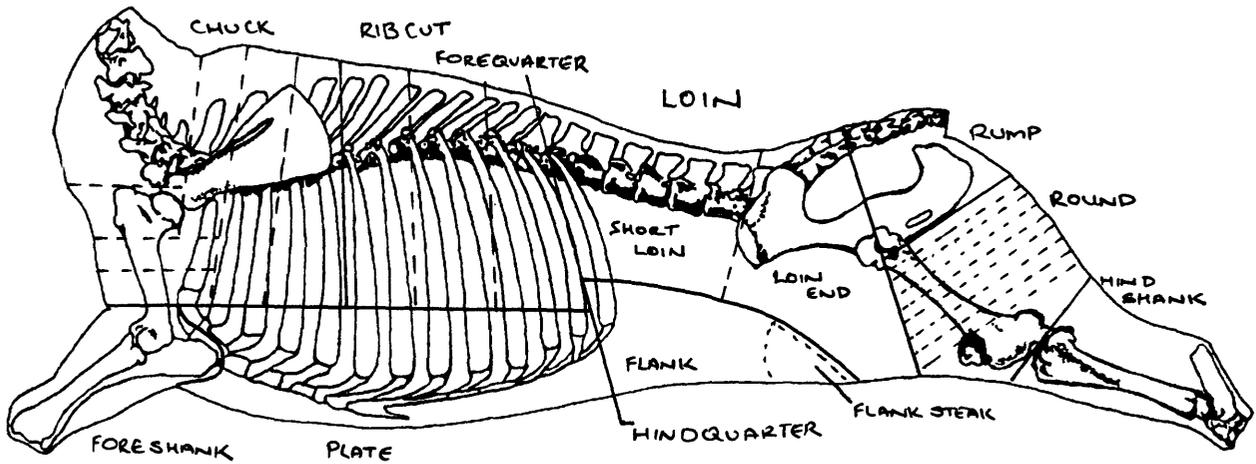


Figure A2.32: Cattle (beef) butchery pattern Example 11

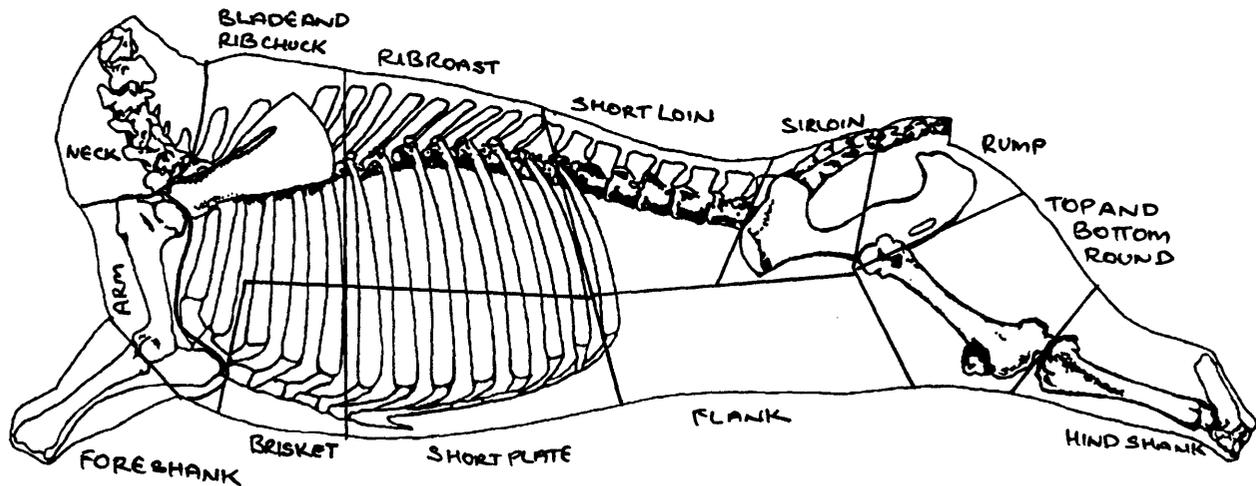


Figure A2.33: Cattle (beef) butchery pattern Example 12

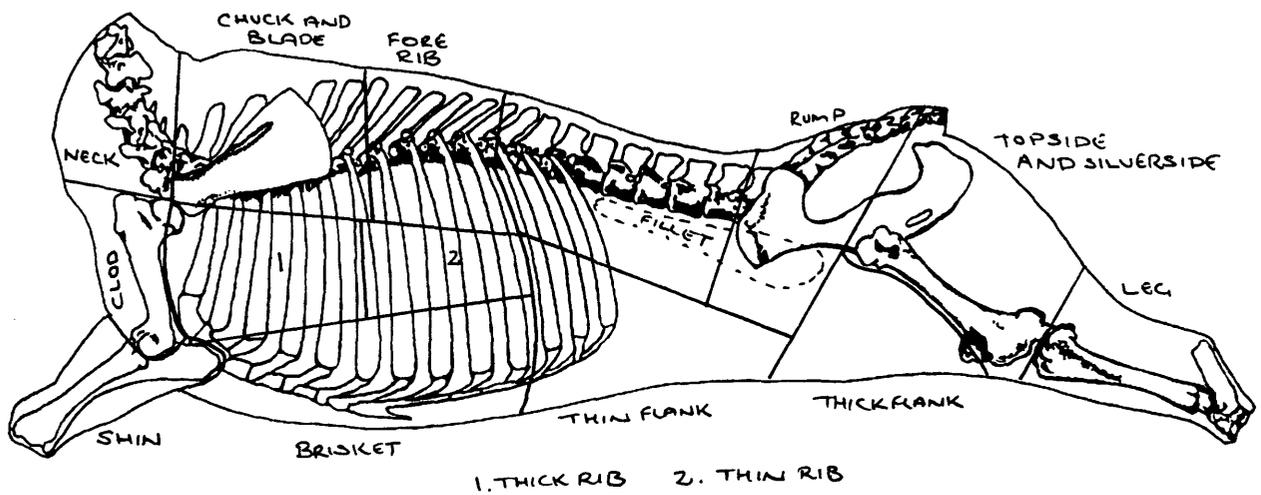


Figure A2.34: Cattle (beef) butchery pattern Example 13

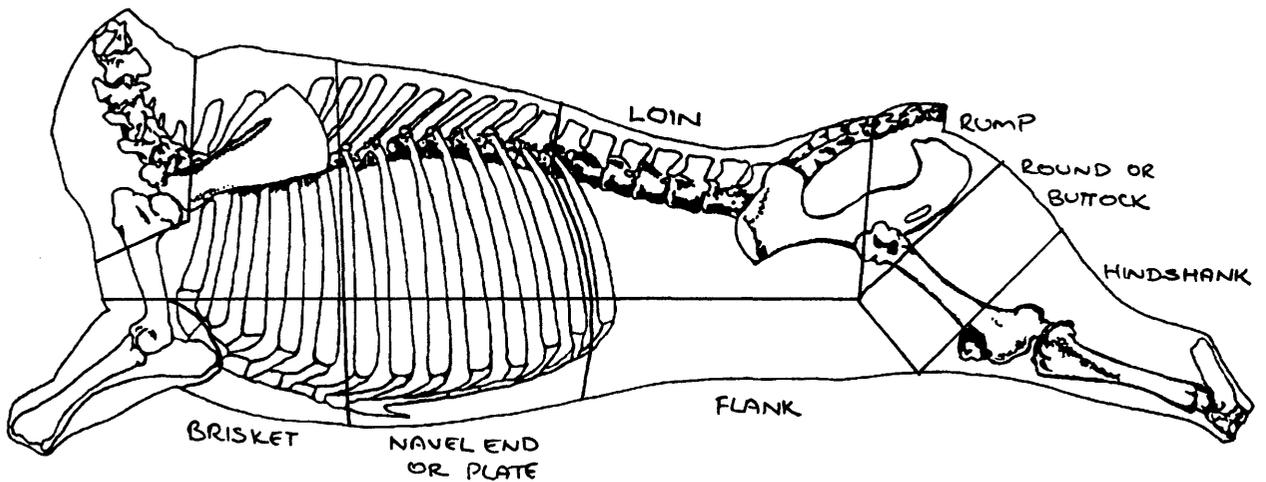


Figure A2.35: Cattle (beef) butchery pattern Example 14

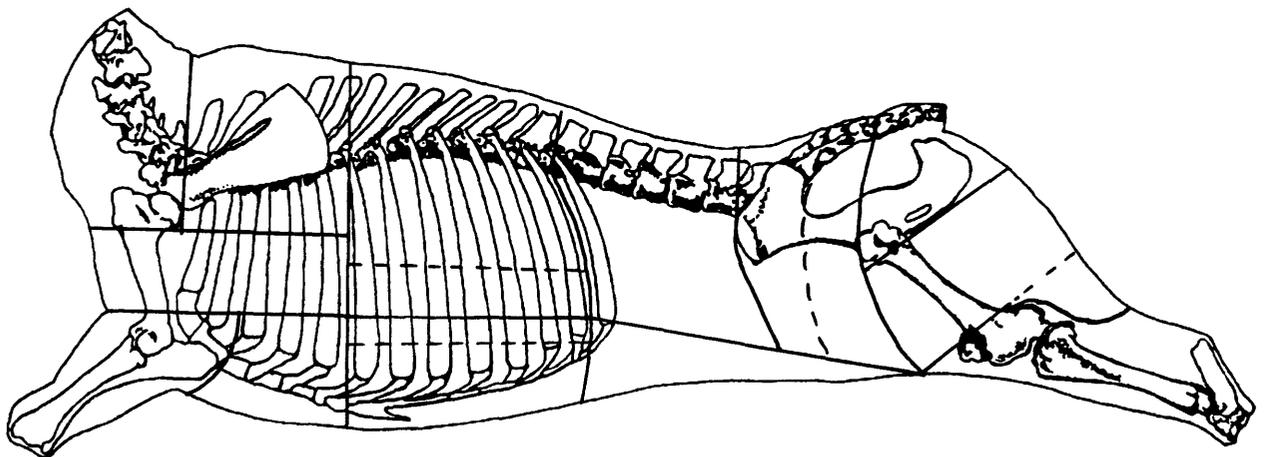


Figure A2.36: Cattle (veal) butchery pattern Example 1

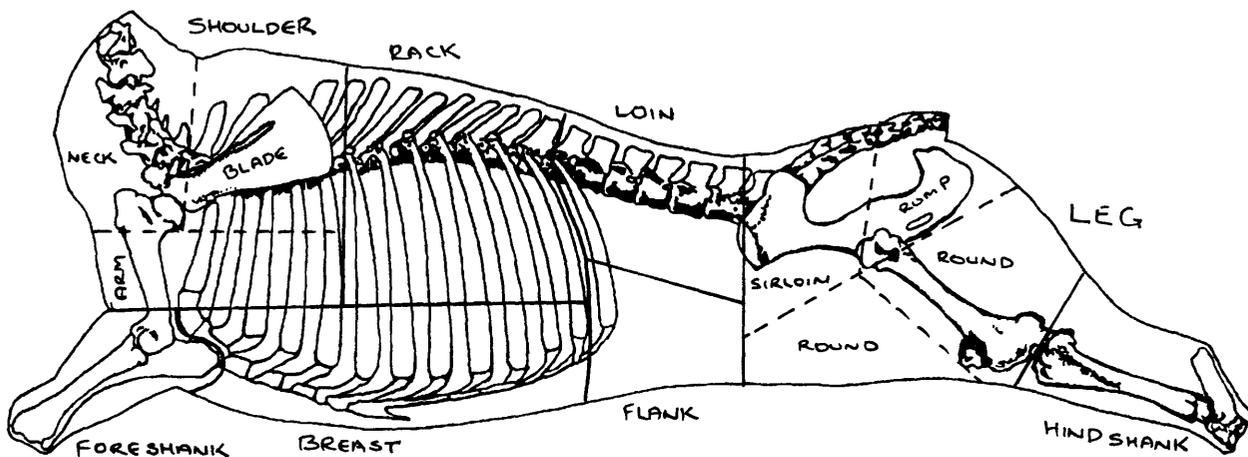


Figure A2.37: Cattle (veal) butchery pattern Example 2

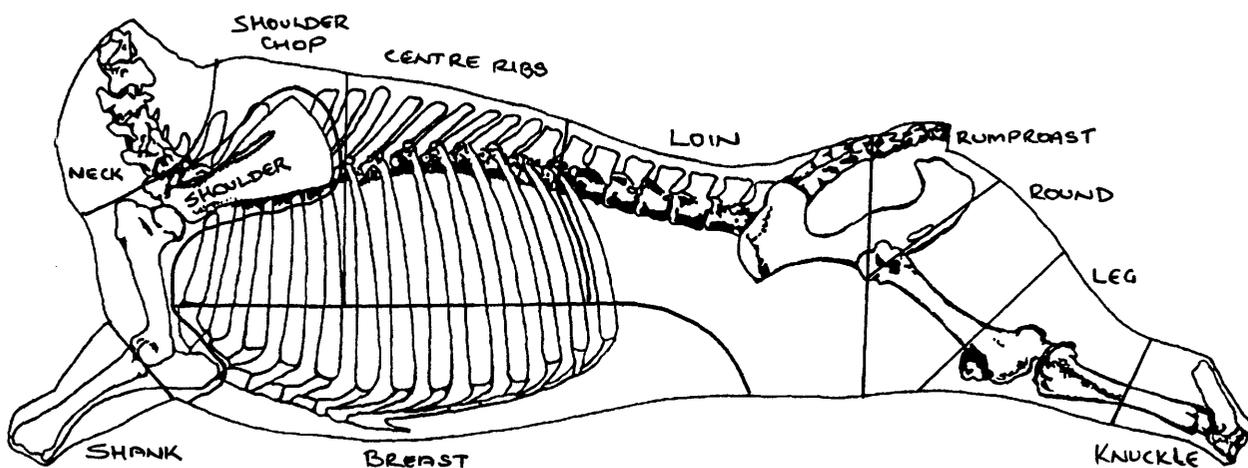


Figure A2.38: Cattle (veal) butchery pattern Example 3

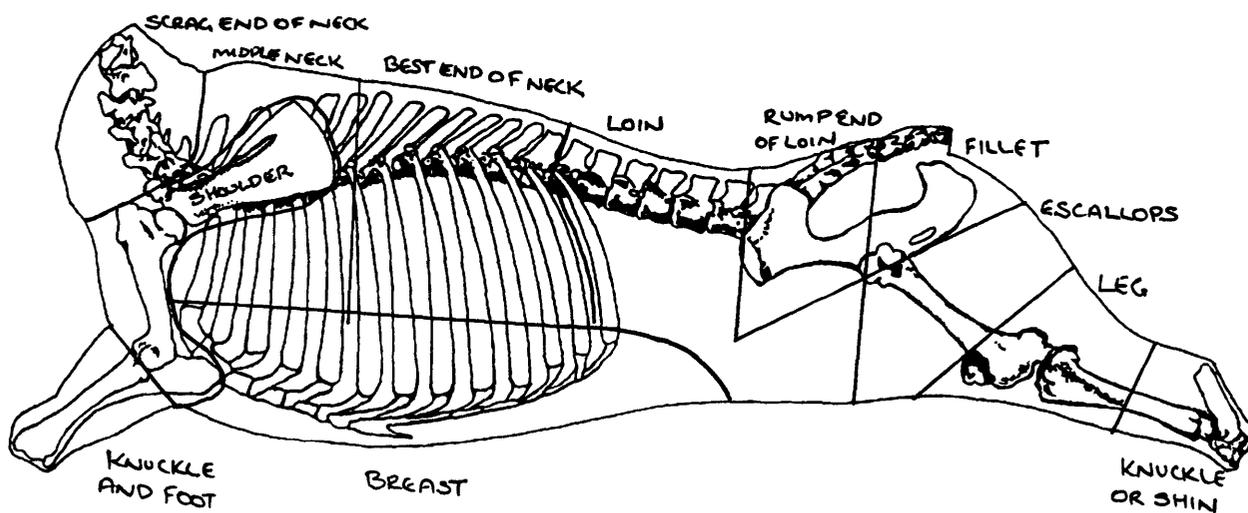


Figure A2.39: Cattle (veal) butchery pattern Example 4

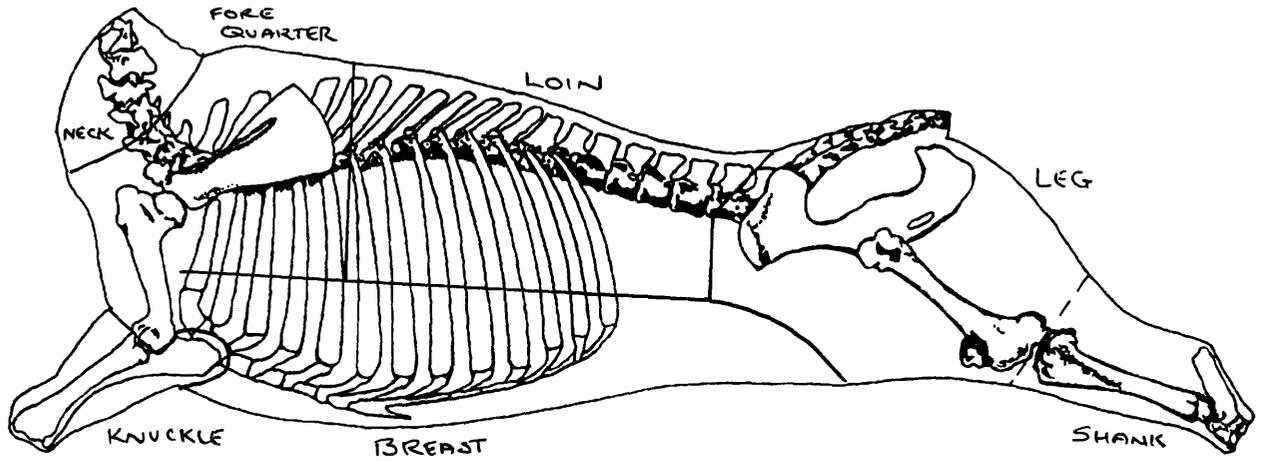


Figure A2.40: Cattle (veal) butchery pattern Examples 5 and 6

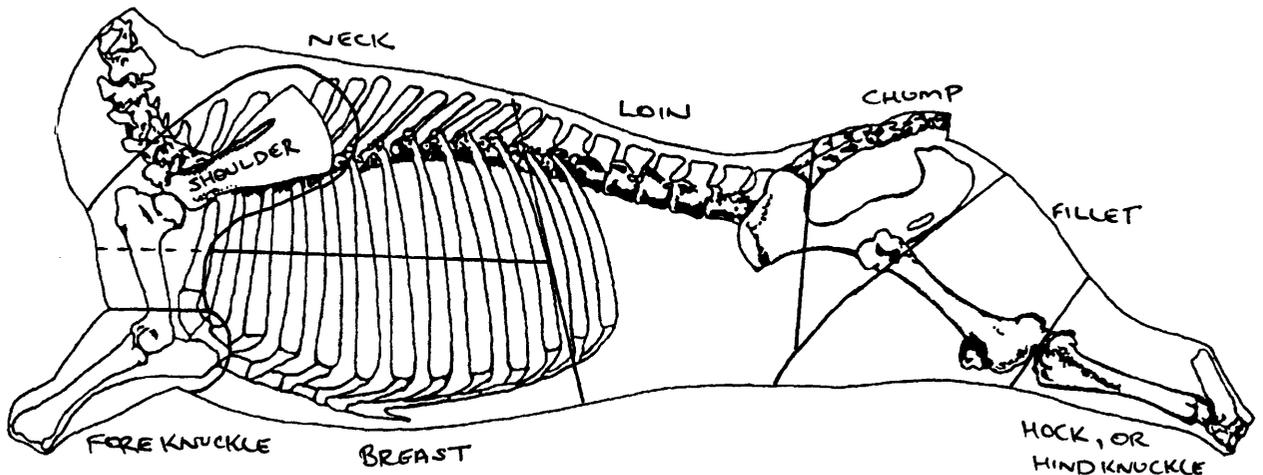


Figure A2.41: Cattle (veal) butchery pattern Example 7

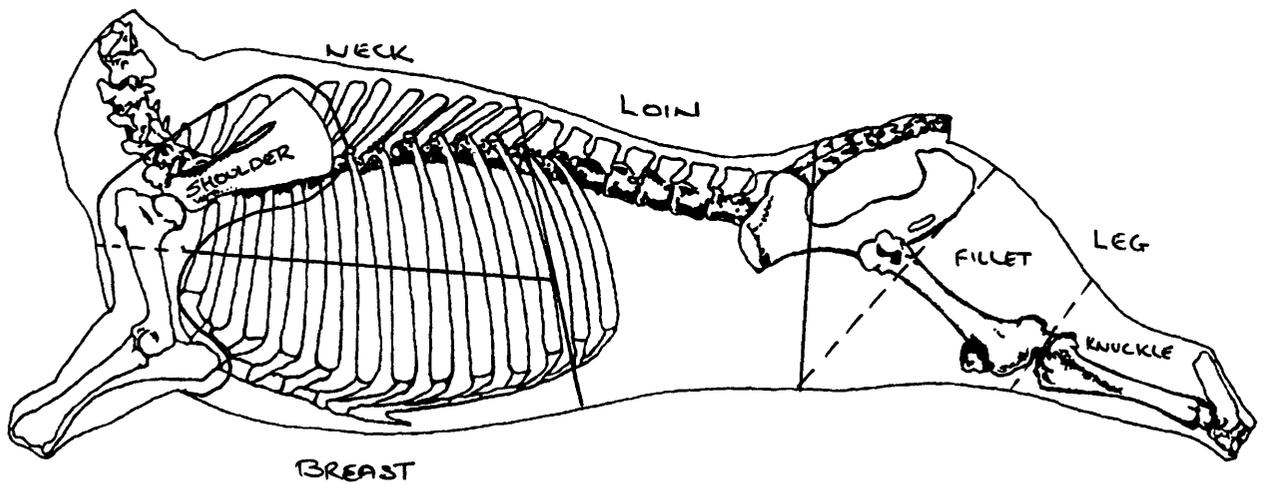


Figure A2.42: Cattle (veal) butchery pattern Example 8

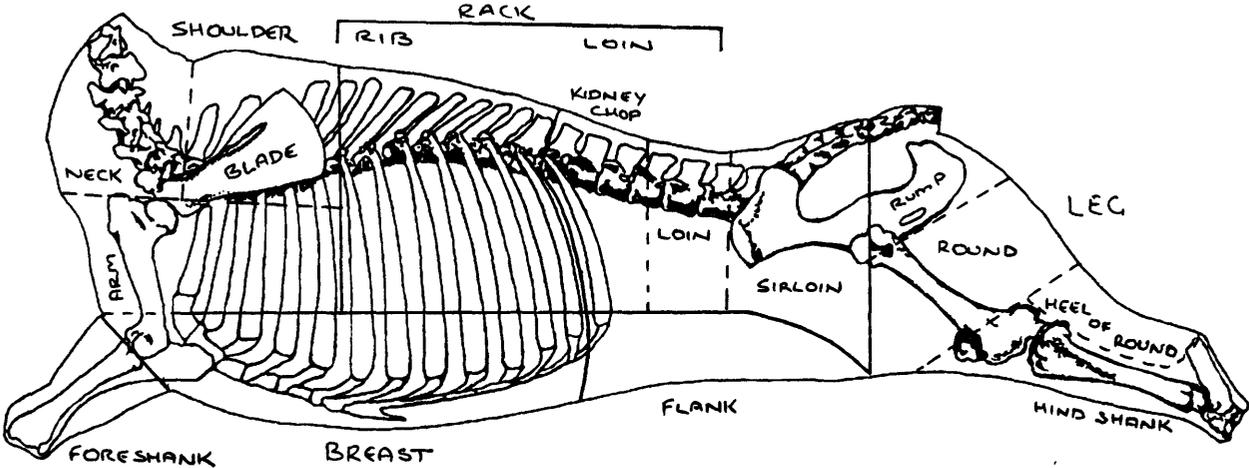
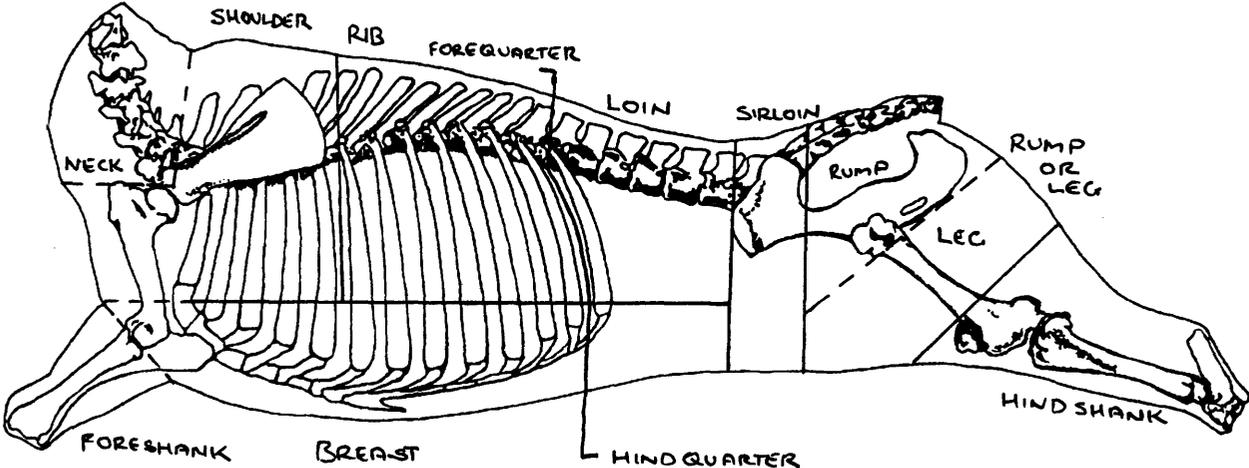


Figure A2.43: Cattle (veal) butchery pattern Example 9



A2.3 Pig

Example 1	(Fig. A2:44)
Reference:	Dolowich (1976)
Nationality:	American

Notes from reference

- Suckling pig is the term used to describe pigs slaughtered at about 3 weeks of age after subsisting solely on their mother's milk. They usually weigh around 18 lbs.
- Pigs are usually slaughtered at between four to six months of age when they weigh between 125 and 200 pounds.
- The commercial wholesale cuts of pork are shown in Fig. A2:44. Their breakdown into retail cuts and cooking methods are discussed below.
