

# Lamb *and* Fresh Meat Technology



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 should subject to strict food hygiene and animal welfare standards.

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**MEAT EATING QUALITY - A WHOLE CHAIN APPROACH**

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.... *Quality begins on the farm....*



*The Lamb Quality* Mark represents a set of standards designed to deliver a consistent level of quality. Lamb is responsible for implementing the Quality Mark programme.

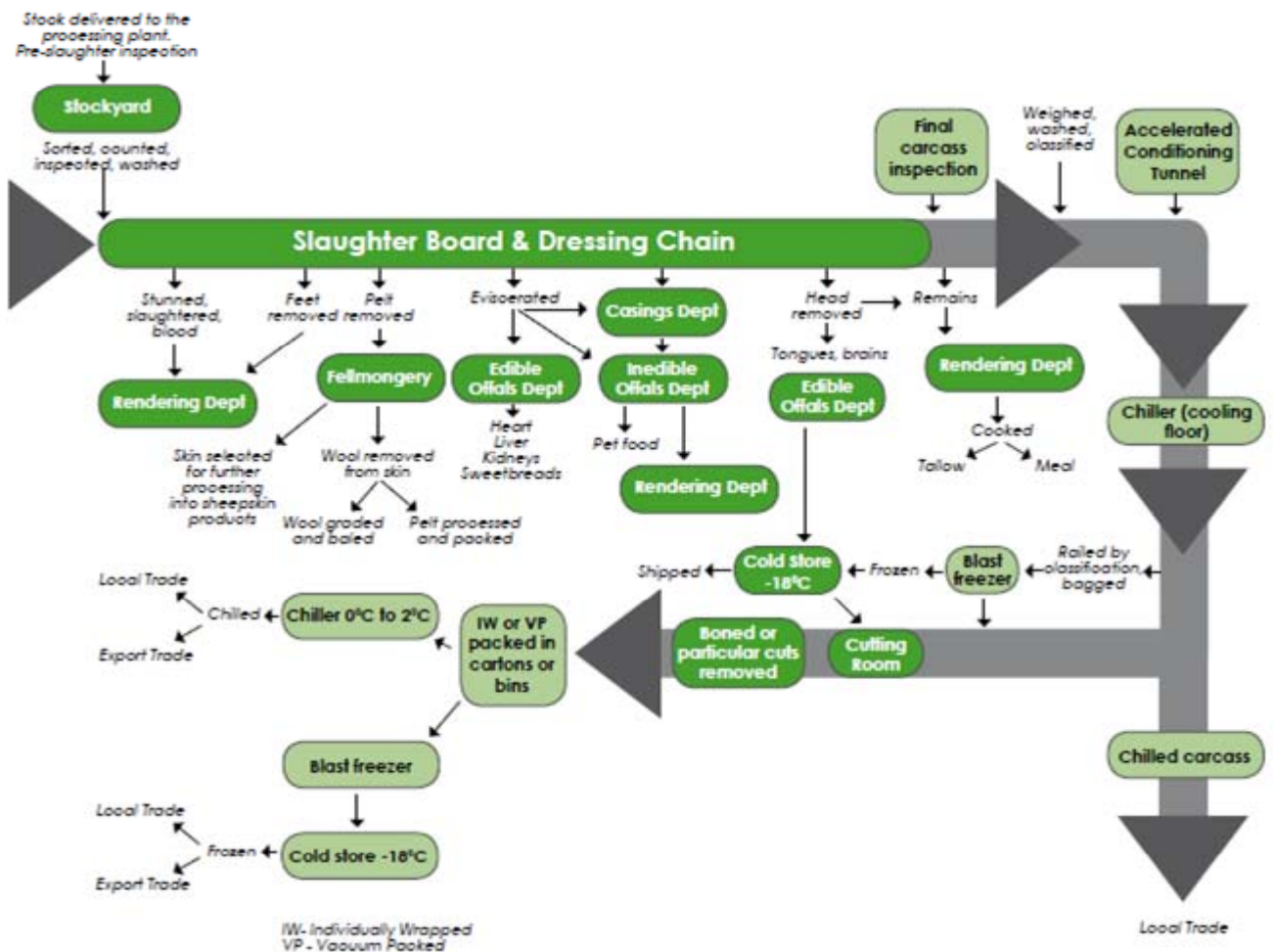
The Quality Mark label appears only on meat which has achieved standards and representatives of the meat industry at all levels through to retail .

