



Beef + Lamb New Zealand Reference Guide

**BEEF + LAMB**  
NEW ZEALAND









## New Zealand Beef and Lamb - Products to be Proud of

New Zealand has a long history as a producer of quality meat. We are justly proud of the excellent reputation of our naturally raised beef and lamb, in export markets around the world, and on New Zealand dining tables.

Meat is important to New Zealanders. Beef and lamb are delicious, nutritious meats which make an important contribution to a healthy, balanced diet.

Beef + Lamb New Zealand Inc is responsible for the promotion of beef and lamb within New Zealand and is jointly funded by farmers, processors and retailers.

Beef + Lamb New Zealand Inc manages the New Zealand Beef and Lamb Quality Mark. The introduction of the Quality Mark in September 1997 put New Zealand's domestic meat industry at the forefront of quality initiatives.

Beef and Lamb which carries the Quality Mark provides buyers with an assurance that a range of quality standards for beef and lamb, carried right through the supply chain to retail.

The Beef + Lamb New Zealand Reference Guide has been produced to give butchers, chefs and cookery students a better understanding of New Zealand beef and lamb quality, the range of processing cuts available and their attributes, handling and cooking methods. It includes a broad background on meat structure and the nutritive value of beef and lamb, with both a glossary and index for easy reference.

If you would like further information on beef and lamb, contact us at Beef + Lamb New Zealand on freephone 0800 733 466 or email [enquiries@beeflambnz.co.nz](mailto:enquiries@beeflambnz.co.nz), or visit [www.beeflambnz.co.nz](http://www.beeflambnz.co.nz)

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**BEEF + LAMB**  
NEW ZEALAND

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# Naturally raised, Quality assured

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## Quality begins on the farm

New Zealand cattle and sheep are raised on grass - their natural diet - a luxury this country can afford because of the temperate climate, and its extensive pasture and hill country.

This is not the case elsewhere in the world. In the USA and Europe, for example, many animals are finished on a grain-based diet for varying periods of time and some are housed indoors for part of the year.

Pasture-fed beef is generally lower in fat with less marbling than grain-fed beef.

A very small percentage of New Zealand beef and lamb is grain-finished to meet specific market demand. The animals are fed a specially formulated grain-based diet for a specified time before slaughter.

New Zealand's healthy feed regime produces quality beef and lamb, and the technology and hygienic conditions employed in processing meat are unsurpassed.

Beef and lamb are nutritious meats providing high quality protein. They are considered nutrient dense (ie a small serving gives a high concentration of many essential nutrients).

### New Zealand beef cattle breeds

In 2009 New Zealand's beef herd numbered nearly four million.

The majority of New Zealand's cattle herd evolved from traditional British breeds, including Angus and Hereford. Today the main beef breed is Angus, followed by Hereford and the crossbreeds of these.

Other beef breeds include: Simmental, Shorthorn, Charolais, Murray Grey, South Devon, Limousin, Blonde d'Aquitaine, Belgian Blue, Salers, Gelbvieh, Chianina, Piedmontese, Welsh Black and Red Devon to name a few.

Some beef originates from New Zealand's dairy herds (mainly Friesian/Holstein), often being crossbreeds derived from traditional beef bulls.

### New Zealand sheep breeds

In 2009 New Zealand's estimated sheep flock was just over 32 million.

Since the refrigerated meat export business began over 125 years ago, there has been an increasing focus on developing dual-purpose breeds to produce both quality meat and wool. More recently, with wool prices low and lamb, especially chilled lamb, a premium product in overseas markets, most sheep are being bred first and foremost for the quality of the meat they produce.

Today the New Zealand Romney is the country's main sheep breed, being 41% of the national flock. Coopworths (Romney/Border Leicester cross) represent 12%; Perendale (Romney/Cheviot) 10%; and the Corriedale, the first New Zealand-bred sheep, 2%.

Some other sheep breeds include New Zealand Halfbred, Merino, Borderdale, Texel, Drysdale, Southdown, Cheviot, South Suffolk, Suffolk, Poll Dorset, Dorset Down, Dorset Horn, English Leicester, Hampshire, Cormo, Polwarth and Lincoln. More recently breeds such as the Finn have been introduced. East Friesian, a breed used for milking as well as meat has also become popular.

### Quality meat comes from unstressed animals

There are some differences in meat texture between the different breeds of cattle and sheep. Beef with more marbling is likely to be more succulent.

Flavour differences in meat are related to an animal's age, feed and breed.

For meat tenderness, the feeding and management, pre-slaughter handling and processing of the animal are far more significant than any breed difference.

Quality begins on the farm. An animal stressed because of undernourishment or excessive activity will not produce quality meat.

## The New Zealand Beef & Lamb Quality Mark

### Quality for the customer

The New Zealand Beef and Lamb Quality Mark represents a set of standards designed to deliver a consistent level of quality. It was launched to the consumer in 1997.

Beef + Lamb New Zealand is responsible for implementing the Quality Mark programme.

The Quality Mark label appears only on meat which has achieved standards set by Beef + Lamb New Zealand and representatives of the meat industry at all levels through to retail.

The Quality Mark label on beef and lamb provides customers with an assurance the meat has been produced in a way which ensures high standards of:

- eating quality including tenderness and colour;
- microbiological quality (food safety);
- storage and handling treatment;
- animal welfare.

### Auditing the Quality Mark

The Quality Mark programme involves producers, processors, wholesalers, retailers and marketers.

To ensure the success of the Quality Mark, regular auditing is undertaken at all points to ensure standards are being met.

Processors and independent wholesalers are audited on average four times a year and retailers are audited a minimum of twice a year.

Product tenderness is audited at point of sale (retail). Random samples of beef and lamb are purchased from meat retailers and analysed for tenderness (see page 21).

### Customer feedback

Customers are encouraged to call Beef + Lamb New Zealand toll free on 0800 733 466 or email any concerns to [enquiries@beeflambnz.co.nz](mailto:enquiries@beeflambnz.co.nz) if they have any issues about Quality Mark beef and lamb products.

## Why have the Quality Mark?

The quality of meat cannot be judged solely by its appearance.

Customers today want consistent quality. If a product does not meet their expectations or if the quality is inconsistent, they will switch to something else.

Consumer confidence in beef and lamb and the meat industry is critical.

All meat produced in New Zealand is subject to strict food hygiene and animal welfare standards.

The Quality Mark provides for some additional requirements in these areas as well as having a specific eating quality standard.

For some years Beef + Lamb New Zealand research at retail level showed while there was a great deal of good quality meat being sold, there was also variability.

Beef + Lamb New Zealand's most recent consumer research highlights the fact consumers are unsure about what meat to buy or how to cook it. This Guide is designed to assist the understanding of these processes.



## Processing: efficient, hygienic and humane

New Zealand is a world leader in innovative meat processing technology, including humane slaughter.

Meat processing companies are very aware they are in the food business. For this reason, plants where stock is slaughtered are now known as processing plants and considered as food factories (the term 'freezing works' is seldom used).

Modern, efficient meat processing facilities comply with stringent New Zealand hygiene standards to meet those demanded by certifying agencies from all major importing countries.

Achieving ISO 9002 standards is a priority for many meat companies, as is introducing Hazard Analysis Critical Control Points (HACCP) and other quality assurance systems as part of the overall management system.

An increasing amount of product is further processed (ie beyond the carcass) at the plant after slaughter, although some major supermarket chains prepare and package meat at their own boning centres.

Large companies may have several thousand specifications for cuts to suit various customers. Many specialist suppliers to the New Zealand market offer a buyers' manual listing their specifications. Some specialists supply restaurant-ready chilled meat by courier.

The first large cuts made from the carcass are the whole muscle cuts known as primal cuts (such as a rump).

Sub-primals are prepared by subdividing these (eg by seaming, which is cutting along the muscle seam).

Everything from the animal is used. In addition to meat, a wide variety of by-products (co-products) are produced which range from hides and pelts to casings (used for sausages) and pharmaceuticals, eg from blood. Inedible materials may be rendered down to produce tallow and meal.

Note: Plants which process meat for export each have their own Meat Export (ME) licence number. Plants which process for the domestic market only have an Abattoir (AB) licence.

### Pre-slaughter care

Pre-slaughter care of livestock is the most important part of the production of quality meat. Meat quality starts with healthy, well-nourished stock. Prevention of animal stress and maintenance of good hygiene standards are top priorities for ensuring quality meat. The process starts on the farm, with farmers required to present their stock in a clean, rested condition.

The farmer, the stock truck driver and processing plant staff all have a part to play in animal welfare. Livestock must be handled with care during muster, loading and transport, as well as on arrival at the plant.

A transport code of practice has been drawn up by the Animal Welfare Advisory Committee, which also sets Recommended Plant Pre-Slaughter Standards. These codes are underpinned by animal welfare legislation.

Pre-slaughter stress in livestock affects meat quality because the glycogen in muscle cells is used up, resulting in a high pH (see page 18). High pH affects meat colour, texture, shelf life, flavour and tenderness.

Keeping animal stress to a minimum helps maintain meat quality.

### The slaughter process

- The slaughter process complies with the New Zealand slaughter regulations (controlled by the New Zealand Food Safety Authority or NZFSA).
- The slaughter process is fast, humane and efficient. Animals are stunned immediately prior to slaughter and experienced operators carry out slaughter. For details of what happens at each stage of processing from slaughter to packaging, see page 6 (beef) and page 7 (sheep and lamb).

### Post-slaughter

Post-slaughter procedures, which include conditioning, accelerated conditioning, chilling and aging, also have a major impact on meat quality and tenderness.

These procedures are designed to avoid cold shortening, which causes meat to be less tender.

Cold shortening occurs if meat is exposed to temperatures colder than 7°C before the muscle has passed through the process of rigor mortis (stiffening after death).

This process, known as conditioning, takes from 18 to 24 hours to occur naturally in lamb and from 24 to 36 hours in beef.



It can, however, be accelerated by passing an electric current through the carcass after slaughter. This reduces the conditioning time for sheep to within two to six hours and beef to within three to six hours.

Accelerated conditioning, usually followed by aging (Accelerated Conditioning and Aging) is widely used in New Zealand to achieve uniform levels of meat tenderness. (See section on tenderness, page 16.)

### Meat Inspection

New Zealand's meat inspection regime is regarded as being one of the best in the world.

- Plants meet international hygiene standards under NZFSA mandated inspection regimes.
- Inspection is done both before and after slaughter and at various points throughout the processing/dressing chain operation.
- The task of the Government-appointed inspectors is to ensure stock is slaughtered humanely and meat is free from disease and fit for human consumption.
- The New Zealand Meat Classification Authority is responsible for the meat classification system (see page 8).

For more scientific and technical information about the slaughter process, you can contact either Carne Technologies on 07 826 0731, or Beef + Lamb New Zealand, email: [enquiries@beeflambnz.co.nz](mailto:enquiries@beeflambnz.co.nz) or freephone 0800 733 466.



### Special Cultural Procedures

#### HALAL

New Zealand produces meat for Islamic markets and is the world's major exporter of halal-certified sheep meat as well as a significant exporter of halal beef. New Zealand plants are inspected and approved by halal-certifying authorities prior to exporting any halal product.

- To be accepted as halal meat, the sheep or cattle must be slaughtered in the true Islamic manner, in accordance with the Shari'a of Islam.
- Only accredited Muslim halal slaughtermen are employed to perform the ritual procedure, which is supervised by halal-certifying authorities.
- Customers are assured by certification that the meat is truly halal.

Halal processed meat is also available on the New Zealand domestic market.

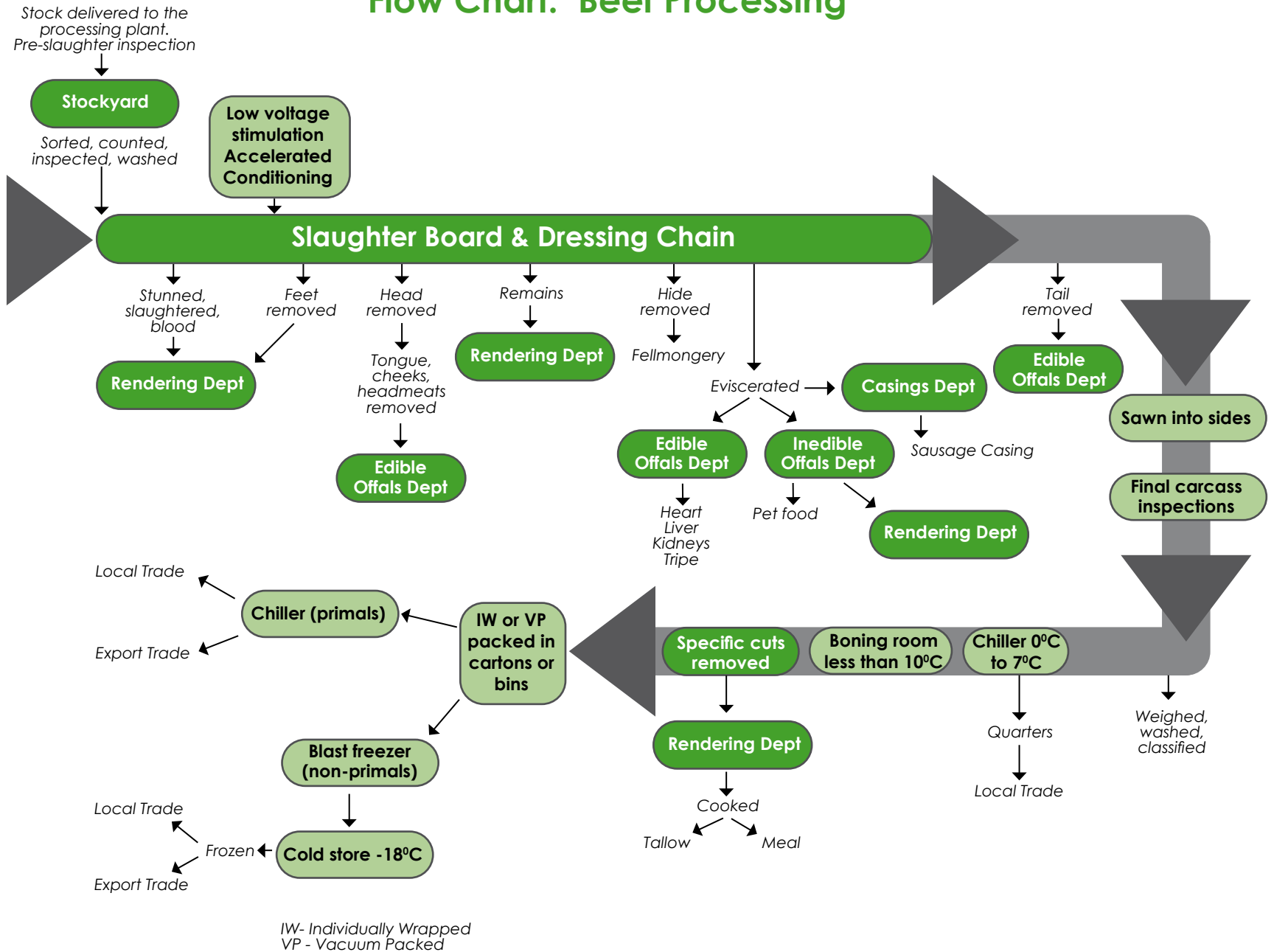
#### KOSHER

Jewish people observe the dietary laws of kashrut, which lists foods which are not permitted and those which are. Permitted foods are termed kosher-fit.

- Animals must be slaughtered in a ritual manner by a professional slaughterman, to cause least pain and let as much blood drain as possible. Consumption of blood is forbidden.
- Certain parts of the animal are not permitted, eg fat from below the abdomen and the hindquarters may not be eaten unless the sciatic nerve and sinews are carefully removed.

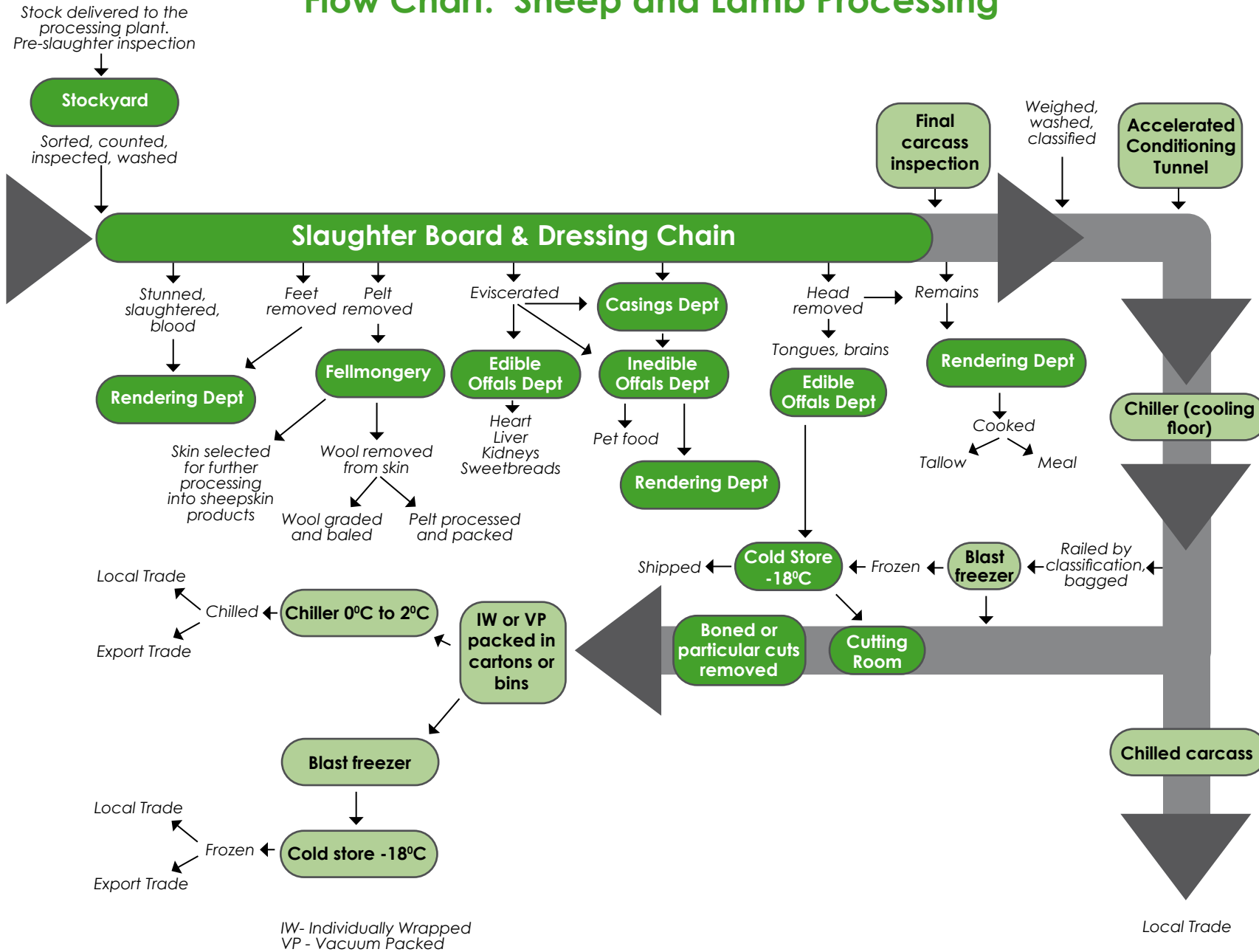
Kosher processed meat is not produced in New Zealand.

# Flow Chart: Beef Processing





# Flow Chart: Sheep and Lamb Processing



## Classification: putting like with like

New Zealand's export meat classification system has been designed to put like product with like. This benefits both the farmer, who is paid according to what has specifically been produced and the buyer, who can give clear specifications.

Once livestock has been slaughtered, the carcass meat from cattle and sheep is classified as beef or veal, or as mutton, hogget or lamb.

After slaughter and dressing, meat companies classify all carcasses according to a voluntary standard. (Dressing is the term for evisceration of the carcass and removal of head, hooves and hides or pelts.)

Meat is classified by four factors:

1. Gender (sex)
2. Maturity (age)
3. Fat content (finish)
4. Muscling (conformation)

All export meat companies employ their own graders to carry out this function. The Meat Classification Authority employs auditors to ensure the classification is carried out consistently across all meat plants.

There are some slight differences in definitions used for classifying meat for export and local sale. Many local suppliers choose to classify to export standards.

### NEW ZEALAND BEEF CLASSIFICATION

#### For domestic/local market

Beef (bovine) carcasses are: Steer, heifer, cow, bull and bobby calf. For the purpose of this classification the following definitions apply:

#### Gender and maturity

- Bobby Veal - meat from a calf weighing less than 30kg and generally under two weeks of age.
- White Veal - meat from a calf which has been fed entirely on milk or milk products.
- Veal - the meat from calves weighing no more than 160kg (domestic market only, no export equivalent).
- Calf - a bovine animal of either sex not over 12 months of age.
- Heifer - female cattle over 12 months of age and having no more than six permanent incisors (cutting teeth) and a carcass weight over 160kg.
- Steer - a castrated male bovine over 12 months of age, or with a carcass weight over 160kg.
- Cow - female cattle having more than six permanent incisor teeth.
- Bull - uncastrated (entire male bovine) 12 months or older.

#### Fat

All carcasses, except bobby calves, are classified according to depth of fat cover.

Prime quality beef comes from steers or heifers and occasionally from Selected Young Beef (see following column). Most manufacturing beef comes from bulls or dairy cows.

#### For Export Classification the following variations apply:

- Steer carcass weight is over 145kg.
- Heifer carcass weight is over 145kg.
- Steer, heifer, bull and cow carcasses (except dairy types) are graded into muscling classes. Muscling classification is based on the degree of muscling in the hindquarter.
- Selected Young Beef is a voluntary carcass category. These are young bovine animals having no more than four permanent incisors erupted and weighing between 245 to 360kg.

New Zealand is unique in having a substantial export trade in beef from young bulls, slaughtered at 18 months to 3 years of age.

### NEW ZEALAND SHEEP CLASSIFICATION

For the domestic/local market, sheep carcasses are classified according to the maturity of the carcass (lamb, hogget or mutton), sex, fat content, weight and in some cases muscling.

For the purpose of this classification the following definitions apply:

#### Gender and maturity

- Lamb - a young sheep under 12 months of age, or with no permanent incisor teeth (cutting teeth).



- Hogget (two-tooth) - a young male or female sheep with no more than two permanent incisors (these usually appear at about 12-15 months of age).
- Ram - adult uncastrated (entire) male sheep with more than two permanent incisors.
- Four-Tooth Mutton - a wether (castrated male sheep) or ewe (female) with four permanent incisors.
- Mutton - a wether or ewe with six or more permanent incisors.

#### **Fat**

All fat content assessment is based on the measurement of total tissue depth over the twelfth rib, at a point 11cm from the midline of the back. This is known as the 'GR' measure.

Lambs or hoggets provide quality meat for table cuts. Meat from wethers and ewes is more suited to stewing or manufacturing, although legs and loins can be suitable for table cuts.

#### **For Export Classification:**

- Alpha Lamb - a specialised class for young lamb under 9.1kg, almost devoid of fat.
- Lamb - a young sheep under 12 months of age or without any permanent incisor teeth.
- Hogget - a young male sheep or maiden ewe having no more than two permanent incisors.
- Mutton - a wether or ewe with six or more permanent incisors.
- Ram - adult uncastrated male sheep with more than two permanent incisors.



# Processing Notes

## Processing Notes

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## Beef Boning

New Zealand meat companies have a variety of beef processing systems that allow them to match products to their customers' needs.

Two major systems, cold boning and hot boning, are used; the names referring to the time and temperature at which the carcass is processed into cuts following slaughter.

### Cold boning

Cold boning is the more traditional system used for processing beef to produce quality table cuts.

After slaughter, the carcass is placed into a temperature and humidity-controlled chiller where it is held for approximately 24 hours to allow the meat to cool and go into rigor. The carcass is then processed into cuts in a temperature-controlled environment (7°C). Cuts are trimmed to specification before packing.

### Hot boning

Hot boning is carried out soon after slaughter, while the muscles are still pre-rigor and the meat still warm.

The process was originally designed for the production of beef for manufacturing or further processing, eg hamburgers, ground beef for pizzas, etc. However there has been significant research and development carried out in this area and, as a result, many now claim hot boning is the equivalent to cold boning in terms of eating quality consistency.

## Chilled and Frozen Product

The New Zealand export meat industry owes its existence to the development of refrigerated shipping. The first shipment of frozen meat from New Zealand to England was in 1882.

In the early days, almost all product exported from New Zealand was frozen, the large percentage of sheep meat as carcasses and beef as quarters.

Now, only about 3% of lamb is exported as carcasses. A huge variety of cuts, both boneless and bone-in, are prepared for export. Almost all beef is exported boneless.

The first shipments of chilled beef were in the 1930s, but chilled exports of both beef and lamb did not really begin to grow until after the development of vacuum packaging and Controlled Atmosphere Packaging (CAP).

These and other new packaging techniques, many of them developed or refined in New Zealand, make it possible for meat to be transported by sea to international markets and arrive in a fresh condition, with several weeks of shelf life remaining.

Now an increasing proportion of both beef and lamb is exported chilled.

## Product Descriptions

### Chilled beef

Vacuum-packed and stored at a temperature of - 1°C (+ or - 0.5°C). This product has a storage life of up to 12 weeks after production.

### Aged frozen beef

In this process, beef is vacuum-packed then chilled at - 1°C (+ or - 0.5°C) for 15 to 21 days. It is then blast frozen at - 36°C, and kept at a temperature of - 12°C or colder. This product has a storage life of up to 24 months. When required, it is best thawed slowly under refrigeration.

### Chilled lamb

Lamb cuts are vacuum-packed and held at - 1°C (+ or - 0.5°C) for up to 12 weeks after production.

### Frozen lamb

After conditioning, lamb is chilled for up to 72 hours at - 1°C (+ or - 0.5°C) to ensure tenderness. After chilling it is cut, vacuum-packed or shrink-wrapped, then frozen and stored at - 12°C or colder. This product has a storage life of up to 24 months.

## The Curing of Meat

### Reasons for curing meat

- Increase the keeping time (preservation)
- Alter or improve flavour, aroma and/or texture
- Offer greater variety of cuts
- Add value to the cut

Cured, corned, salted or pickled meat is fresh meat which has been prepared by treatment with salt or brine (or both), with or without the addition of sodium nitrate.

Cured meats may also have any of the following added:

- Sweeteners, flavouring substances, smoke and smoke flavours, spices
- Acidity regulators
- Ascorbic acid, isoascorbic acid (erythorbate) or their sodium salts
- Sodium citrate
- Phosphates (retain moisture)

### Nitrate has several desirable effects on meat:

- It has a preservative, bactericidal effect. Nitrate (when working together with pH and common salt) inhibits harmful organisms such as *Clostridium botulinum*.
- It has an antioxidant effect (delaying rancidity of animal fats).
- It causes reddening of the meat (cured meat is pink to dark red). This reddish, cured meat colour is a result of reactions between the muscle pigment, myoglobin or the blood pigment, haemoglobin with nitric oxide (NO).
- It causes flavour and aroma changes. (No one has succeeded in producing the typical cured aroma in meat products without the help of nitrous compounds.)

### Food regulations

There are strict regulations on additives permitted in cured meats and limits on the nitrite or nitrate content of final products.

In limited quantities, nitrate itself is not toxic. Nitrate is found in all vegetable foods. Quite high levels are found in vegetables, such as spinach and silverbeet. But nitrate is easily changed to nitrite - harmless in small doses but poisonous at very high levels.

Nitrite can form nitrosamines, which are reported to be carcinogenic in animals if taken for a long time at high concentrations. However, this has not been proven in humans.

### The curing process

Brine, a mixture of clean water, salt, nitrite with or without nitrate, polyphosphate, sweeteners and spices, is injected into meat using an electrically-operated brine pump.

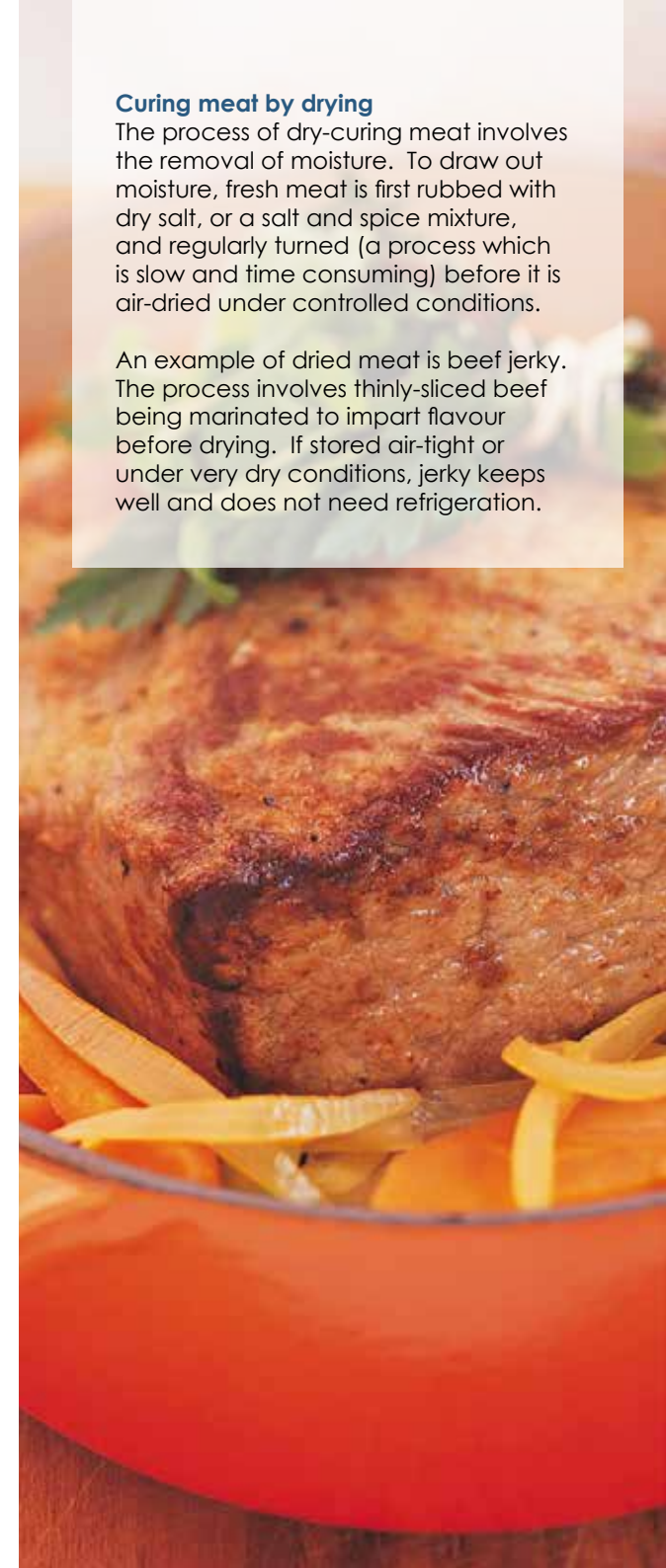
The strength (concentration) of the brine is very important and is measured by an instrument called a salinometer. The pumped meat is then placed in a holding brine for approximately 48 to 72 hours under 10°C.

**Cuts commonly cured:** Beef silverside, brisket, topside, tongue, lamb or mutton leg. Some cured meats are further processed by smoking, eg smoked beef, pastrami and ham.

### Curing meat by drying

The process of dry-curing meat involves the removal of moisture. To draw out moisture, fresh meat is first rubbed with dry salt, or a salt and spice mixture, and regularly turned (a process which is slow and time consuming) before it is air-dried under controlled conditions.

An example of dried meat is beef jerky. The process involves thinly-sliced beef being marinated to impart flavour before drying. If stored air-tight or under very dry conditions, jerky keeps well and does not need refrigeration.





## Technical Facts about Meat

### Structure and composition

An understanding of the structure and composition of meat is helpful in understanding why meat 'behaves' the way it does during processing and when it is cooked.

Meat is made up of:

- Protein (in muscle and connective tissue)
- Water
- Fat
- Minor components (glycogen, vitamins, minerals, etc)

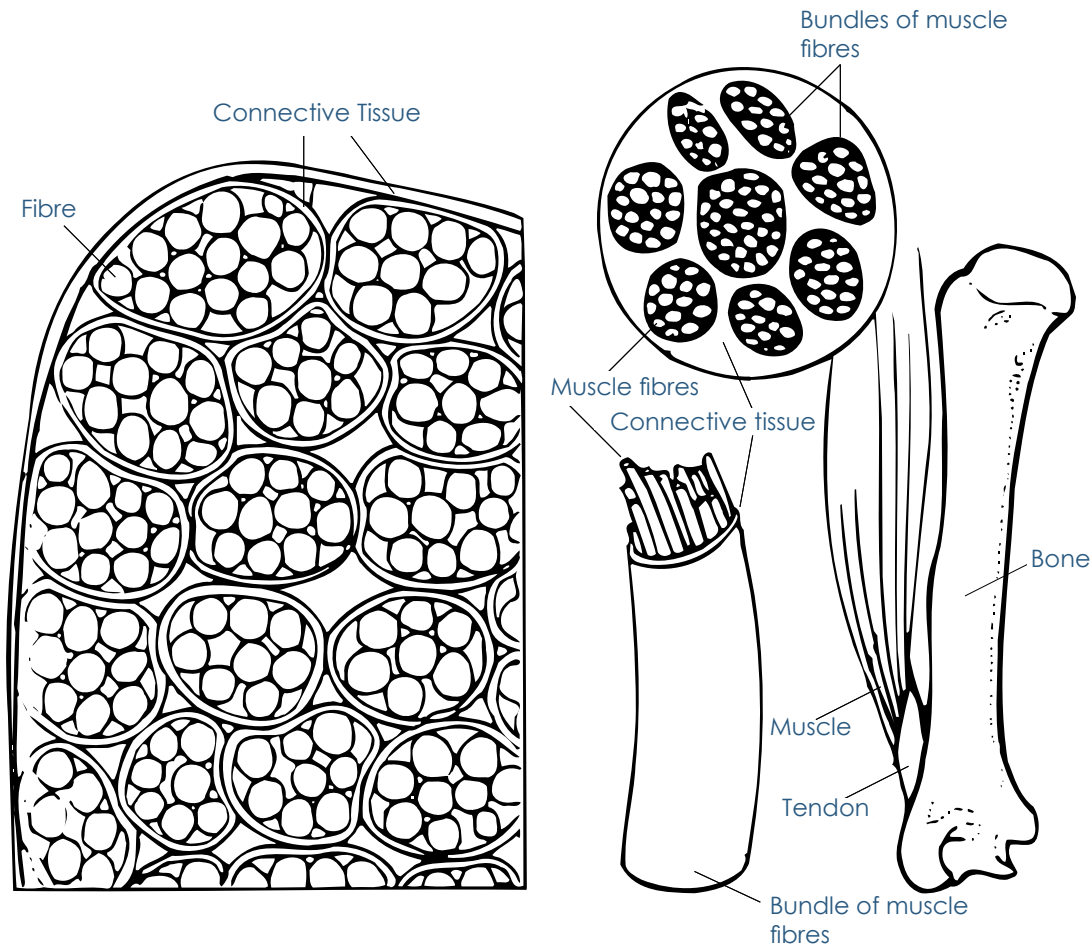
### Muscle

Muscle tissue is made up of long, thin cells or fibres bound together by thin sheets of connective tissue.