- Pig meat can be purchased as fresh pork, cured or smoked. It can also be purchased as sausages, canned meat or as cold meats.
- Pork can be cooked in many different ways depending upon taste. It can be braised, roasted, broiled or panfried.
- Pig meat scraps and bone left over from cooked cuts can be used to make stock in the kitchen.
- The hind and fore feet are sold as pig's feet to be cooked in liquid or else braised. They can be purchased a number ways. They can be purchased whole or divided into knuckles and hocks. They can also be pickled in vinegar upon purchase.
- The leg of pork may be purchased fresh or smoked. It can be sold whole or else subdivided. The whole leg or ham can be purchased fresh, smoked or cured. A whole fresh ham can be purchased boned out and rolled for roasting. The leg can be subdivided into a butt half of ham or rump half of ham and a shank half of ham. Both the butt half and shank half can be purchased fresh or smoked. These large subdivisions are sold for roasting or for poaching. Smoked leg ham can be broiled and then sliced of the bone and sold. It can also be sold uncooked as boneless slices for broiling, panfrying or panbroiling. Smaller than whole smoked ham portions are sold boneless for roasting. Center smoked ham slices or steaks are cut transversely from the femoral shaft. The usual thickness of the cut is half inch with these slices or steaks being broiled, panbroiled or panfried. Thicker cuts can be roasted. These cuts are sold with the bone in. Ham can also be canned.
- The belly is practically always cured and smoked. It is used to make bacon and the bones are sold as pork spare ribs. Spare ribs can be purchased smoked or fresh. They are best cooked by broiling or barbequing, but they can also be baked, panbroiled, panfried or poached, as can salt pork which is spare ribs which have been dry salted or brine cured. Salt pork is used for flavouring. Bacon can be purchased as a slab for baking or broiling or as slices for panbroiling and panfrying.
