MEAT & LIVESTOCK AUSTRALIA

2019
AUSTRALIAN BEEF EATING QUALITY INSIGHTS

MEAT & LIVESTOCK AUSTRALIA

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Introduction

The 2019 Australian Beef Eating Quality Insights (ABEQI) is generated from the analysis of Meat Standards Australia (MSA) grading results of 6.6 million cattle, processed and graded through 42 MSA licensed processors across the country during the 2017-18 and 2018-19 financial years.

MSA is the world's leading eating quality grading program for beef, providing producers with the information and tools to understand the trends and drivers of eating quality. This allows producers to implement improvement strategies and create opportunities for improved returns.

This report aims to help beef producers optimise the eating quality of their cattle by demonstrating the impact of various production factors on the MSA Index.

This is the third time this benchmarking exercise has been in conducted in Australia, following the 2015 Australian Beef Eating Quality Audit, and the 2017 ABEQI, which established a baseline from which to benchmark the national herd. This initiative was made possible with the introduction of the MSA Index in 2014.

The biennial release of the report resources the Australian beef industry to measure its improvements and identify shortfalls.

Methodology

This report was generated through the analysis of all MSA-graded cattle in the 2017-19 financial years using quantitative objective and subjective data collected by MSA-accredited graders

All data analysis related to the MSA Index outcomes are based on the location of the MSA-registered property the cattle were consigned from, rather than the location of the processor. This method was chosen to give a more accurate indication of state-based production opportunities and challenges.

In 2017-19 6.6 million cattle were graded against MSA standards. Compliant carcases are eligible for an MSA Index score. This report uses the MSA Index scores of 6.2 million cattle.

myMSA – the home of carcase feedback

myMSA was released in 2014 and in the years since more than 11,000 producers have logged into the portal 59,000 times to access carcase grading feedback.

myMSA allows producers to:

- Benchmark the performance of their herd against the average for their region, state, nationally and by selecting for feed type and hormonal growth promotant (HGP) status
- Create full sets of carcase feedback
- Look at performance trends
- Create customised datasets
- Download data to import into farm software
- Use the MSA Index calculator to determine the potential change in eating quality with on-farm management changes. The calculator has been accessed 12,289 times since 2017.

Why benchmarking is important

Benchmarking is the process of measuring performance, as an industry or individual business, with the objective to identify opportunities for improvement. It provides producers with the ability to identify strengths and weaknesses within their business, enabling them to make informed decisions and to better meet customer specifications. The benchmarking data presented in this report, and tools available on myMSA allow producers to:

- Measure and compare current compliance and eating quality performance
- Identify key drivers of eating quality to inform on-farm decisions for animal and business management practices
- Identify areas of performance where improvement can be made.

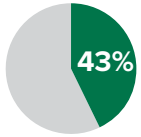
National snapshot (at 30 June 2019)

47,426
MSA registered producers

6.6 million
Head of cattle presented for MSA grading (Figure 1)

39
MSA licenced beef processors

57.62
Average MSA Index
for 2017-19



MSA graded cattle represented 43% of the national adult cattle slaughter (Figure 2)

195
MSA licenced beef brands

Figure 3. Proportion of MSA graded cattle by state

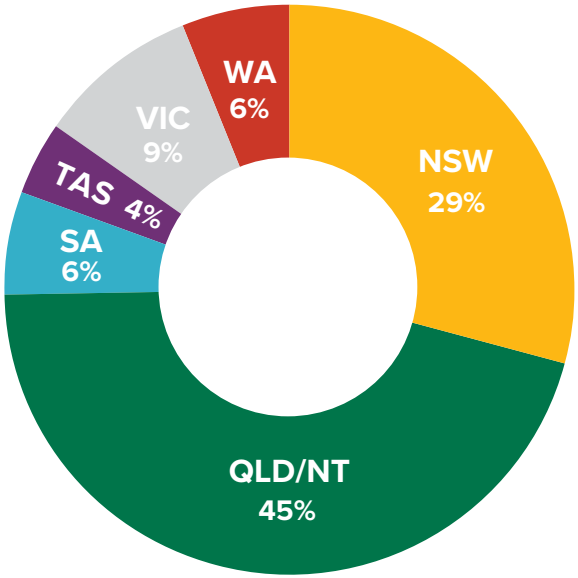


Figure 1. Number of MSA graded cattle – national

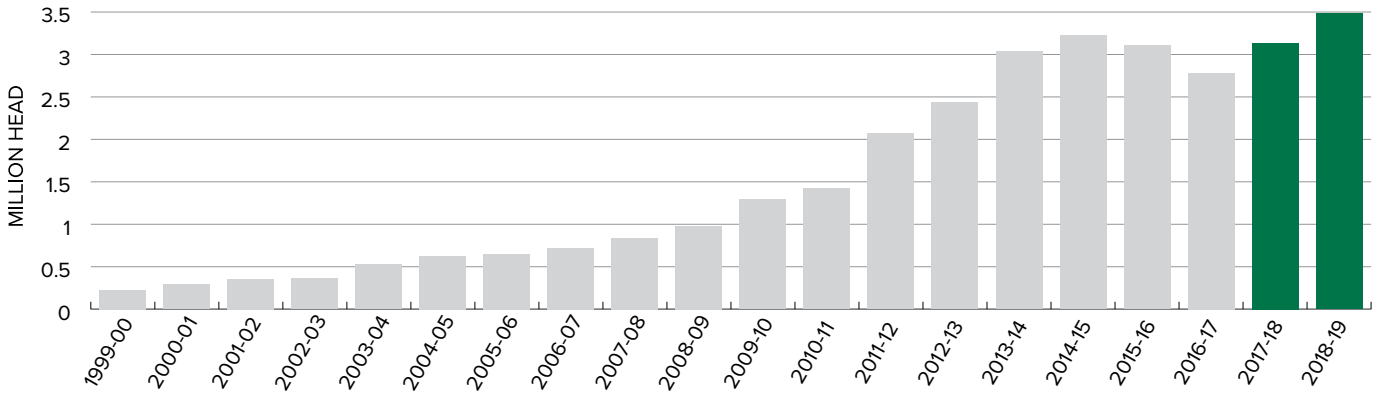
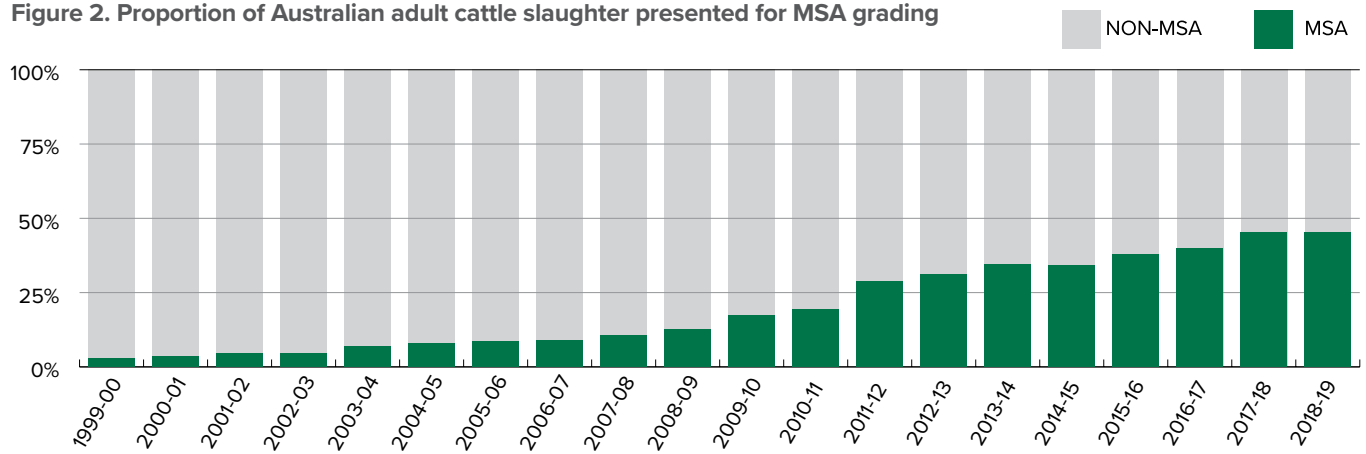


Figure 2. Proportion of Australian adult cattle slaughter presented for MSA grading



Setting eating quality benchmarks with the MSA Index

What is the MSA Index?

The MSA Index is a number between 30 and 80 expressed to two decimal places i.e. 54.62. It is the weighted average of the predicted MSA eating quality scores of 39 cuts in the carcase.

The Index is a standard measure of the predicted eating quality potential of a whole carcase and is calculated using only attributes influenced by pre-slaughter production. It reflects the impact of management, environmental and genetic differences between cattle at the point of slaughter and can be used across all processors, geographic regions and over time.

