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# Using the MSA Index to optimise beef eating quality

## What is the MSA Index?

The MSA Index is a single number and standard national measure of the predicted eating quality and potential merit of a carcase.

The MSA Index is a number between 30 to 80, expressed to 2 decimal places (ie 54.62), to represent the eating quality potential of a whole carcase. The MSA Index is independent of any processing inputs and is calculated using only attributes influenced by pre-slaughter production. It is a consistent benchmark which can be used across all processors, geographic regions and over time. It reflects the impact on eating quality of management, environmental and genetic differences between cattle at the point of slaughter.

## How is the MSA Index calculated?

The MSA Model predicts the eating quality of 39 cuts in a carcase using the measurements collected by accredited MSA graders.

MSA eating quality scores are the combination of tenderness, juiciness, flavour and overall liking of beef. The MSA Index is a weighted average of these scores for the 39 MSA cuts for the most common corresponding cooking method. It is not a yield measurement.

The MSA Index is a tool to be used by producers and lot feeders. Inputs in the MSA model controlled by the processor, for example hang method, days aged, ultimate pH (within the acceptable range), and loin temperature are set as default values. The MSA Index is calculated for Achilles hung carcases with 5 days ageing.

A carcase with a higher MSA Index will have higher beef eating quality scores for many cuts compared to a lower MSA Index carcase. The changes in eating quality of individual muscles will depend upon the different combinations of carcase inputs affecting cuts in different ways. This is why the MSA Index is a measure of the average eating quality of the whole carcase.

## Key points

- The MSA Index is a weighted average of the predicted MSA eating quality scores (MQ4) of 39 MSA cuts in a carcase
- The MSA Index is a number between 30 to 80, expressed to 2 decimal places
- It is a tool that producers and lot feeders can use to benchmark the impact of genetic and management interventions on eating quality, across time periods
- Producers can monitor changes in eating quality between slaughter groups, seasons and years
- It also provides a useful national and regional benchmark for beef eating quality, across time and seasons so changes in beef eating quality can be monitored

## Why is the MSA Index useful?

Producers are able to access MSA feedback for individual carcase traits including carcase weight, rib fat, MSA marble score, ossification score, HGP status, hump height and sex. However it is difficult to assess the importance of these individual traits on eating quality and how changes in breeding and genetics or management decisions impact on the eating quality of the carcase. The MSA Index combines the impact of all these inputs and allows producers to evaluate changes in their business, to drive a faster rate of gain in eating quality.

With the goal to improve eating quality for the consumer, the producer and lot feeder are faced with how to economically improve eating quality and the MSA Index through genetics and management interventions.

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## Do I have to do anything different on-farm?

Producers are not required to do anything different on-farm to prepare cattle and consign them for MSA. The MSA Index forms a feedback tool to monitor the changes that have occurred in the past as well as make predictions about future changes and how this will impact on the eating quality of your cattle.

## What impacts on the MSA Index?

The key factors impacting on eating quality influenced by the producer are:

- Tropical breed content (TBC), verified or determined by hump height measurement
- MSA marbling score
- Ossification score
- Hormonal Growth Promotant (HGP) status
- Milk-fed vealer category
- Saleyard status

These inputs have a very high or high impact on the MSA Index of a carcase (Table 1). The magnitude of effects shown in Table 1 are an indication only, as the relative importance of the different traits in changing the MSA Index will vary slightly for each producer.