- The fat back is boneless and can be panfried or boiled or turned into lard as can the clear plate for use in making pastry, cookies, quick breads and cakes, or for use as a frying medium.
- The loin is usually sold as fresh pork in the form of roasts or chops. Three roasting joints are cut from the loin. These are the blade loin, center loin (or rib roast) and sirloin. These are sold with the bone in. The center loin can be boned out and rolled but the bones are incorporated in the roll in order to act as a kind of rack while the meat is cooking. The whole loin can be boned out to give two cuts. One comes from the top side and is called top loin and the other comes from the under side and is called the tender loin. The top loin is sold as a roasting joint and may be sold as a rolled double top loin roast. The tenderloin can be sold whole for roasting or as large and small portions for braising or panfrying. Chops cut from the loin are sold with the bone in. The sirloin can be cut into double chops as can the center loin. These are known as butterfly chops. A chop cut from the pelvic region of the sirloin is called a sirloin outlet. Chops cut from the lumbar region of the sirloin are called sirloin chops. Chops cut from the lumbar region of the center loin are known as loin chops if they retain the tenderloin or else they are known as top loin chops. Chops cut from the thoracic region of the centre loin are known as rib chops. Chops cut from the blade loin are known as blade chops. All chops can be cooked by braising, broiling, panbroiling or panfrying. The whole loin can be turned into