The Quality Mark label on 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



## Flow Chart: Sheep and Lamb Processing



### Product Description

**Chilled lamb:** Lamb cuts are vacuum-packed and held at - 10C (+ or - 0.50 C) for up to 12 weeks after production.

**Frozen lamb:** After conditioning, lamb is chilled for up to 72 hours at - 10C (+ or - 0.50C) to ensure tenderness. After chilling it is cut, vacuum-packed or shrink-wrapped, then frozen and stored at - 120C or colder. This product has a storage life of up to 24 months

# 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.)

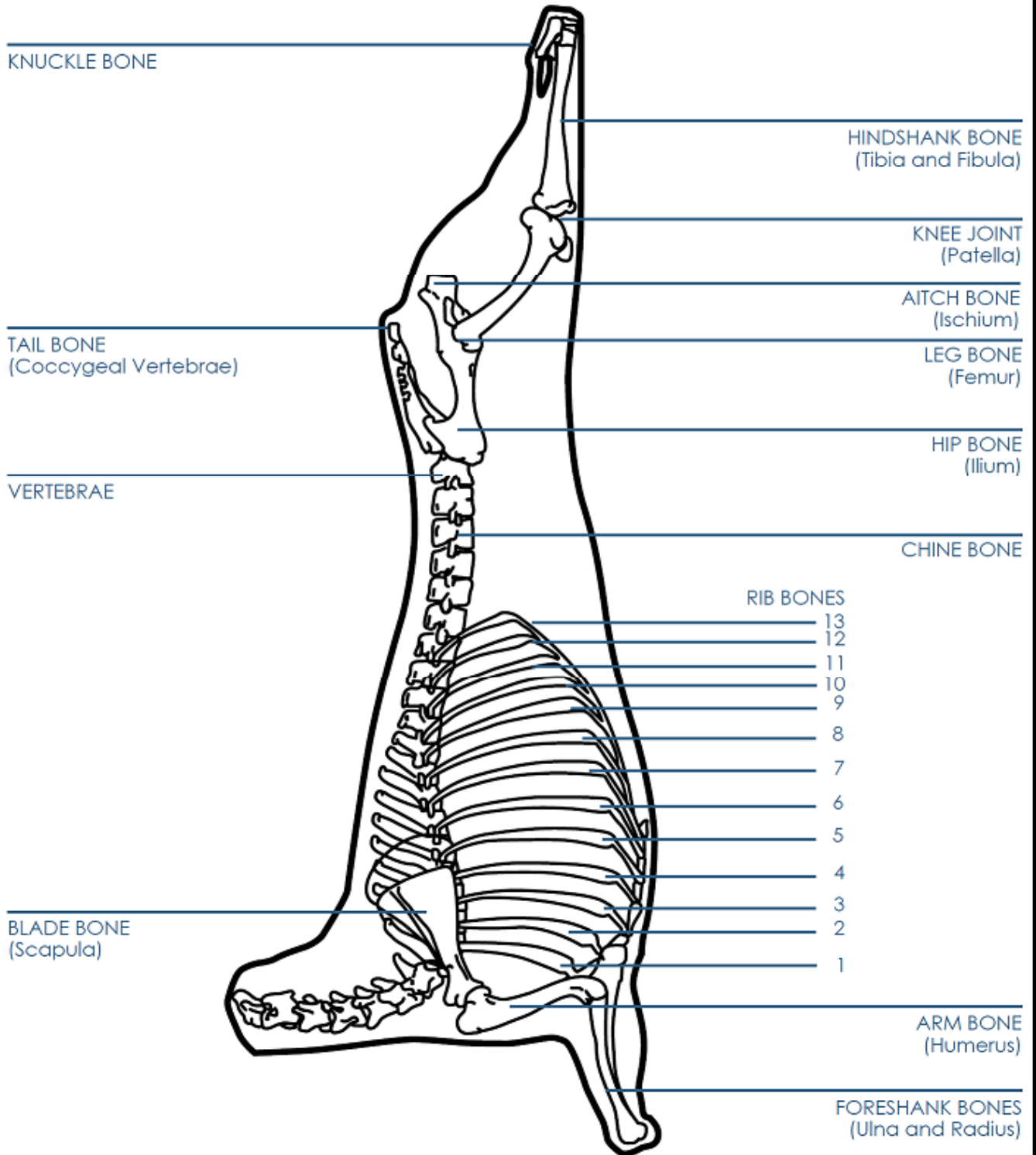
### **Muscle**

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

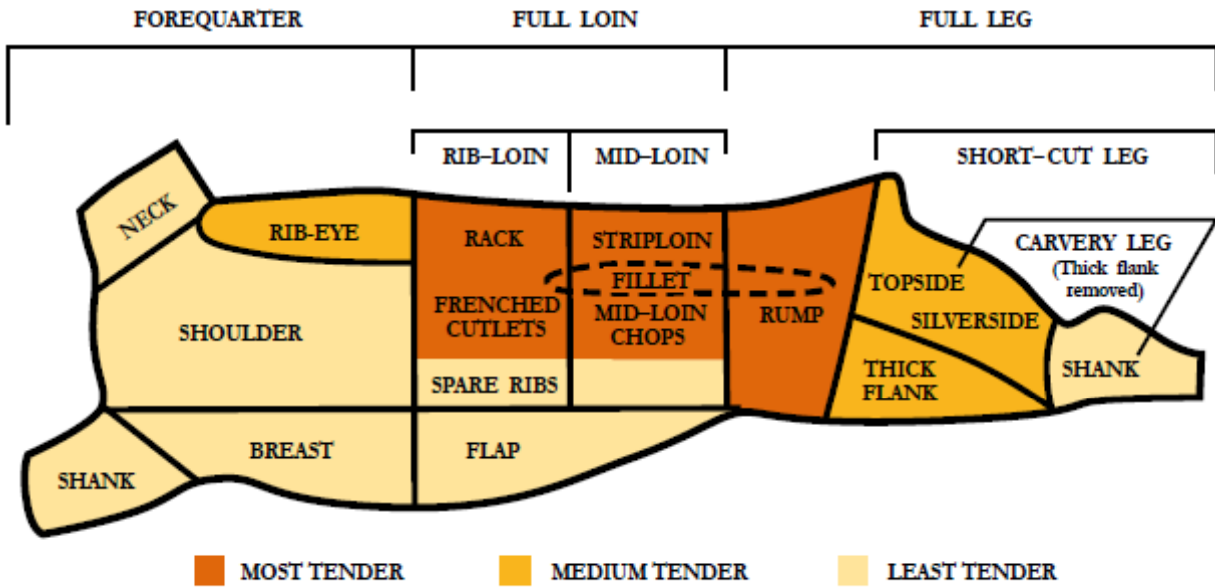