The value of MSA compliance

In many instances, processors and brand owners offer financial incentives for improved MSA compliance and compliance to eating quality specifications.

In 2017-19, young cattle (typically non-grainfed and 0-2 tooth categories) that met MSA and company requirements on average, potentially received an additional $0.27/kg over-the-hooks (OTH) compared with non-MSA cattle. The average animal consigned for MSA grading in 2017-19 weighed 304kg, which potentially equated to an additional $80.56.

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*
Hormonal growth promotant (HGP) status	5	The MSA Index of carcases with no HGP implant is about five index units higher	Very high
Milk-fed vealer	4	The MSA Index of milk-fed vealer carcases is about four index units higher	Very high
Saleyard	5	Carcases that were consigned directly to slaughter and NOT processed through a saleyard have an MSA Index about five index units higher	Very high
MSA marbling	0.15	As MSA marbling score increases by 10, the MSA Index increases by about 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 about 0.7 units. In carcases that have no Tropical Breed content (TBC) , hump height has no impact on MSA Index	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 1mm, 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 less than 0.01 index units	Low
Sex	0.3	With low ossification values, females have a higher index value than steers by about 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 that 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.

Figure 4. National MSA Index distribution 2017-19

Source: Meat & Livestock Australia

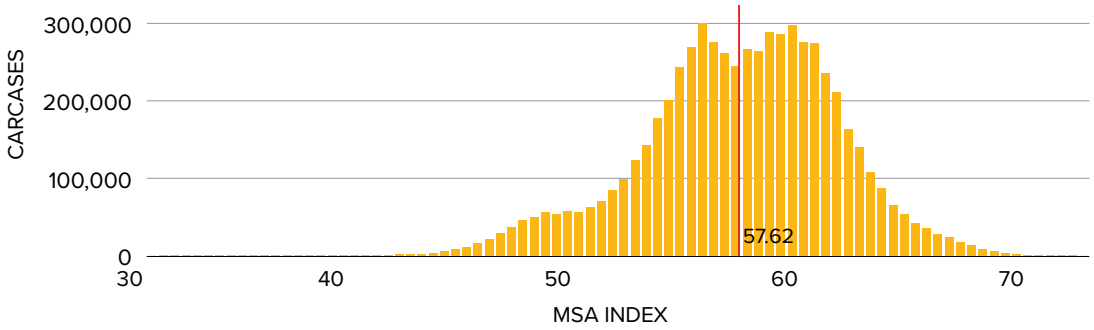
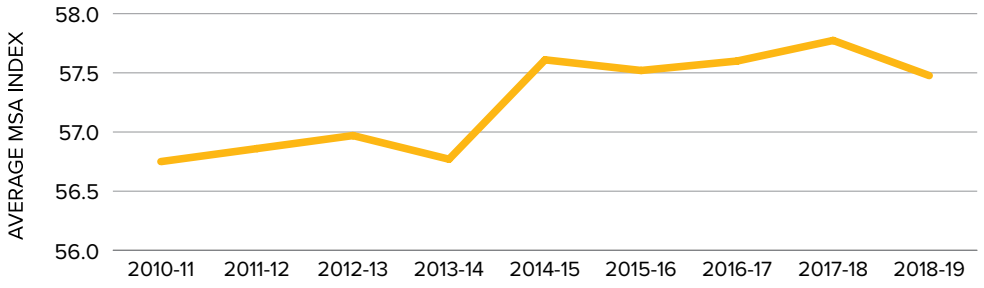


Figure 5. Change in national MSA Index since 2010-11

Source: Meat & Livestock Australia



Current Australian eating quality performance

The average MSA Index for 2017-19 was 57.62. Figure 4 shows the national distribution of the MSA Index for MSA graded carcases throughout 2017-19. MSA Index values from the 6.6 million MSA-compliant carcases ranged from 31.5 to 73.

The two peaks in the MSA Index distribution as seen on Figure 4 and Figure 7 (page 9), are indicative of two distinct populations and can be attributed to a range of fixed and variable on-farm management interventions, including, but not limited to, the impact of hormonal growth promotants (HGPs), marbling, ossification, and hump height.

The average MSA Index of the national herd has improved by 0.73 Index points since 2010-11 (Figure 5). This improvement is reflective of changes in on-farm management interventions.

Figure 6. Understanding the MSA Index

The numbers on each muscle illustrate the individual predicted eating quality scores of 39 cuts across the carcase. Improving the MSA Index, means the eating quality scores of each cut also improve.

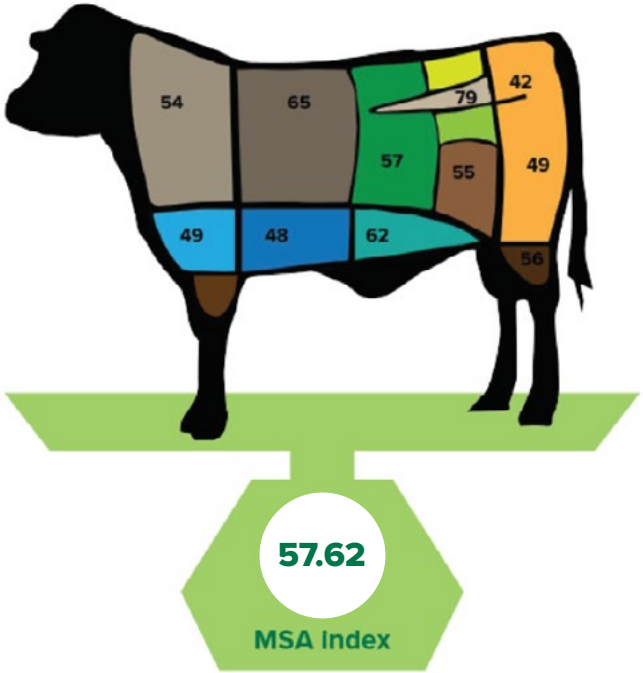


Illustration is for example purposes only.

Benchmarking individual MSA Index performance

This report is intended to rank carcases by performance bands from bottom 1% to the top 1% to allow producers to benchmark how their cattle are performing against others in their state.

What are the MSA Index percentile bands?

An MSA Index percentile band provides an indication of an individual's average MSA Index performance relative to the performance of others (Table 2). For example, an average MSA Index greater than 62.79 places a herd in the top 10% of producers in Australia in regards to eating quality performance (Figure 7).

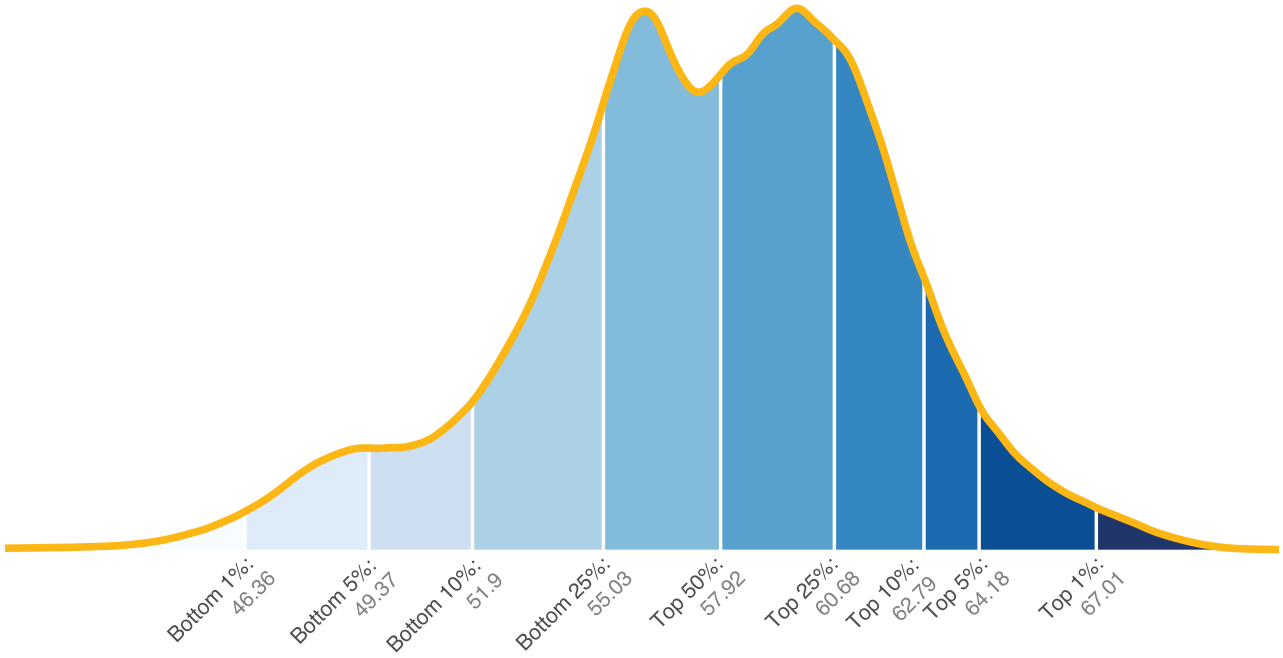
Understanding the specific carcase attributes that determine a percentile band gives producers the tools to target production factors to improve their herd's performance.

