

# tips & tools



MSA11

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.
- Producers may consider using abattoirs that utilise tenderstretch hanging as it will improve MSA grading results.

### Does tenderstretch improve all cuts?

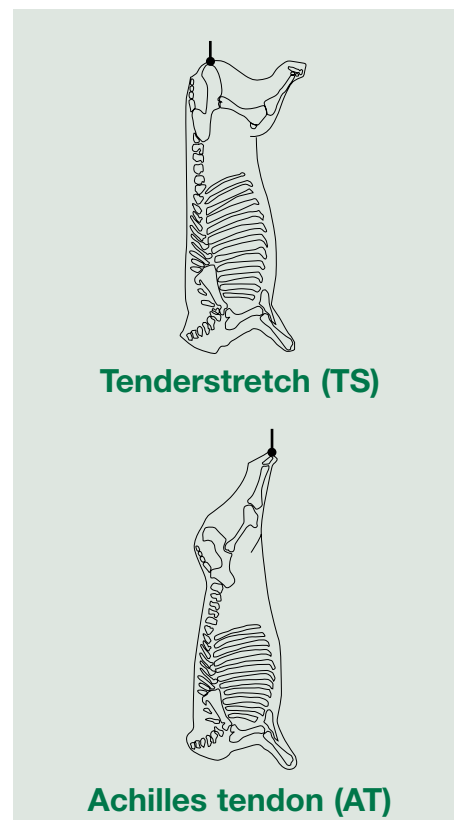


Diagram 1.



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

Cut	Achilles		Tenderstretch	
	MSA score	MSA grade	MSA score	MSA grade
<b>Cube roll</b>	61	3	66	4
<b>Striploin</b>	51	3	59	3
<b>Rump</b>	50	3	57	3
<b>Tenderloin</b>	76	5	74	4
<b>Eye round*</b>	45	Fail	46	3

The above data is taken from a standard MSA carcass with the following specifications: HSCW 240kg; male; 80mm hump; ossification 150; MSA marbling 270; rib fat 7mm; pH 5.55; loin temp 7.0°C; ageing 5 days, cooking method grill and non HGP-treated.

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.

Days age	Cube roll MSA score	
	Achilles	Tenderstretch
<b>5</b>	61	66
<b>14</b>	63	67
<b>21</b>	65	68
<b>28</b>	66	69

The above data is taken from a standard MSA carcass with the following specifications: HSCW 240kg; male; 80mm hump; ossification 150; MSA marbling 270; rib fat 7mm; pH 5.55; loin temp 7.0°C; cooking method grill and non HGP-treated.

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## Why is tenderstretch not used more widely?

Although tenderstretch was proven to be effective in improving tenderness twenty years ago, it was not widely adopted due to the perceived inconvenience, extra costs and the lack of financial incentive for improved eating quality. MSA grading quantifies the benefit of tenderstretch, offering the potential to increase returns. This has resulted in several MSA abattoirs adopting the process.



A tenderstretch carcass.

## For more information

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



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Released: September 2018  
ISBN: 1 74036 391 4  
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ABN 39 081 678 364