## Lamb Skeletal Diagram





## Lamb Cuts and Tenderness

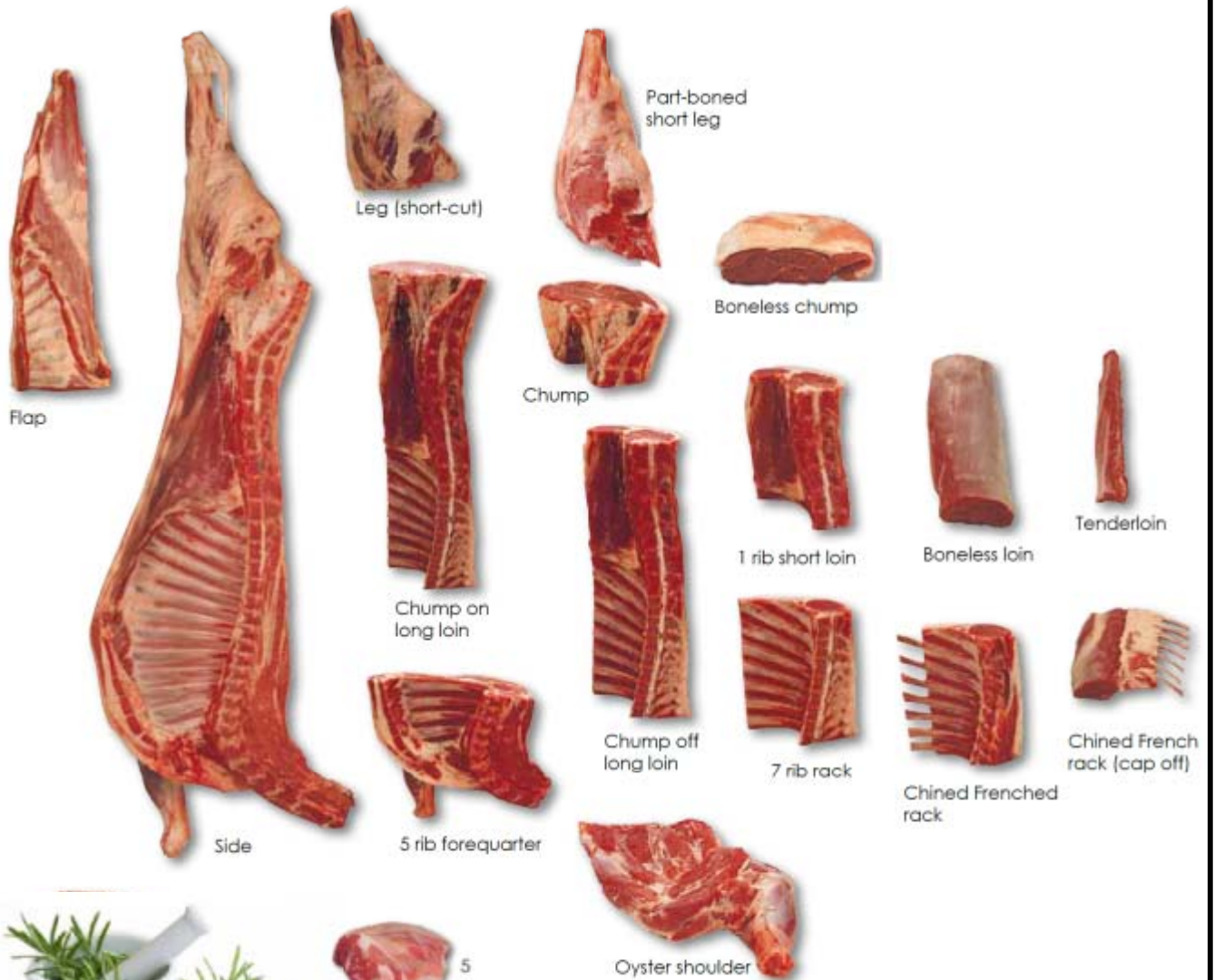


## Lamb primal cuts (principally retail)



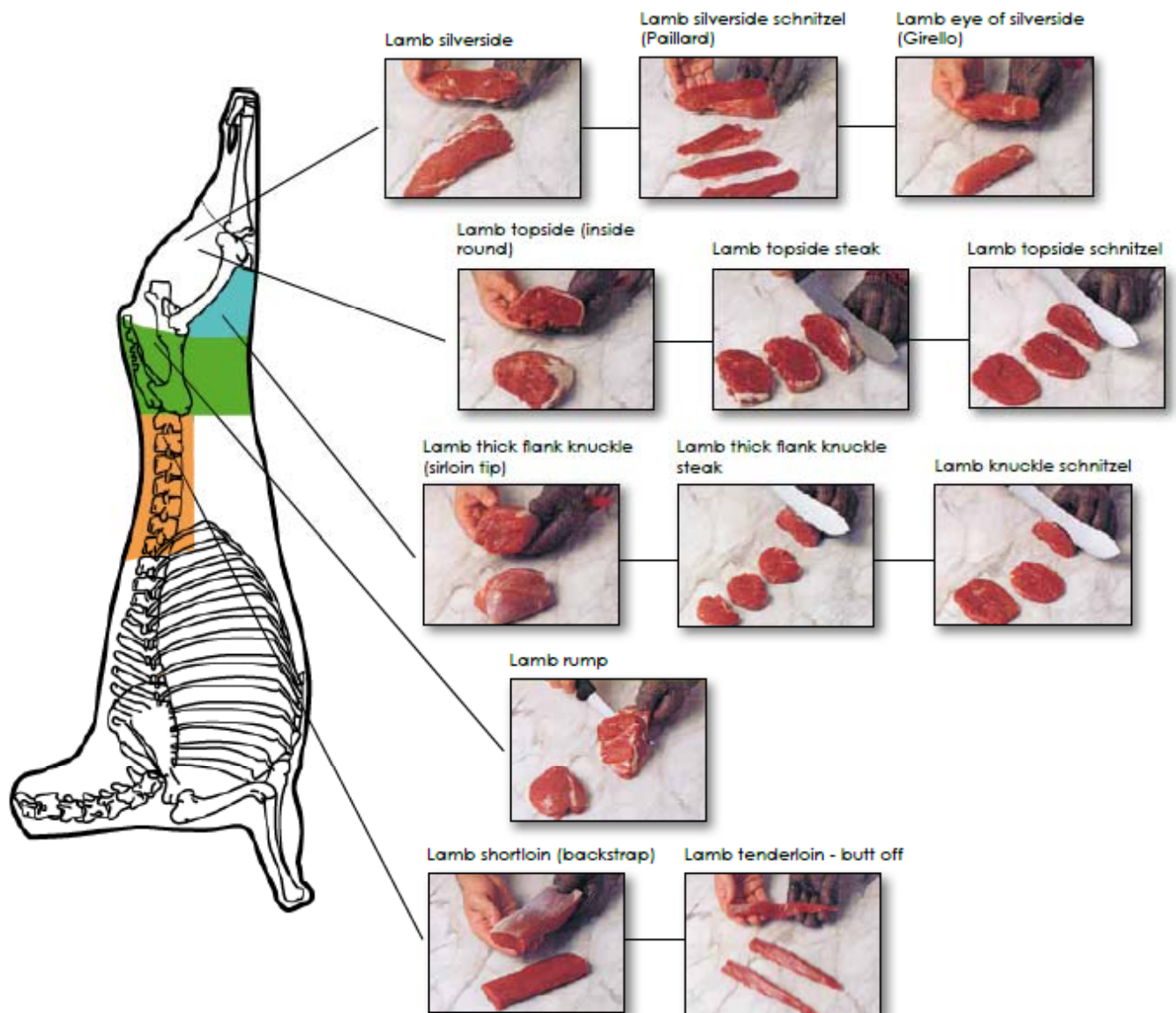
## Lamb primal cuts (retail and foodservice)

