

# TIPS & TOOLS

MEAT STANDARDS  
AUSTRALIA

## How tenderstretch affects beef eating quality

### What is tenderstretch?

Tenderstretch is an alternative means of hanging the carcass during chilling. While carcasses are traditionally hung by the heel (Achilles tendon or AT), tenderstretch carcasses 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 carcass 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 carcass 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 carcass is suspended by the Achilles tendon. In the Achilles hung carcass, 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?

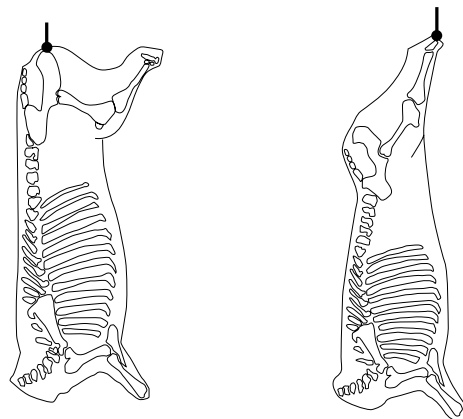


Diagram 1  
Tenderstretch (TS)

Achilles tendon (AT)

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

**Table 1: Hang method**

	AT	TX	TL
	CMQ4	CMQ4	CMQ4
<b>Tenderloin</b>	77	76	75
<b>Cube Roll</b>	61	65	66
<b>Striploin</b>	57	64	65
<b>Rump</b>	53	60	60

The above data is taken from a standard MSA carcass 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 carcass), 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.

The table below shows the values for the cube roll tenderstretch and Achilles 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 carcass.

**Table 2: Hang method + ageing**

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

The above data is taken from a standard MSA carcass 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 tenderstretching 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 carcasses take up more room than Achilles tendon hung carcasses.



A tenderstretch carcass.

### Further information

Visit [www.mla.com.au/msa](http://www.mla.com.au/msa) or contact MSA 1800 111 672



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