These bundles of fibres are held in groups by more connective tissue to make up an individual muscle. Several muscles usually make up one meat cut, eg rump consists of five main muscles.

Two major proteins are found in muscle: myosin and actin. These exist as long, chain-like molecules lying parallel to each other and are molecules of motion. They are able to slide alongside each other, form cross-bonds and lock together to form a complex molecule, actomyosin. This cross bridging shortens the muscle cell so the muscle contracts.

## The Structure of Muscle



**Muscle fibres are held in bundles by connective tissue, then the bundles are held together by more connective tissue to form muscle.**

**Cross-section of a muscle showing fibres in bundles bound together by connective tissue.**

### Cut across the grain

The lengthwise structure of the muscle bundles creates what is called the 'grain' of the meat. This lengthwise structure or texture is clearly visible in many meat cuts. If cut at right angles across the fibres or grain, meat is more tender and easier to chew.

### Connective tissue

Connective tissue is the protein structure which holds muscles together.

It is found:

- between individual muscle fibres
- holding bundles of fibres together
- between whole muscles
- anchoring muscles to bone

The amount and type of connective tissue in a cut of meat affects the tenderness of the meat. Cuts with a lot of connective tissue tend to be less tender than those with little connective tissue.

Connective tissue is made up of elastin and collagen in varying proportions depending on the muscle.

- Elastin does not soften on cooking.
- Collagen does soften on cooking and above 60°C it can be transformed into soluble gelatin.

Looking at various meat cuts you can see different forms of connective tissue. For example, filmy, thin and white; thicker, cream-coloured and less tender; more elastic and yellowish; thick and gristly.

- An example of connective tissue containing a lot of elastin is the paddy wack – the yellow strip running along both sides of the spine and seen in a cross-section of lamb/mutton neck chops.
- An example of connective tissue containing a lot of collagen is the line of gristle visible in cross-cut beef blade steak.

### Fat

- Fat is found on the surface of cuts and, to a lesser degree, scattered throughout the muscle.
- Fat colour is influenced mainly by natural pigments in the animal's diet and also by age and breed. It ranges from white through to creamy white to yellow. New Zealand beef fat is generally creamy. Its yellowish tinge is the result of pigment in the grass called carotene or pro-vitamin A. (This is the same pigment which makes carrots orange.) Lamb fat is pearly white.
- Fat helps to contribute to meat flavour and succulence.

### Fat Cover

Subcutaneous fat (under the skin) is called fat cover or outer fat. It is easily trimmed off to give lean cuts.

### Marbling (intramuscular fat)

- A fine network of fat sometimes visible throughout the meat is called marbling. Marbled meat is usually obtained from carcasses with a large amount of subcutaneous fat. Marbling develops with the maturity of animals. Beef animals raised to provide marbled beef (eg in feedlots), are fed to mature at a faster rate, hence produce marbled beef at a younger stage.
- Marbling primarily contributes to flavour and juiciness. The more fat in meat, the less muscle fibre. Cooked fat gives a softer mouth feel than meat fibre. Thus, marbled meat is easier to chew and may seem more tender than lean meat. However, meat marbled or otherwise, can be less tender if poorly processed.

- Marbling is thought to enhance the sense of succulence in several ways. Fat acts as a lubricant to aid in chewing and swallowing. The melted fats, in combination with water, are released upon chewing, which helps stimulate the flow of saliva, creating an even greater sense of eating pleasure (known as 'mouth feel').

### Fat in cooking

Meat cuts with a high fat content take longer to cook than lean cuts. Traditional large meat cuts with the fat cover on, are cooked slowly for a long time so fat melts and bastes the lean meat. Marbled fat keeps meat from becoming dry when cooked to well done.

Conversely, lean meat cuts with virtually no marbling and with all outer fat removed, need less cooking time than similar cuts containing more fat. In lean, totally trimmed cuts, juiciness depends more on retaining moisture during cooking. Very lean meat will become dry if overcooked.

### Water

Lean muscle contains 50% to 75% water. B vitamins and other natural substances are dissolved in this water.

The water in meat contributes to juiciness. Water is driven out of meat during cooking. As meat is heated, proteins coagulate and shrink, squeezing out water, especially from cut surfaces. The longer the cooking, the more water is lost.

Very lean cuts, if cooked too long, lose much of their moisture and the result is dry meat (see Meat Cookery, page 69).



## Colour

The colour of meat does not indicate tenderness.

Lean meat colour is affected by:

- **The pH**  
pH is influenced by the pre-slaughter condition of the animal (see page 18). Meat with a high pH level may appear dark. This meat is called 'dark cutting' and can have texture and flavour problems. This meat is sticky and does not keep as well. It should not be used for table cuts.
- **Age, sex and breed of animal**  
Older animals have darker meat than young animals. This darker meat in older animals does not necessarily mean the meat has a higher pH.

- **Exposure to oxygen**  
When raw meat is first exposed to air or oxygen, the freshly cut surfaces 'bloom' to a brighter red. After some days, the meat surface begins to turn brownish. This meat may still be good to eat, as long as it hasn't spoiled.
- **Packaging**  
Meat in a low-oxygen package such as a vacuum pack or Controlled Atmosphere Packaging (CAP) has a dark purple/red colour (see page 52). When the pack is opened and the meat exposed to the air (oxygenated), the bright red colour returns.

## Consumer preference

When buying meat, most consumers prefer bright red beef, and lamb of a lighter shade of red. However, aged beef and lamb with a darker appearance is more likely to be superior in eating quality.

It is important to remember colour is only one indication of eating quality.



# Tenderness and Eating Quality

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## Tenderness & Eating Quality

Tenderness, juiciness and flavour all contribute to the eating quality of meat. But tenderness is judged the most important of these three.

It is impossible to tell meat tenderness by appearance. The best looking piece of meat is not necessarily the most tender when cooked. Consumers perceive meat tenderness and texture as a combination of mouth feel, juiciness, and the amount of residue after chewing.

Many factors in the progression from paddock to plate affect the final tenderness of meat, but processing methods have a greater effect on tenderness than any other.

### Factors affecting meat tenderness:

1. Animal age
2. Pre-slaughter handling
3. Post-slaughter handling
4. Aging
5. The cut and its location on the carcass
6. Cooking

#### 1. Animal age

As an animal ages, connective tissue and muscle fibres change, making meat less tender. Older animals have more connective tissue and the connective tissue is tougher. For example, meat from older sheep (mutton) is less tender than that from 18 month old hogget, which in turn is less tender than meat from young lamb.

Some meat cuts have clearly visible connective tissue covering the outside, eg silverskin on beef fillet, which can be trimmed off to make the meat tender when cooked.

Other meat cuts such as lamb shanks and beef shin have a lot of connective tissue between the muscles and this is not easily removed. However this tissue is the collagen type, which will soften. For example, the connective tissue in lamb shanks and beef shins, when cooked slowly with liquid, becomes gelatinous, making the meat succulent and tender.

Thickness of muscle fibres affects meat texture: fine, small muscle fibres (eg in a young animal) are usually more acceptable than coarse, large fibres (eg in well-exercised muscles of an older animal).

#### 2. Pre-slaughter handling

Animals must be in good condition, well rested and handled carefully to prevent pre-slaughter stress, which can increase pH levels and affect eating quality and shelf life of meat. If animals are stressed before slaughter, chemical changes can occur that affect the structure of the muscle tissue and hence the final product.

When muscles are active they burn up their own energy stores of glycogen. A waste product of this process is lactic acid. In the live animal the lactic acid is carried away by the blood or is further oxidised.

The muscles continue to be active for a time after an animal is slaughtered, and produce lactic acid which accumulates, lowering the pH of the muscle.

With unstressed, well fed and rested animals, there is enough muscle glycogen to reduce the final pH to about 5.4 to 5.6 at rigor mortis.

However, when animals are stressed or excessively active before slaughter, the muscles start to use up their glycogen energy stores while the animals are still alive. At death there is less glycogen, so less lactic acid is produced and the muscles will be less acidic at rigor mortis, resulting in an elevated pH.

Meat with a slightly elevated pH, between 5.8 and around 6.0, will be less tender. If the animal has been stressed even more and the pH is even higher, the toughness problem disappears but the meat has other quality defects such as 'dark cutting' (ie dark coloured) and reduced shelf life.

#### 3. Post-slaughter handling

Correct handling and temperature control after slaughter are most important for meat tenderness. The aim is to avoid cold shortening, which reduces tenderness.

After slaughter the muscles gradually stiffen as rigor mortis sets in. Cold shortening occurs if muscle is chilled to low temperatures, or frozen too rapidly prior to rigor after slaughter. This causes the muscle fibre to contract and consequently the meat to toughen.

Cold-shortened meat can be almost inedibly tough and no amount of aging will make it tender. To avoid cold shortening, meat must be conditioned (the muscle passed through the stiffness of rigor mortis, then relaxed). When a carcass has been properly conditioned, the muscles are already 'set' and will not contract further. The natural conditioning process is time consuming. 'Accelerated Conditioning' was developed to speed up the process.

Accelerated Conditioning reduces conditioning times by at least two-thirds.



## Why is pH so important?

pH is a measure of acidity which ranges from 0 (very acid) to 14 (very alkaline). Water is neutral, pH 7.

The ultimate pH (pH at rigor) level of beef and lamb (measured once the carcass has reached rigor mortis), affects everything from its colour, tenderness and eating quality, to its storage life.

The normal pH for beef and lamb is 5.4 to 5.6.

Within this range the meat is a bright, attractive red colour and has good eating quality.

**Lower levels:** At a lower pH (below 5.3) meat will be pale and soft.

**Higher levels:** An increase in pH above about 5.8 may indicate an overall decrease in meat quality. High pH meat (pH more than 6) is dark with a slightly different odour and flavour. Meat becomes progressively less juicy as pH increases. High pH meat spoils early due to its different biochemical make-up.

Every carcass needs to be measured for pH using a specifically designed meter. The longissimus (striploin/cube roll, see page 27), is the muscle most commonly used for measurement.

To be given the Quality Mark, beef must have a pH value of 5.8 or less at rigor.

## Accelerated Conditioning & Aging (AC&A)

Accelerated Conditioning and Aging is the most widely used process to achieve uniform lamb tenderness in New Zealand.

With Accelerated Conditioning, carcasses or sides are stimulated electrically soon after slaughter. This speeds up conditioning, which is naturally a time-consuming process. Electrical stimulation works by causing the muscles to contract. This uses up muscle energy stores (glycogen) and therefore speeds the onset of rigor mortis. The carcasses or sides are held at a controlled temperature for a while after stimulation, so cold shortening cannot occur.

With appropriate holding/chilling, the meat can be subsequently matured (aged) to a higher degree of uniform tenderness.

Note: AC&A processing will not overcome toughness due to pre-slaughter stress, poor stock quality, or old age of animals.

### 4. Aging

After rigor mortis is complete, a carcass (or primal cuts of meat) should be given time to hang, or be held for several days or weeks, to allow the meat to age. This post rigor tenderising is called 'aging' (sometimes referred to as maturing or ripening).

To 'age' meat means to keep it for a time under controlled temperature. This allows the naturally occurring enzymes within it to slowly break down and soften the muscle fibres, making the meat more tender and developing flavour.

The aging rate increases with temperature, so aging occurs quite rapidly in warm carcasses and more slowly in very cold meat.

Fluctuations in temperature or humidity during meat aging can have detrimental effects on meat quality and result in a reduced storage life.

Controlled aging improves tenderness. Two methods of aging are: Carcass Aging and Vacuum-Packed Aging.

### (a) Carcass Aging (sometimes called 'dry' aging)

In this process the fresh/chilled carcass or side (not vacuum-packed) is stored or hung in the chiller, ideally at - 1.5°C to + 2°C and at 88% humidity.

During carcass aging there is some weight loss due to evaporation. A carcass stored for 10 days may lose from 1% to 4% in weight.

Surface drying can sometimes mean extra trimming is required and this means more weight loss, but carcass surfaces should not be wet (dry surfaces prevent microbial growth). Lower temperatures and higher humidity can lessen weight loss.

### (b) Vacuum-Packed Aging

This process eliminates the need to hang entire carcasses or quarters in the cooler and allows aging to take place in vacuum bags.

Large cuts, usually primals, are packaged in moisture-proof, airtight material and stored chilled. This vacuum pack protects the meat from oxidation and evaporation during storage. The oxygen-free environment inhibits aerobic bacterial growth and provides better yields by preventing weight loss from evaporation.

## How long should meat be aged?

The rate of aging depends on temperature; the lower the temperature, the longer the aging time required for a given level of tenderness.

Beef is considered aged when it has been stored, chilled, between 0°C and 2°C in 88% humidity for at least 10 days from time of slaughter.

A side of beef that is not vacuum-packed, can be aged under controlled conditions for a longer period (maximum about 30 days) and the flavour will continue to develop.

Vacuum-packed beef, stored chilled, is generally aged for five to six weeks, but can be aged for up to 10 to 12 weeks, providing the temperature is kept low.

Lamb (not vacuum-packed) is considered aged when it has been held chilled, ideally at -1.5°C to +2°C (maximum up to 4°C), for at least five to six days from time of slaughter.

Vacuum-packed lamb, held at -1.5°C to + 2°C, may be aged for up to 21 days. If temperature is kept low, the aging process can last up to six weeks. In vacuum packs, lamb has a slightly shorter storage life than beef at the same temperature.

### 5. Meat cut/location on the carcass

Some parts of the carcass are naturally more tender than others.

- The amount of connective tissue in a cut of meat and the amount of work the muscle does, are related to the position of the cut on the carcass.
- Muscles used more frequently develop thicker muscle fibres and more connective tissue because they work harder. Thus, these muscles get the most exercise and are the least tender.
- Muscles not used for vigorous exercise are finer-grained and more tender. For example, the tenderloin or fillet (lying along the backbone) performs little physical work and is a tender cut. Beef shin (leg) and beef chuck (shoulder) muscles are continually working and are less tender.

It is important to identify meat cuts according to their position on the carcass, as this determines the end use for eating. Understanding meat structure helps to determine the method of cooking best suited to the cut.

### 6. Cooking

The method of cooking, length of cooking time, and end-point temperature of cooked meat can have a marked effect on tenderness.

- For optimum tenderness, the cooking method must suit the meat cut. If a meat cut containing large amounts of connective tissue is cooked quickly by a dry heat method, it will not be tender. However, cooked slowly by a moist heat method, the same meat cut can become meltingly tender.
- A meat thermometer is a handy tool to monitor internal meat temperature during cooking, to assess degree of doneness. A thermometer is particularly useful for accurately judging cooking end-point when roasting large joints of meat.
- Lean meat cooked too long will dry out and be less tender. Even the most naturally tender meat cuts (eg fillet), lose moisture if overcooked, so seem less tender.

If cooking beef to 'medium well' or 'well done', choose meat cuts with a higher degree of marbling to ensure juicy, tender eating.

## Measuring Tenderness

Meat tenderness can be measured by using a mechanical testing device and correlating results with sensory evaluation.

A meat tenderometer is the device usually used. This is a mechanical 'tooth' driven by air pressure, which records the force required to shear through samples of meat.

A good level of tenderness is indicated by tenderometer results that average less than 8 kgF (kilograms shearforce).

Meat is less tender when it exceeds a tenderness value of 11 kgF (ie the higher the value, the less tender the meat).

In recent trials, consumers rated steaks of shearforce around 3 or 4 kgF as very acceptable.



## New Zealand Beef & Lamb Quality Mark: Bringing it all together

The New Zealand Beef and Lamb Quality Mark is a comprehensive programme for domestic consumers to ensure New Zealand beef and lamb complies with quality standards at every stage from entering the processing plant through to retail sale.

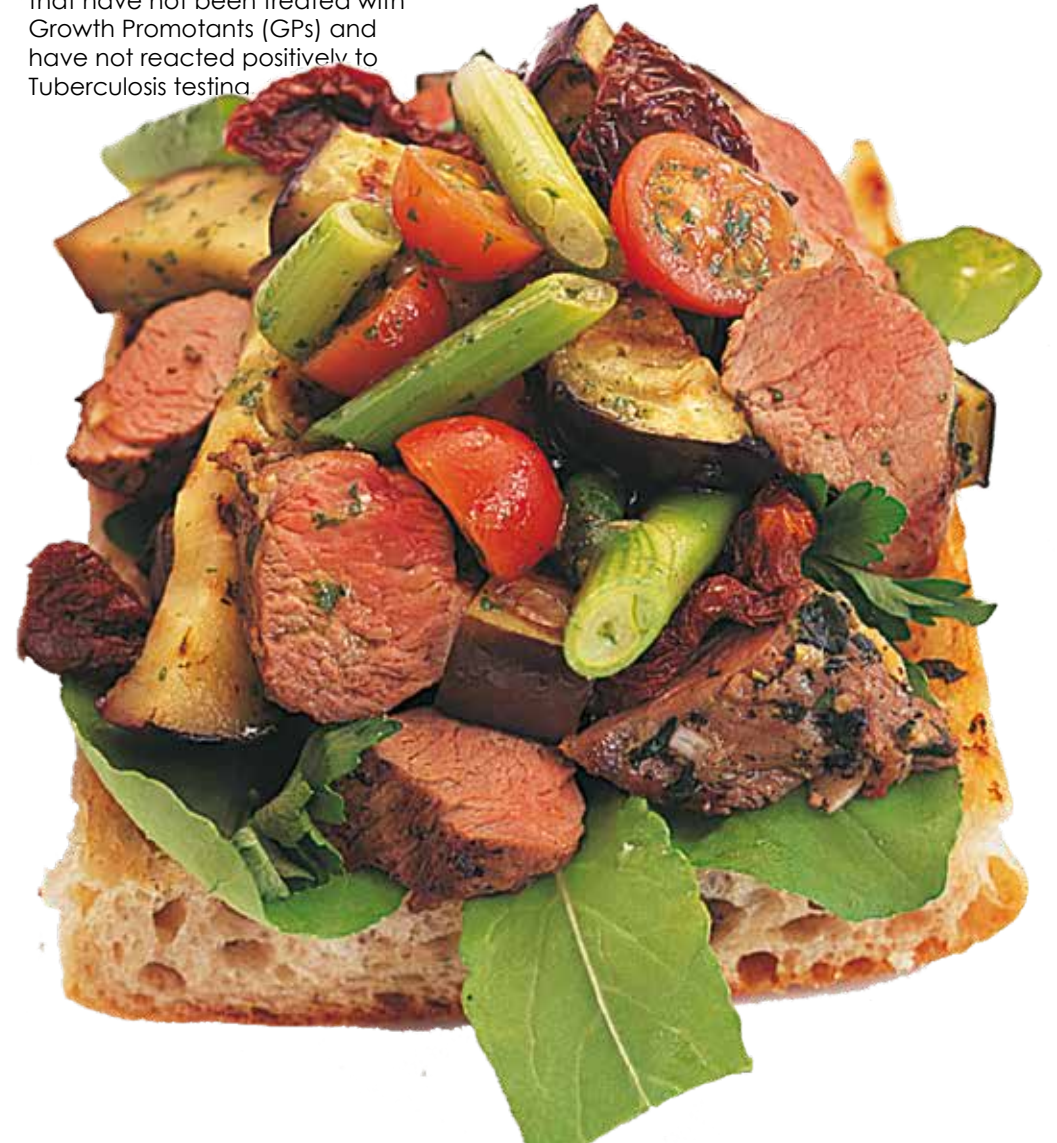
Shoppers can look for the Quality Mark sticker to identify product which has earned the Mark. Among other things, it shows the meat has been processed in a way to ensure tenderness.

To earn the Quality Mark, beef must have a pH value of 5.8 or less at rigor.

### Beef and lamb product that qualifies for the Quality Mark:

- Product must be derived from animals grown in New Zealand.
- All categories of steers, heifers, veal, lamb and hogget may qualify for the Quality Mark.
- Mutton, cow and bull are excluded from the Quality Mark.
- The Quality Mark may be used on carcasses, parts of carcasses, cuts, boneless product, whole muscle table meat and value-added speciality cuts (eg marinated stir-fry, crumbed schnitzel and seasoned roasts).
- The Quality Mark may not be used on processed meat, eg sausage, salami, luncheon, patties, rissoles and meat balls, whether or not they are made from pure meat product.

- The Quality Mark may not be used on offal. For this purpose, offal is defined as any portion of a carcass other than whole muscle meat and includes the following from beef, lamb and hogget: heart, tripe, tongue, brain, sweetbread, tail, kidney, cheek and liver.
- Product is derived from animals that have not been treated with Growth Promotants (GPs) and have not reacted positively to Tuberculosis testing.
- Product is processed in licensed ME or AB plants certified as Quality Mark approved processors. It must not be prepared and retailed in premises that has uninspected meat from any source, including wild game meats, present on the premises at any time.





## Quality Mark Identification Trail

### Farmer

Stock from the farmer.



### Processor

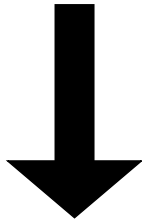
Processor assesses suitability for Quality Mark status.  
Carcass stamped (stamp provided free to Quality Mark holders by Beef + Lamb New Zealand),

**OR**

A ticketing system used (company's own system, approved by Quality Mark auditors),

**OR both.**

Delivery dockets MUST specify 'Quality Mark - quality meat' and the 'Retail Ready' date/time (staff need to be aware of this - it is essential for retail-level auditing).



### Wholesaler

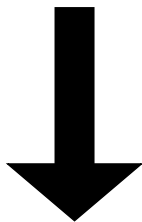
Cartoned/boxed meat  
Package also stamped with similar stamp to carcass stamp (stamp provided free to Quality Mark holders by Beef + Lamb NZ),

**OR**

Packaging labelled (company's own system, approved by Quality Mark auditors),

**OR both.**

Delivery docket MUST specify 'Quality Mark - quality meat' and the 'Retail Ready' date/time.



### Retailer

Retailer checks Quality Mark status by means of visual carcass/box and delivery docket identification.

Further processed, as applicable and stored in designated Quality Mark qualifying holding areas (chilled or frozen).

Quality Mark beef and lamb must not be presented to the consumer until at least the 'Retail Ready' date.  
( 'Retail Ready' does not apply to veal.)



### Consumer

For the consumer, the retailer marks Quality Mark meat by:

- A Quality Mark sticker (supplied free by Beef + Lamb NZ),

**OR**

- Their own sticker, incorporating the Quality Mark (viewed/approved by Beef + Lamb NZ),

**OR**

- Using point-of-sale material around the appropriate counter/server to indicate which is Quality Mark meat (supplied free by Beef + Lamb NZ).

## Auditing

Auditing will generally occur:

- Processing: **four times per year**
- Wholesaling: **four times per year**
- Retailing: **twice per year**

At retail level, the auditor may purchase samples for tenderness testing during the audit.

### What is 'Retail Ready'?

'Retail Ready' refers to the date and time at which meat will have reached acceptable tenderness. Each processing plant has determined the Retail Ready date and time appropriate for meat processed through their operating system.

Retail Ready times differ from plant to plant because systems differ.

Retail Ready applies to all lamb cuts but to only five beef cuts:

- Eye fillet (tenderloin)
- Sirloin
- Scotch fillet (cube roll, ribeye)
- Rump
- Thick flank (knuckle)

Retail Ready does not apply to veal.







# Meat Cuts

## Beef Cuts

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## Lamb Cuts

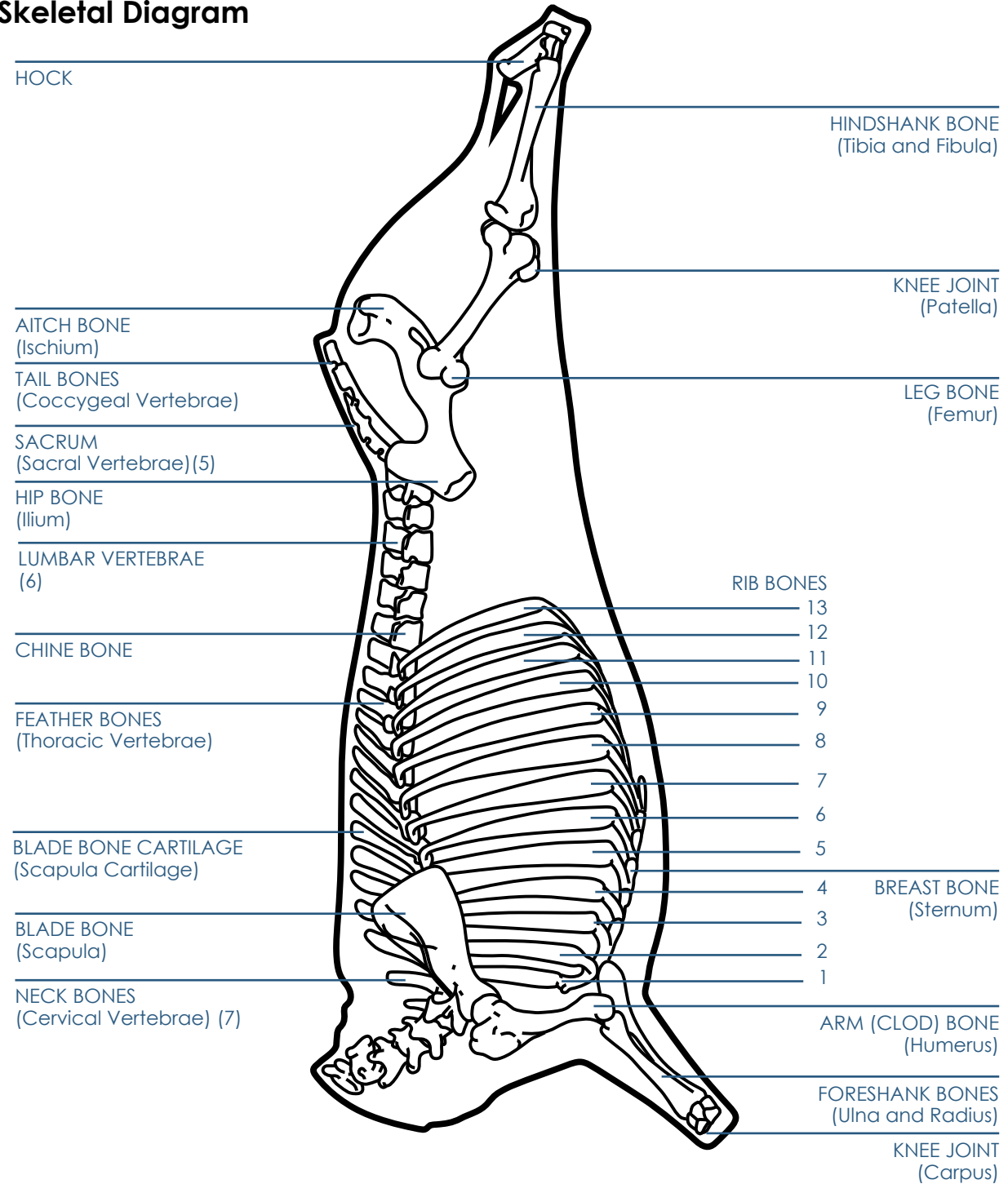
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## Edible Offal/Variety Meats

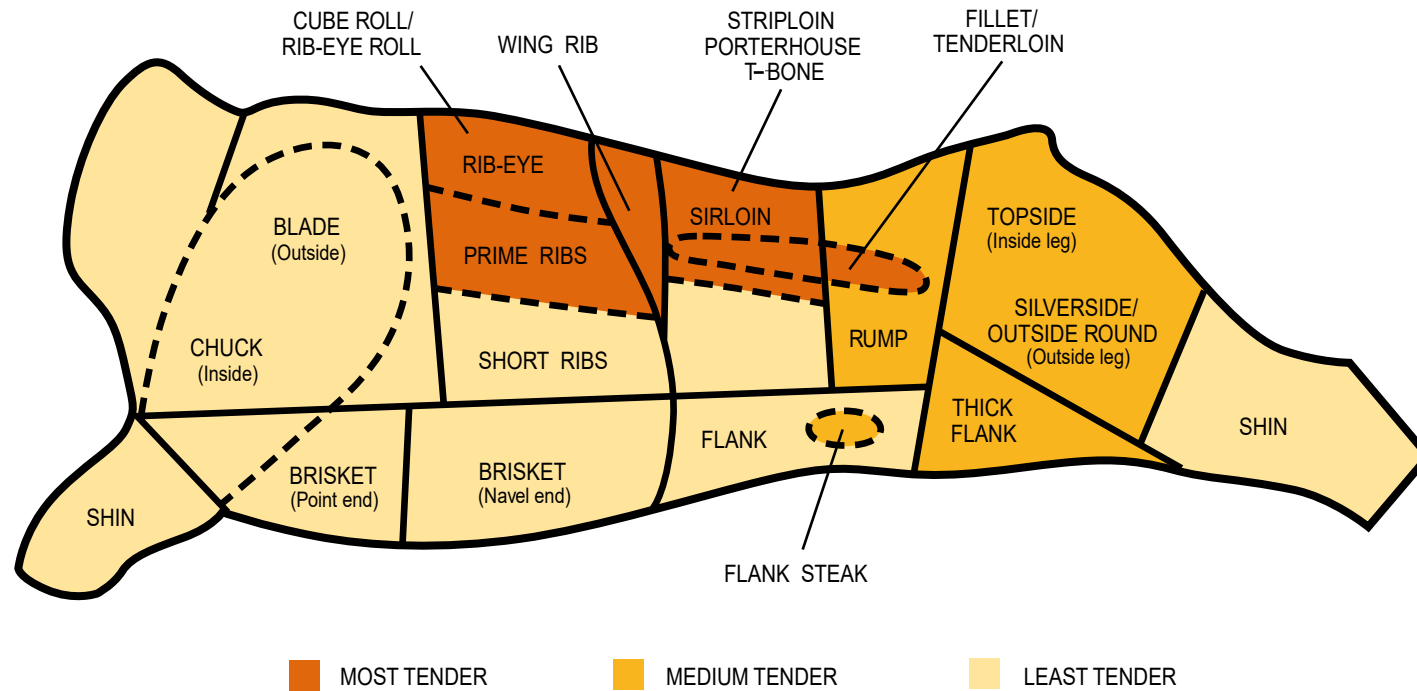
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# Beef Skeletal Diagram



# Beef Cuts and Tenderness



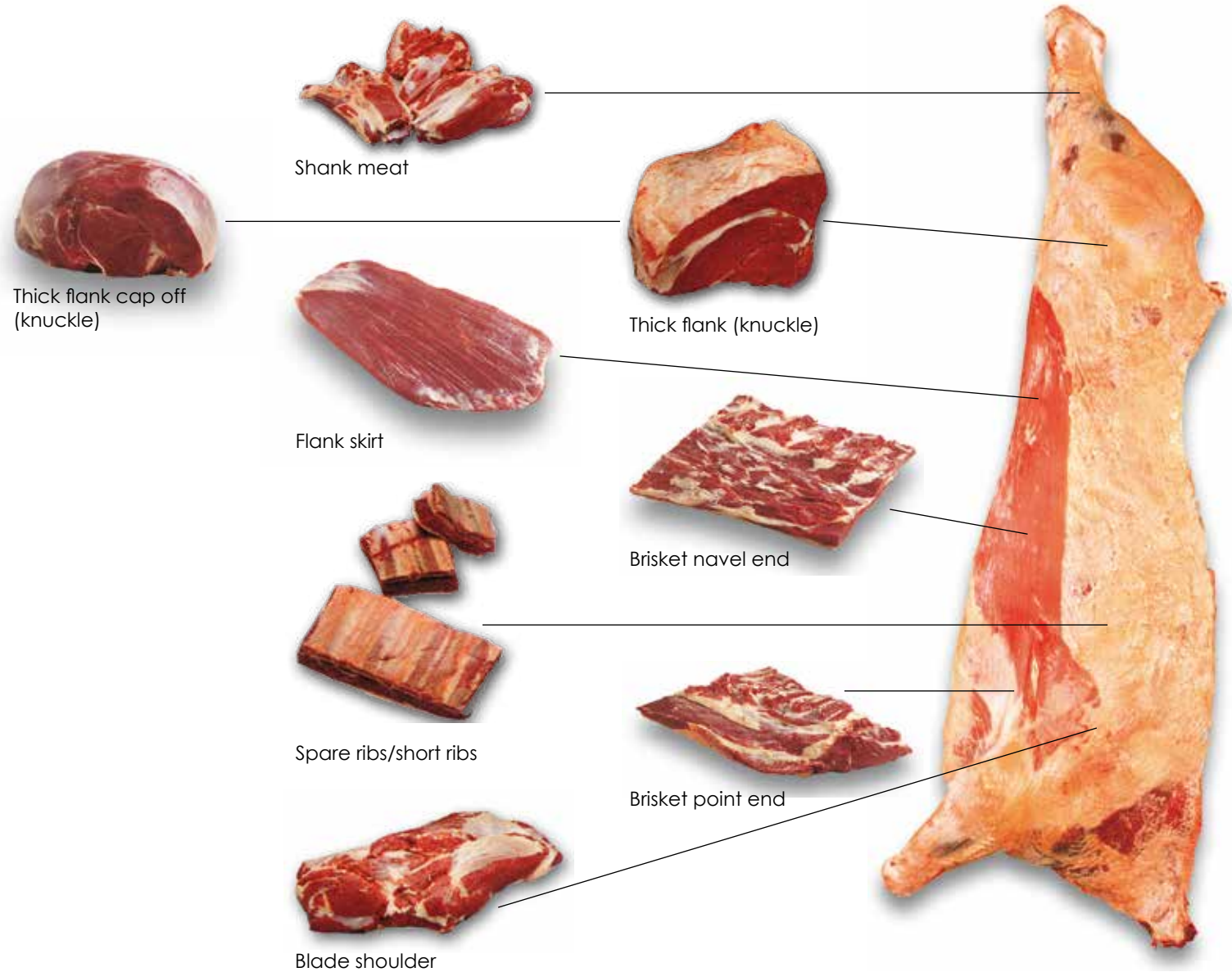
New Zealand descriptions are used here. Some cuts have alternative names - see following pages.