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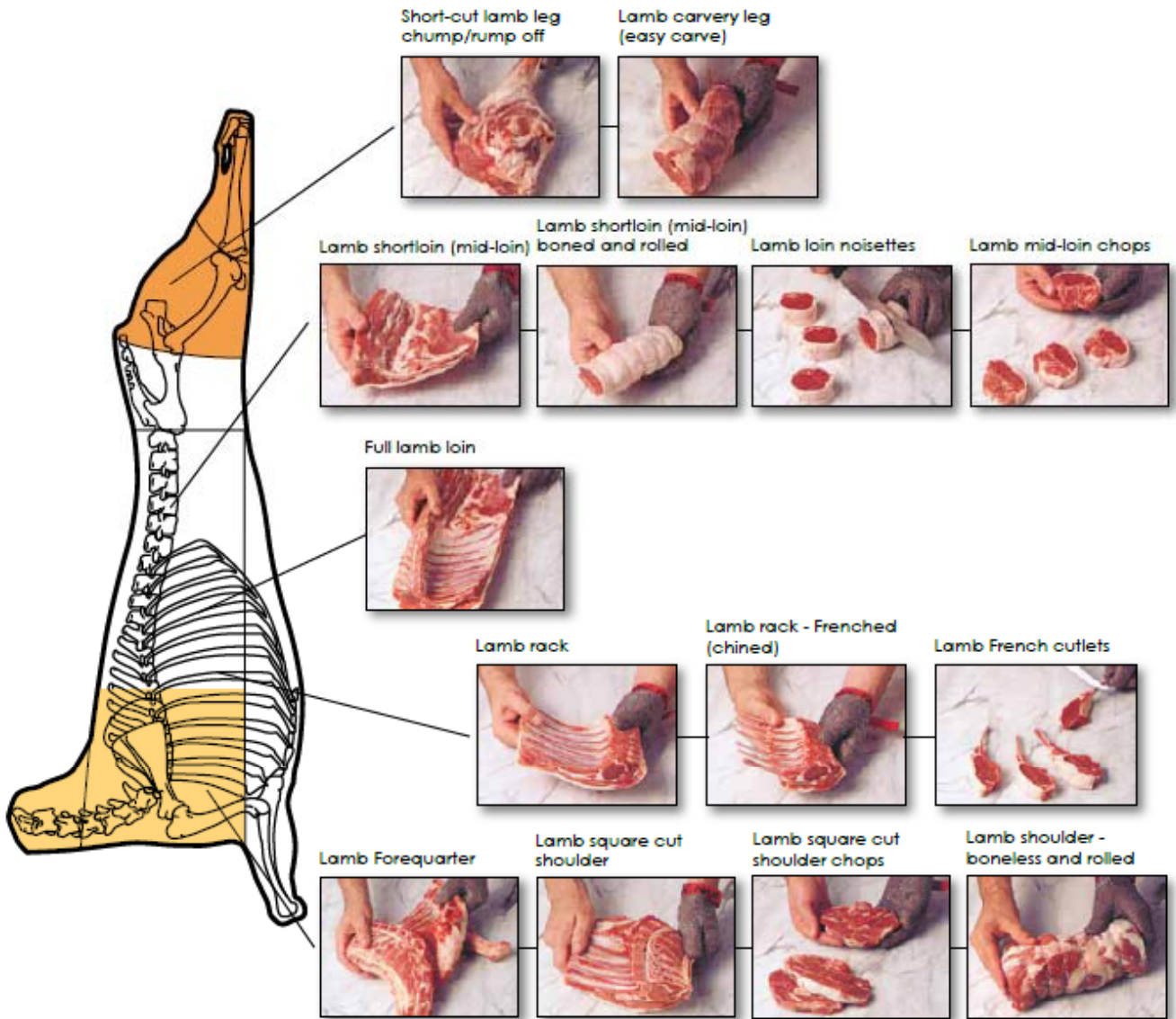


