

On farm tips & tools

Meat Standards Australia : MSA11

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 (TS) carcasses are suspended by the pelvis. Tenderstretch carcasses may be hung either from the pelvic bone or through the ligament that runs down the back and over the tail of the animal (illiosacral ligament).

How does tenderstretch work?

As the carcass is chilled, 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.

When a carcass is tenderstretched, the carcass is suspended by the pelvis so that 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.

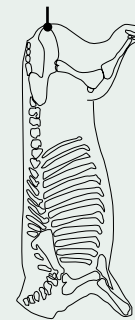
Tenderstretching can be done by a variety of methods. The most common is by positioning the hanging hook under the ligament that runs down the back of the animal (illiosacral ligament) or under the Aitch bone of the pelvis.



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 which utilise tenderstretch hanging as it will improve MSA grading results.

Diagram 1



Tenderstretch (TS)



Achilles tendon (AT)



Does tenderstretch improve all cuts?

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
Cube Roll	59	3	64	4
Striploin	49	3	57	3
Rump	47	3	52	3
Tenderloin	75	4	70	4
Eye Round*	49	3	49	3
Topside*	43	Ungrade	52	3

The above data is taken from a standard MSA carcass with the following specifications: HSCW 240kg, male, 25% *Bos indicus*, ossification 160, US marbling 230, meat colour 1C, rib fat 7mm, pH 5.55, loin temp 7.0°C, ageing 5 days, cooking method grill or *roast

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 *Bos indicus* cattle (see MSA tips & tools *The effect of Bos indicus & tropical breed content 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 5 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
5	59	64
14	61	65
21	63	66
28	65	67

The above data is taken from a standard MSA carcass with the following specifications: HSCW 240kg, male, 25% *Bos indicus*, ossification 160, US marbling 230, meat colour 1C, rib fat 7mm, pH 5.55, loin temp 7.0°C, cooking method grill.

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. Producers supplying these abattoirs will receive superior grade results from cattle supplied.



A tenderstretch carcass

For more information

Visit the MLA web site at www.mla.com.au
Or contact your nearest MSA grading office or MLA for other tips & tools on the factors that affect eating quality.

Contact

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