

tips & tools

MEAT STANDARDS AUSTRALIA



MSA12

How ageing affects beef eating quality

What is ageing?

Just as wine or cheese can mature with age, beef also can be improved with time. Ageing is a process that occurs as the muscle fibres in meat are slowly broken down. Naturally occurring enzymes continue to act in the meat resulting in a slow breakdown of the proteins that make up the muscle fibres. This leads to the muscle fibres being weakened and, as a result, aged beef tends to be more tender. The appearance of beef does not change with ageing, as the breaking down of the muscle fibres happens on a microscopic level.

The influence of ageing on eating quality

MSA research has shown that ageing can improve eating quality. The ageing effect is different for various muscles as shown in the table below. The rate of ageing also decreases over time with most improvement in the first 21 days.

Days aged	Cube roll		Tenderloin	
	MSA score	MSA grade	MSA score	MSA grade
5	62	3	77	5
14	64	4	77	5
35	67	4	77	5

The above data is taken from a standard MSA carcass with the following specifications: HSCW 240kg; male; 75mm hump; AT (achilles tendon) hang; ossification 150; MSA marbling 270; meat colour 1C; rib fat 7mm; pH 5.55; loin temp 7.0°C; cooking method grill and non HGP-treated.

Key point

- Ageing can improve the eating quality of beef by improving the tenderness.
- Ageing can occur on the carcass or in vacuum packaging.
- As all factors that effect eating quality interact, ageing rates and affects also differ. For example, tenderstretch carcasses age at a different rate relative to those that are not tenderstretched.

As all factors that effect eating quality interact, ageing rates and effects also differ. For example, tenderstretch carcasses age at a different rate relative to those that are hung by the achilles tendon (See *MSA Tips & Tools: How tenderstretch affects eating quality*).

How can beef be aged?

Beef can be aged in carcass form, on the bone in primals, or in vacuum packaging for long periods. In practice carcasses tend to be aged only for five days. Further ageing can be carried out, but good chilling and food safety considerations need to be taken into account. Primals can be aged up to 14 days on the bone, although the edges of the meat may tend to spoil and will need to be trimmed.

Product from a boning room is packaged in vacuum-sealed plastic bags that are oxygen free. Meat can be safely stored this way, under refrigeration for up to 12 weeks. Meat that is aged beyond this time may develop 'off' odours and give the beef what is described as a 'liver' taint.

How ageing is applied in the MSA system

The MSA grading model determines the ageing effect for each cut. This establishes the date the cuts will reach the applicable MSA grade. Some cuts may achieve a higher grade with additional ageing. For example, if the cut grades as MSA 4 product after five days, the model will then determine if the cut can improve with ageing to reach MSA 5 and the date at which it occurs.

In abattoir boning rooms, carcasses are often assigned into boning groups. This enables the carcasses that have the same grades for the same cuts to be boned out and packaged together. Carton labels are produced showing the required ageing period. A sample carton label is shown below.



In this example, the cube roll can be released as:

- ✓ MSA 3 grill, roast or stir fry after 5 days ageing
- ✓ MSA 4 grill or roast after 14 days ageing
- ✓ MSA 4 stir fry after 21 days ageing

Who is responsible for ageing?

All MSA product has a minimum five-day ageing period before it can be sold to the consumer. Ageing meat requires refrigerated storage which adds cost. When MSA product has two grade options, it can be sold at either grade. In this way, the processor, wholesaler or retailer who is prepared to bear the cost of ageing, can then gain the benefit of a value-added product. Using the carton label below as an example: the processor may wish to age the product for five days to be sold as MSA 3. The wholesaler may wish to move the product quickly and also sell it as MSA 3. The retailer, having determined a demand for MSA 4 product, may wish to store the product for 14 days to be able to charge a premium for MSA 4 quality.

Can anything affect ageing?

The pH temperature decline maintained at the abattoir can have a significant effect on the potential ageing of a product. Carcasses that go through a very rapid pH decline will be heat-shortened. When this happens the enzymes that enable the ageing process to occur are destroyed. This results in the product not being able to age at all (See *MSA Tips & Tools: The effect of the pH temperature decline on eating quality*).



Example of a vacuum-packed primal.

For more information

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