bacon, often marketed as Canadian-style bacon. The center loin of a smoked loin can be cut into smoked loin chops. These and Canadian style bacon are sold for baking, broiling, panbroiling and panfrying. Should the loin be boned out then the bones from the blade loin are sold as country-style ribs and if sold with those from the center loin, are marketed as back ribs which are roasted, braised or poached.
- The loin, Boston butt or shoulder, picnic shoulder, and leg can all be deboned and sold as cubed steak or ground into mince or sausage meat to be cooked by braising, broiling, or panfrying.
- The picnic or picnic shoulder ham as it is also known can be purchased fresh or smoked. The picnic is sold with the bone in. As fresh pork it is roasted but as a smoked ham it can be roasted or poached. The picnic can be divided into an arm and a hock. The arm is sold as a fresh pork roasting joint with the bone in. It can also be cut with the bone in into arm steaks which are cooked by braising or panfrying. The hock can be purchased either fresh or smoked and are excellent for making stews or soups. They can also be braised when fresh.
- The Boston butt or shoulder is most frequently sold as fresh pork. The cervical vertebrae are boned out and sold to be poached, stewed or used to make soups. The cut is then sold with the bone in or out as a roasting or braising unit. It can be cut transversely to give blade steaks with the bone in which can be cooked by braising or panfrying. The whole cut can be deboned and cut into cubes which are either braised, broiled or poached. The Boston butt can also be cured or smoked like ham and bacon and then deboned and rolled to produce a boneless smoked shoulder roll which is also referred to as a cottage roll. This may be roasted or poached.