1. Shank
2. Silverside
3. Thick flank (knuckle)
4. Topside
5. Rump

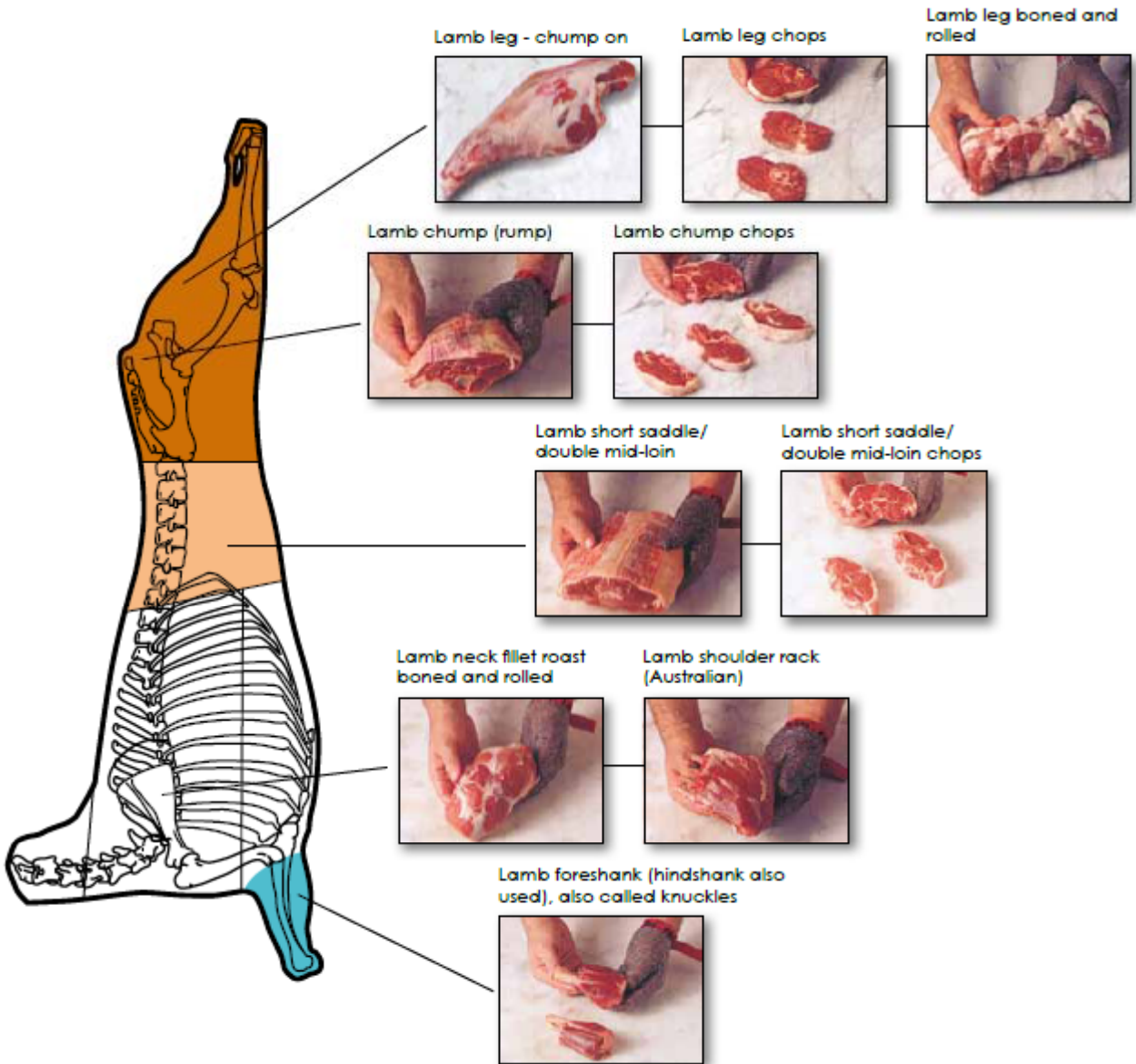
# Lamb cuts: silverside, topside, thick flank/knuckle, rump, shortloin/tenderloin



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



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



## 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 tenderizing 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, minimizing 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.



### 3. Modified Atmosphere Packaging (MAP)

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 metallized 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. MAP is generally used for wholesale or bulk storage and transport packs of cuts and carcasses.

- Storage life: lamb packaged in saturated MAP 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 color: because there is no oxygen in the packs, the meat is the same purple color as that in vacuum packs. Once the pack is opened the meat 'blooms' to a bright red color.
- Odor: with MAP there is little or no confinement odor when the pack is opened. Meat stored for long periods in MAP tends to have a milder odor and flavor than fresh or vacuum-packed meat.