For detailed advice on Cooking Techniques for each cut, see page 74 onwards.

## Beef Primal and Sub-Primal Cuts

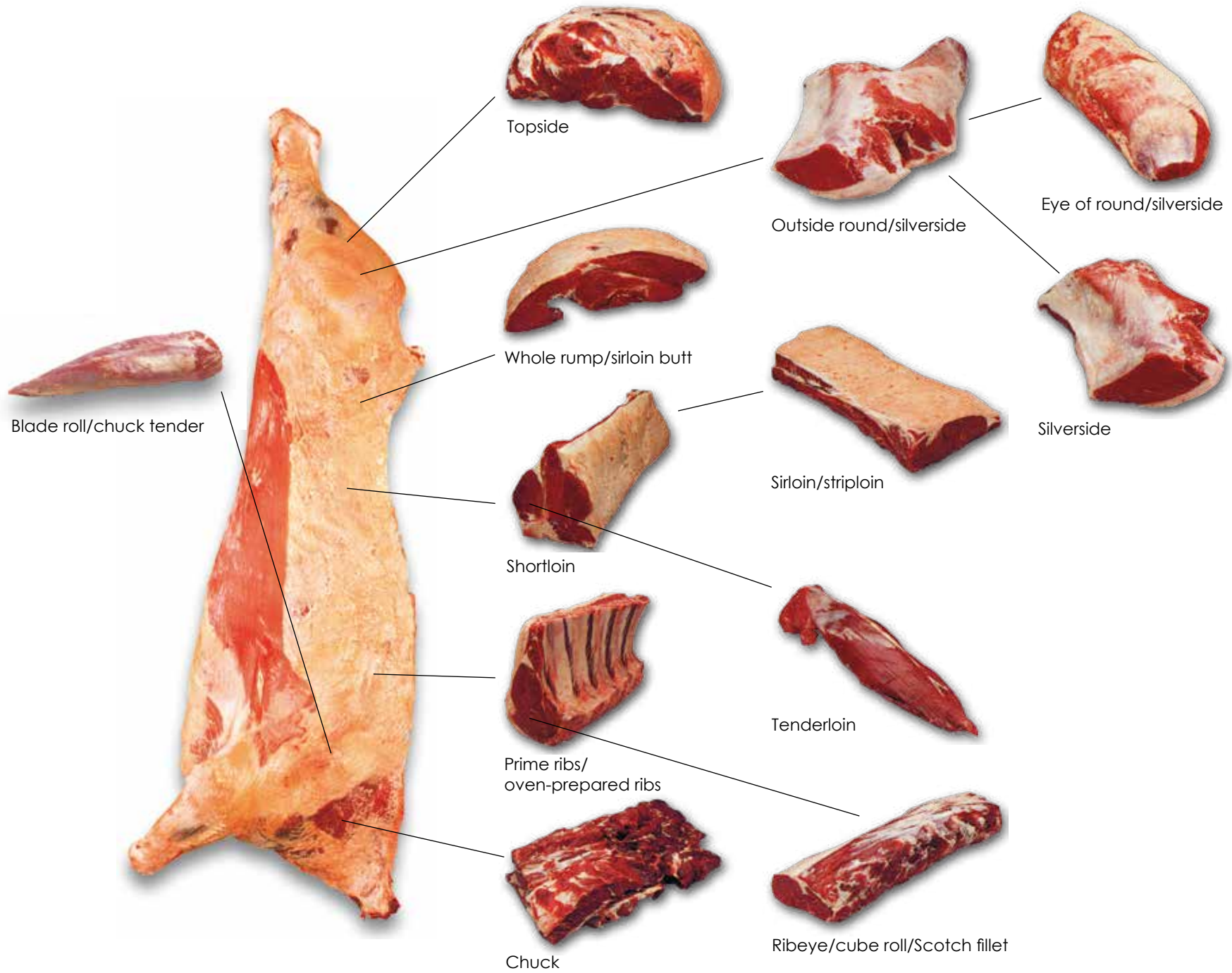
A side of beef consists of the forequarter and the hindquarter. The separation point is between the eleventh and twelfth rib, leaving 11 ribs on the forequarter and two ribs on the hindquarter.

The first large cuts made from the carcass are the whole muscle cuts, known as primal cuts (such as rump). Sub-primals are prepared by subdividing these (eg by seaming, which is cutting along the muscle seam).





# Beef Primal and Sub-Primal Cuts

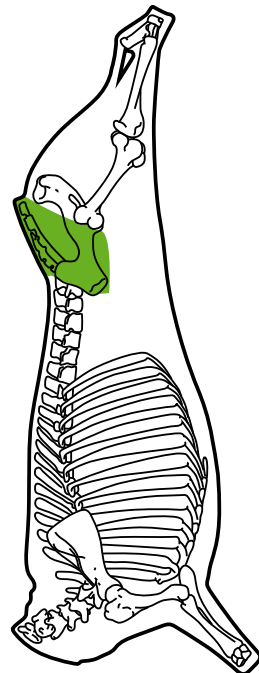
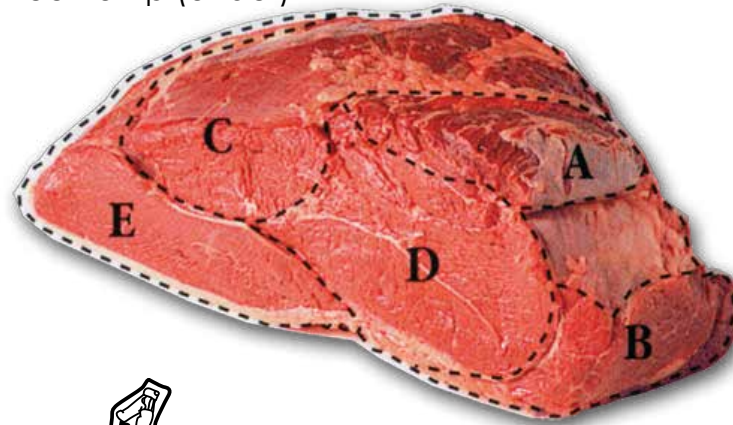


## Beef Sub-Primal Rump

The primal cuts can be further broken down into smaller cuts. With connective tissue removed, these offer enhanced tenderness and variety.

### Some examples of sub-primal cuts

Beef rump (under)



- A&B** Tiritip and underlying muscle
- C** Eye of rump
- D** Rump centre
- E** Rump cap

**Muscle C**  
Eye of rump



**Muscle D**  
Rump centre



**Muscle E**  
Rump cap



Eye of rump medallions



Rump centre steaks



Rump cap schnitzels

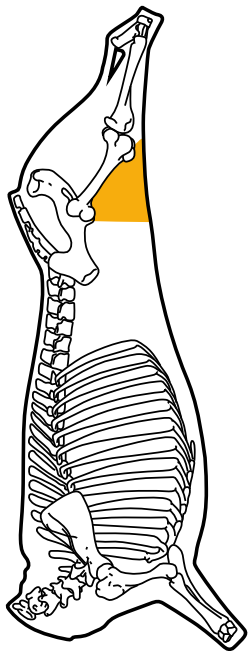


# Beef Sub-Primal Thick Flank

Thick flank/knuckle



- A Knuckle undercut
- B Eye of knuckle
- C Knuckle cover/cap



**Muscle A**  
Knuckle undercut



**Muscle B**  
Eye of knuckle



**Muscle C**  
Knuckle cover/cap



Strips and cubes



Eye of knuckle  
medallions

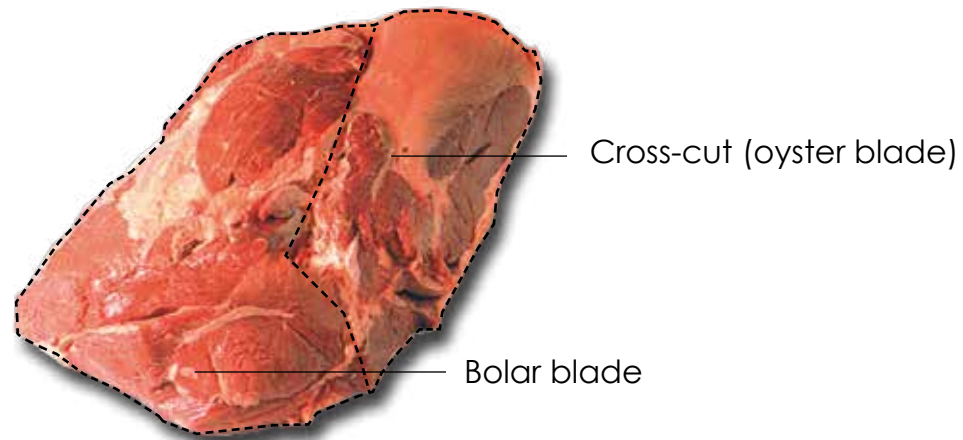


Cover minute steaks/  
schnitzel





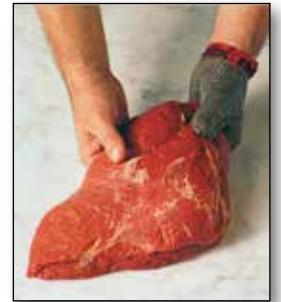
# Beef Sub-Primal Blade



Cross-cut blade/  
oyster blade



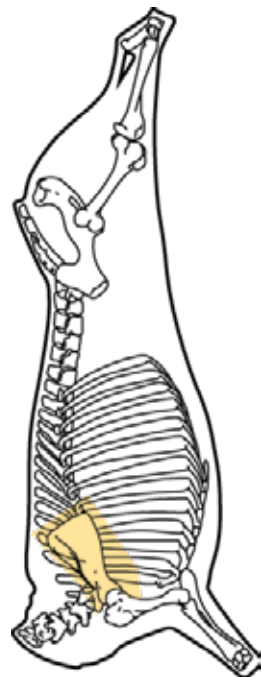
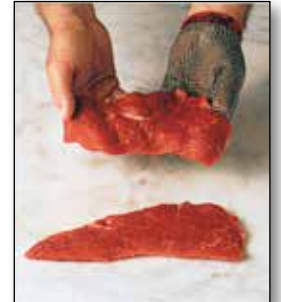
Bolar blade



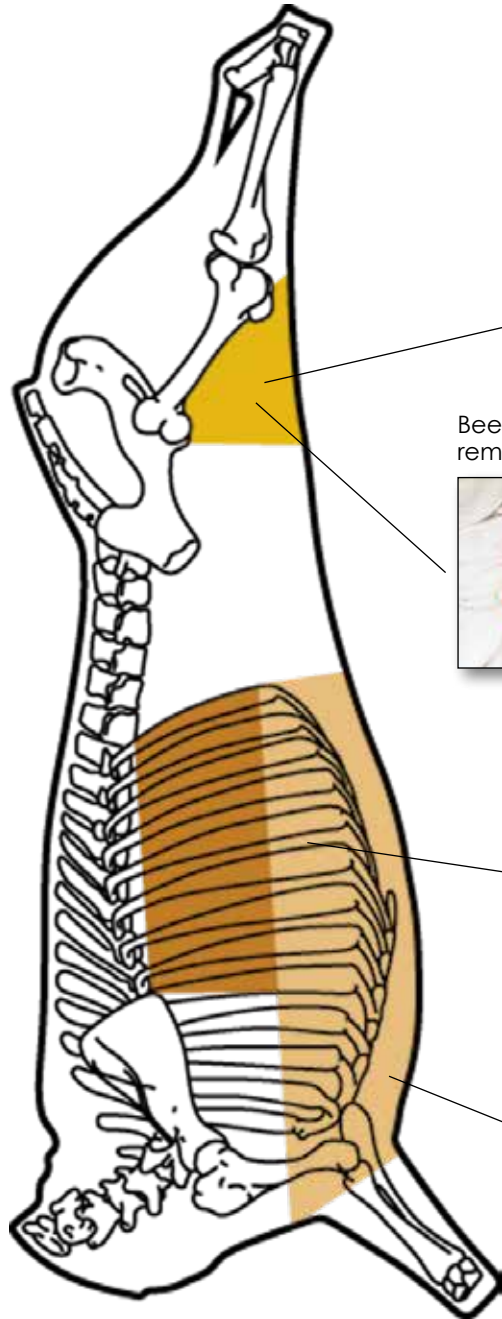
Cross-cut blade steak



Bolar blade steak



# Beef cuts (thick flank/knuckle, ribs, brisket)



Beef knuckle (round cap) cover



Beef knuckle cover minute steak or schnitzel



Beef knuckle (cap removed)



Beef knuckle undercut



Beef eye of knuckle



Beef eye of knuckle medallion



Beef rib ends



Beef short ribs (whole)



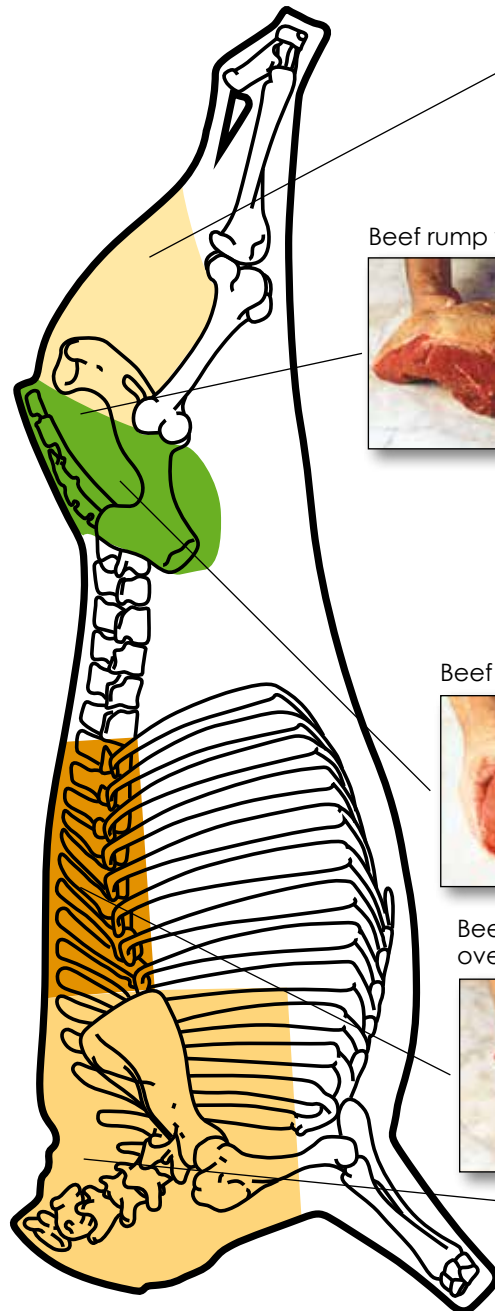
Beef short ribs (sliced)



Beef brisket



**Beef cuts (silverside, rump, rib roast, chuck)**



Beef silverside (outside)



Beef silverside (flat)



Beef eye round silverside



Beef rump whole



Beef D-rump



Beef D-rump steak



Beef eye of rump



Beef eye of rump medallions



Beef rump centre



Beef rump centre steak



Beef rump cap



Beef rump cap schnitzel



Beef ribs:  
oven-prepared



Beef rib steak - bone-in



Beef chuck

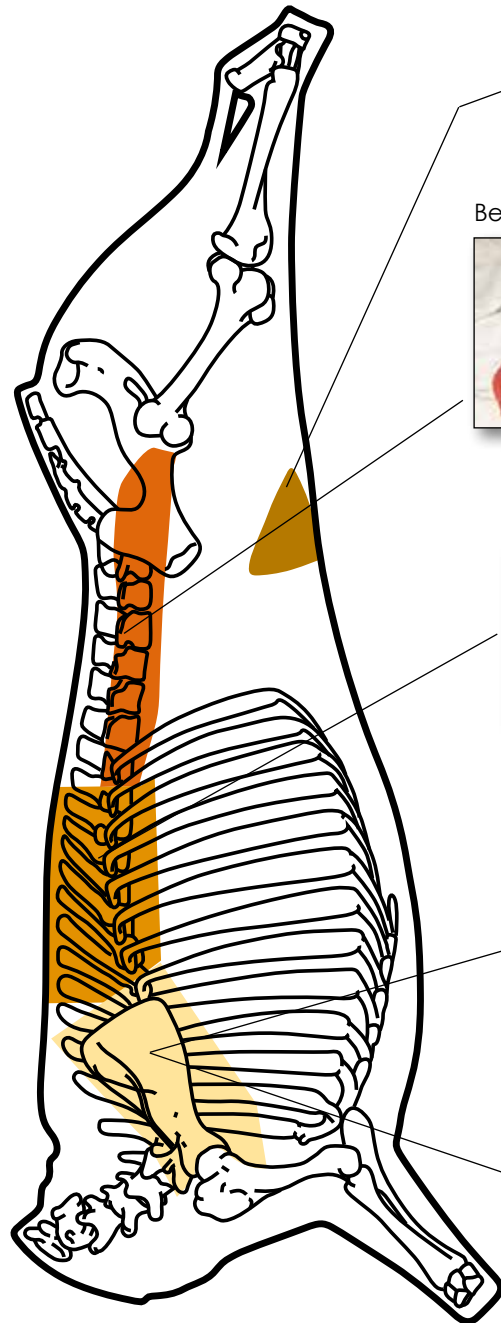


Beef blade roll  
(chuck tender)





# Beef cuts (flank skirt, tenderloin ribeye, blade)



Beef flank steak (skirt)



Beef tenderloin (fillet)



Beef butt tenderloin/ fillet



Beef tenderloin centre cut



Beef tenderloin medallion



Beef Spencer roll (Australian)



Beef cube roll (ribeye)



Beef cube roll steak (Scotch fillet)



Beef blade



Beef bolar blade



Beef bolar blade steak



Beef blade cross-cut blade



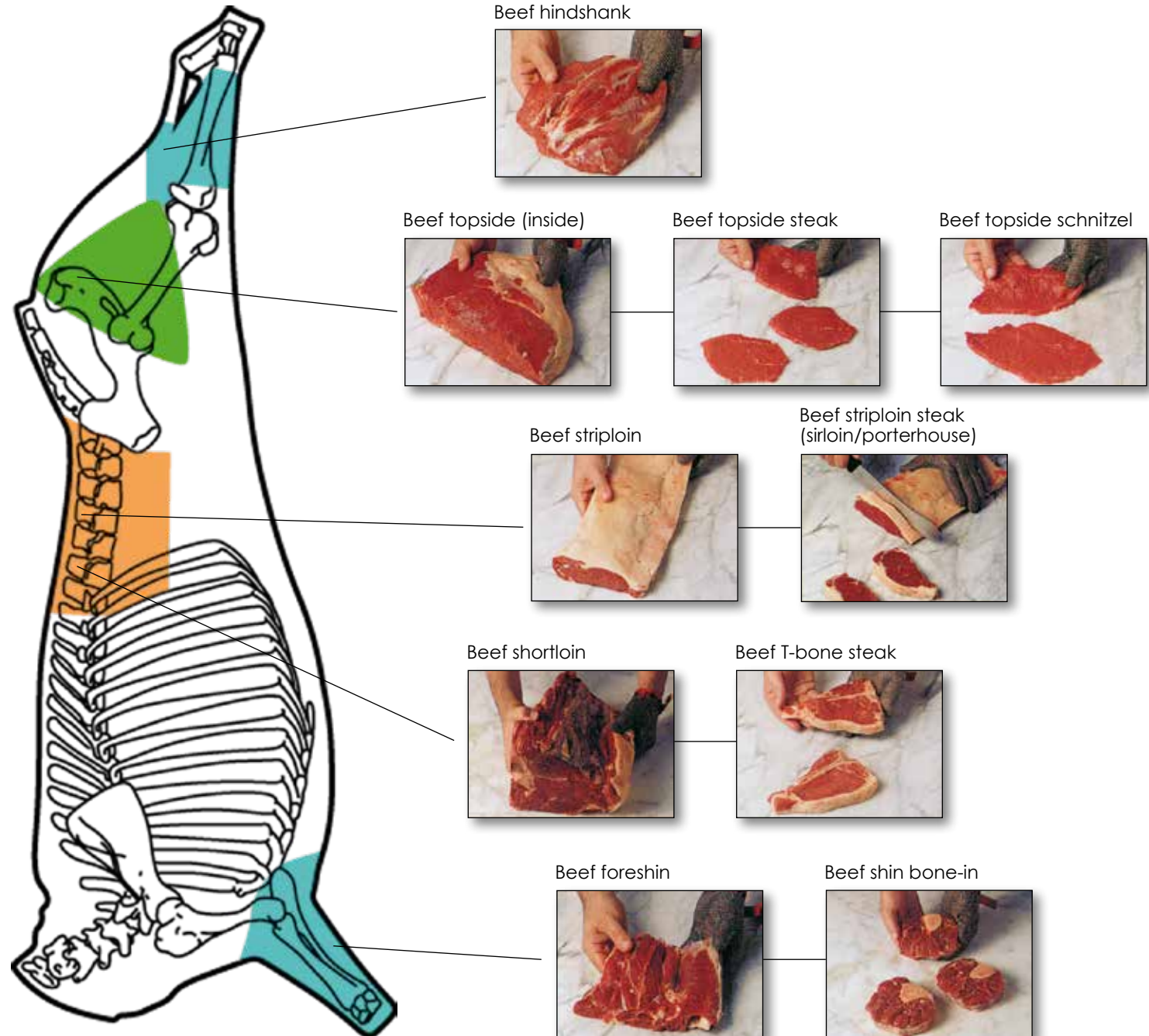
Beef oyster blade (blade roll)



Blade steak



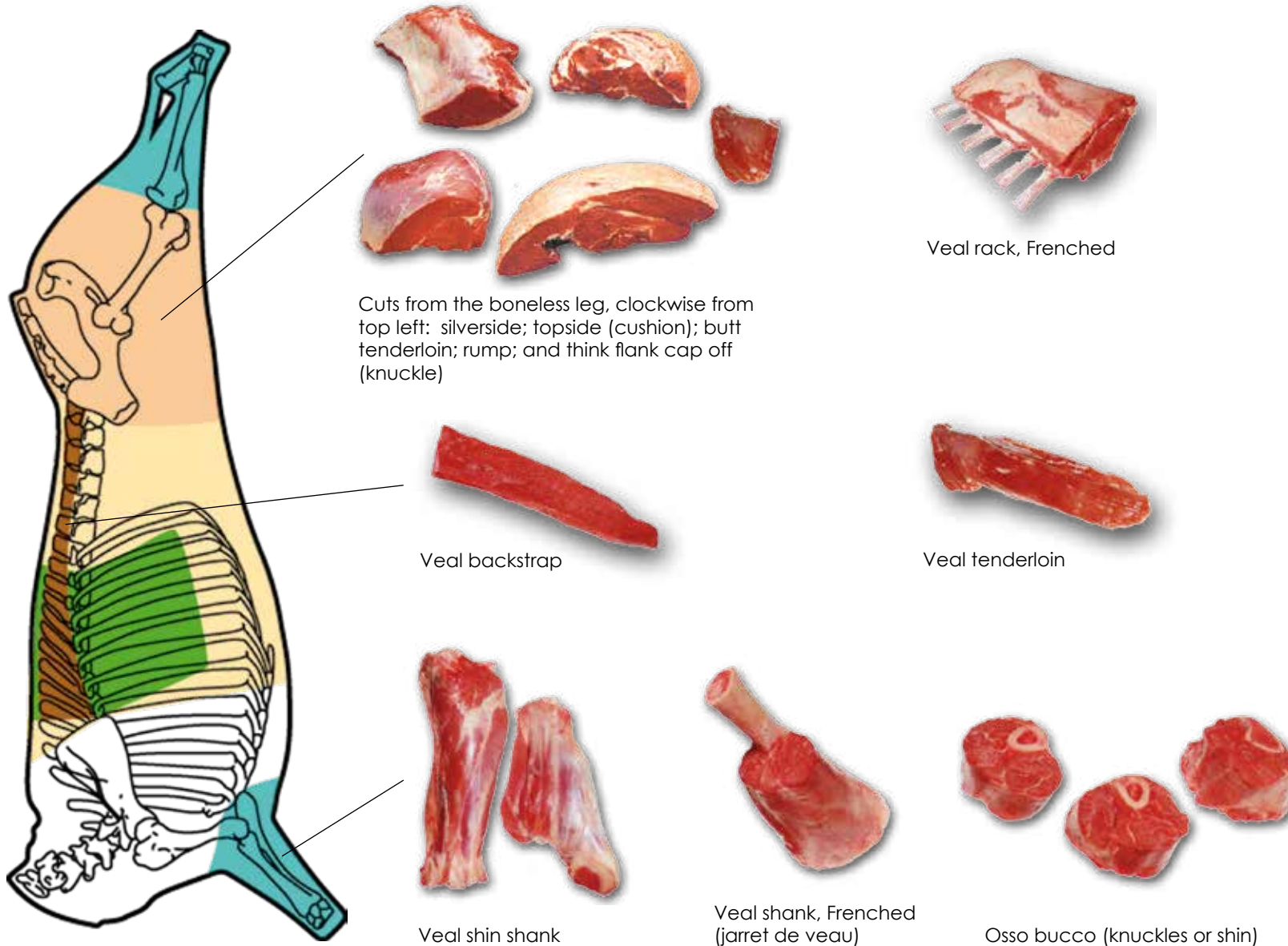
# Beef cuts: shin - hindshank, topside, striploin, shin - foreshin



## Veal: popular catering cuts

Two types of veal are produced in New Zealand: Bobby veal, the very pale meat from calves slaughtered at only a few days old; and Veal, which is defined as the meat from bovine animals of either sex under 12 months of age and having a carcass weight of no more than 160kg.

White (milk-fed) veal and grain-fed veal are imported products. For a variety of reasons, including the seasonality of production, veal may not always be readily available to local buyers.





# Lamb Skeletal Diagram

KNUCKLE BONE

HINDSHANK BONE  
(Tibia and Fibula)

KNEE JOINT  
(Patella)

AITCH BONE  
(Ischium)

TAIL BONE  
(Coccygeal Vertebrae)

LEG BONE  
(Femur)

HIP BONE  
(Ilium)

VERTEBRAE

CHINE BONE

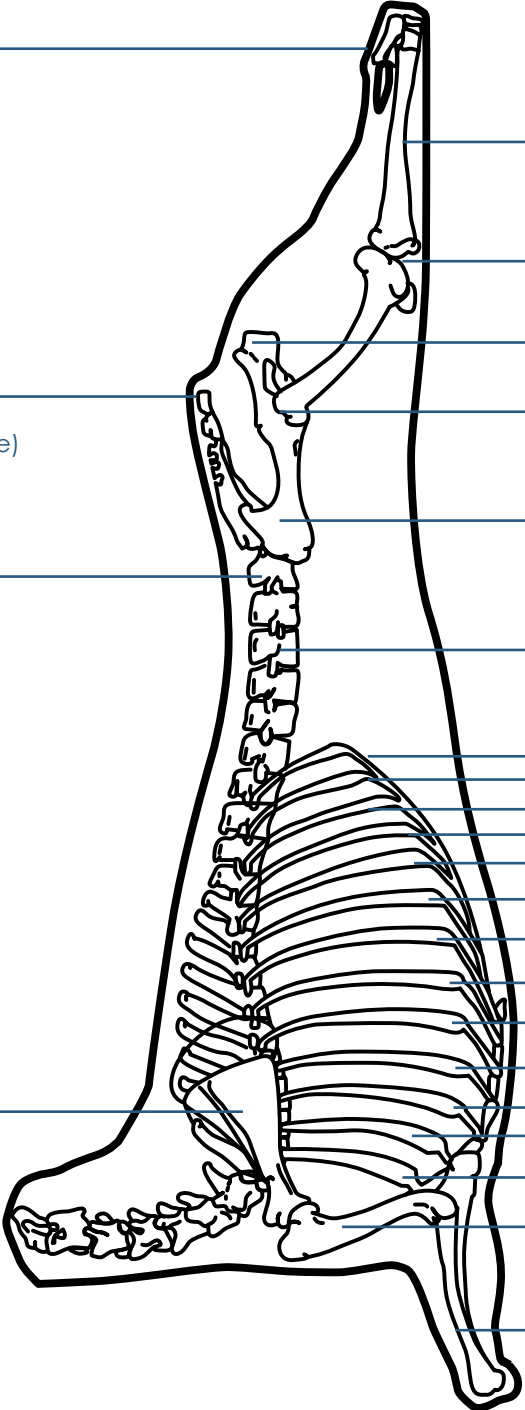
RIB BONES

- 13
- 12
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1

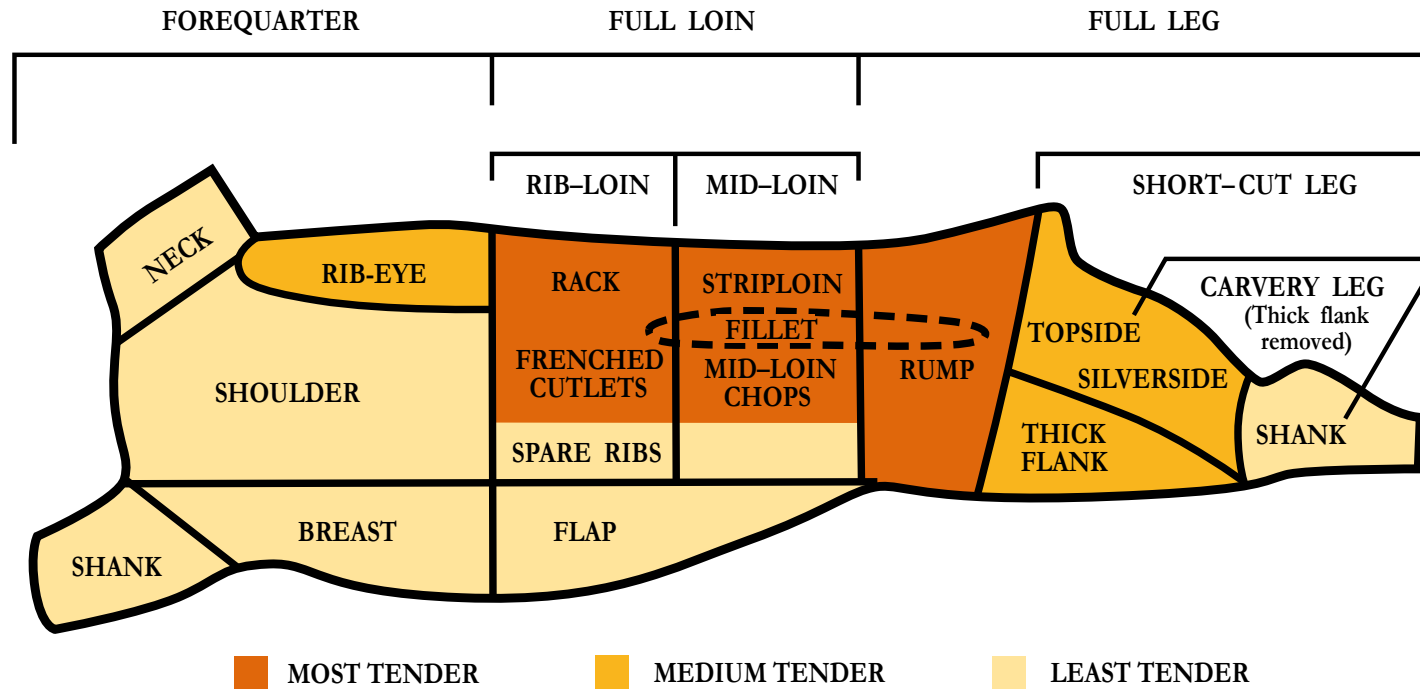
BLADE BONE  
(Scapula)

ARM BONE  
(Humerus)

FORESHANK BONES  
(Ulna and Radius)



# Lamb Cuts and Tenderness



New Zealand descriptions are used here. Some cuts have alternative names - see following pages.

For detailed advice on Cooking Techniques for each cut, see page 74 onwards.

## Lamb primal cuts (principally retail)

The first large cuts made from the carcass are the whole muscle cuts known as primal cuts (such as leg or forequarter). Sub-primals are prepared by subdividing these (eg by seaming, which is cutting along the muscle seam).