Example 2 (Figs A2:45, A2:46 and A2:47)
Reference: Beeton (1899)
Nationality: English

Notes from reference

- The intended use of pig flesh had to be taken into consideration when choosing a pig for slaughter. If the pig was meant for fresh pork or simply salted then a small breed was best. If slaughtering was for hams or bacon then a larger variety was needed.
- Suckling pigs were slaughtered before they were weaned at six to eight weeks of age.
- Full stature was reached after five months, and when this had been reached and the animal was regarded as having reached maturity and it was slaughtered.
- Pork could be preserved by curing it in several ways. It could be covered with salt or immersed in ready made brine. Alternatively it could be partially salted and then hung to dry (white bacon) or after salting it could be hung in wood smoke (bacon). Hogs killed for the purpose of bacon in England average 18 to 20 stone, whereas those killed in the country for farm purposes seldom weighed less than 26 stone.
- Three ways to cut up a pig were shown in the text. These can be seen in Figs A2:45, A2:46 and A2:47.
- Suckling pigs were purchased whole and roasted whole.
- Pig meats were in season between September and April, but were considered best between November and March.
- Besides joints which were sold with their associated bone the following was sold:
 - The heart.
 - The kidneys.
 - The head, including the brains and tongue. It was also known as the check or chopper. It weighed 5 to 6 lbs and was sold cheaply. It was generally sold slightly salted and made into brawn. It could also be collared or boiled.
 - The feet or pettitoes were generally boiled and served hot or cold. They were often boned out in the kitchen and stuffed.
 - The liver, sweetbreads and some of the internal fat was often sold together under the name pig's fry.
 - Lard was made by melting down any part of the fat and sold in bladders, tubs or by the pound for pastry making, frying and the like.
 - The spare rib could be cooked as a roasting unit or turned into bacon. If used for making bacon then the meat was separated from the scapula and the other bones and then cured. The bones with part of the meat left on them were divided and sold as spare ribs, griskins and chines.
 - The hand was usually slightly salted and boiled to be eaten hot or cold.
 - The fore loin was used as a roasting unit.
 - The spring or belly was salted and boiled or else pickled.
 - The loin was regarded as the best roasting joint. Large chops were also cut from it.
 - The leg was regarded as the most economical roasting joint. It could be deboned and the flesh used in pie-making. It could also be cured to make a ham.

Example 3
Reference: Beeton (1986)
Nationality: English

Notes from reference

- The information presented in this reference was very similar to that outlined above for Beeton 1899. The mode of cutting up a pig was that outlined in Fig. A2:47. This text did however outline a mode of butchering for which a whole pig carcass was to be cured for hams and bacon. This is outlined now.
- After hanging overnight to cool the carcass had the head removed close behind the ears. The feet and the internal fat were removed. The carcass was then divided into two sides by transversely dividing the ribs about an inch from the thoracic vertebrae. The vertebral column was then removed giving two sides. The sternum and also the first rib were boned out of each of the sides and sometimes all of the ribs were removed. The legs were cut off and cured to make hams, while the body sides or flitches were cured and possibly smoked to make bacon. The curing process first involved salting and this may have been as far as the process went.

Example 4 (Fig. A2:48)
Reference: Beeton (n.d.)
Nationality: English

Notes

- Figure A2:48 shows the cuts (post World War I) which were made to the side of a pig carcass once the feet were removed for the making of bacon. These differ greatly from those described for the nineteenth-century.

Example 5 (Fig. A2:49)
Reference: Glasse 1751
Nationality: English

Notes from reference

- Because there is no diagram or skeletal representation to cuts Fig. A2:49 is merely an interpretation of this work.
- Pigs were butchered differently for fresh pork than if they were destined for bacon, hams or pickled pork.
- Figure A2:49 is the my interpretation of the butchery practice for fresh pork. There was not enough information to interpretate the pattern for cuts in curing.
- The carcass was longitudinally bisected along its mid-line in order to produce two sides. These were then transversely cut to produce a forequarter and a hindquarter.
- The forequarter was cut into a fore loin and a spring or hand. If the pig being butchered was large a spare-rib may have also been cut. The spring was roasted from young pigs and boiled from those of older animals. If the spare rib was cut then it was roasted.
- The hindquarter was cut into a loin and a leg. The loin was used as a roasting joint. The leg was usually parboiled and then skinned before roasting.
- The impression is that no bones would have been discarded by the butcher.
- Sometimes whole hindquarters were roasted after been skinned.
- Whole small pigs (piglets) were roasted.
- The head was eaten as were the innards. These were called the haslet and were made up of the liver and crow, kidneys and skirts. The haslet was mixed with herbs and spices and rolled in the caul fat before being roasted.
- The chitterlains and guts were cleaned and used in sausage making.
- Fat was used to make lard.
- Fresh pork came into saeson at Bartholomew-tide and stayed in season until Lady-day.

Example 6 (Fig. A2:50 and A2:51)
Reference: Davies (1987)
Nationality: British

Notes from reference

- Figure A2:50 shows the contemporary commercial pattern of butchering pigs for fresh pork.
- Figure A2:51 shows the contemporary commercial pattern of butchering pigs for bacon and smoke cured joints.

Example 7 (Fig. A2:52)
Reference: Lyman (1977)
Nationality: American

Notes from reference

- The pattern of carcass division shown in Fig. A2:52 was interpreted from archaeological remains from the military site of Fort Walla Walla (Washington) dated to 1903.
- The animal was gutted after slaughtering and then possibly skinned. The head and feet were retained for consumption.
- The carcass was then split along its mid-line to give a left and right side.
- The carcass was then divided into the portions shown in Fig. A2:52.

Example 8 (Fig. A2:53)
Reference: Ashbrook (1955)
Nationality: American

Notes from reference

- Pork is the most popular meat for home processing.
- Medium-weight hogs (180-250 pounds) aged from eight to ten months are the best for home butchering.
- The animal is killed by 'sticking' it with a knife in order to cut the veins and arteries of the neck. It is best not to stun or shoot a hog before sticking. If the animal is stuck without being stunned then the blood will drain out more completely than if it is stunned first. A quick and thorough bleed is one of the foundation steps in processing high quality meat. It is also important because meat cannot be properly chilled or cured without being properly bled.
- Once an animal has been bled it should be scaled in water of a temperature best at 140-144° F. The purpose of this is to permit the easy removal of body hair.
- Once scaled the carcass is scraped and washed to remove hair and dirt from the skin. The toe nails (dew claws) are also removed at this stage.
- The carcass is then hung using either a gambrel or single tree hooks by the rear legs through the gambrel tendon.

- The head is removed next from the carcass. This permits the complete drainage of blood from the carcass and also adds in the rapid chilling of the carcass. The head is removed using a knife at the atlas/axis interface, in such a manner as to leave the jowls (the chin or throat flesh and flesh of the cheeks) attached to the carcass.
- Once the head has been removed a deep slit is made on the underside of the ears and the core or waxy portion is peeled out and cleaned, and the eyes and eyebrows are removed. The tongue is removed and saved for later consumption. The muscles on each lateral side of the mandibles are cut free and the mandibles are removed. The meat on the mandibles is carefully trimmed off before they are discarded. The snout and skin from the front of the face is removed. The facial bones are sawn off just posterior to the maxilla. The brains are then removed by sawing the skull lengthwise. The head has now been prepared in such a way as to produce no bone splinters. The head is then cleaned and saved to make head cheese (brawn) and other pork delicacies.
- The carcass is gutted removing the entrails by a series of longitudinal cuts made along the mid-line of the ventral surface of the carcass. A knife (but possibly a saw for older animals) is used to split the pubic symphysis and also the sternum. The kidneys are left in the carcass with the leaf fat which surrounds them. Once the entrails are freed of the carcass it should be washed and rinsed with cold water.
- The liver, heart, spleen or melt, and the thin layer of caul fat which covers the stomach is saved. The ruffle fat which is associated with the intestines can be used to make lard, however, lard made from this fat is not of a high grade. It is better adapted for making soap grease. The intestines and stomach if properly cleaned are edible. They are known as chitterlings. The stomach can also be used as a container for head-cheese.
- The carcass is then split while still warm. This helps to hasten the chilling process as more surface area is exposed. The carcass is split down the middle of the back bone using a saw or a cleaver. Approximately 15 inches of skin is left uncut at the shoulders. This method of splitting the carcass does not allow the country-style backbone piece or chine cut to be made but it does allow more useful finished cuts suitable for curing and canning.
- The leaf fat is pulled out at this stage as it is easier to accomplish while the carcass is warm and its removal helps the carcass to chill quicker. For these same reasons the hams should be faced while still warm using a knife.
- The carcass is then left to chill. In order to do a neat job of cutting and trimming, the carcass must be thoroughly and completely chilled. This takes about 24 hours.
- Pork carcasses are cut as soon as they are thoroughly chilled, usually within 48 hours of slaughter.
- The butchery mode described below separates the thick ham, loin, and shoulder from the thinner bacon strip, fat, and head. All other pieces can be classified as trimmings. All trimmings, including the very small ones, can be used to advantage in making sausages, scrapple, headcheese, and other pork products.
- The side of pork is divided by a transverse cut using a saw and a knife between the third and fourth ribs.
- The jowl is then cut off using a knife at the anterior end of the vertebrae. The jowl is then trimmed into a square shape using a knife. The trimmed jowl is known as a 'bacon square' and can be cured and used the same as bacon or used for seasoning with boiled foods.
- The cervical vertebrae are boned out in such a manner as to leave as little meat as is possible adhering to them.
- The shank is cut off using a knife and the shoulder is trimmed.
- This shoulder cut is the long-cut method of trimming and produces the maximum amount of cured meat from the shoulder.
- If smaller cured cuts are desired the shoulder can be transversely divided using a knife and a saw to produce a shoulder butt and a picnic shoulder. When the shoulder is subdivided like this the clear plate which is a covering of fat on the top of the shoulder butt is skinned off. This fat may be cured for seasoning or used for lard. The shoulder butt without the clear plate is called the Boston butt. It can be cured or used to make sausages.
- The ham is taken off using a saw to cut through the posterior end of the ilium and a knife to cut through the flesh. The ham is shaped using a knife to curve the cut on the belly side. The tail is then removed and the ham trimmed smooth of all loose pieces of meat which can be used to make sausages.
- Once hams have been trimmed the hind shank is sawn off just below the button (tuber calis) of the hock.
- The loin is then cut from the belly by sawing across the ribs at their greatest curvature. This is about one third the distance from the top of the back bone to the bottom part of the belly edge. Once the ribs have been sawn the cut is finished in the lumbar region using a knife.
- A few sharp blows are delivered to the belly from the side of a cleaner or hatchet when it is lying on a table with the lateral side up. This separates the ventral ends of the ribs from the rib cartilages. The ribs are then trimmed out. The rib cartilages or 'buttons' are left on the belly which is also known as the bacon. The bacon is now trimmed. The low edge is trimmed first in a straight line in such a manner that all the 'seeds' or mammary glands are trimmed out. Next the top line is trimmed parallel to the lower edge until a good streak of lean appears. Both ends are then trimmed square to reach an attractive lean streak. Frequently there is an uneven space at the anterior end of the of bacon. This is known as the bacon brisket. It may be cured or used to make sausages or lard.
- The tenderloin is removed from beneath the lumbar vertebrae. It is usually cut transversely into pieces one inch thick. This is called 'frenching'. The tenderloin is the most tenderest cut of pork and it is eaten fresh.
- The fat back is then cut from the loin. This may be used for lard, or it may be cured and used for seasoning when cooking. One of the most practical ways to use the loin is to cure it as Canadian style bacon.