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

This is a multi-gas aerobic packaging system. The pack contains oxygen to ensure the meat develops and maintains a bright red color and carbon dioxide to retard the growth of aerobic spoilage bacteria. This packaging works well for retail display of chilled/fresh meat allowing good color stability and longer storage life than meat over-wrapped with cling-wrap.

## 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	3 to 5 days**	Fast, aerobic
	Stored meat	1 to 3 days**	
High O <sub>2</sub> MAP	Fresh meat	7 to 10 days**	Slower, aerobic
	Stored meat	2 to 6 days**	

\* Stored at -1.5°C

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

Chart from MIRINZ Bulletin 21

# Offers more than just packaging

We emphasize:

- Innovation
- Quality
- Quick delivery
- Many options
- Mono-materials
- User-friendly packaging solutions
- Respect for the environment
- Optimum product presentation
- Extend shelf life

As your packaging partner, we look forward to working together in a mutually beneficial collaboration.

*Vacuum chamber machines with gas flash*



*Single Chamber*



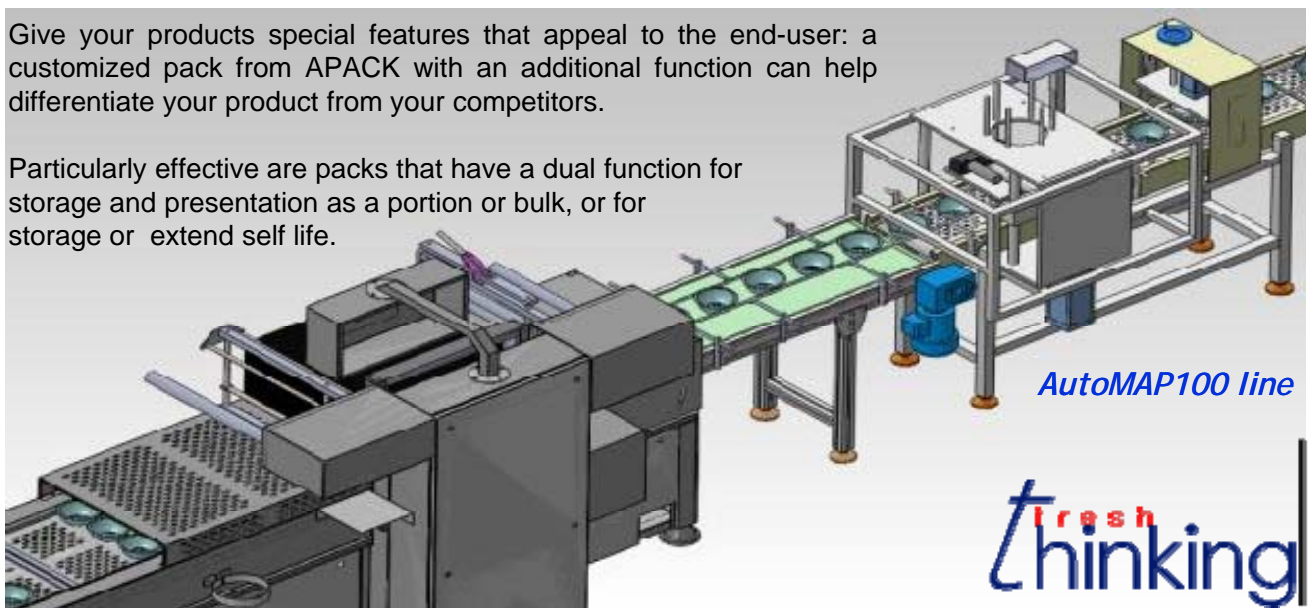
*MAP25*



*Double Chamber*

Give your products special features that appeal to the end-user: a customized pack from APACK with an additional function can help differentiate your product from your competitors.

Particularly effective are packs that have a dual function for storage and presentation as a portion or bulk, or for storage or extend self life.



*AutoMAP100 line*

**fresh**  
**thinking**