Full leg



Flap



Forequarter (5 rib)



Side



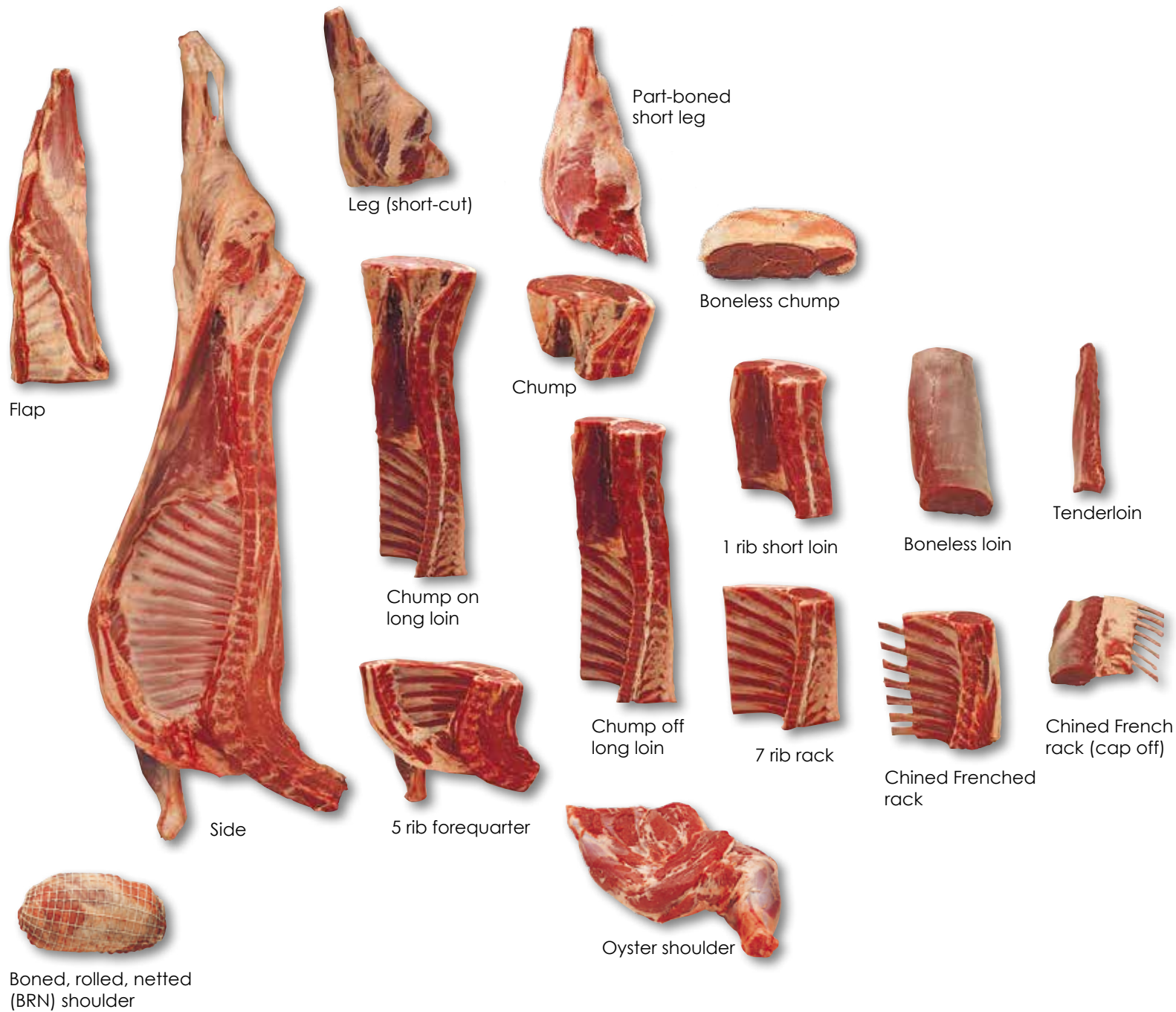
Mid-loin



Rib-loin



# Lamb primal cuts (retail and foodservice)

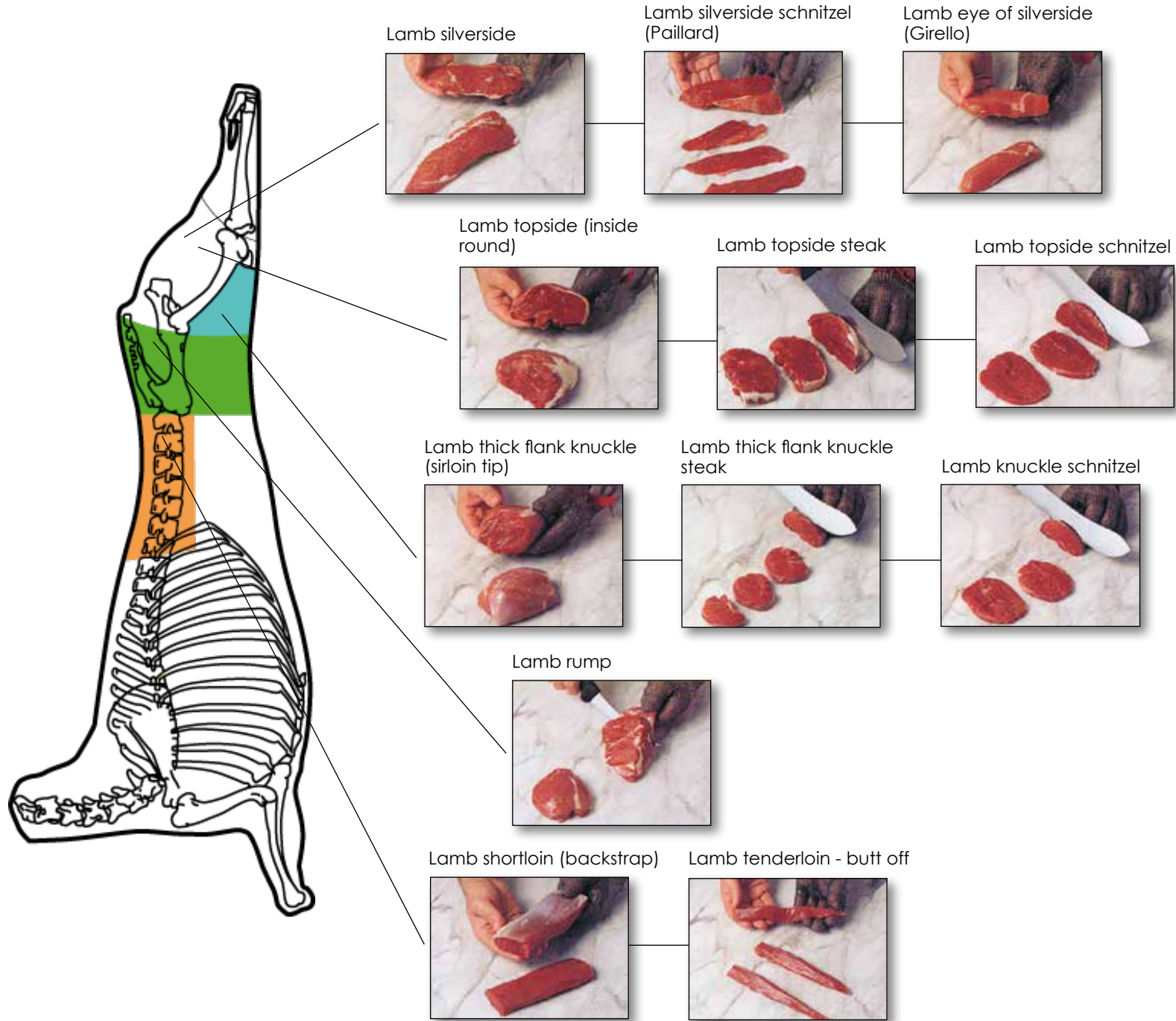


## Lamb sub-primals

The leg of lamb, when boned and seamed out into various cuts (the same sub-primal cuts we know from the beef hindquarter), offers many options for quick cooking and tasty dishes to suit today's cooking styles.

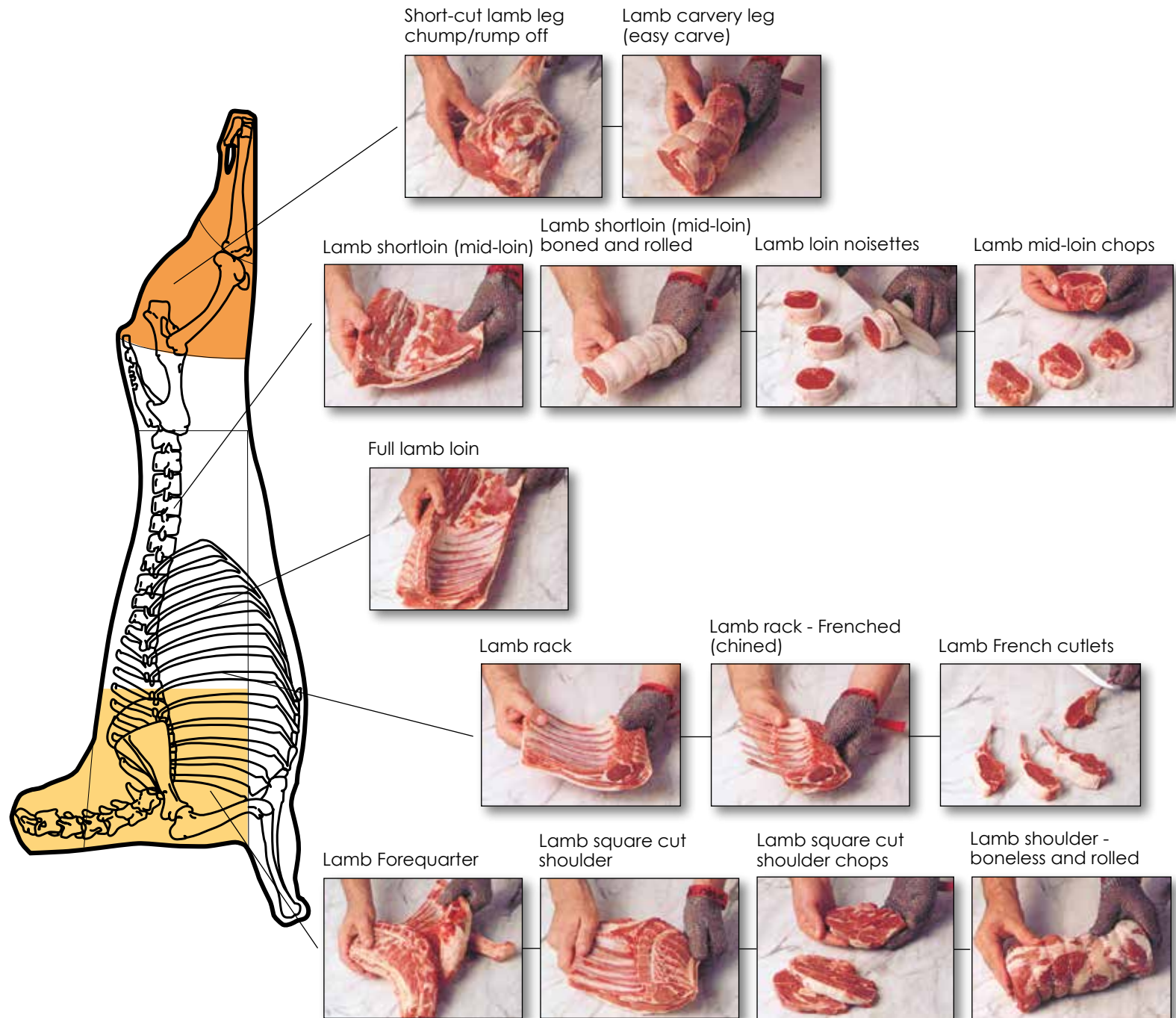


# Lamb cuts: silverside, topside, thick flank/knuckle, rump, shortloin/tenderloin

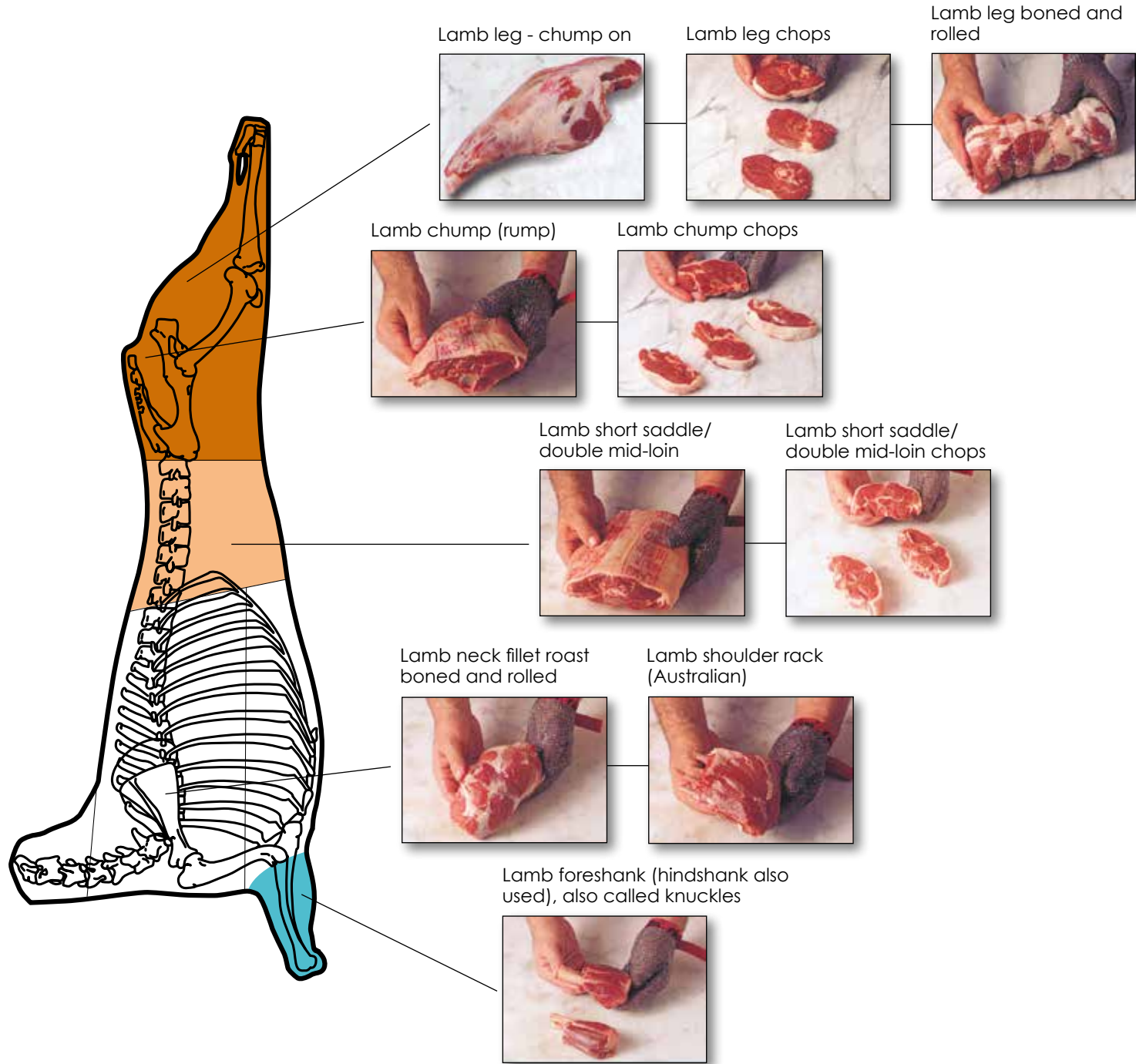




# Lamb cuts: shank, short-cut leg, carvery leg, loin, rack, shoulder



# Lamb cuts: leg, rump (bone-in), saddle, neck fillet, shoulder rack, foreshank



## Edible offal or variety meats

Offal meats (also called variety or fancy meats) are generally rich in minerals and vitamins, and most are full of flavour. Many chefs find offal dishes are popular items on their menus.

### Preparation and cooking notes on beef and veal offal



#### **Beef/ox and calf liver**

The complete liver with gall bladder, large blood vessel and all fat removed. Young calf liver is slightly paler and more tender, with more delicate flavour than beef liver.

**Cooking notes:** Remove outer, thin membrane and tubes. Thinly sliced liver may be dusted with flour and pan-seared to medium-pink, or slowly braised until tender.



#### **Beef and veal kidney**

The whole kidney with blood vessels, ureter and capsule removed. Beef kidney is darker in colour with stronger flavour than veal/young calf kidney.

**Cooking notes:** Remove any outer thin membranes, cut in half and remove fat and sinew. Dice and pan-sear veal kidneys until pink. Dark coloured kidneys should be braised or simmered slowly until tender.



#### **Beef tripe**

Comes from the first two stomachs of the beef animal and consists of the complete paunch or rumen (seamy tripe) and reticulum (honeycomb tripe).

**Cooking notes:** Wash tripe well, cut into strips or dice and simmer until tender. It requires long, slow cooking or pressure-cooking to tenderise.





### **Beef/ox heart**

The complete heart with blood vessels cut at their entry point into the heart. Heart muscle structure is unique with no readily distinguishable grain, very dense-textured meat.

**Cooking notes:** Remove tubes and fat, cut into strips and simmer or braise for two to three hours until tender. Can be pot-roasted.



### **Beef/ox tongue**

Whole tongue with root, and usually hyoid bones, removed. Excess muscle from underneath the tongue may be removed and fat is well trimmed. Tongue skin is very tough and must be peeled off after cooking. The cooked meat is very tender. Tongue is usually purchased corned (cured).

**Cooking notes:** Rinse well in cold water, simmer gently for about three hours (or pressure cook for 45 minutes) until tender. Peel off skin while still warm. Remove any tiny bones and fat. Chill under weights for improved shape and easy carving.



### **Beef tail (oxtail)**

Removed from the carcass at the junction between sacral and coccygeal vertebrae. Normally sold cut into sections between joints. Oxtail contains a high amount of fat, bone and connective tissue relative to the lean. Requires moist heat and long slow cooking.

**Cooking notes:** Trim outside fat, brown (in pan or oven), then slow simmer for two to three hours until fork tender. Remove surface fat before thickening.



### **Veal sweetbread**

The thymus gland from young animals. The gland is in two parts: a long lobular structure lying along the neck (called headbread), and a triangular part at the base of the heart (called heartbread). Sweetbreads are sold with all fat removed. Pale, very tender meat.

**Cooking notes:** Soak in cold water with lemon juice for one to two hours, changing water frequently. Blanch until white, refresh, remove membrane and tubes. Press in fridge until cold before cooking.



### **Beef cheek**

The cheek is the muscle, together with the mouth lining, that lines the upper and lower jaw bones. The thinner part of the cheek (called the lips) has papillae attached and is sold separately. Purchase cheek with membrane and fat removed. More often used for stock, but can be braised.

**Cooking notes:** Soak in cold water with lemon juice for one to two hours. Remove any sinews, dice and slow simmer for two to three hours until fork tender.



### **Beef bones**

Any bones removed from the carcass. Beef marrow bones may be any round bone from fore or hind leg, but are most commonly cut from the hind shank. The femur is sawn into short lengths across the bone, resulting in sections each with a central round of fatty marrow exposed at the end.

**Cooking notes:** Use bones in stock making. Poach marrow bones then extract the marrow. May be used as garnish for beef steaks.



### **Beef suet**

Fat derived from around the kidneys.

**Cooking notes:** Suet can be grated and used for pastry and steamed puddings.

## Preparation and cooking notes on lamb offal



### Lamb kidney

Whole kidneys sold with fat cover removed, then usually skinned. Medium-tender, very lean meat.

**Cooking notes:** Remove any outer remaining thin membrane, cut in half and remove fatty, white core. May be briefly cooked by pan-searing to pink, or simmered slowly until tender.



### Lamb liver (lamb's fry)

The complete liver with gall bladder and all fat removed. Tender, very lean meat with a very fine covering of almost invisible membrane/skin which toughens on cooking.

**Cooking notes:** Peel away the outer thin membrane before slicing and remove large tubes. Best briefly cooked by pan-frying to medium-pink.



### Lamb heart

The whole heart with blood vessels removed at their entry point to the heart. Muscle structure is unique, meat very dense with no obvious grain.

**Cooking notes:** Needs long, slow cooking. Remove any outer fat, cut in half and remove tubes and fat. Braise for two hours until tender.





### **Lamb tongue**

The portion of the tongue remaining after removal of hyoid bones, excess muscle underneath and fat trimmed. Tough skin removed after cooking. Tender meat when cooked by moist heat methods.

**Cooking notes:** Blanch and simmer gently for one to two hours until fork tender. Peel off skin while warm. Press for neat shape and to make for easier slicing.



### **Lamb sweetbread**

The thymus gland which lies along the neck of each side of the trachea (windpipe) and extends to the heart region in young animals. Pale and lobulated, sold with fat removed, very tender, delicate meat.

**Cooking notes:** Soak in cold water for one to two hours, changing water frequently. Blanch in simmering lemon water until white, refresh, remove membrane and tubes, then press in refrigerator until cold before cooking.



### **Lamb brains**

Usually only the cerebral hemisphere (larger part of the brain) with covering membrane intact. Pale greyish in colour before cooking, but whitens on cooking, very delicate and tender meat.

**Cooking notes:** Soak in cold water for one to two hours, changing water frequently. Blanch in simmering lemon water. Refresh, remove membrane then press in refrigerator until cold. Brains can then be quickly pan-fried.



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## Notes for Meat Buyers (Foodservice)

### Exact specifications save you money

Discuss your meat requirements with your supplier. Specifying exactly what you want can eliminate waste and improve your profitability.

The New Zealand Beef and Lamb Quality Mark is your guarantee of quality.

### Name the cut

Learn the correct New Zealand names for all the meat cuts and be precise when you order. You can order beef and lamb as primals, sub-primals or portion cuts.

### Primals

Primals, the first cuts produced when the carcass is divided into main sections, may have fat, bones and connective tissue still intact. Primals are large muscle groups such as whole rump, whole sirloin or topside of beef, or whole legs and forequarters of lamb.

### Sub-primals

Sub-primals are divided primals; smaller cuts which are usually boneless, trimmed of fat and connective tissue. They come ready to portion or cook.

### Bone-in or boneless

When ordering, if appropriate, specify bone-in or boneless.

### Fat

Specify the degree of trim you require.

### Portion cuts

These cuts are prepared, trimmed and cut to your specifications. Portion cuts, also known as 'restaurant' cuts or 'chef-ready' cuts, are ready for immediate cooking. Many chefs purchase vacuum-packed primals, sub-primals, or portion cuts for ease of handling, reduced labour costs and consistent quality.

### Specify the weight range

Irregular portion sizes can mean wastage. Specify a weight or weight range when ordering portion-controlled meat cuts.

- State your delivery requirements: Fresh/chilled or frozen, vacuum-packed or not.
- You want fast, refrigerated delivery. Order from a reliable supplier who adheres to strict transport standards.
- Verify your order on delivery.
- Check your delivery invoice against your order specifications.
- Check overall product appearance and the temperature of the product on delivery.
- Date products and place in refrigerator or freeze immediately after checking.

### Delivery checklist

1. Accept only cartoned product that is very cold to touch, delivered in an insulated, clean, refrigerated van. Take sample temperature readings. Low-cost devices to monitor temperatures are readily available.
2. Check the delivery invoice against your order specifications.
3. Check the weight, packed-on date and use-by date.
4. Meat should be correctly aged and 'restaurant-ready' on delivery.
5. Watch for wet boxes, which can be a sign of leaking vacuum bags. Vacuum bags that are punctured on delivery should be returned to the supplier.
6. Immediately on delivery, stack chilled, cartoned product on shelves in the cool room.

### How much do you need?

An average cooked serving of meat weighs 140-160g. The amount of raw meat required for that serving size depends on how much the meat shrinks during cooking, which in turn depends on a number of factors, such as the particular cut, its size, fat and bone content, and the degree of doneness.

Generally however, cooking losses range from a quarter to a third of the raw meat weight. Remember, cooking loss in small roasts and portion cuts tends to be greater than in large cuts.

### Maintaining the quality: packaging, storage & handling

From the moment meat is processed, the aim of all handling, packaging and storage is to keep it microbiologically safe and minimise contamination that causes spoilage.

This is important both for food safety and to ensure the meat maintains quality throughout its shelf life.

Bacteria are the main cause of meat spoilage. Aerobic bacteria need oxygen to grow and multiply, while anaerobic bacteria can multiply without oxygen (see pages 53 & 18).

The main protections against spoilage are:

1. Maintaining the right temperature.
2. Strict hygiene in all handling.

### The right temperature

Whether meat is fresh or frozen, it is critical to the quality of the meat to hold it consistently at the right temperature throughout all stages, from processing to preparation for cooking ('the cold chain').



Fluctuating temperature is harmful to meat quality. Damage that occurs through uncontrolled temperature is known as temperature abuse. Shelf life reduces by 10% for each degree in temperature above 2°C.

Temperatures between 5°C and 63°C allow harmful bacteria to flourish.

### Transport

1. Fresh/chilled meat should always be transported in a refrigerated vehicle, maintaining the meat at a constant surface temperature below 7°C.
2. Transport time should be kept to a minimum.
3. Frozen meat must be kept frozen and below -18°C.
4. Check the temperature of all frozen products on delivery. Accept nothing that shows signs of thawing.

## Packaging, storage and handling: fresh/chilled meat

### 1. Cling-film overwrap packaging

With this packaging, used for retail display, fresh chilled meat is placed on a plastic tray, then both tray and product are wrapped with an oxygen permeable cling-film. This prevents the meat from drying but does not slow bacterial growth.

- Hygienically-produced fresh meat that is loosely wrapped in permeable plastic, and stored in a cool room with other produce at around 2°C, has a relatively short shelf life of about one day up to about five days, depending on the cut. Meat that is vacuum-packed has a much longer shelf life.

### 2. Vacuum packaging

Vacuum packaging is a process that protects the meat from oxidation and dehydration during storage.

Fresh chilled meat is packaged in pouches made of material of low oxygen permeability, which are then vacuum sealed and shrunk to a snug fit. The resulting package is airtight and moisture-proof.

The oxygen-free environment inhibits the growth of some spoilage bacteria, while still allowing the natural tenderising process of aging to take place. However, anaerobic bacteria will be able to grow in the pack. Maintenance of correct temperature is therefore still essential to good shelf life and safety.

### Benefits of vacuum packaging

Vacuum packaging significantly extends the shelf life of fresh/chilled meat.

- Storage life for chilled vacuum-packed beef is up to 12 weeks after production.
- Storage life for chilled vacuum-packed lamb is up to eight weeks after production.

Vacuum packaging allows meat to age in a controlled environment, minimising weight loss through evaporation, giving increased profits through better yields. Vacuum packaging offers hygienic handling, ease of storage and inventory control.

### Storage and handling:

- Avoid temperature fluctuations. Maintain a constant temperature, ideally between -1.5°C and +2°C.
- Handle meat carefully to avoid puncturing vacuum bags. Check regularly to identify broken seals. If seals are broken, the meat can spoil quickly (by aerobic bacteria). Once the seal is broken, use the meat promptly.
- Once the vacuum bag is opened, remove the meat and dispose of the bag and juices. Dry meat well with a clean paper towel and use as soon as possible.

## Hints for users of vacuum-packed meat

### The colour

Fresh/chilled vacuum-packed meat is a different colour from unpacked fresh meat. Since there is essentially no air in the vacuum-sealed package, the beef or lamb has a purple-red colour. Once the packaging is removed and exposed to air, the meat pigment absorbs oxygen and within a short time the meat returns to a bright red colour. This fresh colour is called 'bloom'.

### The odour

You may notice a slightly sour, milky or nutty odour when you open the vacuum bag. This odour is the result of the natural maturation within the package as the meat ages. It will dissipate within about 20 minutes.

### Drip loss

In addition to protein, vitamins and minerals, meat contains about 70% water. Because of this fluid content, cut meat loses a certain amount of fluid called 'weep' or 'drip'. Fluid in a vacuum pack of meat is not blood but drip, which oozes from the cut surfaces. Natural pigments in the meat give the fluid a reddish brown colour.

A normal amount of drip from vacuum-packed meat aged for three weeks or more is around 1-2%. This is far less than fluid loss by evaporation and trimming under ordinary hanging conditions over the same period. The amount of weep or drip increases with length of storage. Excessive weep means loss of weight so it is important to keep it to a minimum. Large amounts of drip indicate temperature abuse.



### 3. Controlled Atmosphere Packaging (CAP)

This is a packaging technology in which meat is held in 100% carbon dioxide (CO<sub>2</sub>) in packs made of gas impermeable materials such as foil laminate or double metallised films (in which the meat cannot be seen). The CO<sub>2</sub> controls bacterial growth and gives a longer storage life than vacuum packaging, especially for lamb. CAP is generally used for wholesale or bulk storage and transport packs of cuts and carcasses.

- **Storage life:** lamb packaged in saturated CAP and held at a constant temperature of - 1.5°C has a storage life up to 16 weeks. The storage life of beef is up to 20 weeks.
- **Meat colour:** because there is no oxygen in the packs, the meat is the same purple colour as that in vacuum packs. Once the pack is opened the meat 'blooms' to a bright red colour.
- **Odour:** with CAP there is little or no confinement odour when the pack is opened. Meat stored for long periods in CAP tends to have a milder odour and flavour than fresh or vacuum-packed meat.

### 4. High Oxygen Modified Atmosphere Packaging (High O<sub>2</sub> MAP)

This is a multigas aerobic packaging system. The pack contains oxygen to ensure the meat develops and maintains a bright red colour and carbon dioxide to retard the growth of aerobic spoilage bacteria.

This packaging works well for retail display of chilled/fresh meat allowing good colour stability and longer storage life than meat over-wrapped with cling-wrap.

## Packaging, storage and handling: frozen meat

Frozen beef or lamb can be as good in eating quality as fresh/chilled meat providing it has been correctly handled through all processes.

Defects in meat handling procedures before freezing can toughen meat. The freezing process itself will not make tender meat tough. However, correct procedures must be followed to prevent loss of juices and deterioration in flavour and texture.

The meat's condition before freezing, the packaging material, method and rate of cooling and freezing, and the temperature during storage are all important. So, too, is careful thawing and skilful cooking.

### Packaging

- Packaging must be moisture-proof so moisture is sealed in.
- Meat should be packaged in sturdy, freezer-quality, oxygen impermeable plastic bags. The air must be extracted and the bags tightly sealed.
- Vacuum packaging is preferred. Any air left between the meat surface and packaging encourages deterioration in quality.
- Poor packaging or punctured packaging leads to development of freezer 'burn' (surface drying and discolouration).

### Storage temperatures for frozen meat

- Freezer temperature should be maintained at -18°C.
- Avoid fluctuation in temperature where possible.
- Frozen packs should be arranged to ensure good air circulation.

## The freezing process

- Meat should be frozen fast, in small lots. This is important.
- Blast freezing is ideal, which lowers temperature extremely rapidly.
- Slow freezing causes large ice crystals to form. These can rupture the meat cells and, on thawing, cause excessive loss of juices.
- The size and shape of the meat to be frozen is important: small, flat packages freeze more quickly than large joints.
- Hygienic handling is essential at all stages.
- Free-flow freezing steaks or small cuts should be spread in a single layer on clean, foil-lined trays. Cover with a sheet of foil and freeze. As soon as they are frozen solid, pack the cuts in freezer-quality bags, extract air and seal to ensure adequate protection from drying. Promptly return packs to the freezer.

## Average Expected Life of Chilled Meat Cuts

(with good manufacturing practice)

Packaging System	Suitable Application	Life to Spoilage	Spoilage Bacteria
<b>Storage packaging</b>			
Vacuum	Boned out primal cuts	8 to 12 weeks*	Slow, anaerobic
CO <sub>2</sub> CAP	Cuts and carcasses	14 to 20 weeks*	Very slow, anaerobic
<b>Display packaging</b>			
Cling-film overwrap	Fresh meat Stored meat	3 to 5 days** 1 to 3 days**	Fast, aerobic
High O <sub>2</sub> MAP	Fresh meat Stored meat	7 to 10 days** 2 to 6 days**	Slower, aerobic

\* Stored at -1.5°C

\*\* In retail display cabinets, set at 4°C

Chart from MIRINZ Bulletin 21

## Hints on Freezing

- Before freezing, beef or lamb should be sufficiently aged, as meat does not continue to tenderise when frozen.
- Meat should be well trimmed (fat can become rancid on long storage).
- The ends of bones which may pierce the wrap should be shielded (eg with foil or plastic) before packaging.
- Frozen large cuts will keep better, longer and with less flavour change, than frozen small cuts, thin slices or mince.
- Again, it is important to ensure temperatures don't fluctuate by more than 0.5°C. Big temperature changes can mean a partial thaw, which damages the structure of the meat.



## Thawing

If at all possible, plan ahead when you intend using frozen meat. The best way to maintain quality of frozen meat is by slow thawing in the refrigerator or chiller, in its original wrapping.

Ensure there is no possibility meat drip during thawing can contaminate other foods. For example, thaw meat on a tray if there is a chance the packaging may leak.

Thawing meat at room temperature is not recommended. The meat surfaces may reach warm temperatures that encourage microbial spoilage. The higher the temperature above freezing, the faster the microbial growth. Temperatures above 7°C are especially dangerous as they allow the growth of pathogens such as Salmonella, if they are present on the meat.

**Remember for best results, thaw meat slowly in the refrigerator or chiller.**

### Safe ways to speed thawing

If you need to hurry thawing, leave the meat in its sealed freezer wrap or vacuum-pack for all the following 'speed-thaw' methods:

1. Place meat on a tray in a relatively cool room for one to two hours before completing thawing in the refrigerator.
2. Use a microwave oven set on defrost.
3. Use a fan-forced oven, with only the fan on (cold oven).
4. Place sealed vacuum pack in a sink of cold running water. Note: the pack must be watertight.

Never place frozen meat which is not in a sealed vacuum pack, in water in an attempt to speed up thawing. This will cause flavour and colour loss and may encourage bacterial growth.

Meat which has been thawed using a 'speed-thaw' technique should be cooked straight after thawing.

### The best way to store thawed meat

- Remove freezer packaging or vacuum bag and blot meat dry with clean paper towels if necessary. Place meat on a tray (one with sides to prevent dripping onto other foods). Loosely cover and return to the refrigerator.
- Do not store raw meat above food that will not be cooked before it is eaten (for example, pre-cooked meat or salad vegetables).
- Do not allow meat to sit in a pool of meat juices. The juices will go off faster than the meat itself and can taint the flavour of the meat.
- Thinly sliced meat loses more liquid than large pieces. Slicing may introduce micro-organisms onto meat surfaces, so cut slices or steaks shortly before cooking.