Example 9 (Fig. A2-54)
Reference: Johnston (1976)
Nationality: Australian and New Zealand (trade method, but also intended for farmers)

Notes from reference

- The pork carcass generally yields a much higher percentage of dressed meat in relation to the live weight of the animal than do cattle or sheep. The average yield is about 75 per cent of live weight, whereas it is approximately 60 per cent with cattle and 58 per cent with shorn sheep.
- The head is usually removed during slaughter, split and the brains removed.
- After the carcass has chilled it is split longitudinally in half along its mid-line using a cleaver in order to produce two sides.
- The hand and spring are cut first from the carcass using a knife and a saw. The actual width of the spring is determined by the size and weight of the carcass. When making this cut it is important to make sure that the loin above is not cut too short. The general practice in New Zealand is to cut the scapula so that the glenoid cavity and the neck of the scapula are part of the hand when the spring is cut. The general practice in Victoria and South Australia is to bone out the spring (belly), roll and then pickle it.
- A long leg can be cut from the carcass using a knife. This cut consists of the chump and the short leg. The long leg can be cut into smaller cuts: the fillet and the small leg. It is also sold as a large leg and is widely used for hams.
- The short leg is cut using a knife and a saw. It is a popular retail cut. If this cut is made then the chump is left uncut as part of a long loin.
- The long loin contains the chump, the short loin, the rib loin, and the fore loin. It is mostly used for chops and small joints.
- The long loin is divided using a knife into the fore loin and the short loin.
- The fore loin can be divided into two smaller joints or cut into chops. Alternatively it can be boned out and sold as a boneless roasting joint.