Table 2. National MSA Index percentile bands by state 2017-19

PRODUCER STATE	TOP 1%	TOP 5%	TOP 10%	TOP 25%	TOP 50%	BOTTOM 25%	BOTTOM 10%	BOTTOM 5%	BOTTOM 1%
NSW	66.21	63.73	62.53	60.48	57.67	55.6	53.85	52.04	47.45
QLD/NT	67.25	64.18	62.17	59.38	56.37	53.28	49.68	48.05	45.45
SA	67.89	65.27	63.96	62.23	60.49	58.47	54.91	53.31	50.08
TAS	65.96	63.85	62.82	61.39	59.82	58.15	55.69	51.29	47.20
VIC	66.14	64.24	63.29	61.83	60.20	57.56	54.33	53.06	50.66
WA	68.02	65.05	63.54	61.77	59.99	57.90	55.71	54.87	52.95
NATIONAL	67.01	64.18	62.79	60.68	57.92	55.03	51.90	49.37	46.36

Figure 7. Visualising MSA Index rankings (national)

Source: Meat & Livestock Australia



MSA compliance

In 2017-19 94% of carcases met the MSA minimum requirements. The number one reason for non-compliance was high ultimate pH (>5.71), followed by fat cover (<3mm of rib fat). Figure 8 illustrates the reasons for non-compliance throughout the past two years.

Company specifications are additional requirements set by processors and brand owners to meet their customer's requirements. The extra requirements can be based on eating quality, or other carcase attributes.

At both a national and a state level, variation in compliance seen across the year is driven predominantly by non-grainfed systems that are impacted by seasonal variation.

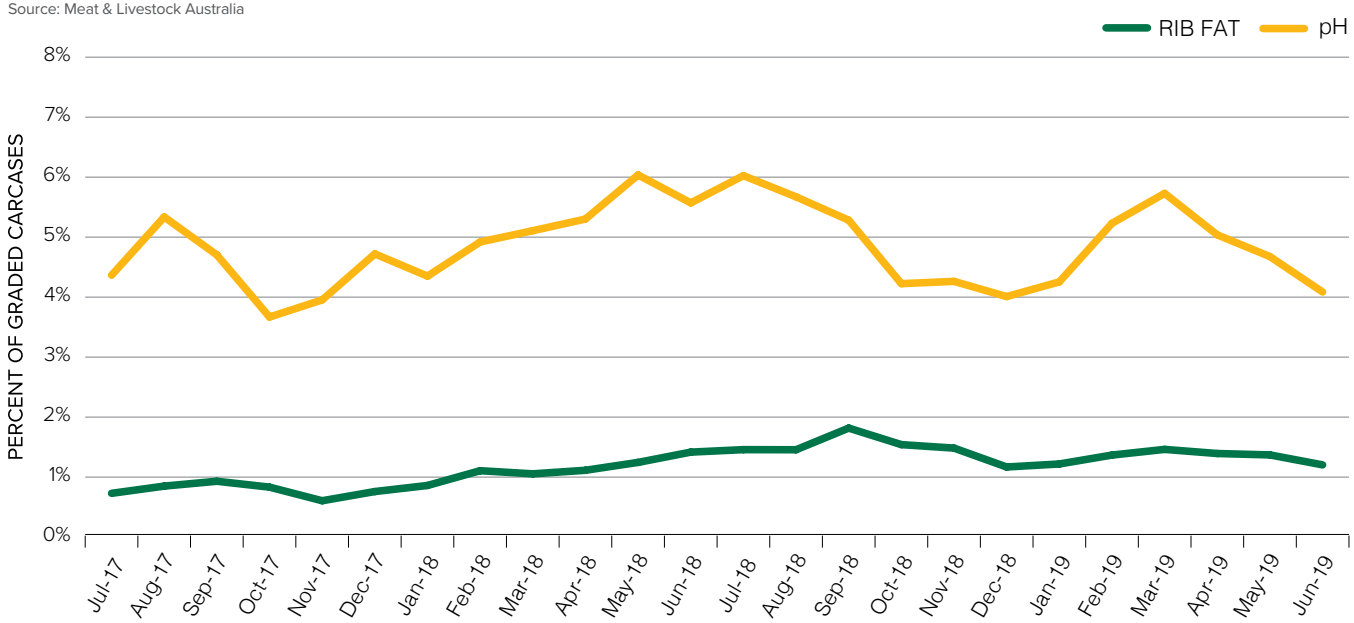
MSA minimum requirements

To be eligible for an MSA Index score, MSA graded carcases must have:

- Met MSA pre-slaughter requirements
- pH less than 5.71
- Minimum rib fat of 3mm
- Adequate fat coverage over all major primals.

Figure 8. National non-compliance by attribute 2017-19

Note: Carcases can be recorded as not meeting specifications for multiple attributes.
Source: Meat & Livestock Australia



Victoria had the highest overall compliance to MSA minimum requirements at 95.6%, and Tasmania had the lowest at 90.5% (Figure 9). The higher compliance in New South Wales, Queensland, South Australia and Victoria may be attributed to a higher proportion of grainfed animals in these states, which have an inherently high compliance to MSA minimum requirements due to the consistent, high energy balanced ration they are fed prior to slaughter. Tasmania's pasture-based production system is more variable, being more greatly affected by climatic conditions.

Figure 9 shows that cattle treated with hormonal growth promotants (HGPs) have a higher rate of compliance compared to those without (96.6% and 92.6% respectively). It is possible to explain this by noting that the majority of HGP-treated cattle are also grainfed, which have a higher average rate of compliance to MSA minimum requirements, compared to non-grainfed cattle (97.9% and 90.1% respectively).

The higher incidence of non-compliance in females may be attributed to the finishing system. Only 34% of grainfed cattle are female, compared to 48% of non-grainfed cattle. Heifers in oestrous are also more susceptible to high ultimate pH due to extra pre-slaughter activity and stress.

Figure 9. Compliance to MSA minimum requirements by production type and state 2017-19

MSA performance by feed type

Effect of feed type on MSA performance

In 2017-19, 50% of MSA-graded cattle were identified as grainfed (Figure 10).

Queensland has the largest proportion of grainfed cattle supplied through the MSA program at 62%, while Tasmania had the lowest with 0% as the state's production system is dominated by non-grainfed production systems. See more information in the state breakdown from page 20.

3.1 million cattle were turned off Australian feedlots during 2017-19. Of these it is estimated that 55.4% were MSA-graded.

MSA compliance by feed type

Compliance to MSA minimum requirements differs between feed type groups.

In 2017-19, 9.9% of MSA graded non-grainfed carcases did not meet MSA minimum requirements compared with 2.1% of grainfed cattle. Figure 12 illustrates the difference in compliance by month for each feed type group.

Non-grainfed cattle display consistently higher non-compliance rates throughout the year and are also subject to greater variation in compliance rates. This is not surprising as this production system is more susceptible to seasonal fluctuations.