### Approximate thawing times in the refrigerator

Large roast:	4-7 hours per 500g
Small roast:	3-5 hours per 500g
Steak, 2.5cm thick:	12-14 hours

### Avoid refreezing thawed meats

- Refreezing thawed meat is not recommended. Each time meat is frozen there is some deterioration of quality: ice crystals can rupture muscle fibres, breaking down texture and letting juices escape.
- But meat that has been partially thawed in the refrigerator can be refrozen. It will be safe to eat, but not at its best eating quality.

- Never refreeze meat that has been thawed and held at room temperature.
- Do not expect poorly frozen, badly stored and roughly thawed meat to give top quality eating results.

## Your cool room is the key

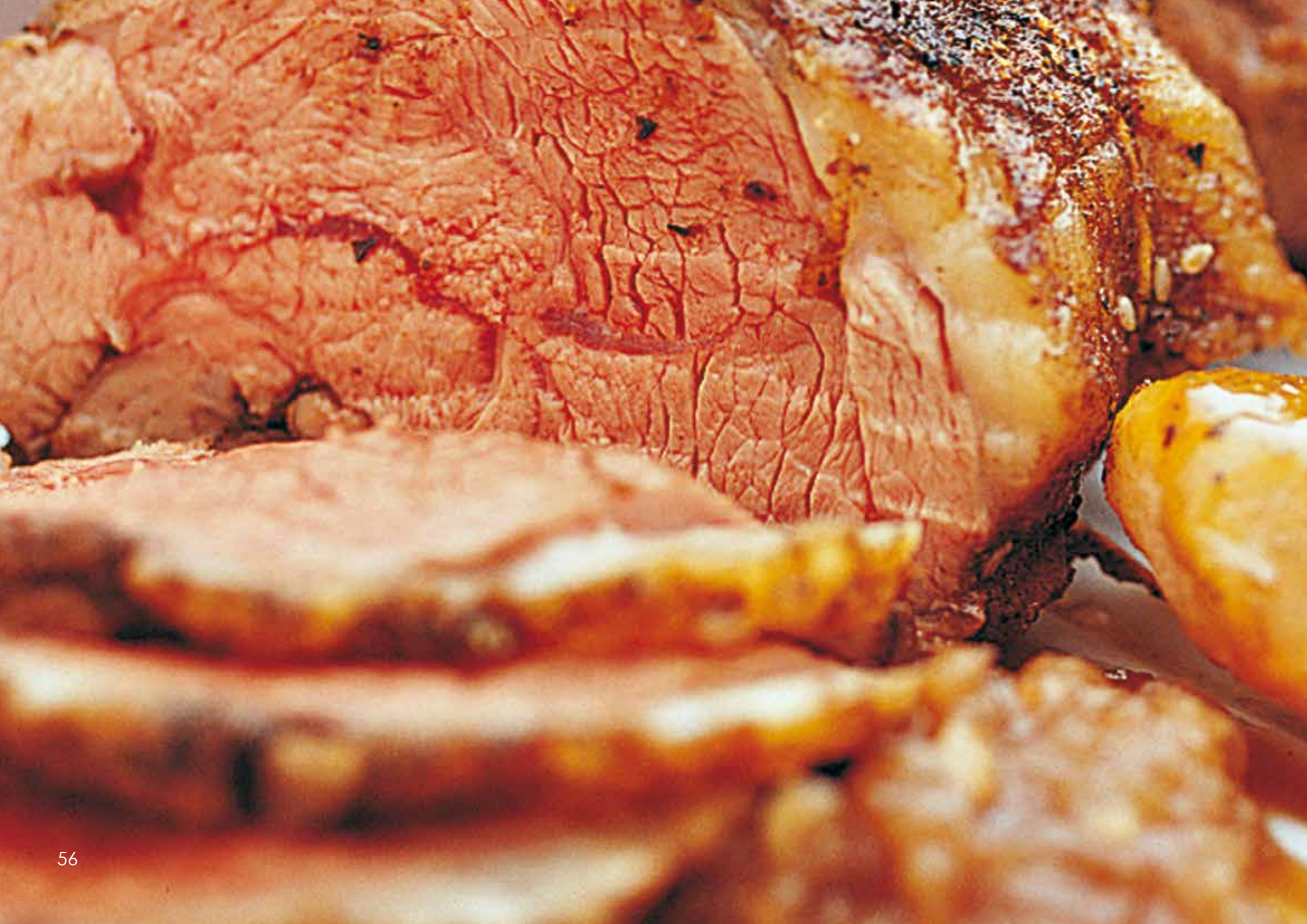
- The right temperature for storing fresh, raw meat is ideally -1.5°C to +2°C.
- Keep a visible temperature gauge in your cool room.
- The correct humidity is about 85% to 88%, though humidity is far less important than temperature.
- Keep your cool room clean, sanitised and dry.
- Keep a written record of the product in your cool room.
- Rotate stock on a first-in, first-out basis, removing meat for cutting only when required.
- Keep cool room entry and exit to a minimum. Don't leave the door open unnecessarily. Fluctuations in temperature can reduce shelf life.
- Maximise cool room air flow by keeping the door tightly closed when not in use. Stack product so air flow is not blocked.
- Keep cool room trays clean and dry. Change regularly so meat products are not left soaking in excess moisture.
- Ensure adequate lighting inside the cool room, but turn lights off when room is not in use.
- Have a scheduled cool room maintenance programme.



## Summary of storage and handling temperatures

7°C	For the transport of fresh/chilled meat, ideal temperature is <b>BELOW</b> this.
2°C	Maximum storage temperature for fresh/chilled meat.
0°C	Ideal maximum storage temperature for fresh/chilled vacuum-packed beef or lamb products.
-1.5°C	Ideal minimum storage temperature for fresh/chilled vacuum-packed beef or lamb products.
-1.5°C	For Controlled Atmosphere Packed product, ideal storage temperature.
-12°C	Frozen meat, whilst being displayed for sale, should be maintained <b>AT</b> or <b>BELOW</b> this temperature and should not at any time have been refrozen after thawing.
-18°C	Frozen meat should be stored <b>AT</b> or <b>BELOW</b> this temperature.









## Food Safety and Meat Hygiene

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## Food Safety and Meat Hygiene

Meat from healthy animals is sterile before slaughter, but despite the most stringent hygiene during and after processing, it will be exposed to micro-organisms (microbes). Most contamination will be on surfaces; the deep meat tissue normally remains sterile.

Regular testing shows New Zealand meat is microbiologically very clean. This is a tribute to the care taken by everyone from the farmers who present their stock in clean condition, to the processing plant workers who follow procedures designed to maintain food safety.

A meat processing plant is a strictly controlled environment with a total focus on producing safe and wholesome food. Unless it is handled with care, meat is at much greater risk once it leaves the processing plant.

### Bacteria and spoilage

The bacteria which can contaminate food are extremely small organisms and are always present in the environment. Proper handling, good personal and kitchen hygiene, and appropriate cooking protect against food poisoning.

Some bacteria grow on meat and produce chemicals or chemical changes we recognise as spoilage.

Bacteria harmful to human health are called pathogens. Pathogens on meat can cause infection in the body, like gastroenteritis, or they can produce toxins that, when eaten, make people sick by giving them food poisoning.

### Spoilage – seeing is not always believing

When bacteria grow to high enough numbers and enough time passes, they can cause offensive odours or flavours, or they can discolour the meat or produce a layer of slime.

But sometimes pathogens are growing on meat, yet the meat may still smell, taste and look wholesome. If you are uncertain whether meat has been properly handled (for example, left at room temperature for a long time), it is safer to throw it out as you cannot be certain it is safe to eat.

You cannot always rely on how meat looks or smells. This is why it is important to keep meat at low temperatures and handle it hygienically.

### Control harmful bacteria

Usually two events must occur to lead to food poisoning:

1. Contamination of a potentially hazardous food with food poisoning bacteria.
2. Growth of bacteria on the food.

Although harmful bacteria can't be seen, they can be controlled. By knowing what conditions they need to multiply and depriving them of these, their growth can be prevented.

Bacteria need water, nutrients, appropriate temperatures, the correct pH (acidity/alkalinity) and time to grow.

Bacteria flourish on foods that are moist, nutritious and warm. They thrive on high protein foods. High risk foods are easily recognised because they are the ones which require refrigeration to stop them from spoiling.

Some potentially hazardous foods are: cooked meats and poultry, casseroles and sauces, seafood dishes, dairy products, cooked rice and other moist cereals.

### There are three simple rules for food safety:

1. Keep it clean.
2. Keep it cool.
3. Keep it moving.

### Temperatures promoting bacterial growth

- Bacteria multiply quickly in warm food and grow best at temperatures between 5°C and 63°C.
- Bacteria don't like their environment too hot. Most bacteria begin to die at temperatures above 63°C. Boiling temperatures will destroy bacteria (but may not destroy their toxins).
- Bacteria do not grow in very cold environments. However, cold does not kill them. When refrigerated or frozen, most food poisoning bacteria merely become dormant. Once warm again, they can quickly begin to multiply.

### Safe temperatures for food

- If holding cooked, hot food, its temperature should be above 60°C.
- For food safety, keep fresh/chilled food below 4°C. For a good storage life, keep the storage temperature as low as is practical. For example, keep your cool room between 0°C and 2°C.

## Don't give bacteria time to grow

When given the moist, warm food they like, food poisoning bacteria grow very rapidly. With optimum conditions bacteria split in half, one becoming two in about 10 to 20 minutes.

In this way, in only four hours, a single bacterium in food can become 40,000. Within seven hours, 2 million. Initial contamination of food usually involves hundreds or more bacteria, not just one, so dangerous numbers can be quickly reached.

- Keep perishable foods cold and use as soon as possible.
- Limit the time high risk foods are kept at temperatures between 5°C and 63°C, or room temperature, to two hours maximum.

## Pathogens and disease

The bacteria most often responsible for food poisoning in New Zealand are *Salmonella* and *Campylobacter*.

*E. coli* 0157:H7, which has been linked with some high profile cases overseas, has not been associated with food poisoning derived from New Zealand meat.

The most publicised human health problem recently associated with meat, BSE or bovine spongiform encephalopathy, is caused by an organism called a prion, not by bacteria. New Zealand cattle are completely free from BSE and because they are naturally pasture-fed, are at minimal risk of developing it.



## Minced meat

Take extra care with hygiene when handling and storing mince and finely sliced or diced meats.

Remember, the more surface area of meat exposed, the greater the possibility of contamination.

Minced meat and hamburger patties should be thoroughly cooked to an internal temperature of 70°C. They should not be served undercooked, rare or pink.

## Meat hygiene

### Food quality is your business

Your reputation and your business depend upon providing your customers with safe, delicious, high quality food. Food poisoning can destroy it all.

### Food poisoning is avoidable

Food poisoning and other foodborne illnesses are usually a result of incorrect handling, preparation, storage of food and poor personal hygiene. The importance of a strict hygiene programme cannot be overstated. To ensure success and the survival of your business:

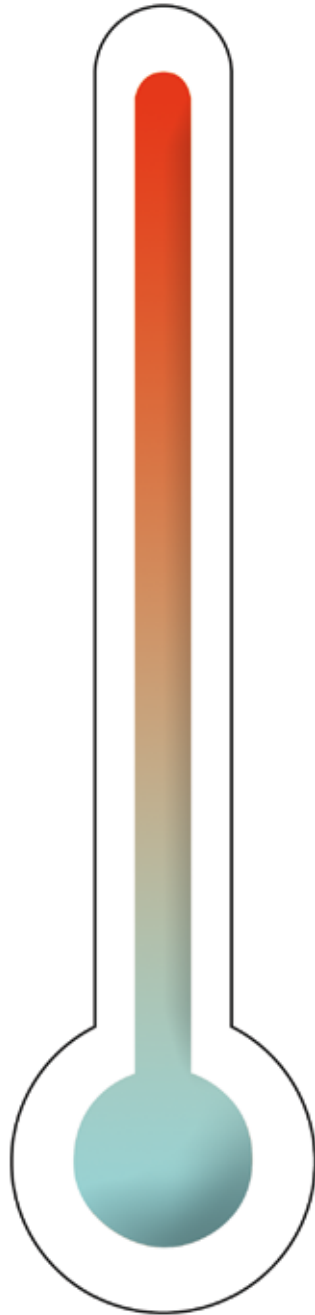
- Buy your meat from a Quality Mark supplier who adheres to a strict code of meat hygiene.
- Institute a strict personal, kitchen and food safety programme in your restaurant.

### Personal hygiene checklist

- Maintain hygiene standards by showering daily and keeping hair and nails clean. Any cuts should be covered with waterproof bandages.

- Keep uniforms and work clothing clean. Wear a hairnet or cap and cover all hair.
- Before beginning work, wash hands thoroughly with soap and warm water and dry hands thoroughly with disposable paper towels or a roller towel or air dryer.
- Wash hands frequently during the day and always after visiting the toilet, handling raw goods or garbage or smoking. Ensure you dry your hands after washing.
- Never smoke in the kitchen.
- Gloves should be worn and changed regularly when handling foodstuffs. If disposable plastic gloves are worn they should be disposed of after use.
- Jewellery should not be worn in the kitchen.
- Do not taste food with fingers. Use a clean tasting spoon every time.
- As much as possible, use utensils rather than hands when preparing and handling food. Be sure utensils are clean.





## Food Temperature Guide

100°C	Boiling point of water
75-80°C	Acceptable reheating and serving temperature
65°C	Minimum holding temperature for bain-maries, hot cupboards
65°C	Foods stored hot must be <b>AT</b> or <b>ABOVE</b> this temperature
63°C	Bacteria multiply <b>AT</b> and <b>BELOW</b> this temperature
5°C	Many food poisoning bacteria multiply <b>AT</b> and <b>ABOVE</b> this temperature
2°C	Ideal storage temperature for fresh/chilled meat
-1.5 to 0°C	Ideal storage temperature for vacuum-packed beef or lamb products
-12°C	Frozen meat on display for sale should be maintained <b>AT</b> or <b>BELOW</b> this temperature
-18°C	Frozen meat should be stored <b>AT</b> or <b>BELOW</b> this temperature

### Food safety checklist

- Always check food and meat before use to ensure it has not spoiled. If in doubt, throw it out! Remember however, food poisoning organisms can be present on food that looks and smells fresh.
- Monitor use-by dates on foods. Use a strict rotation programme based on first-in, first-out.
- Store raw and cooked foods separately in the refrigerator.
- Clean work surfaces, chopping boards and meat slicers frequently and always after the preparation of raw foods.
- Operate freezers at - 18°C or below and keep them clean.
- Operate refrigerators at 0 to 4°C (32°F to 39°F) or below and clean them weekly or as required.
- Freeze foodstuffs once only. Meat, once thawed, should either be refrigerated or cooked and served promptly.
- Chill cooked meat to below 3°C or less in under two hours.
- Avoid cross-contamination with harmful bacteria: follow a strict personal hygiene regime, always exercise clean working procedures and clean as you go.
- Do not use the same utensils or cutting boards to prepare raw meat and food not to be cooked (eg salad vegetables, cooked meat), to prevent cross-contamination from the raw to ready-to-eat foods.
- Cool stock to be stored quickly and chill to below 3°C or less in under two hours.



### **Meat is a perishable food requiring high standards of hygiene**

Before and after handling meat:

- Wash equipment thoroughly in hot water.
- Wash hands with soap and water.

### **Working with meat:**

- Keep temperatures of the preparation area as low as possible (ideally under 10°C) and move meat as quickly as possible from refrigerated or frozen storage to preparation area.
- Keep all work surfaces, utensils and cutting boards clean.
- Always use a clean, sharp knife for preparing cuts.

Temperature control is crucial to the maintenance of food safety standards.

### **Fresh meat storage guide**

Remember, when storing fresh/chilled meat, the lower the temperature the longer the shelf life.

- Keep fresh raw meat at the lowest practical temperature that does not cause freezing, and at a humidity of around 85 to 88%.
- Keep handling of meat to a minimum. Place fresh, raw meat, fat side up, in single layers on trays.
- Loosely cover meat with plastic wrap. Change trays regularly to prevent pools of drip.
- Keep different raw meats and meat cuts separate.
- Never store raw and cooked meat together on the same tray.
- Avoid any possibility of drip from raw meat onto cooked meat: never store raw meat above cooked meat.
- Minimise dehydration and spoilage by using a strict stock rotation plan: first-in, first-out.
- Ensure all meat is labelled and dated.
- Restaurant portions can be stored for approximately three to four days under correct storage conditions.
- Primal and sub-primal cuts may be kept for up to 10 days (if packaged correctly and kept at low temperatures).
- Remember, actual storage life depends not only on the refrigeration conditions, but also on how long the meat has been stored and under what conditions, at the time you received it.

## Good Nutrition with Beef and Lamb

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## Good Nutrition with Beef & Lamb

### Nature's Power Pack

Red meat has been part of the diet for at least 4 to 5 million years, and is believed to be one of the main factors contributing to our large and well-developed brain.

The Paleolithic diet of our hunter-gatherer ancestors is also recognised as protective against the diseases of today.

We still have several physical indicators showing we are designed to eat a mixed diet of both animal and plant foods.

One of these is our teeth, made up of canine teeth for eating meat, and molars for grinding plants.

New Zealand beef and lamb are more than just wholesome, versatile ingredients. They are rich sources of protein, iron, zinc and vitamins, such as vitamin B<sub>12</sub> and vitamin D.

Being naturally 'nutrient-rich', beef and lamb contain a unique package of essential nutrients providing 'a lot in a little', making them an important part of a healthy, balanced diet.

### Protein

The protein in red meat is the best quality, containing a complete range of amino acids – the building blocks for growth and repair.

A 100g serving of cooked beef or lamb provides 25-30g of protein. New Zealanders obtain the greatest amount of protein from beef and lamb.

### Iron

More of the iron found in beef and lamb is used by the body than the iron in vegetables and cereals. Iron is needed for healthy blood, giving us energy, and for brain development in babies.

Many women, and a concerning number of our babies and young children, go short of iron. Eating red meat will help them get enough.

### Why do we need iron?

Iron is a mineral essential for good health and wellbeing. It helps carry oxygen to the brain and muscles, keeping us physically and mentally strong.

### Who needs most?

- Infants, children and teenagers because they are growing rapidly
- Pregnant women
- Girls and women who have periods, due to regular monthly blood loss
- Athletes and very active people

### If we don't have enough iron in our blood, we:

- Feel tired
- Have difficulty concentrating
- Find it harder to learn
- Feel cold
- Are less able to fight infection

Children in particular may suffer long-term learning or development problems if they are iron deficient.



### Iron: Where is it?

Iron is found in a number of foods, including red meat. In general, the redder the meat, the higher the iron content. But not all iron is the same. Iron is found in two forms: haem and non-haem.

**Haem iron foods** – beef, lamb, liver, kidney, pork, poultry, seafood.

**Non-haem foods** – vegetables, bread, breakfast cereals, beans and lentils, eggs, nuts, fruit.

The body absorbs haem iron more easily, with about a quarter being used, whereas only about 5% of non-haem iron is absorbed.



Food	Total Iron (mg)	Absorbed Iron (mg)
120g cooked lean beef (average all cuts)	4.6	1.2
½ cup green mussels, marinated	4.6	1.2
40g slice lamb liver	4.0	1.0
¾ cup stewed lean beef mince	3.5	0.9
120g cooked lean lamb (average all cuts)	3.0	0.8
2 roasted chicken thighs (172g)	1.8	0.5
1 grilled lean pork leg steak (82g)	1.6	0.4
120g baked tarakihi fillet	0.6	0.2
¾ cup baked beans	2.0	0.16
1 cup cornflakes	2.0	0.16
½ cup walnuts	1.9	0.15
½ cup cooked red lentils	1.8	0.14
90g can tuna in brine	0.5	0.13
1 Tbsp pumpkin seeds	1.5	0.12
1 boiled egg (50g)	1.1	0.09
1 cup boiled brown rice	1.0	0.08
1 Tbsp pinenuts	0.9	0.07
½ cup boiled spinach	0.6	0.05
1 slice wholemeal bread	0.5	0.04

Reference: Concise New Zealand Food Composition Tables, 8th Edition, 2009



Red meat can help to increase absorption, boosting the use of non-haem iron by up to four times. Vitamin C also has a similar effect. Eating a combination of foods high in both haem and non-haem iron will ensure an iron-rich diet.

**Lean beef provides approximately:**  
2-3 times as much iron as chicken.  
3 times as much as pork.  
7-8 times as much as white fish.

**Lean lamb provides approximately:**  
Twice as much iron as chicken.  
Twice as much as pork.  
5 times as much as white fish.

## Zinc

Zinc is needed to fight infection and to heal wounds, as well as numerous other body functions. Like iron, the zinc in red meat is used more easily by the body than the zinc in other foods. Beef and lamb are the most commonly eaten sources of zinc in New Zealand.

## Vitamins

There are several B group vitamins in beef and lamb, all with different functions. Some help release energy from foods, some help to maintain good vision and healthy skin, while others are needed for the manufacture of red blood cells.

Beef and lamb contain vitamin B<sub>1</sub> (thiamin), vitamin B<sub>2</sub> (riboflavin), vitamin B<sub>3</sub> (niacin), vitamin B<sub>6</sub> (pyridoxine) and biotin, but are richest in vitamin B<sub>12</sub>.

### <sup>2</sup>Vitamin B<sub>12</sub>

Vitamin B<sub>12</sub> is only found naturally in animal foods, with beef and lamb the most common sources eaten by New Zealanders. Vitamin B<sub>12</sub> is important to every cell in the body because it contributes to our genetic material, DNA.

## Vitamin D

Vitamin D is involved with calcium in the body to give us strong bones. We make most of the vitamin D we need through the action of sunlight on our skin, but with increased awareness of the dangers of over-exposure to the sun, foods containing this vitamin are becoming more important.

Food sources include dairy products and oily fish, but red meat is now known to contain a more potent type of vitamin D, also making it an effective source.

A 100g lamb leg steak provides up to half the amount of vitamin D needed each day (2.6µg/100g); 100g lean beef steak about a quarter (1.2µg/100g).

## Fat

Lean red meat contains about a fifth of the fat in foods such as cheddar cheese. Less than 10% of the fat in our national diet comes from lean beef and lamb, which is also true of saturated fat – the type from which we make cholesterol.

In fact, one tablespoon of the much-acclaimed olive oil contains more saturated fat than two slices of roast beef. Because lean beef and lamb is low in fat, a significant amount qualifies for the Heart Foundation's Tick. Remember to trim the fat though – the good nutrition is found in the lean part.

### Why do we need to eat fat?

- A small amount of fat in our food is essential as fat is found in all body cells. Fat helps us make hormone-like substances and carries the fat-soluble vitamins (A, D, E and K).
- It provides a rich source of energy (kJ/kcals).
- It can make food tastier – compare a dry piece of toast to one with butter or margarine.

### What happens if we eat too much?

- Fat gives us twice as many kilojoules/calories as protein and carbohydrate, so eating large quantities of fat can easily give us more energy than we need. For example, just a tablespoon of butter gives the same amount of energy as two slices of bread.
- We store excess energy as fat, and gain weight.
- Being overweight can lead to a number of health problems such as heart disease, diabetes, high blood pressure, reduced mobility and breathing difficulties.

Trimmed beef and lamb are low in fat. The fat content of lean beef and lamb is comparable to other protein sources such as chicken and pork, and in some cases is significantly lower.

### Can fat be good?

As with everything to do with food and nutrition, the answer is yes and no! There are several different types of fat, some of which are more beneficial to health than others. The main types are saturated, monounsaturated and polyunsaturated. Saturated fat has given all fat a bad name, as it has been linked with raising cholesterol levels and heart disease. Only half the fat in beef and lamb is saturated, and within that saturated fat, the majority is a type now known not to affect cholesterol levels.

### Mediterranean influence

The other half of the fat is mainly monounsaturated fat, as in olive oil. Olive oil has become the most recognised source of monounsaturated fat, made popular by the low levels of heart disease seen in Southern European countries, where use of olive oil is frequent and plentiful. In New Zealand we derive more of our monounsaturated fat from beef and lamb than from olive oil.

## Fat content of Protein Foods

	grams fat per 100g cooked weight	grams fat per (serving)
Baked snapper (1 fillet)	3.4	(3.6)
Lean roast beef topside (2 slices)	5.3	(4.4)
Lean grilled rump steak (150g steak)	5.5	(8.3)
Lean stewed mince (1 cup)	6.0	(10.2)
Grilled chicken drumstick no skin (2 drumsticks)	6.8	(6.0)
Lean grilled lamb leg (1 steak)	7.8	(4.5)
Boiled egg (1)	9.5	(1.0)
Roasted chicken thigh with skin (1 thigh)	19.8	(23.5)
Canned corned beef (2 slices)	28.4	(16.0)
Cheddar cheese (½ cup, grated)	36.6	(21.6)
Peanuts (½ cup, raw)	49.0	(38.2)

Reference: Concise New Zealand Food Composition Tables, 8th Edition, 2009

## Omega 3s

New Zealand beef and lamb contain the healthy omega 3s found in some fish and fish oil supplements, providing a good alternative for those who don't eat oily fish, such as canned salmon or sardines. Omega 3s are needed by those with heart problems, and are important for eye and brain development in babies. Levels of these important oils are higher in New Zealand beef and lamb, produced from grass-fed animals, compared to meat from grain-fed animals overseas.

## Cholesterol

Cholesterol is a type of fat found in many animal products but not in plants. The body also makes cholesterol and a certain amount circulating in the blood is necessary for good health. It is an important component in cell walls, bile and hormones. An abnormally high level of cholesterol in the blood is not good for health. The cholesterol is deposited on the artery walls, increasing the risk of heart disease.

High blood cholesterol can be caused by a genetic (inherited) condition.

Foods high in cholesterol include liver, kidneys, brains, sweetbreads, egg yolks, fish roe, prawns and shrimps. Moderate amounts of cholesterol are found in meat, poultry, some fish, whole milk and cheese.

**Cholesterol in food, however, does not normally cause raised levels of cholesterol in our blood.**

Nutritionists agree an excess of saturated fat in the diet is the main cause of high blood cholesterol, not cholesterol in foods.

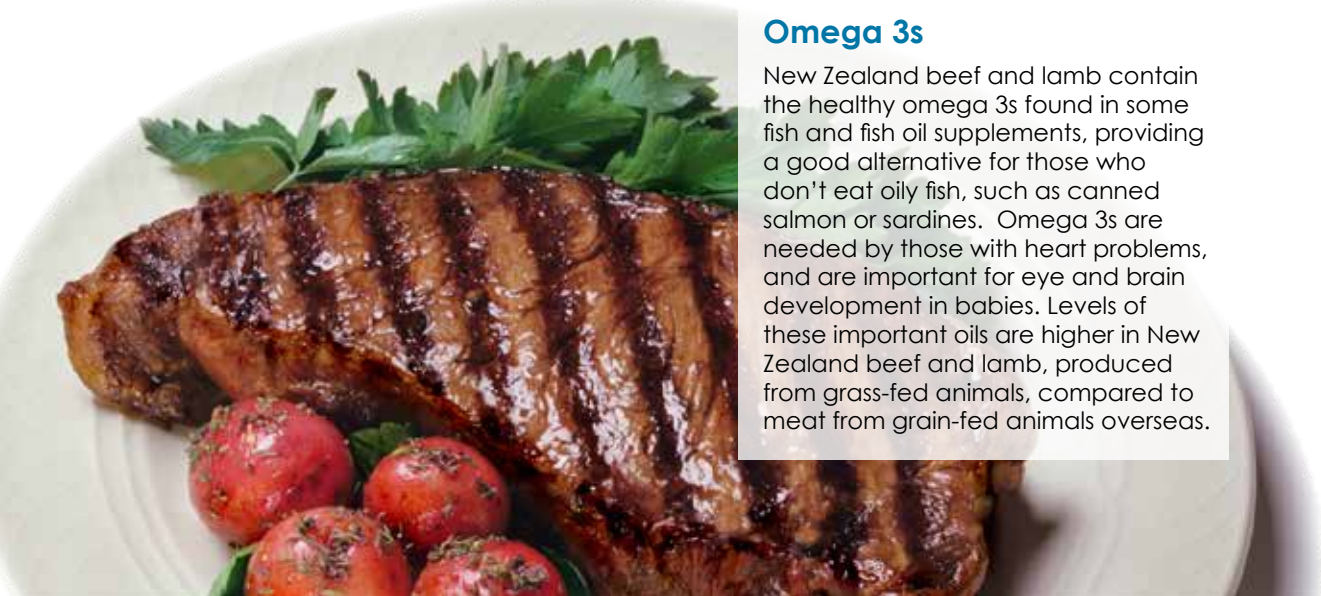
**Lean beef and lamb can be included in a diet designed to lower blood cholesterol.**

## Carbohydrates

Beef and lamb do not supply carbohydrates except for a very small amount as glycogen in liver. Some variety meats have a small amount as added cereal, eg sausages.

## Water

Lean meat muscle contains 50-75% water.











## Meat Cookery

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## Meat Cookery

The aims in cooking meat are to:

1. Develop or improve flavour, colour and aroma.
2. Make it delicious/appetising to eat.
3. Make it more tender.
4. Make it easier to digest.
5. Make it safe to eat - kill any harmful bacteria it may have picked up during handling.

Many changes occur in the process of cooking, affecting the appearance, taste and texture of meat.

### How meat changes during cooking

#### 1. Muscle proteins shrink and moisture is lost

As meat is heated, muscle proteins coagulate and shrink, squeezing out water. The longer you cook meat, the more water is forced out.

The loss of juices through drip, evaporation and cook-out (along with its marbled fat content) determines the meat's juiciness, the amount of shrinkage and thus the final cooked weight or portion yield.

Prolonged cooking or overcooking results in meat that has lost so much moisture it becomes dry and tough to eat.

#### 2. Colour changes

Heat affects the pigments and changes the colour of meat. The red colour of uncooked beef changes to light pink and finally to a brown/grey shade as the 'degree of doneness' increases.

#### 3. Connective tissue softens

During long, slow cooking, some of the connective tissue (the collagen type, which becomes soluble above 60°C) softens and gelatinises.

#### 4. Fat melts, browning occurs and flavour develops

Heat causes fat to melt. Slightly browning fat develops flavour and the more you brown it, the more flavour is developed.

#### 5. Searing develops flavour

Searing - browning the outer, lean surface of meat, usually at a fairly high temperature, develops flavour and colour through caramelisation. It is an important step in several cooking methods, producing tasty meat.

### The myth about searing

Searing meat does not seal in the juices.

A browned surface will not stop the loss of juices from meat as it cooks. As meat is heated, bundles of muscle fibres contract and force out moisture, especially from cut surfaces.

The sizzle you hear when meat hits the hot pan is water turning into steam. Of course, melting fat can sizzle too. Lean meat, totally trimmed of all visible fat, sizzles and spatters as its juices evaporate. The longer it cooks, the more water it loses.

When cooking meat, sear it to a good brown colour to improve appearance and flavour and keep in mind that overcooked lean meat will be dry and therefore not as good to eat as properly cooked lean meat, which is succulent and juicy.

## Tenderising meat before cooking

It goes without saying, the best way to ensure the meat you cook is tender is to choose a cut you know to be tender, from a reliable source (for example, Quality Mark meat).

It is also true that meat toughened during processing can never be made edibly tender.

However, less tender cuts can be made more tender by chemical or mechanical means.

### Chemical tenderising

There are two types of chemical tenderisers:

**1. Acids:** Marinades containing a mild acid ingredient such as lemon juice, wine or wine vinegar help to tenderise meat.

Meat may be soaked in marinade for several hours or days in the chiller. The use of a tenderising marinade is more effective on thinner cuts of meat.

**2. Enzymes:** Some raw fruits contain protein-splitting enzymes (proteases) which act on raw meat to tenderise it.

Examples include paw paw (contains papain), kiwifruit (actinidin), pineapple (bromelin) and figs (ficin).

The enzymes break down and soften muscle tissue. Some commercial meat tenderisers are marinades or powders containing papain to act in this way.

The mashed raw fruit, liquid or powder may be spread over the meat, or mixed with other marinade ingredients to coat the meat, some time before cooking.

The tenderising effect acts mainly at the surface, so a marinade or powder works better on small, thin cuts of meat.

If left too long on raw meat, marinades containing these tenderising enzymes spoil the texture of meat, causing it to become mushy on the surface.

**Note: Not all marinades have a tenderising effect. Many marinades have no acid or enzyme ingredients and are used simply to add flavour and colour to the meat.**

### Blade or mechanical tenderising

**1. Mincing:** Meat is put through a chopper, mincer or grinding machine to break up connective tissue and muscle into small pieces.

**2. Batting out or hammering:** Meat is pounded with a meat mallet (the mallet may have a rough, toothed surface) to break down muscle and connective tissue.

This method is used for individual portioned cuts, steaks or schnitzels, not whole joints.

**3. Cutting or needling by machine:** Steaks can be tenderised using a revolving machine with tiny blades which make very fine cuts in the meat, breaking up tough tissue. This may be used on boneless beef steaks such as topside, silverside, thick flank or blade.

## Dry and Moist Heat Methods of Cooking Beef and Lamb

There are two key types of meat cookery:

- Dry heat methods
- Moist heat methods

Dry heat methods do not use liquid, but can use fat or oil. Dry heat suits tender or medium-tender meat cuts.

Dry heat methods include:

- Roasting
- Grilling (includes fan-grilling, pan-grilling and barbecuing)
- Shallow frying (pan-frying, sautéing and stir-frying)
- Deep-frying

Moist heat methods use liquid and are suitable for less tender meat cuts.

Moist heat methods include:

- Braising (includes casserole cooking), pot-roasting and stewing
- Poaching, simmering
- Steaming, pressure cooking

The method of cookery - moist versus dry heat, or slow versus fast cooking - can have a dramatic impact on the ultimate taste and tenderness.

Since different cuts of beef and lamb vary in composition (eg some having much more connective tissue than others), it is important to choose the cooking method which is most suited to the cut, to give the best results in the final dish.