Figure A2.44: Pig butchery pattern Example 1

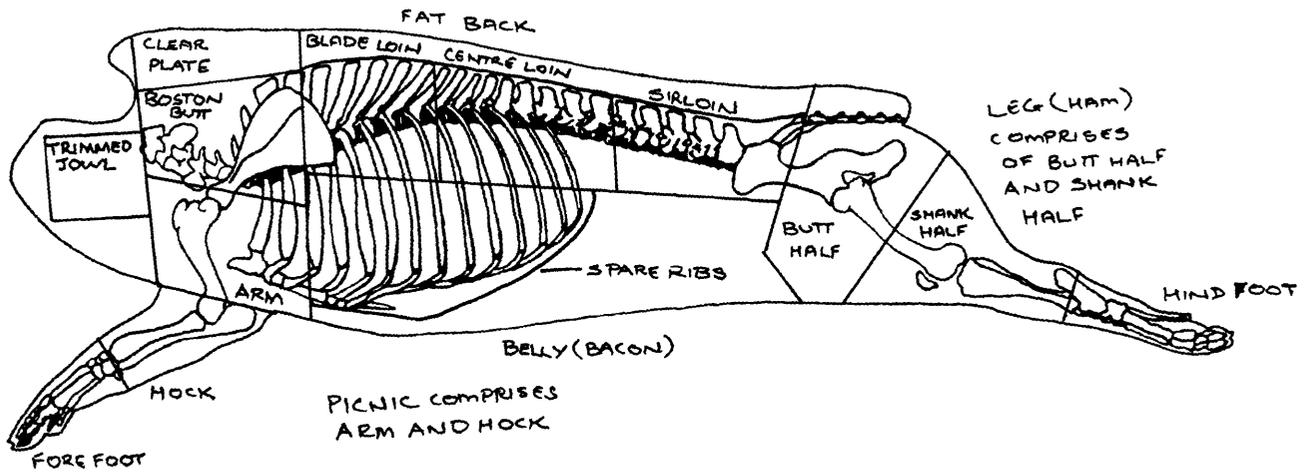


Figure A2.45: Pig butchery pattern Example 2

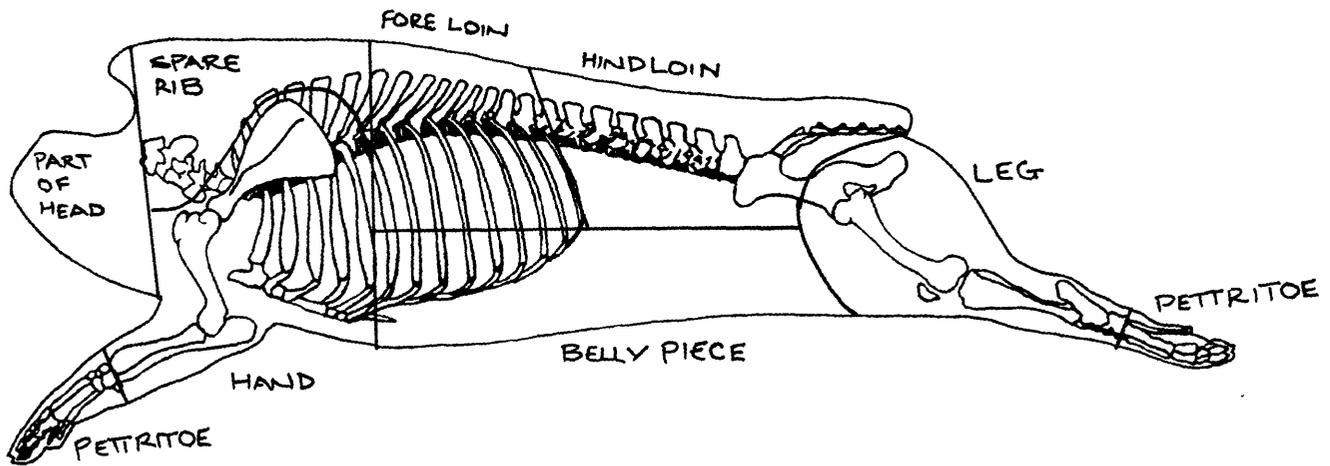


Figure A2.46: Pig butchery pattern Example 2

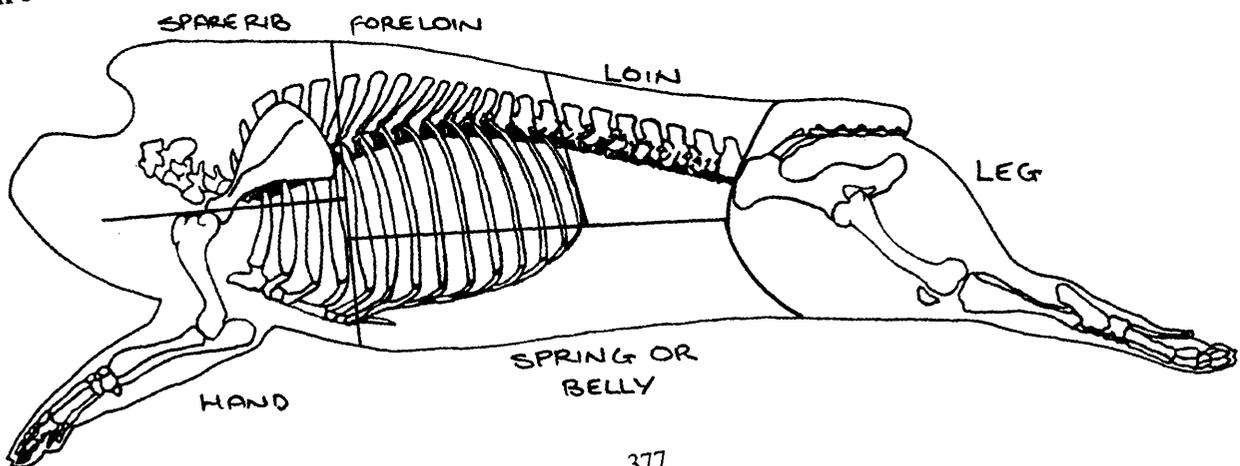


Figure A2.47: Pig butchery pattern Example 2

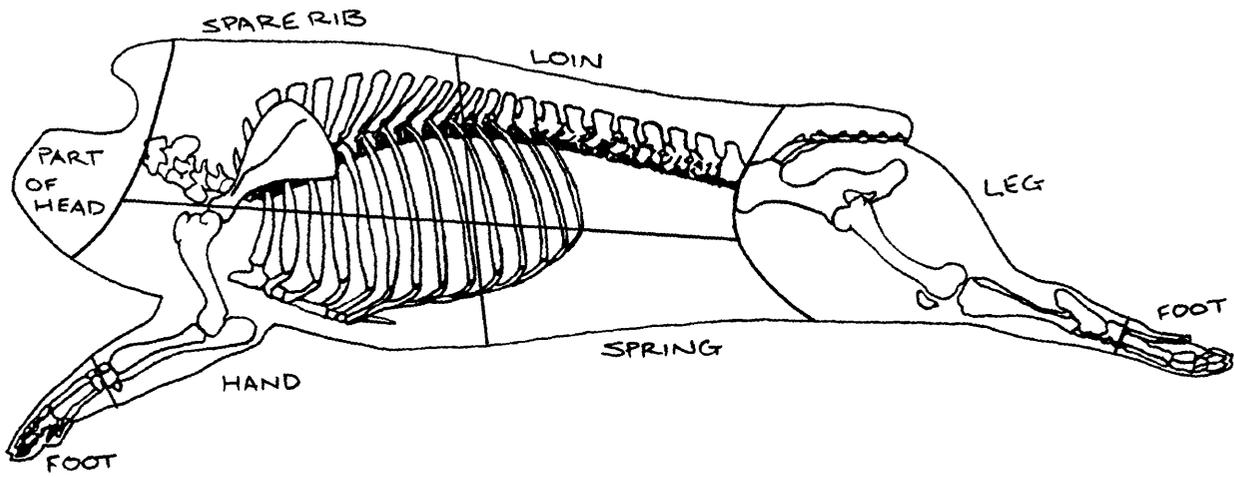


Figure A2.48: Pig butchery pattern Example 4

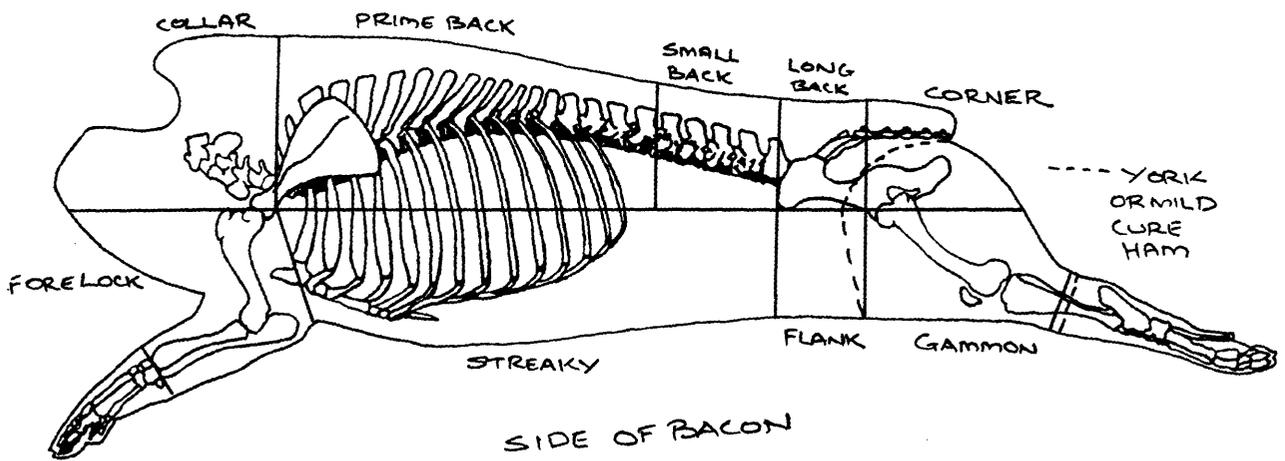