*Table 1: The effect of carcase attributes on the MSA Index*

| Carcase input | Size of effect on the MSA Index (units) | Clarification of effect | Relative importance of these traits in changing the MSA Index* |
|---|---|---|---|
| HGP status | 5 | The MSA Index of carcases with **no** HGP implant is around 5 Index units higher | **Very High** |
| Milk-fed vealer | 4 | The MSA Index of milk fed vealer carcases is around 4 index units higher | **Very High** |
| Saleyard | 5 | Carcases which were consigned directly to slaughter and NOT processed through a saleyard have an MSA Index around 5 index units higher | **Very High** |
| MSA marbling | 0.15 | As MSA marbling score increases by 10, the MSA Index increases by around 0.15 index units | **High** |
| Hump height (for cattle greater than 0% TBC)** | -0.7 | As hump height increases by 10mm, the MSA Index decreases by around 0.7 units In carcases which have no TBC, hump height has no impact on MSA Index | **High** |
| Tropical Breed Content (TBC)** | 0% = 0<br>12% = -1.6<br>18% = -3.2<br>25% = -3.9<br>38% = -4.7<br>50% = -5.2<br>75% = -5.5<br>100% = -6.3 | As declared TBC content increases from 0 to 100%, the MSA Index decreases by up to 6.3 units | **High** |
| Ossification score | 0.6 | As ossification score decreases by 10, the MSA Index increases by 0.6 index units | **High** |
| Rib fat | 0.1 | As rib fat increases by 1 mm, the MSA Index increases by 0.1 index units | Medium |
| Hot standard carcase weight (HSCW) | 0.01 | As HSCW increases by 1kg, the MSA Index increases by <0.01 index units | Low |
| Sex | 0.3 | With low ossification values, females have a higher index value than steers by around 0.3 index units | Low |

The values presented in Table 1 are the average effect calculated for 2.8 million carcases across all states of Australia.

* Relative importance indicates the size of effect changing that trait will have on the MSA Index within a herd, if all other traits remained the same. Some traits may have a large impact but are difficult for a producer to alter.

** Hump height can be used in conjunction with carcase weight as the determinant or verification of TBC during MSA grading.

Using the size of effects from Table 1, producers can estimate how much their MSA Index will change as a result of changes in genetic or management interventions.

## Using the MSA Index to generate change

The MSA Index will allow processors to benchmark their suppliers by evaluating the eating quality of the carcases that they purchase. Producers can change the MSA Index of their carcases to ensure they supply carcases of the desired eating quality for a processor.

Table 2 provides an example of changes made by a producer to supply cattle to a new market, which required cattle to be heavier at the same age with more marbling.

*Table 2: The impact of livestock production changes on the MSA Index*

| Trait | Carcase 1 | Carcase 2 | Change in MSA Index |
|---|---|---|---|
| Carcase weight (kg) | 260 | 280 | + 0.12 |
| MSA marbling | 280 | 300 | + 0.33 |
| Ossification score | 150 | 150 | 0 |
| TBC (%) | 0 | 0 | 0 |
| Hump height (mm) | 50 | 50 | 0 |
| Rib Fat (mm) | 10 | 12 | + 0.18 |
| Sex | M | M | 0 |
| HGP | No | No | 0 |
| Milk-fed vealer | No | No | 0 |
| Saleyard | No | No | 0 |
| **MSA Index** | **59.67** | **60.30** | **+ 0.63** |

***Increase marbling –*** To increase marbling through genetic management, producers can purchase sires with higher Estimated Breeding Values (EBVs) for Intramuscular Fat (IMF%) to increase marbling in their progeny. Ensuring animals are finished on a high plane of nutrition prior to slaughter will also aid in ensuring marbling is developed.

An increase in MSA marbling of 20 points equates to an actual IMF % increase of around 0.4%. The sire of carcase 2 would need an IMF% EBV of around 0.8% higher than the sire of carcase 1 to see an increase of 20 MSA marbling points in their progeny.

***Increased carcase weight and rib fat depth –*** To achieve heavier carcases at the same maturity (ossification), producers could use sires with higher 400 or 600-day growth EBVs and/or increase the nutritional value of feed to enhance the growth rate of the animals. If positive genetic selection pressure was placed on IMF and on rib and rump fat EBVs, then heavier carcases will also be fatter at the rib site. Improving nutrition to increase growth may also increase carcase fatness.

## How to access the MSA Index

Producers can access MSA Index values for carcases in the online feedback system, myMSA at www.mymsa.com.au Producers can also use the MSA calculator at this website to guide decision making by predicting the impact of production changes on the MSA Index.

***Scan to use the MSA Index mobile calculator***

***Or go to www.mymsa.com.au/msamobile on your mobile device.***

## For more information

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

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