### Selecting the correct cooking method for the cut

The cooking method you use depends on:

- The natural tenderness of the cut
- The amount and type of connective tissue
- The leanness of the meat
- Size and thickness of the cut of meat

#### Connective tissue

Meat cuts with a lot of connective tissue are the less tender cuts which need moist heat and longer, slower cooking to make them tender. But not all connective tissue will become tender. Two main components of connective tissue are collagen (white) and elastin (yellow).

Collagen will become soft, tender and gelatinised, so long as a slow, moist cooking process is used.

Elastin is very tough tissue, which will not become tender with cooking. Heat makes it shrink and harden. It is important to remove tough elastin tissue before cooking to help reduce the level of toughness in some cuts.

#### Cuts with large amounts of collagen and elastin

Shank, shin and shoulder cuts of beef and lamb contain collagen and elastin. They should have visible connective tissue cut out and be cooked by slow, moist heat to gelatinise the collagen.

#### Cuts with less collagen

Meat cuts such as fillet and striploin contain little connective tissue so suit dry heat cooking methods such as grilling, searing or short, high temperature roasting.



## Dry Heat Methods

- **Roasting:** Meat is cooked uncovered, in hot air, in an oven. Meat may also be roasted revolving on a spit over a fire.
- **Grilling (Broiling):** Quick cooking by direct heat from a gas flame or an electric element. Meat may be placed under or over the heat source.
- **Barbecuing:** Meat is cooked on a grid or spit over glowing coals or gas flame.
- **Fan-grilling:** Cooking in a multi-function oven using radiant heat from the grill (upper) element and heated air circulated by a fan. A thermostat controls the temperature and the oven door is kept closed. Suitable for tender grilling cuts and some roasts.
- **Pan-grilling:** Meat is cooked on a pre-heated heavy, dry frypan or ridged iron grill pan (griddle pan), or metal hot plate. This is not frying. The cooking surface may be lightly greased, or the meat brushed with oil before cooking, but no further fat is added. Any fat drippings should be poured off as they accumulate. The meat is cooked uncovered.
- **Pan-frying (shallow frying):** Meat is cooked in a small amount of hot fat or oil (usually about 3-12mm depth), in an uncovered pan. A suitable method for thin cuts of tender meat.
- **Stir-frying:** Finely cut food is rapidly stirred and tossed as it is fast-cooked in a little hot oil, usually in a wok, over high heat.

- **Sautéing:** 'Sauté' literally means, to 'jump'. Small pieces of food are tossed (either by shaking the pan or using a spatula or similar utensil) in a little hot oil or fat in a sauté pan (like a frypan but slightly deeper). A suitable method for thinly sliced, small pieces of tender meat. A sauté may be finished with a sauce cooked in the pan.
- **Deep-frying:** Food cooked by being immersed in hot oil or fat.

## Moist Heat Methods

- **Braising:** Meat is first browned in a minimum of fat or oil, then cooked gently with vegetables and a small amount of liquid in a tightly covered pot or casserole on the stove top or in the oven. Used for serving-sized pieces of meat as well as for larger cuts.
- **Pot-Roasting:** The term used for larger cuts or joints of meat cooked as for braising, but without any (or with barely any) liquid. A good method for less tender roasting cuts such as fresh beef silverside, topside and chuck roasts.
- **Stewing or Casseroling:** Meat cut into small pieces or cubes is cooked at a low temperature or gentle simmer in liquid, usually with vegetables, in a covered pan on the stove top or in the oven. The meat may be browned first.
- **Simmering:** Gentle cooking in liquid just below boiling point so the surface barely ripples. Meats for simmering may be cut either in small, or large pieces, eg corned beef silverside.

- **Poaching:** Food is cooked very gently in liquid below simmering point. Liquid is hot but should not exceed a mere tremble, ie less movement than simmering.
- **Pressure Cooking:** Cooking in liquid and steam under pressure, which increases temperature and reduces cooking time to about one third of normal time. A suitable method for less tender meat cuts which normally need long, moist heat cooking, eg ox tongue and beef shin.

## Methods Combining Moist and Dry Heat

- **Microwave Cookery:** Microwave cookery is electro-magnetic. It is neither a dry nor moist technique, but the microwave oven can be used to roast, simmer, braise and casserole meats. However, it gives different results from conventional cooking methods and does not always save time. Generally, meat cooks better and more evenly, at a lower power setting. The size and shape of the meat cut affects evenness of cooking and the time required.
- **Covered Roasting:** This is not true roasting, as the meat is enclosed, either in an ovenbag or covered roasting pan, thus trapping in some steam, and then cooked in the oven.

A variation is frypan 'roasting', eg small lamb leg cuts are first browned in a hot frypan. Heat is then reduced, the lid put on and cooking is completed.





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## Roasting

### Roasting techniques

Roasting is a dry heat method that may use a small amount of fat or oil as a baste. The meat is cooked in an oven or on a rotating spit over a fire, gas flame or electric grill bars.

### Different roasting methods

Some meat cuts suit high temperature roasting while others are better roasted at low temperatures.

Beef and lamb cuts with plenty of outer fat cover, fat seams or marbling are best roasted at low to moderate temperatures. This results in less shrinkage and better serving yields.

Very lean or totally trimmed cuts are better rare-roasted at a higher temperature, or first seared then roasted.

- **Slow roast:** low temperature 100 to 160°C.
- **Moderate roast:** 170 to 180°C.
- **Fast roast:** high temperature 200°C or over.
- **Sear then roast:** brush lean surfaces with oil. Brown meat all over in a hot, dry pan then transfer to a moderate oven, 180°C, to complete cooking.

### Low to moderate temperature or slow roasting in a convection oven (with or without fan-forced function)

Hot air circulates at high speed with slow, gentle, even cooking temperatures between 70 to 160°C.

### Moderate to high temperature roasting in a convection oven

Hot air circulates at high speed, giving fast, even cooking temperatures between 160 to 300°C.

### Combination oven roasting

This method uses a combination of dry heat plus moist heat, eg meat joints cooked in covered roasting pans or oven bags.

### Combination oven with microwave

Dry heat cooking plus microwave power gives reduced cooking times.

### Outdoor spit roasting

Electronically-operated spit turns slowly over charcoal embers, electric or gas grill bars. Meat must be basted constantly.

### Oven spit roasting

Electronically-operated spit in convection oven or in front of radiant-heated spits.

Note: Pot-roasting is a moist heat method (see page 100).

## Roasting cooking times in oven preheated to 160-170°C

Firstly, note the weight of the meat to calculate cooking time:

- A large piece of meat requires fewer minutes per 500g than a smaller cut.
- The thickness of the meat cut affects the cooking time. Thick, chunky pieces take longer than thin cuts of the same weight.
- Roasts with bone-in cook more quickly than boned and rolled roasts.

	Minutes per 500g	Internal temp. of cooked meat
Rare	20-25	60°C (140°F)
Medium	25-30	70°C (160°F)
Well done	30-35	80°C (175°F)

## Roasting Tips for Top Results

- If possible, take meat from the refrigerator about 30 minutes before cooking, to bring it to room temperature.
- Trim excess fat and silverskin if necessary.
- Very lean cuts: sear or brown lean cuts first. Searing a roasting cut in a hot pan improves colour and flavour, particularly when using small, lean beef or lamb cuts that need only short cooking.
- Roast on a rack: when practical, place meat on a rack to roast. This allows even heat circulation and browning. You can use a root vegetable mirepoix, trimmed bones or metal trivet as a base for the meat.
- Self basting: place roast beef or lamb with fat side uppermost to allow natural basting.
- Netting and trussing: collagen film, caul fat, netting or twine may be used to hold plain or filled roast cuts in an even shape for cooking, portioning and carving.
- Resting after roasting: after cooking, before carving or serving beef or lamb, allow meat to rest, approximately five minutes for every 500g of meat, for example, 15 minutes for a 1.5kg beef roast.

Resting enables temperature to even out and the meat fibres to relax and re-absorb some of the juices. The relaxed meat becomes more tender and easier to carve, with less loss of juices.

## Beef Cuts to Roast

Fillet, ribeye, standing rib, rolled rib, wing rib, sirloin and rump. All of these cuts can be either fast-roasted at high temperature (200°C), or slow-roasted (160°C). Rolled rib, topside, bolar and chuck are less tender cuts, more suitable for slow roasting or pot-roasting.



**Whole fillet**

**Fillet (eye fillet, tenderloin, the undercut of the sirloin, taken from under sirloin and part of the rump).** Most tender, fine-grained, juicy cut.

Whole fillet weights around 2-2.5kg. Long, log shape, tapering from thick end to thin, tail end. A strip of slightly coarser textured meat (the chain) joined to the main muscle by a strip of connective tissue, runs from the tail end, about three-quarters of the way along one side.

**Cooking Point:** The chain is often removed before cooking to improve presentation of the roasted meat. Beef fillet may be roasted whole, or cut into shorter lengths.



**(a) Butt end**

The whole beef fillet may be divided across into three sections:

1. The thick **(a) butt end**, or head (tête de filet).
2. The centre portion, middle fillet of heart (coeur de filet). Tournedos are cut from this.
3. The tail, thin end (filet mignon). This end is too thin to roast on its own.

**Cooking Point:** Before roasting, the tail end may be cut off, or folded under on itself and tied in place to give more even thickness throughout.



**(b) Châteaubriand**

A roasting cut taken from the beef fillet is the **(b) Châteaubriand** (Châteaubriand may also be used as a grilling cut, see page 85). This is usually taken from the thick end of the fillet (about 800g) and will serve two to three people. It can also be cut into pieces about 400g each and flattened slightly before cooking.

Châteaubriand can also be cut from the centre of the fillet, a large double fillet steak weighing from 400g to 800g. This is grilled whole, then carved. The beef fillet's shape, with its lengthwise grain, makes it an easy roast to carve into neat slices.

**Cooking Point:** Fast, high temperature roast, or pan-sear then oven roast. Best rare or medium rare.



**Ribeye (Scotch fillet, cube roll).** Tender, fine grain (more open-grained than sirloin), with some marbling and a small strip of fat running lengthwise with the lean, but very little outer fat cover. Boneless log shape (around 2.5-3 kg), well-flavoured roasting cut which carves into neat slices.

**Cooking Point:** Slow or high temperature roast.



**Standing rib.** Tender, fine grain. A large, impressive cut of meat on the rib - maximum six, but may be cut to four. Chined, Frenched and tied for easy carving.

**Cooking Point:** Slow or high temperature roast.



**Rolled rib.** Tender and medium tender meat, from boned ribs, rolled and tied. Prime rolled rib must include the ribeye. (Some rolled rib roasts have the ribeye replaced by less tender chuck or blade.) Has some exterior fat.

**Cooking Point:** Slow roast.



**Wing rib.** Tender, fine grain. Triangular cut from the rib end of the sirloin roasting joint. Includes a maximum of three rib bones.

**Cooking Point:** Slow or high temperature roast.





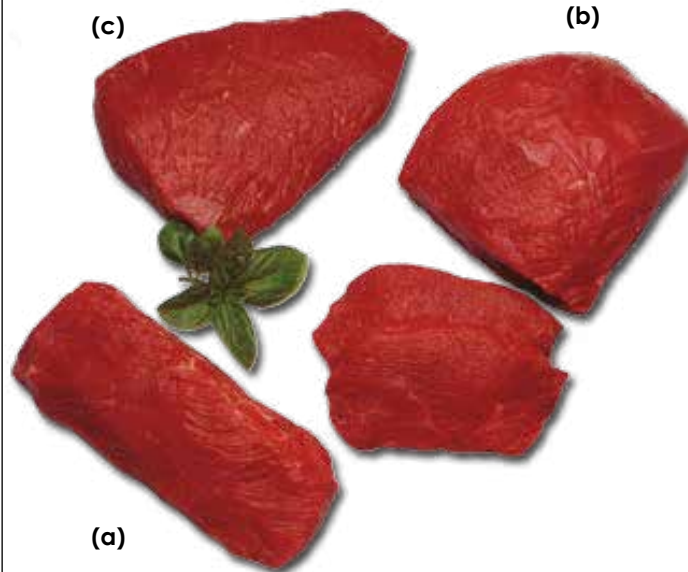
**Sirloin.** Tender, fine grain (closer texture than ribeye), lean, may have some marbling, with outer fat cover. Sirloin-on-bone consists of the upper cut of sirloin on one side of the T-shaped backbone and smaller undercut (fillet) on the other. Striploin, the boned-out sirloin, has the fillet removed. A flattish piece (around 4.5kg) which may be tied before roasting.

**Cooking Point:** Slow or high temperature roast.



**Rump.** Medium-tender, medium-fine grain, boneless. Lean, with exterior fat cover on one side. Sometimes slow roasted as the whole primal (around 4-6kg), or halved. Difficult to carve neatly and produces very large slices.

Smaller, seamed-out cuts - rump eye, centre rump and rump cap - are easier to carve across the grain into neat slices.



**(a) Rump eye.** A short, lean, log-shaped piece (resembles the middle cut of the beef fillet), grain running lengthwise. No fat cover, silverskin removed. The most tender of the rump cuts, this is excellent roasted whole.

**Cooking Point:** Sear then fast roast, best served rare.

**(b) Centre rump.** A compact, chunky piece (about 1.4kg) and thicker than rump eye. It may have fat cover on or off.

**Cooking Point:** With fat on, slow or fast roast. If totally trimmed, sear then roast.

**(c) Rump cap.** A flat, almost triangular piece, thinner at one end (ranging from 2-4cm thick), coarser grain and less tender than rump eye or centre rump. With fat cover and underlying gristle removed, weighs about 800g.

**Cooking Point:** May be seared, then fast roasted to rare. Carves into narrow strips.



**Cornercut**

**Topside, cornercut or eye.** Medium-tender, boneless, lean, rather coarse grain. Can be dry if cooked to well done. Best medium-rare. Slow roast or, if well trimmed, sear then roast.

**Cooking Point:** May be pot-roasted.



**Topside eye**



**Bolar.** Medium-tender, boneless, large piece, lean with a central line of gristle and some exterior fat.

**Cooking Point:** Slow roast or pot-roast.



**Chuck, rolled and tied.** A less tender, cheaper cut, lean with some fat.

**Cooking Point:** Slow roast or pot-roast.

## Lamb, Hogget or Mutton Cuts to Roast

Frenched rack, striploin or backstrap, rump, thick flank, topside, silverside and ribeye. These small, tender, well trimmed cuts suit high temperature, fast roasting.

Leg cuts, rack (traditional), mid-loin, shoulder roast and shanks. These traditional cuts can be slow-roasted at an oven temperature of 160°C.

## Lamb Cuts to Fast Roast

Either:

1. High temperature roast at 200-230°C; or
2. Sear then roast. Cuts with no exterior fat are best seared or browned first in a pan, then transferred to the oven at a moderate temperature of 170-180°C, or hot at 200°C.



**Frenched rack, modern.** Full rack, six or eight ribs, well trimmed, backbone removed (chined). May be cut to three or four ribs. Most tender, lean meat, trimmed of exterior fat.

**Cooking Point:** Needs brief oven roast, best served medium-rare.



**Striploin (backstrap, boneless eye of the long loin).** Most tender, lean, fine-textured piece from the eye of the loin. A flat, log shape, grain running lengthwise. Boneless, no exterior fat. Eye of shortloin is boneless, lean meat from the lamb mid-loin only, by removal of the rack, cutting down between the 12th and 13th rib. This is about half the length of the full backstrap.

**Cooking Point:** Best seared then roasted and cooked to medium-rare.





**Rump.** Tender and lean, but some fat and connective tissue throughout, exterior fat cover easily removed. Boned weight 225-250g, a mini-roast for one or two. May be tied to compact shape for fast roasting. May be further seamed out to give the smaller, heart of rump with less connective tissue.

**Cooking Point:** Brief high temperature roast.



**Thick flank.** Medium-tender, lean, fine grain. A plump, boneless piece, around 325-350g. No outer fat cover.

**Cooking Point:** Sear then roast.

**Topside.** The largest of the seamed-out lamb leg cuts, 350-500g. Medium-tender. A lean, chunky boneless piece, which makes a good mini-roast for three or four.



**Silverside.** Medium-tender, rather thin, flattish piece, lean with exterior fat easily trimmed. Two distinct muscles with fine grain in one (the eye of the silverside) and coarser grain in the other.

**Cooking Point:** Sear then short roast. Carve in two sections, across the different grains.




**Ribeye.** Medium-tender, well marbled, no exterior fat. A small, boneless roll shape, about 270g.

**Cooking Point:** Sear then roast.

## Traditional Lamb Cuts to Slow Roast


**(a)**




**Leg, whole.** Tender rump end, medium-tender middle leg, to less tender shank. Includes the ditch bone (hip bone), femur and shank bone. Lean with some small pockets of intermuscular fat and exterior fat easily trimmed.

A fully-boned leg may be **(a)** tunnel-boned, which keeps the shape of the leg intact and the boned cavity is ideal for stuffing, or **(b)** butterflied.


**(b)**



**Butterflied Leg.** All bones are removed and the meat opened out flat. Being thinner, it cooks more quickly than bone-in leg.



**Short-cut leg.** Has rump removed, bone-in. Lean, medium-tender. Exterior fat easily trimmed.



**Carvery leg.** A semi-boned leg, usually with rump and thick flank removed. Consists of topside, silverside and shank, including shank bone with the end sawn off. Tied in shape, this is a meaty, easy-carve roast.



**Rack.** Rib end of loin, consisting of six to eight rib cutlets together, chined (backbone removed) for easy carving between ribs. Most tender. Traditional lamb rack has exterior fat cover, whilst modern rack has all fat removed. Frenched rack (as pictured) has rib bones trimmed and cleaned of meat down close to the meaty eye of the loin.



**Mid-loin, bone-in (as pictured).** Includes the lean striploin (backstrap) and fillet with backbone. Most tender. Exterior fat easily trimmed, but lean interspersed with fat on the flap.

**Mid-loin, boned.** Fillet is usually removed and the loin rolled and tied.



**Shoulder roast.** Lean and fat interspersed. Bones make carving difficult. Medium-tender. Shoulder may have rib bones removed for semi-boned shoulder. It may be tunnel-boned, or boned, rolled and tied for boneless shoulder roast (as pictured).

**Cooking Point:** Slow roast, covered roast, or pot-roast. May also be simmered.



**Shanks (knuckles).** Least tender. High proportion of connective tissue and bone to lean, but tasty, juicy meat.

**Cooking Point:** Best covered and roasted slowly. May also be simmered.



## Roasting Temperature/Time Guide

Standard term for degree of doneness	Internal core temperature (ICT) (+ or - 2°C) (+ or - 4°F)	Internal description	Approximate oven roasting times @ 160-180°C (320-356°F) for primals	Touch test description for grills & pan-seared cuts
<b>Very rare</b>	40 - 45°C (104 - 113°F)	Internal deep red colour, very moist with warm, red-coloured juices	18-20 minutes per 500g (1.1lb), plus 10-15 minutes resting	Very soft to touch
<b>Rare</b>	45 - 50°C (113 - 122°F)	Internal very red colour, very moist with warmer juices, quite red in colour	20-25 minutes per 500g (1.1lb) plus 10-15 minutes resting	Soft to touch
<b>Medium Rare</b>	55 - 60°C (131 - 140°F)	Internal lighter red colour, moist with pink, warm juices	25-30 minutes per 500g (1.1lb), plus 10-15 minutes resting	Soft and springy to touch
<b>Medium</b>	60 - 65°C (140 - 149°F)	Internal pink red colour, moist with clear pink juices	30-35 minutes per 500g (1.1lb) plus 10-15 minutes resting	Firm and spongy
<b>Well Done</b>	70 - 75°C (158 - 167°F)	Internal light grey colour, a little moist with clear or no pink juices	30-40 minutes per 500g (1.1lb) plus 10-15 minutes resting	Firm to touch
<b>Very Well Done</b>	75 - 80°C (167 - 176°F)	Internal stone grey colour, dry with clear or no sign of juices	40-45 minutes per 500g (1.1lb) plus 10-15 minutes resting	Very firm to touch

Use as a guide only. Cooking times are approximate and depend on the type of cut, thickness and temperature of the meat and the type of equipment used. Follow oven manufacturer's instructions.

## When is the roast ready?

The degree of doneness of both large and small meat cuts is always measured at the very centre of the cut.

Ways to check a roast for readiness.

1. **Use a meat thermometer.** You can place the thermometer in a large cut of meat before roasting. Insert it into the thickest part, away from fat or bone. For example, with a medium-rare beef eye of striploin, you can be sure it's done when the internal core temperature (ICT) has reached approximately 60°C (140°F).

2. **Press meat with tongs.** Lightly press the outside centre or thickest part of the meat:

**Rare** meat gives under pressure, is soft and springy.

**Medium** is slightly firmer.

**Well done** is firm.

You will learn to judge doneness by experience. When calculating temperature/timing ratios, remember to take thickness of the meat into consideration. Teach yourself to judge doneness by sight, smell and feel.

3. **A final test.** Meat juices are an indication of doneness. If you are still unsure, as a last resort, test for colour of meat juices. Pierce meat in the thickest part using a fine metal skewer. Remove skewer and gently press the meat to expel juices.

**Underdone or rare meat** - juices red.

**Medium-rare** - juices pink.

**Medium** - juices clear.

**Well done or overcooked** - no juices visible.

Remember, the internal temperature will continue to rise after the meat is removed from the oven or pan, and for a time during resting. This transference of heat can change the internal temperature of a small joint by 2-4°C after 5 to 10 minutes. In larger joints, the internal core temperature can rise by 4-10°C after 15 to 20 minutes.

Therefore, allowing for this 'carry-over' cooking, roast meat can be cooked to slightly below the desired degree of doneness.

## What Can Go Wrong?

Overcooking lean, tender grilling or roasting cuts of beef and lamb can make them dry and less tender. Extended exposure to high dry heat reduces moisture in the meat and results in poor portion yields. Overcooking less tender cuts (those with a high amount of connective tissue), can cause the meat to break up and fall apart.

## Grilling & Barbecuing

Grilling is a fast, dry method of cooking tender cuts with radiant heat directed from below or above the meat. Char-grilling, barbecuing and fan-grilling are variations of this method (see also Dry Heat Methods, page 72).

Beef and lamb cuts which are best for grilling are suitable for char-grilling, barbecue cookery and pan-grilling; most are suitable for pan-frying. Some cuts need to be cut into smaller pieces for sautéing and stir-frying.

### Grilling Techniques

**Over-heat grilling:** food is placed on a rack or grill bars over a gas, charcoal grill or barbecue. The grill rack must be pre-heated and the meat lightly brushed with oil before cooking.

**Under-heat grilling:** food is placed under a gas or electric salamander or heated element. The salamander must be pre-heated for fast searing.

**Between-heat grilling:** this method uses radiant heat, convection heat or a combination of both. The meat is placed between heated grill bars in a vertical toaster/grill, a convection or conveyor oven.

### Grilling Tips

Trim meat if necessary by removing silverskin, connective tissue or fat.

If seasoning with salt or salt/spice mixtures, do this immediately before cooking.

Dry meat browns better than wet meat. Pat wet meat or marinated meat dry before grilling. Brush meat with oil or rub with infused oil. This adds flavour and prevents meat from sticking.

**Season at the last minute:** if adding salt or salt/spice mixtures, do this immediately before cooking. If salt is left on the meat surface it draws out the juices. Be careful not to burn spices.

With dry herb/spice rubs used to impart flavour, brush off excess before grilling. An option is to brush over the surface with oil before cooking to prevent burning dry rub ingredients.

**Marinating and basting:** before cooking beef or lamb, steaks may be marinated in mixtures of oil with vinegar, wine or citrus juice, herbs and spices to help tenderise and add flavour.

Drain meat of marinade and blot dry before pan-grilling.

**Searing and browning:** always pre-heat your grill so the meat browns quickly. Because the heat is intense, care should be taken to avoid overcooking lean meats that can dry out.

For best results with thinner beef or lamb steaks, sear them fast to develop colour and flavour, then let them rest in a warm place for a few minutes before serving.

Thick steaks or cuts can be seared quickly, then heat reduced to medium or low to complete cooking at a more gentle heat.

**Trellising:** beef or lamb steaks can be marked in a lattice pattern (sometimes called quadrillage) by searing each side twice (turn it at right angles) on a ridged griddle pan or barbecue grid.

Use tongs when turning the meat and grill the presentation side first as it gives a better appearance.

**Cooking times:** knowing correct cooking times to achieve the correct degree of doneness comes with experience.

Factors determining cooking time include the temperature of the raw meat before cooking, grill heat, type of equipment, and the type of meat cut - its size, thickness and amount of fat and bone.

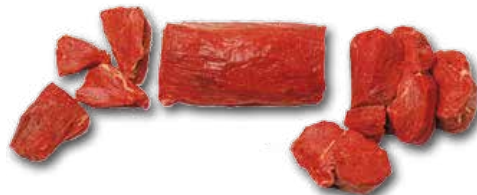
**Resting times:** before serving, allow beef or lamb to rest in a warm place for a short time, depending on size. Larger cuts can rest longer than smaller, thinner ones. For example, a 200g steak should rest for two to three minutes. Resting allows the muscle fibres to relax and more juices are retained in the meat.





## Beef Steaks to Grill, Pan-Grill, Char-Grill or Barbecue

The tender, fine-grained cuts of fillet, ribeye, sirloin, T-bone, rump and seamed rump are suitable for grilling, as is the less tender flank skirt steak. These cuts are also good for pan-frying (see page 93).



**Fillet steak (eye fillet, tenderloin).** The most tender beef cut. Fine grain, juicy with very little exterior fat but some silverskin (removed before cutting into steaks). Whole fillet (a long, log shape), tapers from a thin 'tail' end to a thick 'butt (rump)' end. Steaks vary in diameter from small, rather flat (filet mignon) to larger, plump rounds called tournedos, which are cut from the middle of the fillet. The Châteaubriand is a large piece, usually for two servings, cut from the thickest part of the fillet.

**Cooking Point:** Best rare or medium-rare.



**Ribeye steak (cube roll or Scotch fillet).** Tender, succulent steaks cut across the whole boneless ribeye. Round or oval shape, larger than fillet with fine, slightly open grain and some marbling. A strip of fat within the lean runs through the length of the ribeye, tapering slightly towards the chuck end.

**Cooking Point:** Many chefs consider ribeye the best grilling steak, but due to the internal fat seam, it is usually cooked to medium-rare or medium.



**Sirloin steak (striploin or porterhouse).** Cut from the boned loin. Tender, fine, close-grained meat with exterior fat along one side. A line of gristle lies under the fat. The butcher trims the end part of fat and gristle. Not quite as succulent as ribeye, but an excellent grilling steak.

**Cooking Point:** If narrow fat border is left on, this adds to flavour and succulence of sirloin, but grill to medium-rare and ensure fat is cooked.



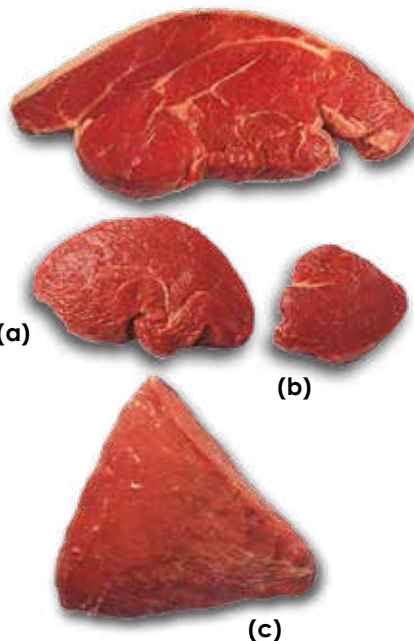
**T-bone steak.** Cut from the bone-in loin, consists of tender striploin on one side of a T-shaped bone, plus very tender fillet on the other. Exterior fat along one side, easily trimmed. When ordering, specify tail length, fat depth and steak thickness.

**Cooking Point:** Because of prominent bone, not an ideal cut to pan-grill as the meat may not sit evenly flat on pan-grill (griddle pan), resulting in uneven searing lines. More even cooking can be achieved by radiant heat grilling.



**Rump steak.** Medium-tender, medium-fine, dense grain. The traditional slice of rump steak cut across the whole primal is a very large steak with a fat border along the curved side. Too big for one portion, it consists of sections of several muscles with grain running slightly different ways, so there is some variation in tenderness within the steak.

**Cooking Point:** Rump should be well aged and a marinade with acid and/or enzyme content can help to improve tenderness.



**Seamed rump steaks.** The whole rump may be divided along natural seams of connective tissue into individual muscles. The three main ones are (a) centre rump; (b) rump eye; and (c) cap. Once connective tissue is removed, these sub-primals can be sliced across the grain to produce smaller, neater, more evenly tender steaks.

**(a) Centre rump steak:** generous-sized, lean steak, medium tender.

**(b) Rump eye steak:** most tender and smallest of the rump steaks, similar in shape to fillet steak, though firmer in texture.

**Cooking Point:** Both cuts best cooked to medium-rare and well rested.

**(c) Rump cap:** this sub-primal is easily removed from the top/outer side of the rump primal. A flat, almost triangular piece (about 3-4cm thick, weighing 800g or more), with grain running horizontally. Not quite as tender as rump eye. Fat cover and underlying connective tissue on one side usually removed.

**Cooking Point:** Due to thin shape and lengthwise grain, this is a good cut to barbecue then carve into thin slices across the grain after cooking. Produces neat slices for beef salads. Before cooking, the cap can be halved horizontally so it takes less cooking time. Cook to rare and rest well before slicing.

## Lamb Steaks, Chops and Cuts to Grill, Pan-Grill or Barbecue

A lamb steak is a boneless cut, whereas a chop has bone-in. Cutlets, shortloin and mid-loin chops, eye of shortloin, lamb fillet, rump chops and steaks, thick flank and topside steaks, lamb schnitzel and lamb topside or silverside steaks, are all good to grill. These cuts are also good to pan-fry (see page 93).



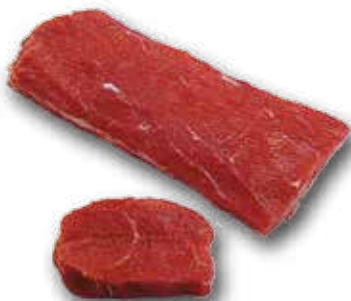
**Cutlet, Frenched cutlet, rack cutlet.** Cut from Frenched lamb rack, backbone cleanly removed (ie chined). 'Frenched' means rib bones scraped bare of flesh almost to the eye of meat. Meat is well trimmed of fat, leaving just enough to hold it on the rib bone during cooking. Chefs sometimes cut double cutlets (two ribs with meat) from the rack and remove one of the rib bones before cooking.

**Cooking Point:** Very tender, lean meat needing only brief cooking. Best rare or medium-rare.



**Shortloin or mid-loin chop.** Cut from shortloin (mid-loin) portion of the loin from 13th rib to point of hip bone, ie between rack and rump (top end of leg). A shortloin chop consists of a central T-shaped bone with a small lean fillet on one side, and on the other, the lean eye of loin, with its outer fat cover (easily trimmed). The chop has the thin, boneless 'tail' (fat and lean interspersed) but it may be removed.

**Cooking Point:** The chop tail is not nearly as tender as the meat around the T-bone and, due to fat content, needs longer cooking.



**Eye of shortloin.** Boneless, lean meat from lamb mid-loin (shortloin) only. The shortloin is about half the length of full loin or backstrap (boneless eye of the long loin). Eye of shortloin is a flat, log-shaped strip of tender meat (grain running lengthwise) without any fat cover. Usually sold with silverskin on.

**Cooking Point:** Remove silverskin before cooking. This cut is often cooked whole then carved. Alternatively, cut across the grain into small medallions or 'nuts' of meat to fast-fry, or butterfly across the grain to give bigger medallions.





**Lamb fillet (tenderloin).** Whole fillet (the equivalent of the beef fillet), boned from under the saddle of lamb, ie from under loin and extending into rump. Lamb tenderloin is a small lean strip, 2-3cm thick, grain running lengthwise. The whole tenderloin, including butt end from rump, is about 20cm long. However, it is usually cut just from the loin, and measures about 20cm. Allow at least two per portion. Remove small covering of silverskin before cooking.

**Cooking Point:** The most tender lamb cut, this needs only brief cooking. Baste with oil, sear in hot pan until rare, then rest before slicing.



**Rump (chump) chop.** From the leg, cut across rump with bone-in. Has a fat cover curving along one side (easily trimmed), a small piece of bone on the other. Tender meat, good barbecued or grilled, though not as popular today as boneless rump steak.



**Lamb rump steak.** Thick slice cut across boned rump. Usually has outer fat cover left on. For smaller steaks with less connective tissue, the rump cap with fat cover is removed, leaving heart of rump, a compact piece which slices into neat medallions. Popular with chefs.

**Cooking Point:** Degree of trim determines cooking method and time. A lean medallion from well trimmed rump is best cooked rare.



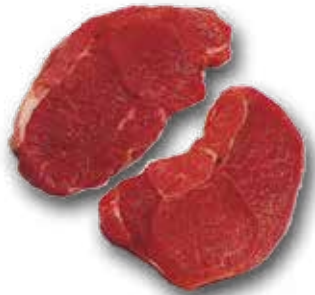
**Lamb thick flank (knuckle or round) steak.** The whole thick flank, trimmed of fat, weighs about 350-400g, a neat shape to cut across the grain into steaks. Best steaks are from the broad end. Near the knee joint they have more connective tissue. Finer-grained meat than lamb topside but both are medium-tender.

**Cooking Point:** A lamb thick flank makes an excellent small roast to serve two. Sliced thinly, it makes neat schnitzels.



**Lamb topside steak.** The whole lamb topside, the largest of the seamed leg cuts, when trimmed of fat, weighs around 350-525g. Meat is medium-tender, slightly coarser in grain than rump or thick flank. It cuts into good-sized steaks. The topside cap can be removed first to give tidier steaks.

**Cooking Point:** A whole lamb topside makes a good mini-roast, seared, roasted, rested then carved.



**Lamb schnitzel from thick flank or topside.** Thin slices cut across grain of well trimmed, boned topside or thick flank, make neat, portion-sized lamb schnitzels. When cutting schnitzels, work from the broad end of the thick flank, as nearer the knee joint (narrow end) there is more connective tissue and slices become too small. Use trim for curries or simmered dishes. For larger lamb schnitzels, use butterfly cut (see below).