Figure A2.49: Pig butchery pattern Example 5

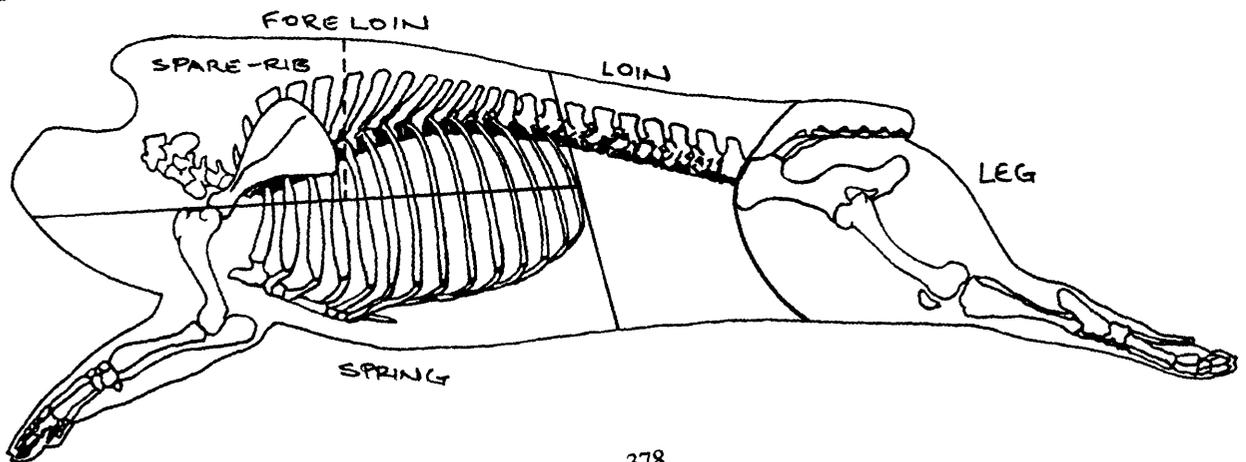


Figure A2.50: Pig butchery pattern Example 6

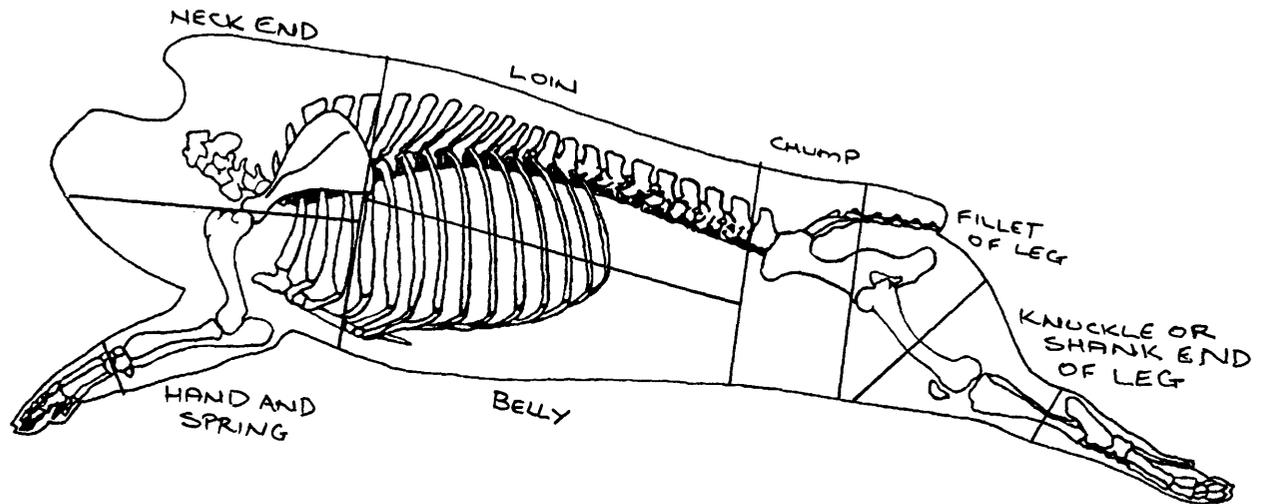


Figure A2.51: Pig butchery pattern Example 6

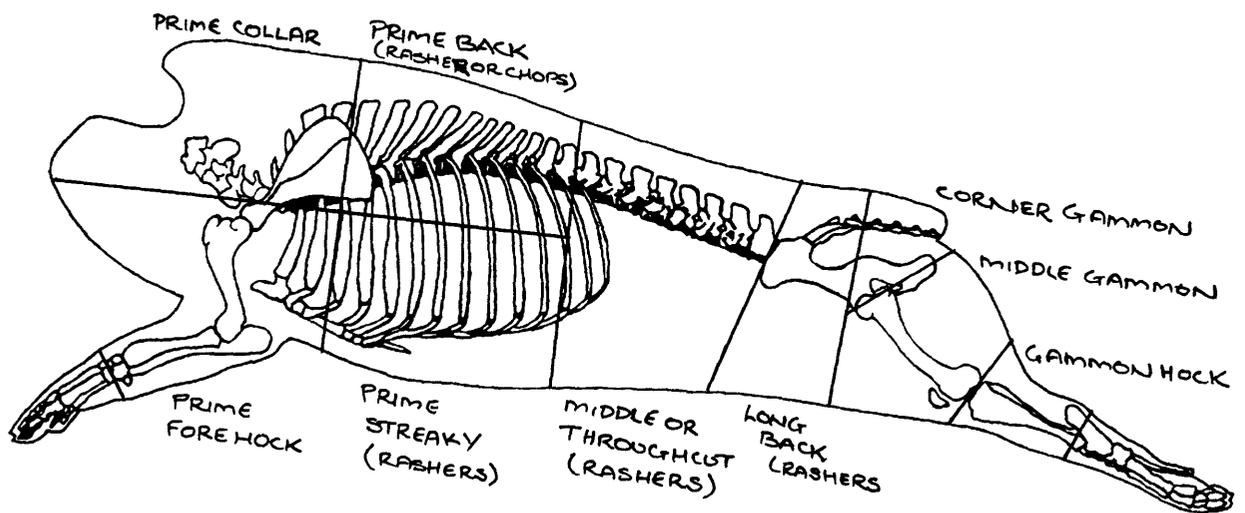


Figure A2.52: Pig butchery pattern Example 7

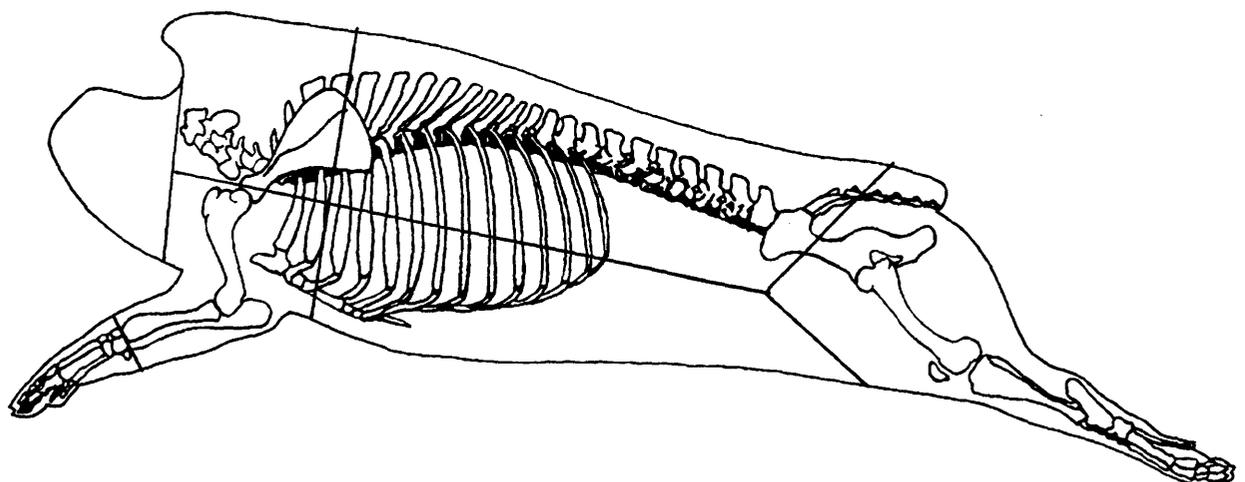


Figure A2.53: Pig butchery pattern Example 8

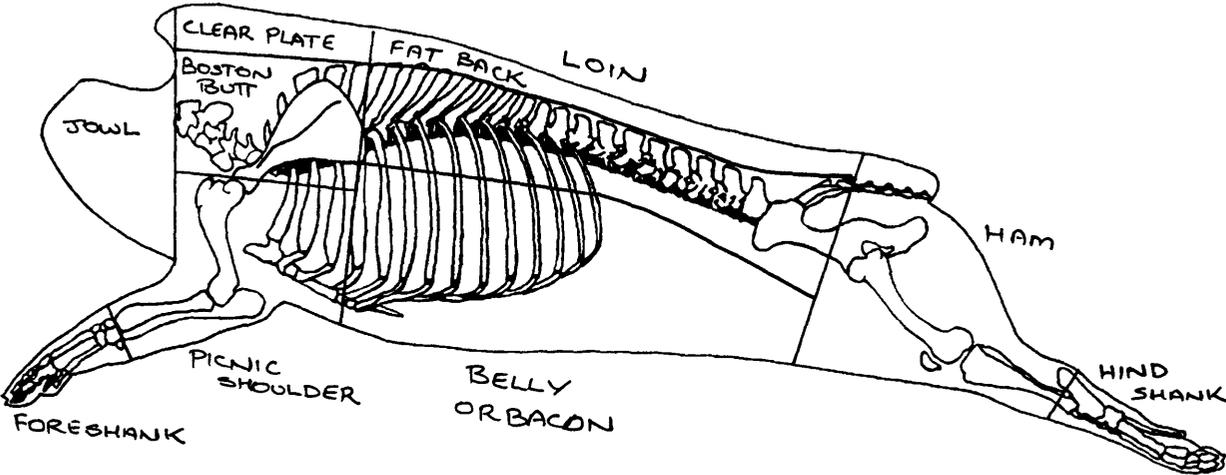


Figure A2.54: Pig butchery pattern Example 9