Figure 10. Proportion of MSA grainfed and non-grainfed carcases 2017-19 national

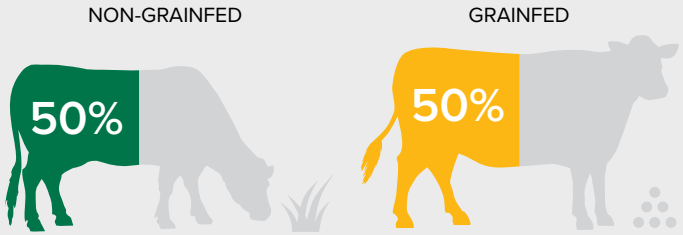
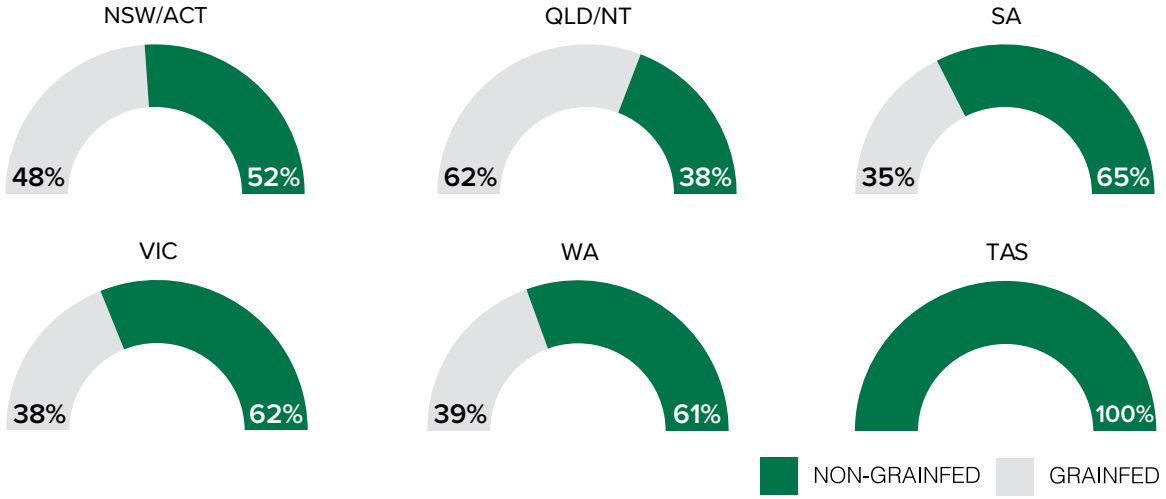
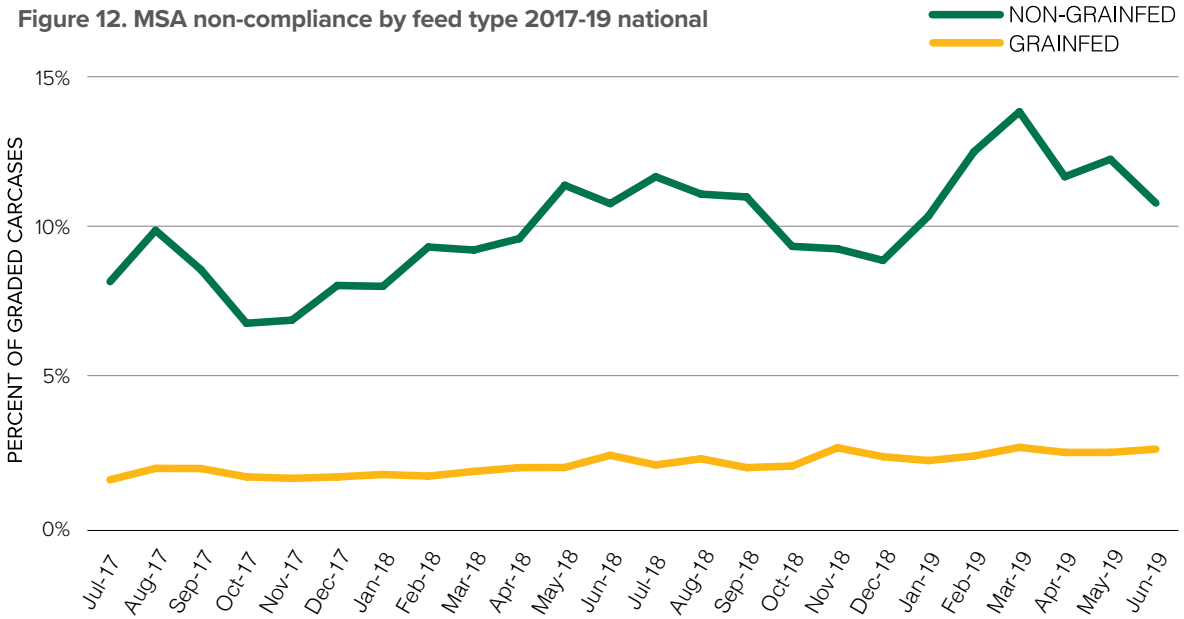


Figure 11. Proportion of MSA non-grainfed and grainfed carcases by state 2017-19



For the purposes of MSA data, grainfed cattle are defined as those that were lot fed at a registered National Feedlot Accreditation Scheme (NFAS) feedlot, and met the Australian grainfed beef minimum standard specifications. Non-grainfed cattle are defined as cattle derived from any production system that did not meet the grainfed specifications.

Figure 12. MSA non-compliance by feed type 2017-19 national



While each state will experience differences in seasonal conditions, on average there was an increased incidence of high pH in non-grainfed cattle in the autumn and winter months (depending on dominant rainfall).

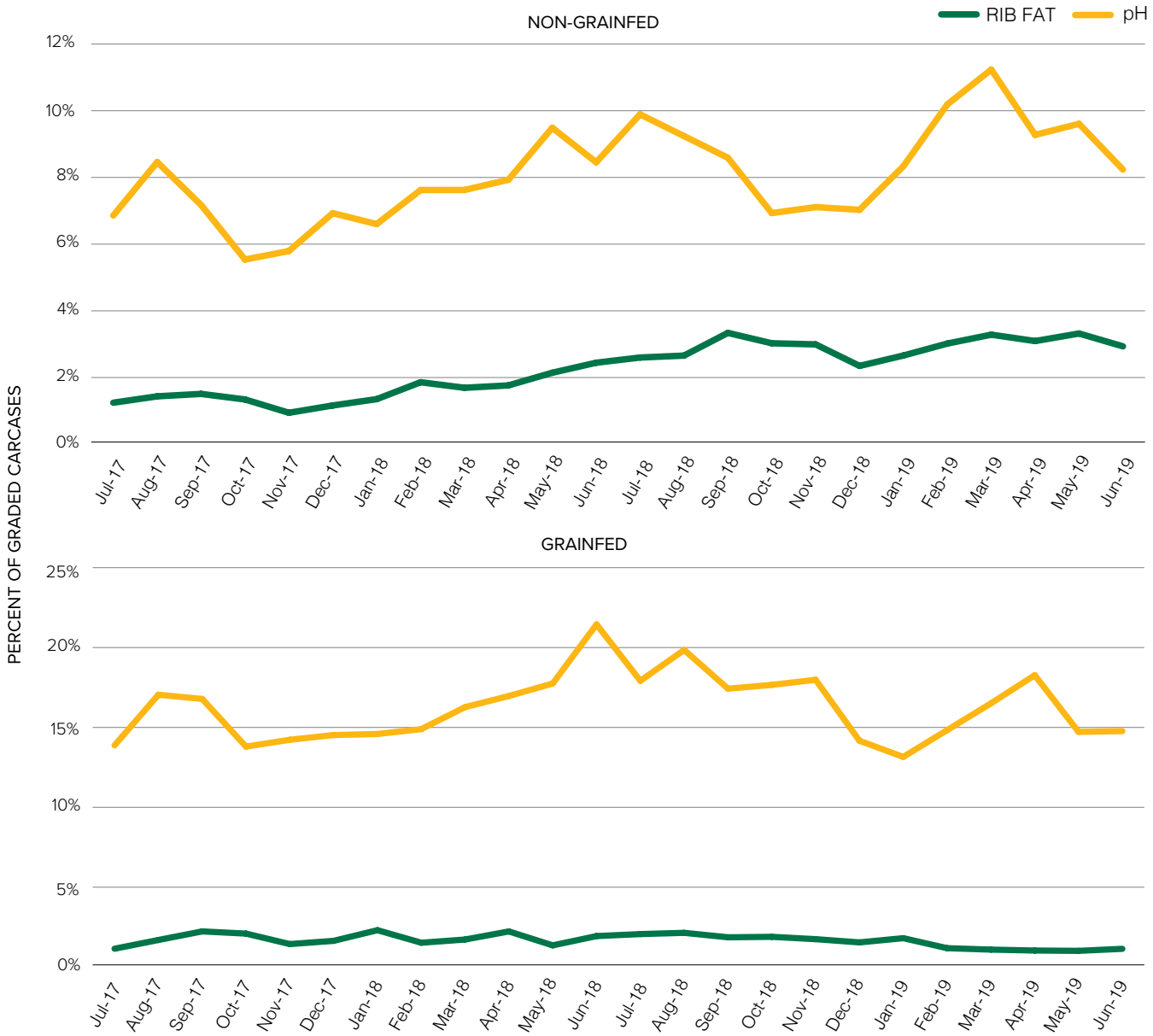
Grainfed cattle are typically less impacted by seasonal variation due to the consistent nutrition levels provided through a balanced, high-energy ration.

South Australia, Tasmania, and Western Australia tend to have high non-compliance during the summer-autumn period while in Queensland, non-compliance peaks from May to September (see State Snapshots from page 20).

Across all grainfed categories, or, number of days on feed, there was a consistent 98% compliance to MSA specifications.

In 2017-19 cattle on feed for 100-150 days, presented the largest number of animals for MSA grading at a total of 1.62 milion carcases. This category had a compliance rate of 97.8%. Cattle on feed for 150-200 days (270,000 carcases) comparatively had the highest compliance rate of 99.3% across all groups.

Figure 13 and 14. Reasons for non-compliance for grainfed and non-grainfed cattle in 2017-19



Note: carcases can be non-compliant for both.