**Cooking Point:** Pound with a mallet to even the meat. Make small incisions into connective tissue around edges to prevent thick flank meat curling during cooking. Best lightly coated before pan-frying.



**Lamb topside/silverside steak.** A boneless leg steak cut from topside and silverside together. The leg is first seam-boned (rump, thick flank and femur removed, then topside and silverside taken off the shank). These steaks are a generous size and a neat shape, better than steaks cut from tunnel-boned leg (with central hole in the meat).

## To butterfly cut

When slicing a small boneless piece of meat, take the knife almost through the meat to the cutting board on every second cut. This produces hinged slices (like butterfly wings) that can be opened out flat like a book, thus giving double-sized pieces. A butterflied leg is a boned leg, opened out flat (see page 82).

## Steak: What is the correct degree of doneness?

Research conducted for the Meat Research Corporation (Australia) has shown customers are often dissatisfied with the degree to which steaks are cooked in restaurants.

One Australian study surveyed more than 3,500 restaurant patrons; more than 30% of those surveyed believed the steaks they received were not cooked to the degree of doneness they had ordered.

The study showed over-cooking caused greater dissatisfaction amongst patrons than under-cooking. However, only 5% of patrons ordered their steaks rare, with medium or well done being the most common preference.

The study noted that the ability of the restaurant to provide patrons with steaks they believed to be cooked to the degree of doneness they ordered, had a large effect on the consumer's perception of tenderness, taste, overall satisfaction, value for money and intent to repurchase.

### Degree of doneness is an imprecise concept

As there is no exact definition for the terms rare, medium and well done, it is a matter open to personal interpretation. Often the chef, waiter and patron can each have a different understanding of the terms.

It is helpful if serving staff, when taking orders for steak, ask patrons for some detail about their expectations.

The photographic guide on the right shows the degrees of doneness which are accepted practice in the catering industry.

### Rare

**Description:** Internal very red colour, very moist, warmer juices.

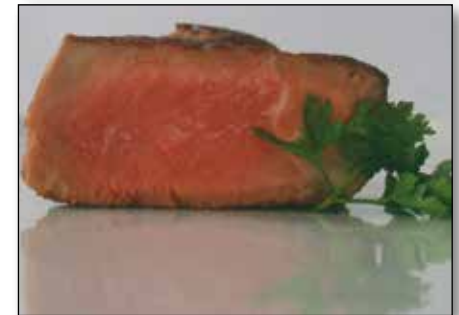
**Touch test:** Soft to touch.



### Medium Rare

**Description:** Internal lighter red colour, pink warm juices.

**Touch test:** Soft and springy to touch.



### Medium

**Description:** Internal pink-red colour, moist, clear pink juices.

**Touch test:** Firm and springy to touch.



### Well Done

**Description:** Internal light grey colour, a little moist, clear or no pink juices.

**Touch test:** Firm to touch.





## Pan-Grilling

Pan-grilling is another fast, dry heat method suitable for tender cuts, but the meat is cooked directly on the heated surface - usually a heavy cast-iron pan or ridged griddle pan, or on a metal hot-plate. The cooking surface may be lightly greased, but minimal fat or oil is used. This is not frying.

**Pan-grill then oven-finish:** thick steaks can be seared on a ridged grill-pan then finished in the oven pre-heated to 180°C to 190°C. The seared steaks, placed on a tray in the oven, must be turned half-way through the oven-cooking.

This method is practical when preparing a set menu for large numbers. It ensures all the meat is cooked to the same degree and achieves more consistency in cooking.

## Pan-Frying

Pan-frying (shallow frying) is a fast cooking method for small, tender cuts in a pan containing a small quantity of hot fat, oil, butter or clarified butter.

This may be done in a frying pan, sauté pan, bratt pan or wok. The pan is not covered during frying. Sautéing and stir-frying are variations on this method.

**Pan-fry then oven-finish:** see Pan-sear then oven-finish column on the right. (Also see dry heat methods, page 72).

**Beef cuts suitable for frying:** the tender fine-grained beef cuts of fillet, ribeye, sirloin, T-bone, rump and seamed rump are suitable for pan-frying.

### Lamb cuts suitable for frying:

cutlets, shortloin and mid-loin chops, eye of shortloin, lamb fillet, rump chops and steaks, thick flank and topside steaks, lamb schnitzel and lamb topside or silverside steaks are all good to pan-fry.

### Pan-frying tips

**Even thickness:** for even cooking, ensure meat is of even thickness. Some cuts (eg lamb cutlets or schnitzels) can be batted out or lightly pounded with a meat mallet to flatten slightly. First cover meat with plastic sheet to prevent mallet sticking to it.

**Dry meat surfaces:** pat meat dry before frying. Wet meat will not brown well. Drain marinated meat well before frying then blot dry with paper towels. When pan-frying thin slices or strips of beef or lamb, a protective coating keeps meat moist and aids browning. Coat with flour or flour/spice mixture immediately before cooking.

Some other coatings are: cornflour, pea flour, beaten egg or egg whites and breadcrumbs.

**Pan size:** use a suitably wide pan so meat is not crowded during cooking. Too much meat added to a small pan reduces temperature and slows cooking.

**Temperature control:** for frying, use clean, fresh fat or oil. Heat oil/fat to the correct temperature before putting meat in. It should 'haze' or shimmer, not smoke. If oil is too cool, food can absorb it, and meat will not brown quickly enough. During frying, adjust temperature to keep heat moderate-to-high, so food sears quickly without burning.

**Drain before serving:** to keep food crisp after frying, drain it well on absorbent paper. If holding food after frying, use dry heat and keep holding time to a minimum.

## Pan-Sear then Oven-Finish

Instead of completely cooking in the frying pan, steaks can be cooked by a two-step method. Initial browning (searing) is done in a pan, then cooking completed in the oven.

**The pan:** use a frying pan, eg well seasoned cast-iron, an oiled hot-plate or heavy-based non-stick pan for searing. Pre-heat the pan well. Lightly oil the pan, or brush the meat with oil; season it if you wish. Ensure there is sufficient heat in the pan to obtain a good brown, seared surface.

**Brown the meat:** sear steaks well on both sides, to achieve attractive colour. Transfer to an oven tray. Place in oven preheated to 180°C to 190°C to complete cooking. Turn half-way through oven-finishing time. Time in the oven depends on the meat cut, its thickness and how much time you take to sear it. For example, a 200g beef steak, 1.5-2cm thick, after pan-searing takes about 5-6 minutes to oven-finish.

**Undercook then rest:** as a rule, cook steaks to a point below the desired degree, then rest the meat, allowing residual heat to carry cooking to the correct degree of doneness.

**Resting time:** before serving, allow steaks to rest in a warm place for approximately one minute per 100g (eg rest a 200g beef steak for two to three minutes), allowing fibres to relax and juices to settle.

## Braising

Braising is a moist heat cooking method recommended for less tender cuts of meat. Braising is an excellent method for cuts with high amounts of connective tissue, making them succulent and tender. For braising, meat is usually cut into serving size portions, rather than just cubes (as in a stew).

**Brown braising:** the meat is browned (it may first be dusted with seasoned flour) in a small amount of oil, fat or butter in a heavy pan or casserole dish. The browned meat is placed on top of vegetables, or with them, and a relatively small amount of liquid is added. The meat is covered and cooked slowly at low temperature on the top of the stove or in the oven. At the end of cooking, the braising vegetables are removed and a sauce is made from the cooking liquid. Sometimes the vegetables are used in the sauce.

### Tips on braising

**Use the appropriate meat cut:** meat cuts with a certain amount of marbling and gelatinous connective tissue retain juiciness better than very lean cuts, when cooked long and slowly.

**Browning meat:** although browning is not essential, it is desirable as it not only improves colour, but develops flavour.

**Tightly cover:** a tight-fitting lid holds in the steam, which helps to soften the connective tissue, making the meat more tender. A sheet of buttered baking paper placed over the meat, under the lid, helps to prevent the surface from drying. To make a loose lid more tight-fitting, put a sheet of foil over the pan then cover it with the lid.

**Temperature control:** after initial browning at low temperature, maintaining a sub-simmer is important. While prolonged simmering, or cooking close to the boil is necessary to soften connective tissue and make tough meat tender, it also dries meat out. As meat is heated, muscles coagulate and proteins shrink, squeezing out water. Cooking meat in liquid does not stop this water loss. For braising, oven temperature may be between 130°C to 160°C, seldom higher.

**Cooking time:** overcooking can make braised meat dry and stringy. Cook a braise just until tender. Check for readiness at intervals. If the meat is ready but the cooking liquid has not reduced enough to give a good sauce consistency, remove the meat (keep it covered so the surface does not dry) while you complete the sauce. Then return the meat to the hot sauce.



## Beef Steaks and Cuts to Braise

Shin steak, chuck steak, blade steak, thick skirt steak, flank skirt steak, topside silverside, thick flank steak and oxtail are all less tender but tasty beef cuts suitable for braising.



**Shin steak.** Slice cut across the leg, bone-in or boned. Coarse-grained, tasty meat with high proportion of gelatinous connective tissue, which softens to succulence with slow, moist heat. Size of bone varies depending on age of animal (eg smaller in veal as used in osso bucco), and position on the leg. Some shin steaks are meaty and compact with relatively small round/oval central bone; some are very large with a high proportion of bone.

**Cooking Point:** Remove large bone and thick cover of connective tissue before cooking. Shin, like chuck and blade, makes flavourful, succulent stews.



**Chuck steak.** Boneless cut taken from the first three ribs of the forequarter. A less tender, open-grained meat with minimal fat, easily trimmed.

**Cooking Point:** A good, tasty cut to cube for stews and curries.



**Cross-cut blade steak.** Boneless cut from the shoulder blade area of the forequarter. A succulent cut, medium-tender to least tender, with medium grain. The distinctive line of gristle through the meat softens to gelatine on slow, moist cooking. Though cross-cut blade is not a prime grilling cut, meat retailers sometimes tenderise it mechanically, marinate and sell it as a cheaper barbecue cut. Australians call this cut oyster blade. In New Zealand, oyster blade is blade roll. Another cut from the blade primal is bolar, usually sold as a large piece for roasting or pot-roasting (see page 100).

**Cooking Point:** Slices of blade steak are excellent braised, retaining their succulence.





**Thick skirt steak.** Coarse-grained, least tender meat with rich flavour. This must be cooked long and slowly by moist methods. Not to be confused with flank skirt steak.

**Cooking Point:** Gives rich, dark stock or gravy.



**Flank skirt steak (sometimes called teardrop steak).** A lean, thin, flat leaf-shaped steak around 20cm long, medium-tender meat, having distinctive coarse, lengthwise grain. Well flavoured meat for stewing. Sometimes thinly sliced across the grain for stir-frying but tends to be chewy rather than really tender.

**Cooking Point:** Flank skirt can also be used as a pan-grilling steak if it is well aged and tenderised or marinated, then cooked rare. Slice across the grain.



**Topside steak.** Lean, medium-tender meat with rather coarse grain. May be braised or casseroled but is not as succulent as shin, chuck or blade. Makes good quality mince.

**Cooking Point:** Makes good casseroles, but topside tends to dry so take care not to overcook.



**Silverside steak (fresh).** Medium-tender, lean meat. The whole silverside is made up of two main muscles with distinctively different grain. Silverside eye is the smaller, log-shaped piece with fine grain. It can be cut into small, neat oval steaks. Silverside, rump-end and centre-cut are coarser-grained.

**Cooking Point:** Silverside eye is sometimes thinly sliced and sold as 'sandwich' or 'minute' steaks, but is not considered a tender grilling steak. Fresh silverside steaks may be braised, although are not as succulent as the more gelatinous cuts (blade, chuck, oxtail). A larger cut (a piece around 1.5kg) makes a good pot-roast (see page 100).



**Thick flank steak (Australian name 'round steak').** From the hindquarter, this primal is most often sold thinly sliced as beef schnitzel. Medium-tender with finer grain than topside. A good braising steak, more tender than most stewing steaks.

**Cooking Point:** If using thick flank for braised beef olives, slices should be thin, but not wafer-thin.



**Oxtail.** Sold joined into short pieces. Medium-grained, least tender cut but very gelatinous, so braising or slow moist heat produces great succulence. A high proportion of bone and fat to lean, but much of the fat can be trimmed and the remainder removed after cooking. Very flavoursome and an excellent braising cut.

**Cooking Point:** After braising oxtail, strain sauce into a jug so fat can be removed from the top. Alternatively, refrigerate the braised oxtail in its sauce overnight then remove solidified fat from the surface.

## Offal

Kidneys, liver, heart and tripe are also suitable for braising (see Offal, page 44).

## Lamb Steaks and Cuts to Braise

Medium-tender and least tender lamb, hogget and mutton cuts, such as boned and cubed forequarter, round neck, shoulder and forequarter chops, leg chops and shank or knuckle, suit moist heat cooking such as braising.



**Forequarter.** Boned, cubed. Medium-tender to least tender, depending on age of animal (eg young lamb or older mutton). Exterior and intermuscular fat. Needs trimming, but juicy meat for stews and curries.



**Round neck chops.** Least tender, with high proportion of bone and fat to lean.

**Cooking Point:** Needs long, slow cooking to tenderise.



**Forequarter chops, shoulder chops.** Least tender, although young lamb shoulder can be tender enough to barbecue. Some bone and fat within the lean. Good braising chops.





**Leg chops.** Medium-tender, lean, with small round central bone. Leg steaks cut from boned leg.



**Shank or knuckle.** Least tender, with high proportion of bone and gelatinous connective tissue which, when braised, becomes juicy and tender.



## Pot-Roasting

Pot-roasting is the term applied to cooking larger joints or cuts (eg beef topside or fresh silverside in a 1.5-2kg piece) in a similar way to braising. However, it is carried out in a deep, covered pot without any, or with barely any liquid. The meat is seared or browned first in a little butter or oil, then placed on a bed of browned root vegetables, or bones and vegetables.

The pot is tightly covered and the meat cooked gently. A pot-roast may be cooked in a pot or pressure cooker, in a bratt kettle, or in the oven. The small amount of liquid and the vegetables produce sufficient steam to make this a moist heat method ideal for the medium-tender roasting cuts.



**Fresh silverside**

**Beef cuts to pot-roast:** topside corner, fresh silverside, rump, chuck (rolled), blade, fresh brisket (rolled) and thick flank.



**Boned leg**

**Lamb cuts to pot-roast:** hogget, mutton or lamb; leg or shoulder, boned and rolled.



**Boned shoulder**

## Stewing

In stewing, meat cut into smaller pieces or cubes is cooked gently in liquid to completely cover it. The vegetables are included. A stew can be simmered in a pot on the stove top or cooked in a covered casserole in the oven.

Stewing is suitable for the least tender cuts of meat which become tender and juicy with the slow moist heat method. Cuts having a certain amount of marbling and gelatinous connective tissue give moist, juicy stews.

When stewing, lean meat, even though it is surrounded by liquid, can become dry in texture if cooked at too high a temperature for too long.

While prolonged simmering, or cooking close to the boil is necessary to soften connective tissue and make meat more tender, it also dries lean meat out.

As the meat is heated the muscles coagulate, proteins shrink and water is squeezed out. Cooking meat in liquid does not stop this water loss.

After initial browning, a low temperature or sub-simmer gives best results. Do not overcook lean meat stews.

The meat for a stew is usually browned before the liquid is added. This develops colour and flavour. Some meat stews are made without initial browning, relying on added ingredients for depth of colour.

In some stews only the vegetables get an initial browning, and then meat and liquids are added. For example, a meat curry is often made this way.

### White Stews

Known as blanquettes or fricassées, white stews are made with lamb or veal that is blanched, or lightly seared without colouring, and cooked in stock.

**To blanch:** cover meat with cold water and bring to the boil, drain and refresh under cold running water. The sauce is then made with the liquid and finished with a liaison of egg yolks and cream.

### Brown Stews

Brown stews are made with pieces of red meat which are first seared or browned. A browned mirepoix (and sometimes browned flour), plus liquids such as stock and wine are added, and the dish simmered gently until tender.

### Thickening Stews

The cooking liquid may be drained from the cooked meat at the end of cooking and thickened by reduction, but stews are more often thickened in one of the following ways:

- (a) Coating pieces of meat with flour before searing. This contributes to thickening of liquid as the stew cooks.
- (b) A starch such as cornflour mixed with cold water may be stirred into the hot liquid towards the end of cooking.
- (c) A roux is used, or beurre manie (uncooked flour and butter paste) added.

**Beef cuts for stewing:** chuck steak, blade steak, topside steak, silverside steak, shin steak, flank skirt steak, thick skirt steak, ox kidneys, oxtail, gravy beef, tripe, minced beef, ox heart and ox liver.

**Lamb cuts for stewing:** forequarter (boned, diced), round neck chops, shoulder chops, leg chops, shank (knuckle), minced lamb, kidneys, liver and heart.

## Poaching & Simmering (Boiling)

Poaching and simmering are very similar methods.

### Poaching

Poaching is a very gentle, moist heat method of cooking using a minimum amount of reduced liquid or stock kept at just below simmering point, approximately 90°C to 94°C.

Poaching liquid should show very little movement - a mere 'murmur' or shimmer at the surface, with no sign of bubbles bursting.

### Poaching methods

Poaching can be done in a pan, on the stove, in a bratt pan or in a covered dish in the oven at 160°C to 180°C.

Poaching temperatures are lower than those used for simmering, and poaching times are shorter.

Tender cuts with lower amounts of connective tissue are best for poaching.

### Simmering (boiling)

Simmering is a slow, gentle, moist method of cooking in liquid or stock, usually in a deeper pan than that used for poaching.

Liquid is heated to just below boiling point, approximately 95°C-99°C (203°F- 210°F) - higher than that used for poaching, with slightly more movement in the cooking liquid, tiny bubbles rising slowly to the surface and only occasionally bursting. This is much less movement than when boiling.

Simmering can be done in a deep pan, stock pot on the stove, kettle, bratt pan or in a combination oven.

Simmering is best for cuts with higher amounts of connective tissue which need long, slow cooking to tenderise them. However, this method can also be used for more tender cuts, eg beef rump, cooked to a medium degree of doneness.

### Tips for poaching and simmering

- Cook gently for most tender results.
- Arrange beef or lamb cuts in a single layer in the poaching pan to ensure even cooking.
- Use a rich stock when poaching for a short time, as brief cooking does not allow rich, strong flavours to develop in the pan.
- A well flavoured poaching or simmering liquid can be used in sauces to accompany the meat.
- Pre-soaking and blanching: some salted beef and lamb products may be soaked in cold water to extract some salt prior to cooking. To blanch salted or pickled meat, start off in cold water, then bring to the boil, simmer and refresh under cold running water. After refreshing, simmer blanched meat in stock or liquid until cooked.



**Beef cuts (and offal) suitable for simmering (boiling):** shin, topside, thick flank, silverside (fresh or corned), flank steak, brisket, chuck, blade, cubes and mince, veal brains and sweetbreads, tongue, beef heart and tripe.



**Beef fresh silverside**

**Lamb cuts (and offal) suitable for simmering (boiling):** lamb leg cuts, breast and flap, shoulder, neck chops, shank, lamb tongue, brains, heart, tripe and sweetbreads.



**Beef tongue**

**Beef cuts (and offal) suitable for poaching:** tenderloin, rump eye, rump cap, veal brains and sweetbreads.



**Beef tripe**

**Lamb cuts (and offal) suitable for poaching:** eye of shortloin, fillet, leg cuts, brains and sweetbreads.

## Steaming

Steaming is a moist heat cooking process. The meat does not come into contact with the cooking liquid but instead is cooked by surrounding steam, sometimes under pressure.

Steaming results in tender, well flavoured, juicy meat with minimum weight loss or shrinkage. Steaming under pressure is fast and easy, saves on energy and provides accurate meat portioning and cost control.

The more tender beef and lamb loin and leg cuts are also suitable for steaming and combination steaming.

### Various Steaming Methods

#### 1. Atmosphere steaming

Meat may be cooked directly or indirectly in contact with steam in the following ways:

- **Directly in a steamer.** Steam is fed into chambers from a separate boiler.
- **Indirectly or in a covered pan.** Sealed food containers are placed over or in a deep pan of boiling water.

Perforated trays or vessels can be used but this method requires pans or containers with tight-fitting lids to contain steam.

#### 2. High pressure steaming

This method requires purpose-built steamers generating high pressure steam for ultra quick cooking. Mainly used for vegetables and processed meat products.

#### 3. Combination and steam oven

High capacity steamer ovens can cook by steam, using moist or dry heat, or a combination of both.

#### 4. Vacuum-cooking by steam

Known as 'sous-vide', this is a method of cooking food in vacuum-sealed plastic pouches, by combination of steam and convection oven, between 70°C to 100°C (158°F to 212°F).

#### 5. Low to moderate temperature steaming

This method steam cooks meat slow or fast, between temperatures of 70°C to 100°C, ideal for blanching, preserving, steam cooking, cooking in vacuum (sous-vide), thawing, reconstituting and reheating.

#### 6. Steam and Smoke Oven

Allows cold and hot smoking of cured meats and small goods in a steam cooking cycle. The unit operates with fan-forced sawdust smoke, by gas or electric burner.

### Tips on Steaming

Use a tight-fitting lid or have steamer door securely closed to retain heat and moisture.

If food is cooked in basins or moulds, grease these well and firmly cover with greaseproof kitchen paper, cloth or foil to prevent sticking, or moisture penetrating food. Steaming is practical for thawing and quickly reheating prepared foods.

**Beef cuts (and offal) suitable for steaming:** tongues, veal brains, kidneys, heart, beef cheek (papillae off), tripe and beef forequarter cuts.

**Lamb cuts (and offal) suitable for steaming:** tongues, brains, kidneys, sweetbreads, heart, tripe and forequarter cuts.

## Microwave Cooking

Microwave cooking is a method of cooking using electromagnetic waves of high frequency that penetrate food. Heat is generated by molecular friction within the food. Food and liquids absorb this energy and cook quickly. This method can be used for cooking meat or reheating it.

Microwave ovens come in various sizes with different levels of power and choice of functions, eg defrosting, browning and reheating. Combination convection and microwave ovens combine dry heat or steam with the addition of microwave energy.

Microwave cooking is quick, convenient, safe and economical. The microwave is useful for quickly defrosting meat and for reheating prepared meat dishes.

## Making the Most of Meat

Meat may often be the most expensive ingredient on the centre of the plate, so it makes sense to cook it in a way that maximises the yield of each portion and minimises cooking losses.

There are two kinds of cooking losses. Yields may be reduced by cooking/shrinkage losses and by wastage in carving and serving.

The cooking or shrinkage loss is the actual weight difference between the uncooked cut and the cooked meat before it is carved. Slicing and serving losses are due to fat trim, poor carving, or smaller portions not suitable for serving.

Shrinkage occurs when water evaporates from the surface of the meat and when fat, water and juices drip from the meat. Shrinkage is affected by cooking method, duration, temperature and degree of doneness.

Shrinkage during cooking is inevitable and it occurs with every cooking method. It can be as low as 10% and as high as 50%, but average shrinkage loss is between 15% and 30%.

### Remember the following when cooking:

#### Keep cooking temperatures low

Some cooking loss is unavoidable, but using low cooking temperatures keeps them to a minimum. There is less meat shrinkage at low temperatures. Tests show that even when two beef roasts are cooked to the same degree of doneness, roasting losses are usually less at a lower, constant temperature for a longer period of time, than at a higher temperature at a shorter time.

#### Simmer, don't boil

Gentle simmering cooks meat evenly and simmered meats have less cooking loss than boiled meats.

#### Grill, don't burn

Grilling requires high temperatures. If the temperature is too high it will burn the outside of the meat, dry, shrink and cook it unevenly.

#### Do not cook meat longer than necessary

But ensure internal temperature is high enough to kill bacteria. The longer a roast is in the oven, the more it shrinks so do not overcook.

The larger the cut, the longer the cooking time needed, but keep in mind that a thin, flat roast might take half the cooking time of a thicker roast of the same weight. Always take into account the shape as well as the cut and weight of the meat when calculating cooking time.

#### Note the cooking load

Remember, the cooking load affects cooking time. Three roasts placed together in a conventional oven will take longer to cook than one roast because heat is dissipated into the greater mass of meat.

#### Calculate according to the situation

If three roasts are being cooked in an oven at the same time, even though the minutes per kilogram increase with the greater load, the cooking time should not be calculated on the total weight of the meat.

Instead, cooking time should be calculated on the minutes per kilogram for the smallest roast, with adjustments made for cooking time of the larger roasts.

#### Carve it right to cut losses

Teach carving techniques to minimise meat losses during slicing. Kitchen personnel training should include carving directions on the correct amount to serve by weight and the importance of uniform thickness. Carve meat across the grain for optimum tenderness.

#### Profits from trimmings

Useable trimmings not only save on waste but can mean added profits.

Some Trimming Uses:

- Fat (dripping) render. Use for cooking.
- Bones and sinews. Use in stock making, for sauces, soups etc.
- Large trimmings. Dice or cut into strips for casseroles, kebabs and stir-fries.
- Small trimmings. Mince for use in pies, patties, meat loaves.









## Glossary

### Glossary of Meat, Butchery, Cookery and Menu Terms

This glossary lists the common and less common terms related to butchery and meat cookery, including those which may feature in menus and cookbooks of various nationalities.

## A

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à la carte:	Menu with each item separately priced, giving the customer freedom to pick and choose (as opposed to fixed price meal or buffet).	Anglaise:	English-style. Applied to many typically English dishes.
à la minute:	Prepared or cooked to order.	Animelles:	Testicles, also known as rognons blanc.
à point:	French term for steak, medium-done or just right for eating.	Ante mortem:	Before death.
Abats:	Offal, eg heart, liver, kidneys.	Arni-lemonato:	A Greek-style roast leg of lamb cooked with lemon juice, oregano and garlic.
Abattoir:	The processing place where animals are slaughtered for human consumption. In New Zealand, most commonly used for plants processing for the local market only.	Arni-pisto:	A Cypriot-style dish of lamb cooked with potatoes, lemon juice, wine, tomatoes, garlic and herbs.
Accelerated Conditioning:	Process using electricity to speed up the rigor mortis cycle and enhance tenderness.	Arni-souvlaki:	Lamb kebabs marinated in white wine, lemon, oregano and garlic, from Greece.
Aerobic bacteria:	Microbes which require oxygen from the air to live. Anaerobic bacteria can grow without the presence of oxygen.	Arroser:	To season, baste or brush with oil or butter when roasting to prevent drying out.
Aging:	The tenderising process in which naturally occurring enzymes break down the muscle fibres in meat.	au bleu:	French term for degree of doneness of steak: very rare and underdone.
Agneau:	French for lamb. Agneau de lait: milk-fed lamb. Agneau pascal: spring lamb. Agneau de pré-salé: lamb from salt meadows, particularly on the French Atlantic coast.	<b>B</b>	
Agnelet:	Another name for milk-fed lamb.	Barbecue:	To cook with dry radiant heat over hot coals or gas flame.
Aiguillette:	A French cut, from top of beef rump. See pièce de boeuf. Also thin strips cut from breast of poultry or game.	Bard, barder:	Cover lean meat with slices of fat or bacon before roasting to prevent drying out during cooking. Barding fat is removed before serving.
Aitch bone:	Ischium, rump bone.	Baron d'agneau	French lamb cut, top end of leg for roasting.
Aloyau de boeuf:	A French cut, a large joint from sirloin of beef.	Baron of beef:	Large joint comprising the double loin and rump area of a full carcass. Sometimes used for large buffet carveries.
		Basting:	Brushing food with oil, marinade or pan juices before or during cooking to keep the food moist or add flavour.
		Bat out:	To flatten slices of raw meat with a cutlet bat. This is sometimes done with meat between plastic cling film to prevent the meat from breaking up. Batting improves tenderness.

Baeckeoffe:	A traditional oven-baked mixed meat stew (Alsace). Beef, mutton and pork first marinated in wine, cooked with potatoes and onions.	Blanch:	To simmer bones or meat to whiten; to boil, steam or simmer vegetables to retain their colour or soften to remove skin, eg tomatoes. To make food limp, or to cook without colour, eg chip potatoes.
Ballotine:	Boned and stuffed, usually poultry but can be leg of lamb.	Blanquette:	Classical white stew cooked in stock from which the sauce is made, eg a blanquette of veal.
Barnsley chop:	A double loin or saddle chop.	Bleu:	French for 'blue'. Of steak, degree of cooking, very rare.
Baron of lamb:	Double striploin, rump and leg area of a full carcass. Also know as saddle of lamb.	Bloom:	Surface colour on raw meat. Process of meat changing colour from a dark purple, such as when vacuum-packaged meat is opened, to a bright cherry-red on exposure to air.
Bavette:	Skirt of beef.	Bobotee:	South African meatloaf dish of boiled beef tongue, brisket, chicken, salted pork, black pudding and other sausages.
Beef à la mode:	Large cut, eg topside, braised in wine with vegetables and herbs, served hot or cold.	Boeuf:	Beef (French).
Beef Anglaise:	Classical dish of corned beef silverside, simmered with a mirepoix of vegetables. Served with flour dumplings and mustard.	Bollito misto:	Italian mixed meat dish of boiled beef tongue, brisket, chicken, salt pork, black pudding and other sausages.
Beef Steak Diane:	Classical dish of a seared tenderloin, medallion or minute steak with a creamy mushroom sauce, onion, parsley, Worcestershire sauce and brandy.	Bookmaker Sandwich:	Char-grilled, rare minute steak served between two slices of toasted bread.
Beef tea:	A beef drink/stock made by simmering lean minced beef in water.	Bouchère (à la):	Butcher's style.
Beef Wellington:	Classical dish of a seared beef tenderloin coated in mushroom duxelle, wrapped in puff pastry and baked.	Boucherie:	Butcher's shop.
Bien cuit:	French term meaning 'well done', of steak, degree of cooking.	Bouillon:	A reduced, unclarified beef bone stock, or broth, especially in pot-au-feu.
Best end (of neck):	Rack of lamb. Six or seven ribs of lamb from between the middle neck and loin, for roasting.	Boudin blanc:	White pudding (French). Type of sausage made of white meat with no blood.
Bifteck:	French for 'a beef steak' on a menu.	Boudin noir:	Black pudding (French). Type of dark sausage containing blood.
Biltong:	South African name for a style of dried strips of beef, also called 'jerky'.	Bourguignon:	Prepared in the style of Burgundy, a famous cooking region in France. Refers to meat cooked in red wine, usually garnished with glazed button mushrooms, little onions and lardons.



Bovine:	Of cattle or oxen.
Brasciole:	A selection of small thin escalopes of lamb or beef filled with a forcemeat, rolled and skewered, finished in a hot sauté pan.
Bratt kettle/pan:	Commercial cooking pan, electrically heated, with lid, works on the same principle as a large electric frypan. May be pivoted and have a pouring lip.
Bredie:	A traditional South African meat and vegetable stew using the breast of lamb.
Bresaola:	A style of Italian air-dried beef cured with salt and herbs. Sometimes pre-soaked in red wine. Served in thin slices.
Brine:	A salt solution or meat preserving solution of water, salt, nitrate and flavouring agents, eg for corned silverside, brisket and tongue.
Brochette:	A skewer. En brochette: food grilled or fried on a skewer.
Broil:	A common American and Australian term meaning to cook by grilling.
Broth:	A flavourful, aromatic liquid made by simmering water or stock with meat, vegetables, spices and herbs.
Brunoise:	A mixture, usually of vegetables, finely chopped or diced. For stuffings, garnishes and soups, especially consommé.
BSE:	Bovine Spongiform Encephalopathy. A disease in cattle, found only in nervous tissue, brain or spinal cord, but not in muscle or milk. New Zealand is free of the disease.
Buttock steak:	Topside or round steak.

## C

Calorie:	Unit of energy released when food is burned for fuel within the body. A measure of the quantity of energy a food can provide. A kilocalorie is the amount of heat needed to raise the temperature of 1 gram of water by 1°C (1.8°F). Now often expressed as kilojoules (kJ). There are 4.2 kilojoules in 1 kilocalorie.
Canon of lamb:	Boneless, filled and rolled loin of lamb.
Carbonnade(s):	Literally 'glowing coals'. Implies braising. Carbonnade of beef flamande is a Belgian-style dish of beef with onions, herbs and beer.
Carotene:	Pigment found in grass, plants, fruits and vegetables associated with vitamin A. Carotene is partly responsible for the yellow colouration in the fat of grass-fed animals.
Carpaccio:	Traditional Italian dish of thin slices of raw beef tenderloin with an olive oil dressing, mushrooms and shaved Parmesan.
Carpetbag steak:	Beef tenderloin steak pocketed and filled with oysters, then char-grilled.
Carré:	French cut of lamb, rack or best end.
Carte du jour:	Menu of the day.
Carve or carving:	Cutting cooked meat into slices.
Casing:	Skin of sausage, may be natural (washed and treated intestine from animal), collagen film, or synthetic.
Casserole:	Covered earthenware dish used for cooking in the oven and then serving at the table. Also refers to the food cooked and served in the dish.
Cassoulet:	French regional casserole-style stew, essentially of dried haricot beans and various different meats, eg pork, goose, sausage, mutton, duck, and garlic and herbs.

