TIPS & TOOLS

MEAT STANDARDS AUSTRALIA

How tenderstretch affects beef eating quality

What is tenderstretch?

Tenderstretch is an alternative means of hanging the carcase during chilling. While carcases are traditionally hung by the heel (Achilles tendon or AT), tenderstretch carcases may be hung either from the pelvic bone (TX) or through the ligament (TL) that runs down the back and over the tail of the animal (illiosacral ligament).

How does tenderstretch work?

As the carcase is chilled, and the conversion of glycogen to lactic acid is complete, the muscle fibres contract slightly and become rigid. This process is known as rigor mortis. After rigor mortis has occurred, the muscles are referred to as meat.

Tenderstretching can be done by a variety of methods. The most common is by positioning the hanging hook under the ligament that runs down the back of the animal (illiosacral ligament) or under the Aitch bone of the pelvis. When a carcase is tenderstretched, and suspended by the pelvis, the leg drops down at a 90˚ angle. As a result, a number of muscles are held in a stretched position so they cannot contract during rigor mortis. This is shown in Diagram 1. Tenderstretch is most effective in the hindquarter and has a varying effect on each cut.

Traditionally, the carcase is suspended by the Achilles tendon. In the Achilles hung carcase, shown in Diagram 1, the spine is curved and the rear leg muscles have less tension on them. As a result, when these muscles go through rigor mortis they can contract. When this occurs the muscle fibres overlap resulting in slightly tougher meat.

Key points

- Tenderstretch hanging improves meat tenderness by preventing muscle shortening.
- The tenderstretch effect varies by muscle, with the eating quality of most hindquarter muscles improved.

Does tenderstretch improve all cuts?

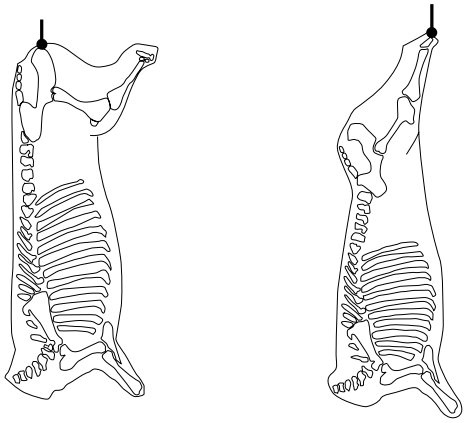

Diagram 1
Tenderstretch (TS)

Achilles tendon (AT)

The tenderstretch effect varies by muscle according to the position on the carcase and degree of stretching. This is shown in the following table.

Table 1: Meat eating quality (MQ4) by hang method

	AT	TX	TL
	MQ4	MQ4	MQ4
Tenderloin	77	76	75
Cube Roll	61	65	66
Striploin	57	64	65
Rump	53	60	60

The above data is taken from a standard MSA carcase with the following specifications: 290kg HSCW; male; no HGP-treatment; 60mm hump; 150 ossification; 320 MSA marbling; 6mm rib fat; 5.60 pH; 7.1˚C loin temp, and aged 5-days.

Although the tenderstretch effect is slightly negative in the tenderloin, (which is stretched in an AT carcase), it is strongly positive in most other hindquarter cuts and largely neutral in forequarter cuts other than the cube roll (ribeye).

Tenderstretch is often a key factor in grading compliance for high tropical breed content cattle (see *MSA Tips & Tools: The effect of tropical breeds on beef eating quality*).

The effect of tenderstretch on ageing

In addition to altering the MSA score, tenderstretch also affects the degree and rate of ageing. Quantifying the impact of ageing on each cut is a complex calculation. The MSA grading model calculates this and all other variables for each individual cut.

Table 2 shows the values for the cube roll tenderstretch and Achillies hung. Tenderstretch significantly improves the five-day score of the cut, but alters the impact of ageing over time. This relationship is variable for each cut and the characteristics of the carcase.

Table 2: Meat eating quality (MQ4) by hang method by ageing

	AT			TX			TL		
	5	14	21	5	14	21	5	14	21
Tenderloin	77	77	77	76	76	76	75	75	75
Cube Roll	61	62	64	65	66	68	66	68	69
Striploin	57	59	62	64	66	67	65	67	68
Rump	53	55	56	60	61	63	60	62	63

The above data is taken from a standard MSA carcase with the following specifications: 290kg HSCW; male; no HGP-treatment; 60mm hump; 150 ossification; 320 MSA marbling; 6mm rib fat ; 5.60 pH ; 7.1˚C loin temp, and grill cook method.

Why is tenderstretch not used more widely?

Although tenderstreching is proven to be effective in improving tenderness, many processors still opt to use the Achilles tendon hang method for convenience and to save costs. This includes factors and costs associated with chiller space as tenderstretch carcases take up more room than Achilles tendon hung carcases.

A tenderstretch carcase.

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

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