Table 3. Average traits for MSA-compliant carcases by feed type

FEED TYPE	PERCENTILE BAND	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
GRAINFED	Top 5%	440	45	120	620	19	64.93
	Average	326	75	160	370	9	57.17
	Bottom 5%	228	130	200	210	4	48.70
NON-GRAINFED	Top 5%	370	40	120	480	14	63.39
	Average	283	65	170	330	7	58.10
	Bottom 5%	219	115	350	190	3	50.94

Figure 15. MSA Index distribution by feed type in 2017-19

Table 4. MSA Index percentile bands by feed type

FEED TYPE	TOP 1%	TOP 5%	TOP 10%	TOP 25%	TOP 50%	BOTTOM 25%	BOTTOM 10%	BOTTOM 5%	BOTTOM 1%
GRAINFED	67.54	64.93	63.30	60.48	56.96	54.38	50.73	48.70	46.35
NON-GRAINFED	65.75	63.39	62.38	60.79	58.73	55.82	53.10	50.94	46.39

Effect of feed type on the MSA Index

On average in 2017-19, grainfed carcases were 43kg heavier than non-grainfed carcases with similar average marbling, ossification and fat coverage measurements.

The average MSA Index for non-grainfed cattle was 0.93 points higher than grainfed cattle. This is likely due to the difference in the proportionate use of HGP treatments between the groups.

Both feed types follow a similar distribution pattern as the national distribution, with both groups experiencing two peaks. These peaks may be attributed to HGP usage or, to a lesser extent:

> Populations of animals with higher ossification

> Populations of animals with lower marbling.

Results show that there is a higher percentage of non-grainfed cattle with MSA Index values greater than 60.

> Non-grainfed cattle had an average MSA Index of 58.1 - a slight decrease of 0.38 from 2017.

> Grainfed cattle had an average MSA Index of 57.17 - an increase of 0.51 points on 2017.

Increasing carcase weight and minimising maturity or ossification development is a key factor in optimising eating quality performance.

Carcase traits impacting on the MSA Index by feed type

Key points

- Non-grainfed cattle had a larger proportion of cattle with ossification scores of 150 or less at 56% of the population compared to 46% of grainfed carcases.
- Differences in marbling distribution were small with a slightly larger proportion of non-grainfed cattle having marbling scores of less than 400.
- There is a larger proportion of non-grainfed cattle at lighter carcase weights than grainfed cattle.

Ossification refers to the physiological maturity of the carcase, and is measured on a scale of 100-590, with 100 being, physiologically, the 'youngest'. Animals that reach market weight at a younger age are likely to have lower ossification scores. Ossification is linked to an increased amount of connective tissue in the muscles, which has a negative effect on tenderness.

Ossification is the process whereby as an animal matures, cartilage present around the bones gradually fills with blood and turns to bone.

Figure 16. Ossification distribution by feed type 2017-19

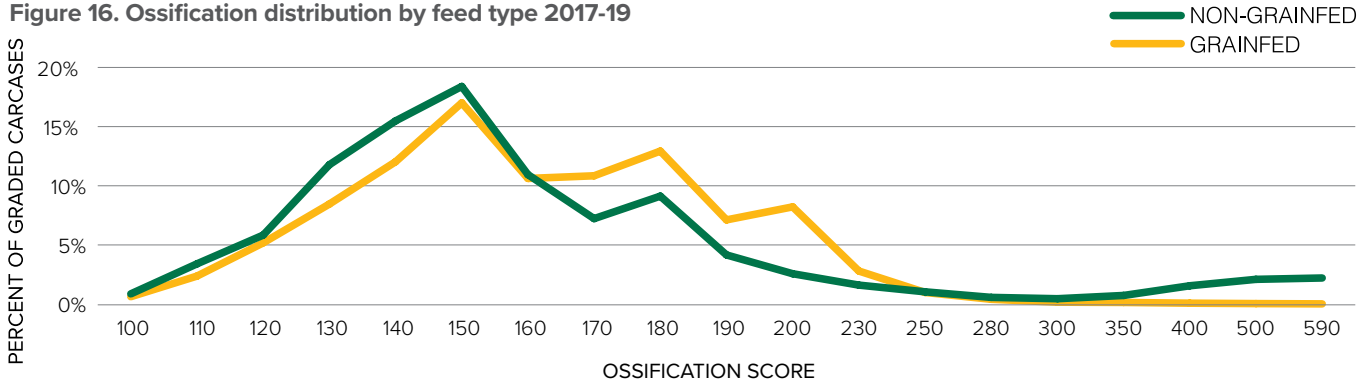
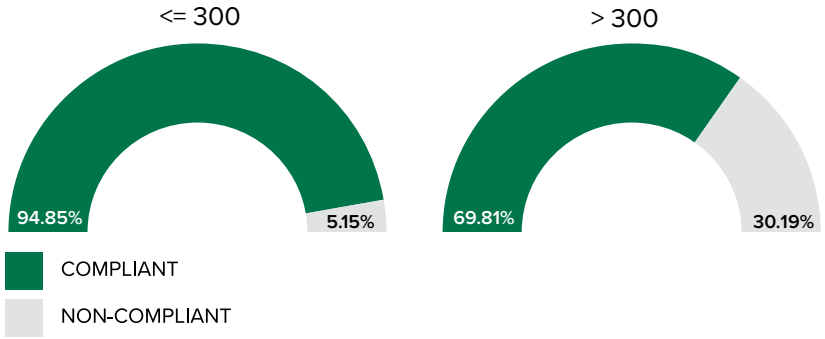


Figure 17. MSA non-compliance by ossification score 2017-19



In 2017-19, nearly 230,000 carcases were presented with ossification scores over 300. 97% of these were female. The non-compliance rates in these animals was noticeably higher at 30% than those with lower ossification scores achieving an average of 5% non-compliance.

Figure 18. Marbling distribution by feed type 2017-19

Note: MSA Marbling extends to a score of 1190 and this graph represents 95% of MSA data

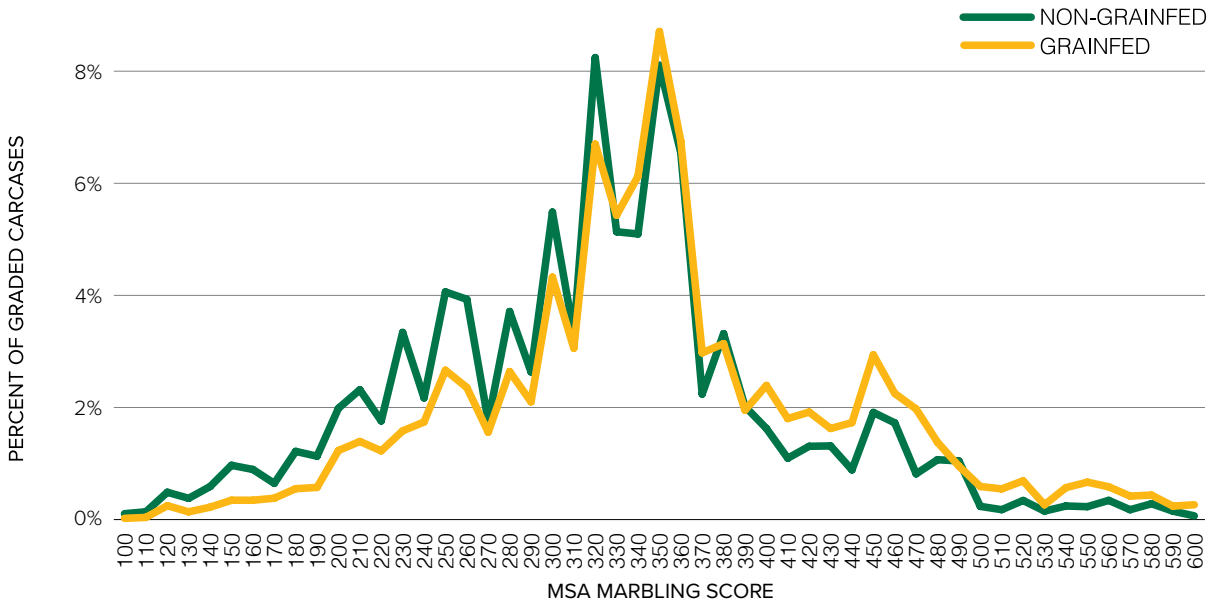
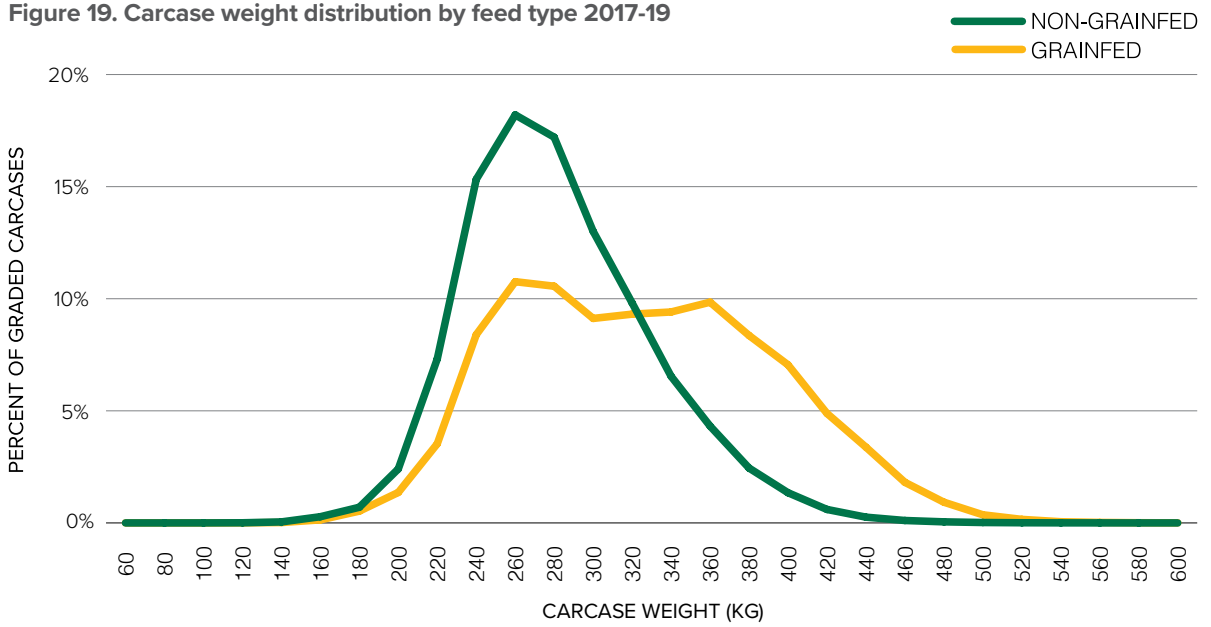