Caul:	Fine lacy network of fat, from stomach membrane, usually pork or mutton. Often wrapped around lean meat or meat mixtures (eg minced meat for patties) before cooking. The caul adds moisture and holds shape but eventually melts.	Cold boning:	Traditional method of boning beef sides after rigor mortis and cooling.
Cervelle(s):	Brains (French).	Cold chain:	All the areas and processes where temperature control must be maintained below ambience.
Channel fat:	Fat in the pelvic cavity of the carcass.	Cold cuts:	Cold sliced meats or processed meats such as salami.
Châteaubriand:	The thick end of the beef tenderloin. Also known as the butt tenderloin or butt fillet.	Cold shortening:	Toughening of meat as a result of rapid chilling or freezing too soon after slaughter.
Chasseur:	A classical beef dish with sautéed mushrooms, shallots and white wine.	Coagulate:	Change from liquid to a more solid state. Clot, curdle, set, as when milk changes to junket or curds in cheese-making.
Chili con carne:	Mexican dish of minced beef with chillies and red kidney beans.	Collagen:	A structural protein in connective tissue found in meat. When heated in water, collagen forms gelatin. Moist, slow cooking makes meat containing collagen soften and become more tender.
Chilled meat:	Meat held at a storage temperature range of minus 1.5°C to 0°C.	Collagen film:	Connective tissue that has been processed (by extraction and refinement), then extruded into plastic-like material. Used for sausage skins, this gives a finer textile than a natural casing.
Chine bone:	Backbone: to chine is to remove the bone, eg on lamb loin.	Collet:	French lamb cut: scrag end of lamb neck. A stewing cut.
Chipolata:	Small thin sausage used in garnishes and for finger food.	Collops:	Small, thickish slices of boneless raw meat. Mutton collops are mutton chops. Also a Scottish dish of minced beef with baked scone topping.
Choesels:	Beef pancreas or sweetbreads, also a ragout containing tripe and pancreas (Belgian cookery).	Confit:	Preserved meat, especially goose, duck or pork, salted, cooked and preserved in its own fat.
Chorizo:	Highly spiced sausage of Spanish origin.	Connective tissue:	The silvery-white or filmy substance between muscles which helps bind muscles together and attaches muscle to bone for support.
Chump:	Rump.		
Clarify:	To make foods clear, eg stocks, jelly or fat.		
Clearmeat:	Mixture of minced beef, egg whites, aromatics and vegetables used to clarify consommés.		
Clod:	English term for cut from neck of beef.		
Coeur:	Heart (French). Coeur de filet: best cut of fillet of beef.		

Consommé:	Classical basic clear soup. Quality stock is clarified using a mixture of ground meat, egg whites, vegetables and other ingredients to trap impurities.
Contre-filet:	French roasting beef cut, part of the beef sirloin or striploin. Also called faux filet.
Cook-chill:	A technique for preparing meals ready to heat and eat. A strictly hygienic system where food is prepared, cooked and chilled rapidly. Portions are stored and transported at below 3°C (37°F) for use within three to five days.
Cook-freeze:	A system of strict hygienic meal production in which food is prepared, cooked or raw and blast frozen. It requires only baking or heating prior to service.
Cordon bleu:	Escalope or thin slice of meat folded to enclose sliced Swiss cheese and ham, then crumbed and fried.
Corned beef:	Beef, usually silverside or brisket, pickled with brine containing nitrite which gives it a red colour when cooked.
Cornish pastie:	Traditional pie made with a round of short pastry filled with beef or lamb, root vegetables and sometimes kidney. The pastry is folded to a crescent shape and crimped along the central join.
Correcting:	Adjusting the meat or sauce seasoning, consistency and colour.
Côte:	French for rib. Côtes couverts are beef ribs on the bone, a roasting joint.
Côtelette:	Cutlet (French). Côtelettes premier are the four cutlets from nearest the loin on a lamb rack.
Cottage pie:	Traditional pie made with minced cooked beef bound with brown sauce, onions, herbs and topped with creamed potatoes.

Crêpinette:	Small, flat sausage, or patty wrapped in caul.
Croûtons:	Small cubes of bread, shallow fried for use as a garnish with soups, or cut larger to garnish stews and vegetable dishes.
Crown roast:	Two frenched racks of lamb joined in a circle, fat side in and ribs uppermost, to resemble a crown. Usually roasted with a stuffing in the central cavity.
Cuissot:	Large leg or haunch of veal, venison or wild boar (French).
Cumberland pie:	Lamb or beef mince pie flavoured with carrots, leeks, onions, topped with mashed potatoes and gratinated.

## D

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Dark cutting meat:	Dark, dull coloured meat with a high pH. This may indicate poor eating quality.
Daube:	Meat braised slowly with stock, generally red wine based, well flavoured with herbs, in a covered pan. Often beef, but may be other meats cooked in the same manner.
Deglaze:	To swirl a liquid or stock with sediment left in a roasting pan or frying pan. Heated and stirred with liquid to loosen the food particles.
Dégraisser:	To skim and remove surface fat.
Delmonico steak:	American beef cut, also called Spencer steak. The eye of beef rib with bone, fat and coarser meat removed. Cut 2.5 to 5cm thick, treated as beef fillet.
Demi-glaze: (demi glaze)	Half glaze. Classical rich brown sauce based on meat stock, and made by reducing equal quantities of basic brown sauce (espagnole) and brown stock reduced by half, or reduced until almost thick enough for glazing.
Dodine:	Boned and stuffed meat (eg shoulder of lamb) or poultry which is braised in the oven. More often applies to poultry or duck.



Donar (doner) kebab:	Turkish style spit-roasted meat, usually lamb, cooked in the form of tightly stacked slices on a vertical skewer rotating in front of an electric element. Carved to order and served in pita bread with salad and spicy sauces.
Dress:	To arrange the finished food item onto the plate or serving platter prior to service.
Dress:	When used of a carcass: to prepare a carcass by skinning, eviscerating and trimming.
Dressed weight:	Of carcass, skinned, eviscerated, trimmed and then weighed.
Drip:	Natural release of juice or moisture from raw or cooked meats.
Dripping:	Fat which has separated from meat during cooking. Fat and juices from roasting a joint, or rendered clean beef fat used for frying.
Dry aged:	Fresh carcass, meat cuts or small goods stored without vacuum packaging for various periods of time under controlled temperatures, humidity and air flow to develop tenderness and flavour, or to reduce spoilage.
Dry cure:	A combination of salts and spices used in processing meats and small goods.
Dry curing:	Preserving process in which salts and spices are rubbed into raw meat, usually before smoking. Commonly used for pastrami and small goods.
Dry rub:	A blend of crushed herbs, spices and sometimes salt that is rubbed onto the surface of steaks and roasts prior to cooking to add flavour.
Duxelle:	Mixture of chopped mushrooms and shallots cooked in butter.

## E

Elastin:	In meat, tough connective tissue which will not soften during cooking.
Émincé:	A thin slice or sliver (French). Émincer: to mince or slice food very thinly, or shred it.
Empanada:	Popular Mexican savoury yeast dough turnover filled with minced beef and spices or spinach.
En papillote:	Cooking small cuts of meat or fish in a foil pouch or greased paper parcel. Or may be in bark or clay.
Engadine beef:	Air-dried striploin of beef from Switzerland and other central European countries. Cut and served wafer thin as an hors d'oeuvre.
Entrecôte:	Literally 'between the ribs' (French). Steak cut from the boned beef sirloin. Another name for sirloin steak.
Enzyme:	An organic catalyst formed by living cells but not dependent on their presence for its action. A natural substance which speeds up a chemical reaction in the body. Examples: actinidin or papain, found in fruits.
Épaule:	Shoulder (French). A lamb roasting joint. Épaule d'agneau is a half shoulder, boned, rolled and tied.
Escalope:	A thin slice of meat, eg escalope of veal.
Escalopine:	A small, thin slice of meat.
Étouffade:	Basic brown beef stock or a beef stew. Or meat, usually in one piece, stewed in a sealed pot with wine, herbs and vegetables.
Étuvé:	Stewed, braised, steamed. Meat or vegetables sweated or cooked in their own juices.
Eviscerate:	Disembowel.

## F

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Fancy meats:	Offal, edible carcass organs, eg kidneys, heart and liver.
Fajita:	Literally sash, a term used in southern states of America for beef flank skirt steak (or other meats) cut into little strips, spiced, cooked and served wrapped in flour tortilla parcels, with crisp-cooked onion, capsicum, chilli salsa etc.
Fallette:	Dish of a breast of mutton stuffed with vegetables and bacon or braised breast of veal stuffed with pâté.
Farce:	Savoury forcemeat or stuffing.
Feedlotting:	Intensive method of raising animals which are kept within an area and fed, during part or all of their growing period, on a grain-based diet.
Ficelle-style beef:	Ficelle means string. Beef poached on a string in a rich broth.
Filet:	Fillet. Also French term for loin of lamb.
Foie:	Liver (French).
Fonds:	A strong stock for making meat sauces.
Forbar Bridie:	Puff pastry, minced steak, onion and fresh herb turnover (semi-circular pie).
Forcemeat:	A stuffing made of raw meat. Used for making sausages, pâtés, mousselines or quenelles.
Freezer burn:	Discolouration on meat surface due to loss of moisture, exposure to air and oxidation during freezer storage.
Frenching:	Removal of meat from the ribs leaving the bone ends exposed.
Fricadelle:	A round, flat cake or meatball made of finely chopped meat and breadcrumbs or mashed potato, fried.

Fricandeau:	Veal topside. Also a veal dish, larded with bacon and braised.
Fricassée:	A light, white stew, often veal or poultry, first sautéed (which distinguishes it from blanquette), made with white stock and cream sauce.
Frikkadels:	Dutch-style meatballs or skinless sausages.
Fumé:	Smoked or of a smoky flavour.
Fumet:	Liquid used to give body and flavour to stocks and sauces. Often refers to good fish stock. A fumet is not an extract or concentrate.

## G

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Galantine:	A cold, jellied dish made traditionally of boned poultry, but may be of meat, stuffed with forcemeat, pressed into a symmetrical shape and cooked in stock. The forcemeat may include ingredients to form a pattern when sliced, eg pistachios, tongue or truffle.
Gelatin:	A soluble protein substance found in animal hides, bones and connective tissue. When dissolved in hot liquid and then cooled, it sets and is used for jellies, aspics, cold desserts and can be used as a thickener and stabiliser.
Georgian steak:	A striploin steak spread with anchovy butter, wrapped in puff pastry and baked.
Gigot:	Top end of hind leg of lamb or mutton (French).
Gigot d'agneau:	Shank end of the leg for roasting (French).
Girello:	Lamb eye of silverside (Australian).
Glace de viande:	Meat glace used for enhancing stocks and sauces.
Glycogen:	A carbohydrate energy store in liver and muscle of animals (and humans).
Goulash:	Hungarian-style stew usually made from less tender cuts of beef, eg chuck, including paprika and onions.

Grain-fed:	Animals fed on a concentrate diet, eg sorghum wheat, barley or maize, for a set period.
Grass-fed:	Free range animals fed on grass pasture, maybe with added silage or hay.
Grenadin:	French veal cut, a small thick steak from the leg.
Grill:	Method of cooking by radiant heat either from above, at sides or below. Heat may be gas, electricity, charcoal or wood.
Guard of honour:	Two Frenched lamb racks joined together, facing each other, having fat sides out, rib bones up and interlocked. Roasted.

Hogget:	Young sheep in age between lamb and mutton. The meat is not as tender as lamb but has more flavour.
Holstein:	Crumbed schnitzel of veal or beef topped with a fried egg, anchovy fillets and capers. Also a breed of cattle.
Hot boning:	Boning carried out soon after slaughter and before rigor mortis.
Hot weight:	Weight of the dressed carcass within two hours of slaughter.

## H

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HACCP:	Hazard Analysis Critical Control Points. A systematic way of analysing potential hazards in a food operation, identifying the points in the operation where the hazards may occur, and deciding which are critical to consumer safety. A tool for testing food safety.
Haché:	To finely chop or mince.
Haggis:	Traditional Scottish dish: sheep's paunch filled with finely minced offal, oatmeal and seasoning, sewn up and boiled.
Halal meat:	Meat prepared according to the ritual slaughter required by Islamic consumers.
Hamburg or Vienna Steak:	Traditional hamburger with brown sauce, fried onions and an egg.
Hang:	To suspend raw meat (usually full carcasses or side) on hooks in controlled temperature and humidity to allow aging.
Hâtelet:	Small skewer for grilling meat.

## I

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Irish Stew:	Lamb stew with potatoes, onions, celery, leeks and parsley.
ISO 9002:	An international quality assurance standard.

## J

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Jarret:	Knuckle or shin of veal or beef.
Jerk:	Jamaican-style marinade or spice mix for meat.
Jerky:	Dried strips of beef for chewing.
Jus:	Juice. Unthickened roast pan juices or reduced stock.
Jus de viande:	Gravy.
Jus-lie:	Lightly thickened roast pan juices or reduced stock.



## K

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Kambing soup:	Indian-style lamb soup with shallots, ginger, cinnamon, coriander and coconut milk.
Kari:	Curry.
Kari-Kari:	Philippine-style beef stew of oxtail, shin of beef, peanuts, eggplant, spring onion and green beans.
Kebab:	Kabab. Arabic term for meat cooked on a skewer with vegetables. Also known as shishkebab or shashlik.
Kefta:	Lebanese-style skewered lamb or beef made with minced meat, onion, cumin and parsley.
Keftedakia:	Greek-style savoury meatball of beef, parsley, onion, garlic, oregano and cinnamon.
Keftedes:	Greek-style veal or beef meatballs highly flavoured with herbs and deep fried.
Keema pilau:	Indian-style minced lamb stew with fresh herbs, peas and rice.
Kibbeh:	Middle Eastern raw meat dish made from minced veal or lamb, pine nuts, onions, burghal wheat, allspice and salt.
Kobe beef:	Japanese, very highly marbled, extremely tender beef. Japanese rate marbling of beef on a scale of 1 to 12, and Kobe beef is between 10 and 12 (see Wagyu).
Kofta:	Indian-style meat balls in sauce with yoghurt, garam masala and fresh coriander.
Korma:	Indian-style meat stew or simmered meat dish (often lamb), with onions, garlic, spices, yoghurt, almonds and fresh ginger.
Kormeski	Russian-style savoury meat croquette made from cold meat, flour panada, reformed and crumbed.
Kosher:	Food prepared according to strict Jewish religious and dietary laws.

Kreatopita: Cyprus-style lamb pie cooked with ricotta and feta cheeses.

## L

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Lactic acid:	A natural food acid found in sour milk. Also produced by muscle when it burns up its energy stores of glycogen.
Lancashire hotpot:	An oven-baked dish using layers of sliced lamb shoulder, onions, potatoes and stock, topped with neatly arranged potato slices.
Langue:	Tongue (French).
Lard (Larder):	To insert strips of bacon or fat into the meat to prevent drying out during cooking.
Lardons:	Batons of bacon, or diced bacon. Also strips of larding fat threaded into meat.
Lobscouse:	A fritter made with mashed potatoes, minced lamb, ham and onions. Served with mustard.
London broil steak:	Flank steak or rump steak that has been char-grilled and thinly sliced before service.

## M

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Marbling:	Intramuscular fat or flecks of fat within the lean meat.
Marinade:	A flavouring or tenderising mixture which may contain vinegar, wine, oils, herbs and spices. Used to soak meat cuts before cooking.
Marmite:	A traditional tall stew pot/stock pot used especially for pot-au-feu. Also the name for the food cooked in a marmite.
Marrow bone:	Beef or veal hind leg shin bone which contains rich, soft fatty bone marrow. This can be scooped from the roasted bones and used as a spread or poached and served in slices as a garnish on meat dishes.

**Massaman nuea:** Thai-style dish of beef cooked with massaman curry paste, chilli peppers and coconut milk.

**Meat yield:** The amount of saleable raw meat obtained after deboning and trimming, or the amount of meat for serving after cooking.

**Medallion:** French medallion. A thin, round or oval slice of meat, also known as mignonette, or a noisette of lamb or a slice of beef fillet.

**Mignon:** Tail end of a beef tenderloin (fillet). A small steak, sometimes called filet mignon. Also applies to lamb.

**Mirepoix:** A mixture of diced vegetables, usually onions, celery, carrots and herbs, sautéed in oil or butter to form a base for many sauces, soups and stews.

**Miroton of beef:** Dish of cooked, sliced beef reheated with browned onions, mustard and demi glace or broth.

**Mixed grill:** Selection of grilled lamb cutlets, kidneys, chipolata sausages, bacon, mushrooms, tomatoes, served with straw potatoes.

**Mock duck:** Partly boned shoulder of lamb with the shank left on and tied in the shape of a duck.

**Mountain oyster:** Testicles of veal, beef, lamb (not to be confused with prairie oyster which is raw egg in vinegar, considered a pick-me-up). Testicles of sheep are also called animelles.

**Mouse's ear:** A butchery term for the small 'mouse end' muscle (flexor digitorum superficialis) removed from the 'heel' muscle of beef silverside.

**Moussaka:** A layered Greek-style casserole of eggplant, savoury lamb mince and cheese sauce.

**Mouth feel:** Perception of physical properties of food in the mouth; feel of food as distinct from taste.

**Mouton:** Sheep, mutton (French).

**Murag:** Iraqi-style stew of beef with spices and tomatoes.

**Murtabak:** Indian or Malaysian-style pancakes filled with minced beef, garlic and spices.

**Musette:** Literally 'bag'. Shoulder of lamb or mutton boned and rolled into an even ball shape for braising.

## N

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**Nam pla:** Thai fish sauce made from fermented small fish or shrimp. Used like soy sauce.

**Napper:** To coat meat with sauce or jelly.

**Navarin:** Brown mutton or lamb stew with potatoes and onions.

**Navarin printanier:** With spring vegetables.

**New England dinner:** Traditional dish of simmered corned beef brisket, served with beetroot, cabbage, carrots, potatoes, swedes, haricot beans, horseradish and mustard.

**Noisette:** (French) hazelnut, or nut-shaped. Of meat, a small steak like a medallion, or a slanted cut across the boned, trimmed eye of lamb loin. Noisette is often confused with rosette.

**Noix:** (French) nut. Topside of veal. Used whole or sliced into escalopes.

## O

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**Offal:** Variety meats. Internal organs of animals, including heart, kidneys, liver, brains, tripe, tongue and sweetbreads.

**Osso Bucco:** Dish of veal knuckles cut into 3cm slices across the bone. Braised with onion, garlic, tomato purée, white wine and veal stock. Garnished with gremolata (mixture of chopped parsley, lemon rind, garlic and anchovy fillets).

## P

Paddy wack:	Strip of very tough yellow gristle running along the backbone.	Pepperpot:	A Caribbean meat stew, highly spiced, including hot peppers, maybe okra, other vegetables and dumplings.
Paillarde:	Grilled escalope of veal, beef or lamb. Thicker than traditional escalope for schnitzel.	Petite marmite:	Small earthenware pot in which soup of the same name is made and served.
Paisti:	Scandinavian-style meat stew made with beef, lamb, bacon, onions and allspice.	Permeable:	Having properties that allow substances to pass through, penetrate or diffuse.
Paleron:	French beef shoulder cut, from between chuck and neck.	pH level:	A scale indicating acidity or alkalinity, ranging from 1 (extremely acid) to 7 (neutral), to 14 (extremely alkaline). Significant in meat quality.
Papillae:	Fine, finger-like protuberances, closely packed on the surface of the intestinal wall and inner beef cheek. Papillae increase surface area for excretion of digestive enzymes and for absorption of food.	Pièce de boeuf:	French beef cut, top of rump. Also known as aiguillette and pointe de culotte.
Papillotte, (en):	Food or meat enclosed in a buttered paper or foil parcel and baked in the oven. Paper bag method of cooking.	Plat-de-côtes:	Flank of beef or pork. French beef cut taken from between ribs and brisket, equivalent to American short ribs. Braising, pot-roasting cut.
Pastitso:	Greek-style dish of layered beef mince pie with macaroni and cream sauce. Other ingredients include red wine, parmesan cheese, nutmeg and tomato paste.	Pluck:	The heart, liver and lungs (lights) of lamb or mutton, used in haggis.
Pastrami:	Highly seasoned, smoked beef traditionally made with eye of silverside. Most often eaten cold, thinly sliced, eg on rye.	Poêle:	Literally 'stove'. Poêlée; pot-roasted on a bed of vegetables. A method of cooking.
Pâté maison:	Rich mixture of ground meats, liver, game etc. Well seasoned and baked in a terrine, or steamed. May be coarse, like a meatloaf, or fine and smooth in texture, as a spreading paste. Usually eaten cold. May include fat, pork, spices, brandy and garlic. Maison: meaning house, thus pâté of the house, or according to the chef's own recipe.	Poêlon:	Round casserole with lid, for pot-roasting.
Pathogens:	Microbes which are harmful to human health. Some examples are: Campylobacter, Salmonella, Listeria monocytogenes, E.coli (Escherichia coli), Clostridium perfringens and Yersinia enterocolitica.	Point, (à):	Medium-cooked, referring to degree of doneness of steak.
Paupiette:	Thin slices of meat or fish, stuffed, rolled and poached or braised, eg beef or veal olive.	Portion control:	Items which have been cut, sliced or formed to specified individual portion weights.
		Pot-au-feu:	Literally 'pot on fire'. Boiled beef with broth, cooked together by simmering in a large stock pot. Sometimes also with various other meats, eg chicken, salt pork, mutton and sausage. Full bodied soup and meal of various meats simmered together with root vegetables.
		Pot-pourri:	Term for a stew of various kinds of meats and spices. Also a mixture of items.
		Primal cuts:	The first muscle cuts derived from breaking down the carcass, eg whole rump.



Protein:	A vital part of every cell in the body. One of the basic nutrients needed by the body to maintain life, supply energy, build and repair tissues, form enzymes and hormones and perform other essential functions. Protein can be obtained from animal and vegetable sources.
Puchero:	A Spanish meat stew/soup also called cocido, like a hotpot or pot-au-feu.

## Q

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Quasi:	French term for veal rump or escalope cut from lean rump.
Queue:	Tail (French).

## R

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Ragout:	Light stew, white or brown which may be of meat, poultry or fish, with or without vegetables.
Ragu Bolognese:	Italian-style meat sauce made from minced beef, wine, tomato paste, vegetables, herbs and meat stock.
Raifort:	Horseradish (French). Raifort Sauce: creamy horseradish sauce.
Réchauffé:	Reheated. Dish prepared from leftover meat.
Reduce:	To concentrate a liquid or stock by boiling.
Reform sauce:	Rich sauce made from a piquant demi glace with redcurrant jelly and julienne of beetroot, egg white, gherkin, mushroom, truffle and tongue.
Render:	To melt solid fat down to dripping. A heat treatment to release fat (tallow) from bones and trimmings.

Rennet:	Animal rennet is an enzyme derived from stomachs of calves, which coagulates milk. Vegetable rennet is obtained from some plants, eg thistle. Rennet is used to coagulate milk into junket, or into curds and whey in cheese-making.
Rest (meat):	Let meat sit for a time after cooking, before carving or serving.
Rigor mortis:	Latin for stiffness of death. The stiffening of muscle during biochemical changes after death, when muscle turns into meat.
Ris:	Sweetbread (French). Thymus gland of calf or sheep obtained from the neck or near the heart.
Rogan josh:	Muslim-style Indian lamb curry, rich dark red colour, made with a fresh spice paste, tomatoes and yoghurt.
Rognon:	Kidney.
Rondeau:	A round shallow pan (usually copper) used for braising or stewing meat.
Rosbif:	Roast beef (French).
Rosette:	Small rounds cut from the boned lamb loin (some fat on), with tail, rolled and tied. Because rosettes include tender eye meat wrapped in the less tender, fattier part, they need to be well cooked. Not to be confused with noisette.
Rossini:	Meat garnish of goose liver pâté and madeira brown sauce.
Rouelle:	Round slice. A French veal cut, thick lean part of leaf between rump and knuckle.
Rouelle de veau:	Boned fillet of veal.
Roulade:	Made into the shape of a roll.
Rumen:	Part of the first stomach of a ruminant.
Ruminant:	Animal that chews cud, eg cattle, sheep, deer, goats.

## S

Saignant:	(French) literally 'bleeding'. Rare or underdone degree of doneness of steak.	Shashlik:	Grilled pieces of meat and vegetables on a skewer, also know as shishkebab and kebab. French is brochette.
Salamander:	Type of grilling equipment having heat source at the top. Used for grilling, toasting and gratinating.	Shell steak:	Striploin steak trimmed of all fat and sinew.
Salisbury steak:	Mixture of minced beef, onion, breadcrumbs and tomato purée, moulded into oval galettes and pan-seared.	Shepherd's pie:	Pie made of cooked meat, usually minced lamb, baked in a pie dish with a topping of mashed potatoes.
Saltpetre:	Potassium nitrate. Inhibits growth of bacteria. Used with salt for pickling and preserving. It gives a characteristic pink colour to cured meat.	Shishkebab:	Pieces of meat and vegetables threaded on a skewer and grilled.
Satay:	Indonesian and Malaysian skewer of small cubes of meat, grilled, usually over charcoal. May be marinated, eg in turmeric, onion, coconut milk, coriander and served with a spicy peanut sauce and cucumber.	Silverskin:	Tough, silvery white connective tissue that surrounds certain muscles, eg on lamb and beef silverside.
Sauerbraten:	Swiss beef dish. A piece of silverside, marinated in beer or vinegar, water, brown sugar, pickling spices and garlic then simmered in the pickle and served with a sour cream sauce.	Singe:	To brown or colour.
Saumure:	Brine containing salt, juniper berries, peppercorns and sugar, used for pickling meat. Also food salted or pickled in brine.	Smoke-roasting:	Method for roasting foods in which items are placed on a rack in a pan containing smouldering wood chips emitting smoke, when the pan is placed on the range top or in the oven.
Sauté:	Literally 'jumped' or 'tossed'. To toss food quickly in a frying pan to brown it. Also means a quick kind of stew using good quality strips of meat.	Sofia boiled beef:	Dish of slices of boiled beef finished in the oven with brown sauce. The sauce is finished with beaten eggs and yoghurt and the dish is gratinated with cheese.
Seal or sear:	To brown or colour, or to set the surface of meat. Usually a preliminary step, using high heat and brief cooking in a hot pan or oven.	Souvlakia (arni):	Greek-style skewered lamb flavoured with garlic, marjoram, onion and bay leaves.
Season:	Add salt, pepper or other seasonings to enhance the flavour of the food.	Steak and kidney pudding:	Mixture of diced beef, ox kidney, onions, parsley, mixed herbs and liquid steamed in suet pastry until tender.
Seasoned flour:	Flour seasoned with salt and pepper.	Steak tartare:	Classical dish of raw minced beef tenderloin, seasoned and topped with a raw egg, accompanied by small bowls of chopped onions and capers. Sometimes made with raw beef bound with fresh egg white, with capers and onions.
Set:	To sear (over high heat) the outside surface of meat.	Stifatho:	Greek-style beef stew with onion, red wine, tomato, garlic and herbs.
Shashlik:	Lamb, grilled on a skewer, sometimes served as a flaming sword (Russian).		

Stock:	Liquid obtained by simmering down various nutritious foods, eg meat, meaty bones, fish, vegetables, extracting their flavours.	Table d'hôte:	Literally 'host's table'. A meal of several set courses at a fixed price. A menu.
Strip steak:	American beef cut, boneless striploin. Other American sirloin steaks include pinbone, flatbone and wedgebone.	Tagine:	Popular Middle Eastern lamb stew (also the dish in which it is cooked).
Stroganoff:	Dish of beef fillet strips sautéed with onions, mushrooms, black pepper, cream, lemon juice, parsley and nutmeg.	Tallow:	Rendered beef or lamb fat.
Subcutaneous fat:	Fat under the skin.	Terrine:	Earthenware dish, fairly deep, with a lid, in which a meat or liver pâté is cooked. Also the food cooked in it.
Sub-primal cuts:	The muscle cuts derived from breaking down the primal cuts into their natural seamed muscles, eg eye of rump.	Toad in the hole:	Traditional dish of sausages baked with a Yorkshire pudding batter.
Suet:	Fat around kidneys of beef and lamb. Grated and used in pastry.	Tokana:	Hungarian stew of lamb with green peppers, potatoes and tomato, thyme and red wine sauce.
Sukiyaki:	Japanese-style stir-fry of beef and vegetables including bamboo shoots, mushrooms and bean curd. Traditionally eaten with raw egg.	Tolstoi:	A braised lamb or beef dish with paprika, onion, tomato concasse and garnished with gherkins.
Supreme:	A quality cut of meat with no bone or fat, eg fillet of veal. Also applies to a cut from game bird or poultry: the breast and wing fillet removed in one piece.	Tournedos:	The middle part, or steaks cut from the middle of a beef tenderloin (fillet).
Sweat:	To cook food (usually vegetables) slowly with a little butter or oil under a lid without colouring, until the food exudes juice. A preliminary step for soup-making and stewing, not to be confused with frying which is not done with a lid.	Tranche:	Slice, rasher, steak, chop of meat. Tranche grasse: thick flank of beef.
Swiss steak:	Traditional dish made from beef thick flank or topside steaks braised in brown sauce.	Tripe:	The lining of the first part of the stomach in ruminants. The inside of the first stomach of cattle is honeycombed, the second smoother. Tripe is scraped, bleached and pre-cooked before sale, but still requires quite lengthy cooking.
		Tronçon:	(French) thick cut, steak or chunk of meat or fish.
		Trumeau:	(French) leg, shin of beef.



## U

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Ultimate pH: The pH achieved when the rigor process in muscles has been completed.

## V

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Vacuum-aging: Aging meat in vacuum packaging. Also referred to as wet aging.

Valentine of Lamb: A butterflied cut from a well trimmed boneless lamb loin.

Value-added: The processing or adding of something, eg a filling seasoning, starch or carbohydrate to a product so the selling price is higher than of the product's raw material.

Veau: Veal (French).

Viande: Meat. In French, this term refers to all meats.

Viscera: Body cavity contents including intestines, lungs etc.

Vitello tonnato: Italian-style poached veal dish with a tuna mayonnaise, anchovies and new potatoes.

## W

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Wagyu: Japanese native cattle breed having a high degree of marbling (fat interspersed with lean). The breed which produces Kobe beef. New Zealand Wagyu cattle have been bred from the Japanese Wagyu, but the meat is not nearly as highly marbled as Kobe beef. New Zealand Wagyu cattle are grass-fed and the certified Wagyu beef, 'Marblebeef', is graded 3 or over on the Japanese marbling scale (See Kobe beef).

Wiener Schnitzel: (Austrian) thin slice of veal, dipped in beaten egg, coated in breadcrumbs and fried in butter. Traditionally garnished with lemon and stoned olives, wrapped with anchovy fillet.

## Z

---

Zrazy: (Polish/Austrian) traditional braised dish of beef rump steak, red wine, onions and lardons. Served with thyme and parsley stuffing.





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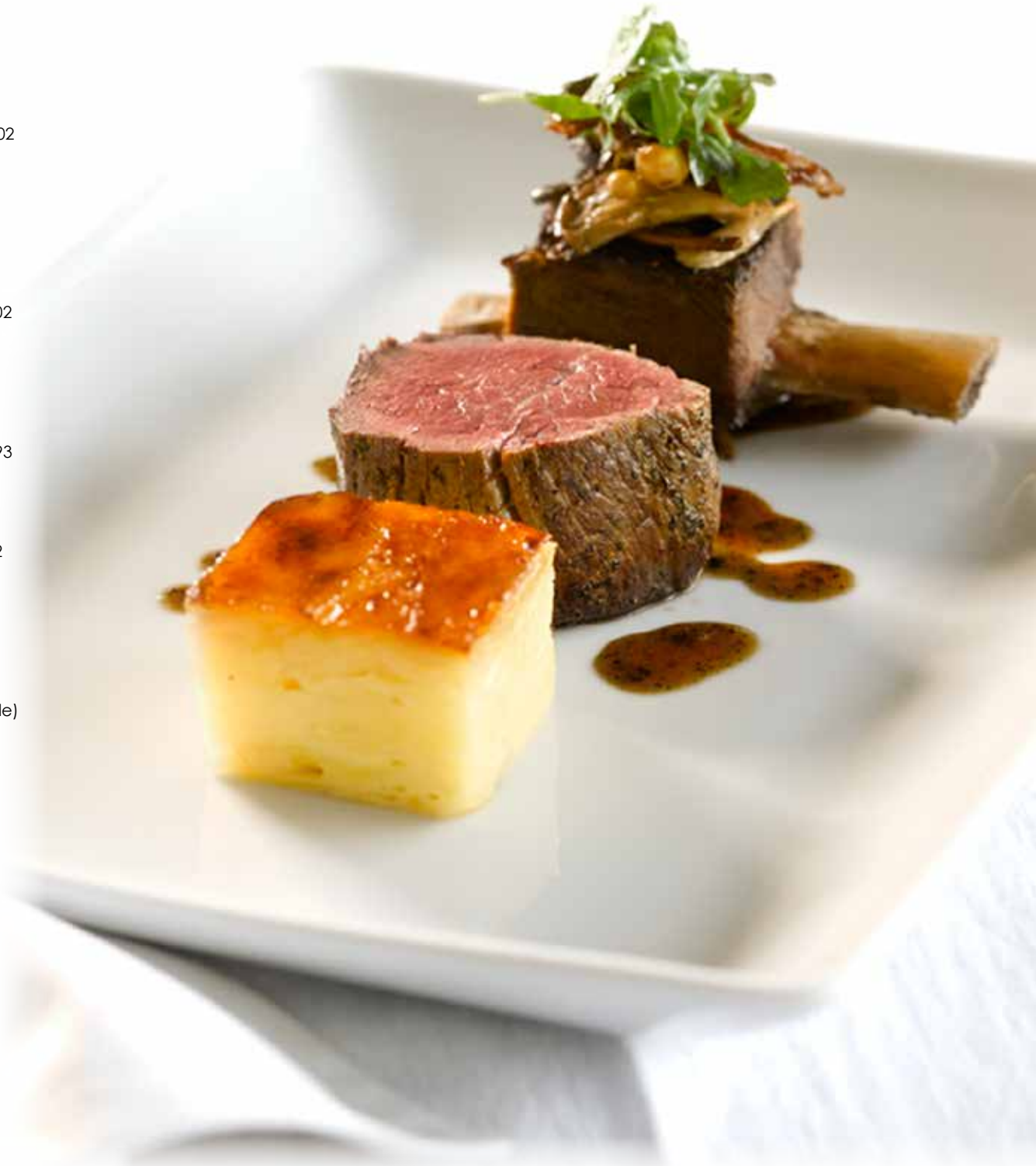
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