



TIPS & TOOLS

MEAT STANDARDS
AUSTRALIA

How ageing affects beef eating quality

What is ageing?

Just as wine or cheese can mature with age, beef eating quality can also improve 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 occurring in the first 21 days.

Table 1: Meat eating quality (MQ4) scores by days aged

	AT				
	5 days	14 days	21 days	35 days	50 days
Tenderloin	77	77	77	77	N/A
Cube Roll	61	62	64	65	66
Striploin	57	59	62	64	66
Rump	53	55	56	58	59

The above data is taken from a standard MSA carcass with the following specifications: 290kg HSCW; male; no HGP-treatment; AT hang method; 60mm hump; 150 ossification; 320 MSA marbling; 6mm rib fat; 5.60 pH; 71°C loin temp, and grill cook method.

As all factors that affect eating quality interact, ageing rates and effects also differ. For example, tenderstretched 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*).

Key points

- 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 effects also differ. For example, tenderstretch carcasses age at a different rate relative to those that are not tenderstretched.

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.

Product from a boning room is packaged in oxygen free, vacuum-sealed plastic bags. Meat can be safely stored this way, under refrigeration for up to 120 days. 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 boning rooms, carcasses are often assigned into groups known as plant boning runs (PBRs). 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.

BONE IN BEEF PRODUCT OF AUSTRALIA *YG* SHORTLOIN MSA IW/VAC		ANY MEAT WORKS Co LONG FLAT ROAD ANYTOWN NSW 32307 KEEP REFRIGERATED	
 (01) 9 93167 1012345 3 (3101) 000262 (13) 140110 (21) 41457354			
GRL MSA 3 @ 5 days MSA 4 @ 14 days RST MSA 3 @ 5 days MSA 4 @ 14 days PACKED ON: 10-JAN-2014 14:28 BEST BEFORE: 19-FEB-2014 26.2kg 57.8lb NET WEIGHT Carton ID 41457354		 EST. NO.9999	

In this example, the shortloin can be released as:

- ✓ MSA 3 star, grill or roast after 5 days ageing
- ✓ MSA 4 star, grill or roast after 14 days ageing

Who is responsible for ageing?

All MSA product has a minimum five-day ageing period before it can be sold and identified as MSA 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 as long as the required ageing periods are met. In this way, the processor, wholesaler or retailer can determine the value of additional ageing.

It is the responsibility of the final end user to ensure the ageing requirements are met before they sell to the consumer.

Can anything affect ageing?

The pH-temperature decline maintained at the processor can have a significant effect on the potential ageing of a product. Carcasses that go through a rapid pH decline will be heat-toughened. When this happens the enzymes that enable the ageing process to occur are destroyed. This results in product with limited or nil ageing potential. (See *MSA Tips & Tools: The effect of the pH temperature decline on eating quality*).



Example of a vacuum-packed primal.

Further information

Visit mla.com.au/msa or
contact MSA 1800 111 672



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