Figure 19. Carcase weight distribution by feed type 2017-19



Marbling

Figure 18 illustrates the distribution of MSA marbling scores by feed type. The similarity in distribution and variation within feed type is noticeable. Almost 73% of all grainfed carcases and just over 85% of non-grainfed carcases had a MSA Marbling score of 400 or less. This is approximately equal to an AUS-MEAT marbling score of 2 or less.

Carcase weight

At 326kg average hot standard carcase weight, grainfed MSA cattle were 43kg heavier than their non-grainfed counterparts at 283kg. This difference in average weights is likely driven by market and brand requirements underpinned by feed type specifications.

Table 5. Proportion of MSA marbling score ranges by feed type (%)

MSA MARBLING SCORE RANGE	GRAINFED	NON-GRAINFED
100–200	4.07	8.44
210–300	21.59	31.16
310–400	47.23	45.63
410–500	17.16	11.41
510–600	4.69	2.16
610–700	1.98	0.66
710–800	1.44	0.26
810–900	0.79	0.11
910–1000	0.46	0.04
1010–1090	0.3	0.02
1110–1190	0.27	0.01

Effects of hormonal growth promotants on the MSA Index

In 2017-19, 35% of MSA-graded cattle received Hormonal Growth Promotant (HGP) treatment.

HGPs have been proven to help increase productivity through weight gain and feed conversion efficiencies.

MSA consumer sensory testing has validated that HGP treatment has a negative impact on eating quality. Additionally, carcase attributes are also impacted by HGP treatment. For example, ossification increases with HGP use. The extent of the effect on ossification is variable depending on the timing of the implant. Cattle implanted with HGPs also tend to have lower intramuscular fat scores and lower MSA marble scores compared to HGP free cattle of the same weight and maturity.

Figure 20. Proportion of HGP-treated MSA graded cattle 2017-19

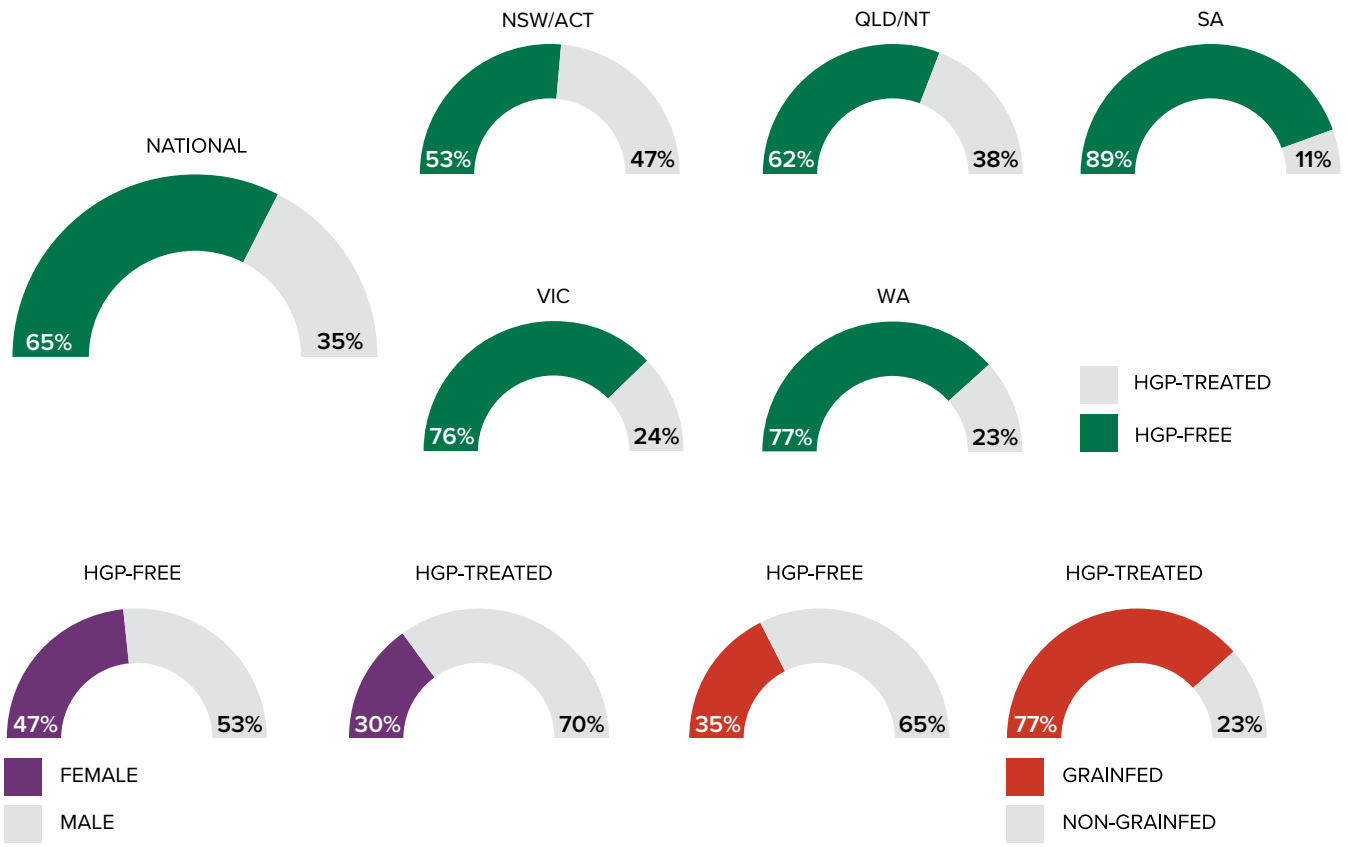


Figure 21. MSA Index distribution by HGP status in 2017-19

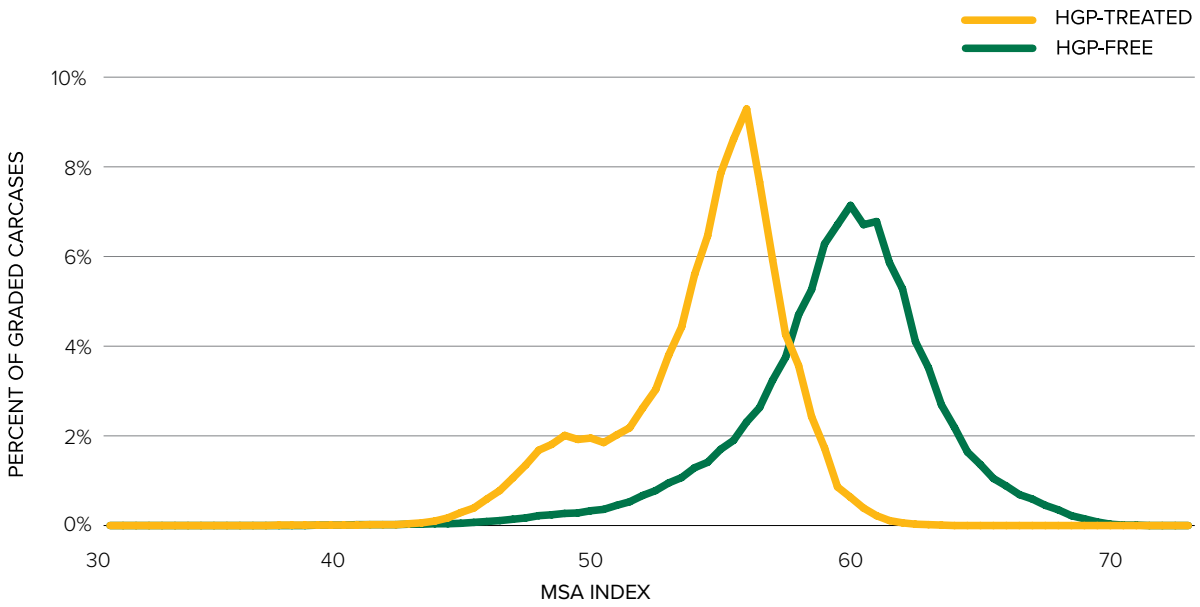


Figure 21 shows the distribution of the MSA Index for HGP status. The peaks of the HGP treated and HGP free populations are about four MSA Index points apart, reflective of the varying and combined impact of HGP on each cut in the carcase.

