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# 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.

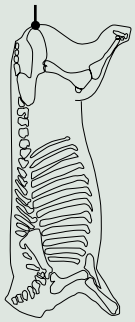
When a carcase is tenderstretched, and suspended by the pelvis, the leg drops down at a 90˚ angle. As a result, a number of muscles are held in a stretched position so they cannot contract during rigor mortis. This is shown in Diagram 1. Tenderstretch is most effective in the hindquarter and has a varying 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.
- Producers may consider using abattoirs that utilise tenderstretch hanging as it will improve MSA grading results.

## Does tenderstretch improve all cuts?



Tenderstretch (TS)

Achilles tendon (AT)

*Diagram 1.*

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

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

*The above data is taken from a standard MSA carcase 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 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.

The table below 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.

| Days age | Cube roll MSA score | |
|---|---|---|
| | Achilles | Tenderstretch |
| **5** | 61 | 66 |
| **14** | 63 | 67 |
| **21** | 65 | 68 |
| **28** | 66 | 69 |

*The above data is taken from a standard MSA carcase 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.*

## 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 carcase.*

## For more information

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

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