Table 6. Average carcase traits by HGP status in 2017-19

HGP STATUS	PERCENTILE BAND	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
HGP-FREE	Top 5%	400	40	110	580	16	65.06
	Average	291.5	70	170	350	8	59.52
	Bottom 5%	215.5	115	300	190	3	52.75
HGP-TREATED	Top 5%	435	45	230	220	17	58.53
	Average	326.4	80	170	350	9	54.24
	Bottom 5%	234.8	140	130	490	4	47.76

HGP status has a ‘very high’ importance rating for its ability to change the MSA Index (see page 7). Optimising other carcase traits of treated cattle such as marbling and ossification is important when aiming to increase MSA Index results.

Carcase traits impacting on the MSA Index by HGP status

HGP-treated cattle had a larger proportion of animals with heavier carcase weights, reflected in the average 34.9kg difference between the two groups.

The HGP-free group had 77% of cattle with an ossification of less than 170, compared to 58% in the HGP-treated group.

The HGP-free group had 79.40% with an MSA marble score of less than 400 compared to 78.71% in the HGP-treated group. This effect is likely due to an interaction between HGP usage and feed type. Although more grainfed cattle are HGP treated, they also tend to have higher marble scores.

Figure 22. Ossification distribution by HGP status 2017-19

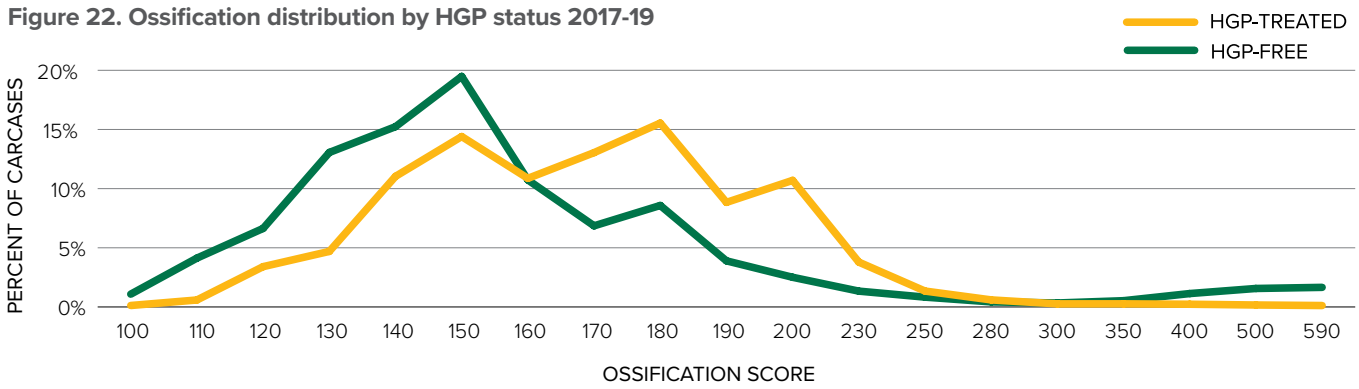


Figure 23. Marbling distribution by HGP status 2017-19

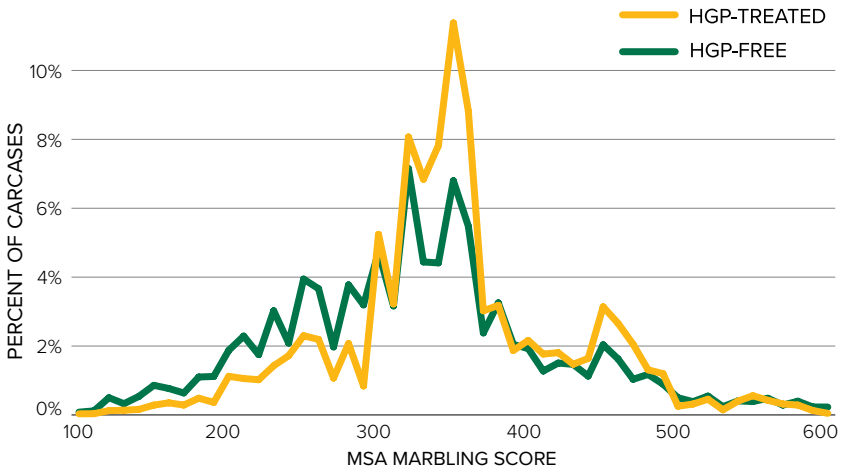


Figure 24. Carcase weight distribution by HGP status 2017-19

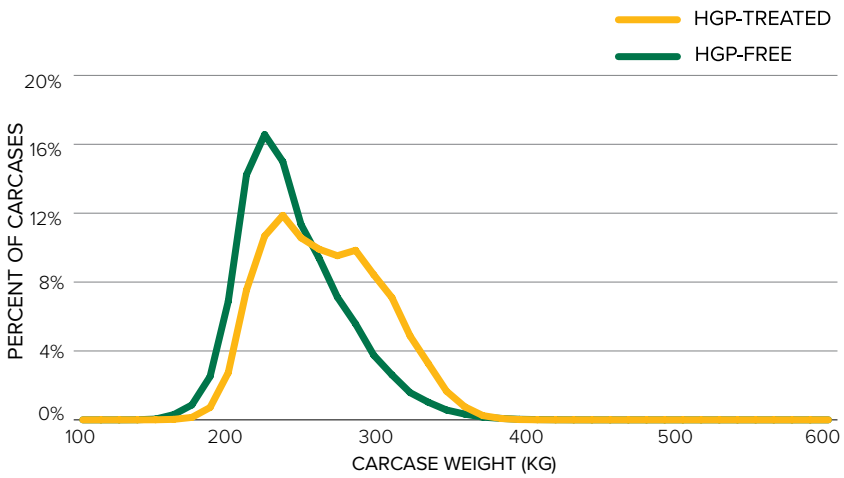
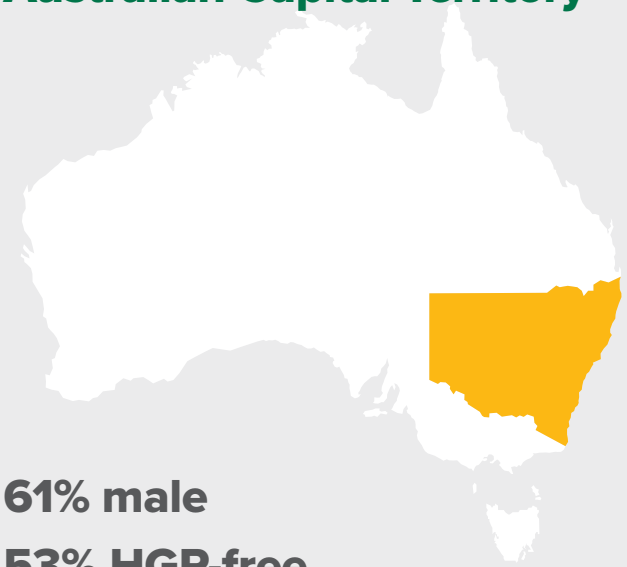


Table 7. MSA Index percentile bands by HGP status 2017-19

HGP STATUS	Top 1%	Top 5%	Top 10%	Top 25%	Top 50%	Bottom 25%	Bottom 10%	Bottom 5%	Bottom 1%
HGP-FREE	67.56	65.06	63.69	61.77	59.87	57.71	54.83	52.75	48.06
HGP-TREATED	60.09	58.53	57.75	56.42	54.99	52.59	49.14	47.76	45.53

STATE SNAPSHOTS

New South Wales and Australian Capital Territory



61% male

53% HGP-free

48% grainfed

More than 1.9 million MSA cattle were consigned from New South Wales and the Australian Capital Territory, representing 29% of all MSA-graded cattle in Australia in 2017-19.

38% of MSA-registered cattle producers reside in New South Wales and the Australian Capital Territory. This equates to 17,500 MSA-registered beef producers, with more than 6000 of these producers consigning cattle to the program in 2017-19.

Figure 25. NSW & ACT MSA grading volume 2017-19

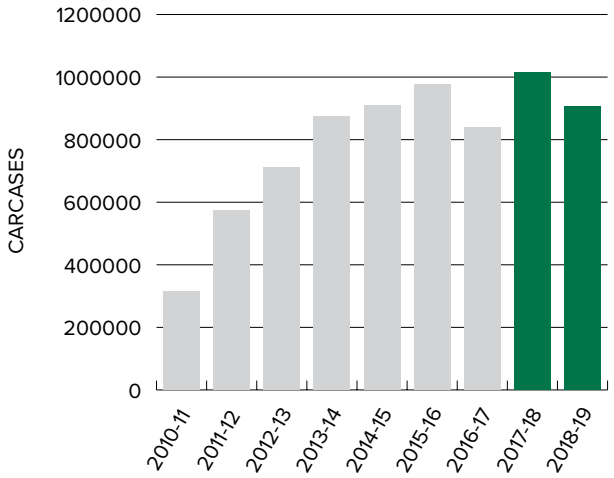


Figure 26. Proportion of adult cattle slaughtered in NSW & ACT and presented for MSA grading 2017-19

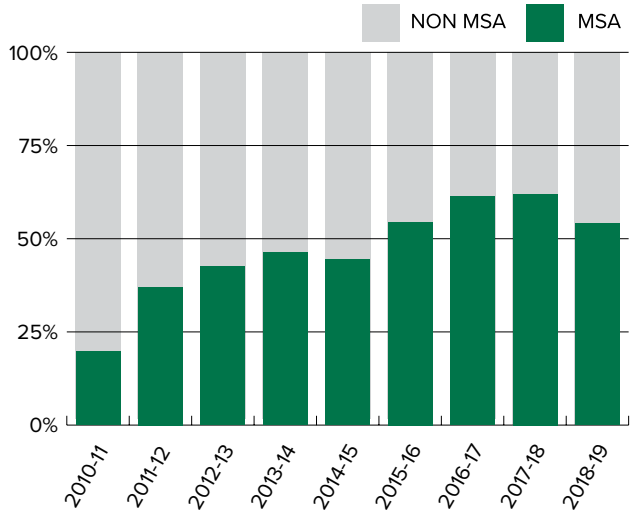


Figure 27. NSW & ACT MSA non-compliance 2017-19

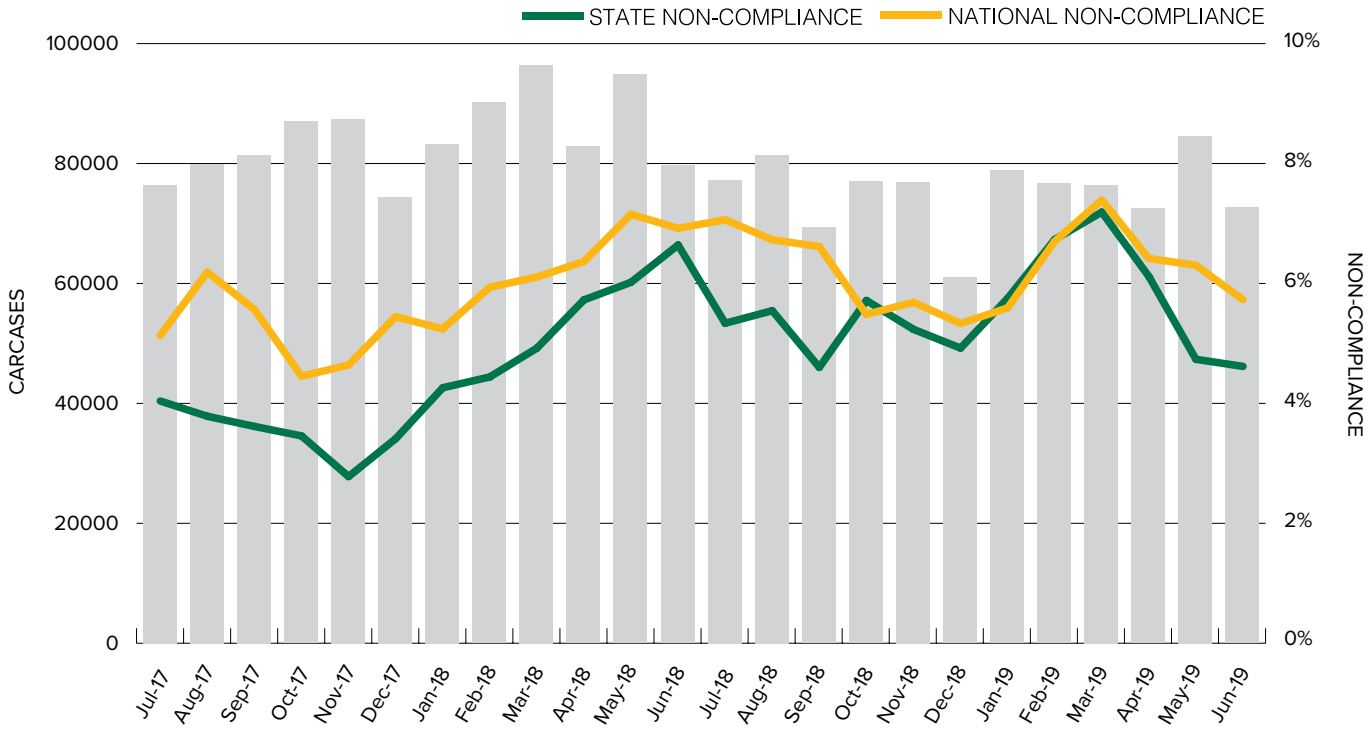


Figure 28. Proportion of NSW & ACT HGP-treated MSA graded cattle 2017-19

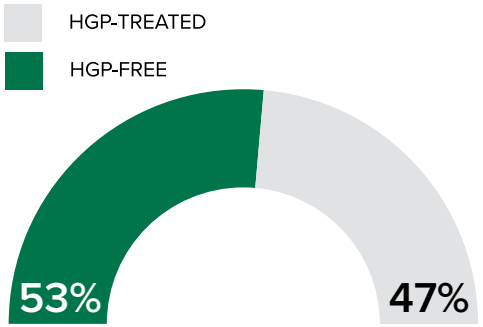


Figure 29. NSW & ACT compliance to MSA minimum requirements 2017-19

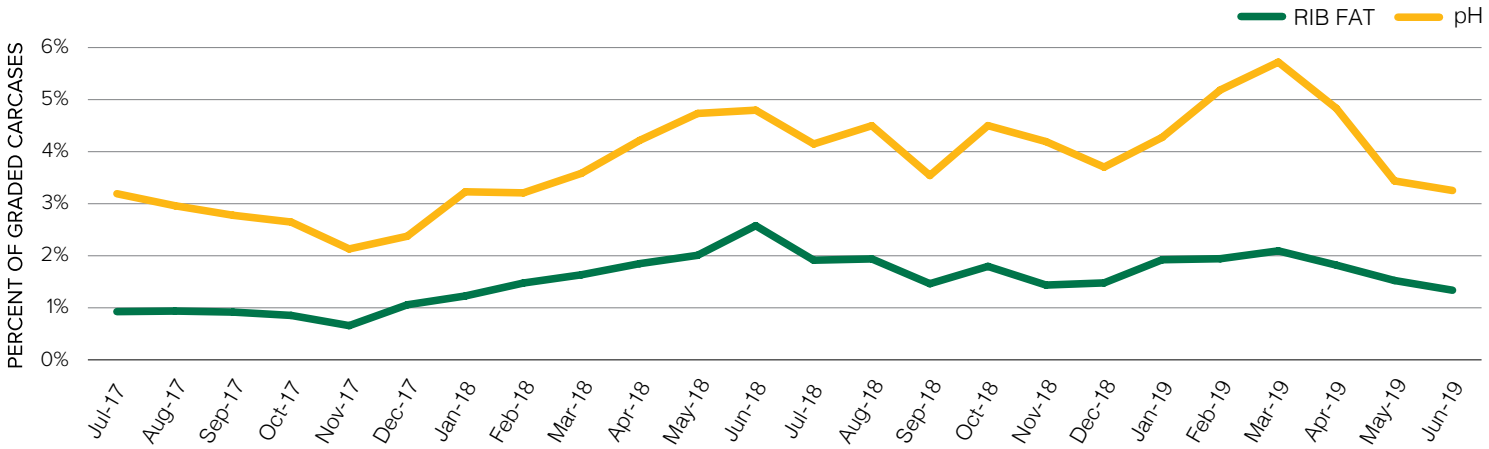
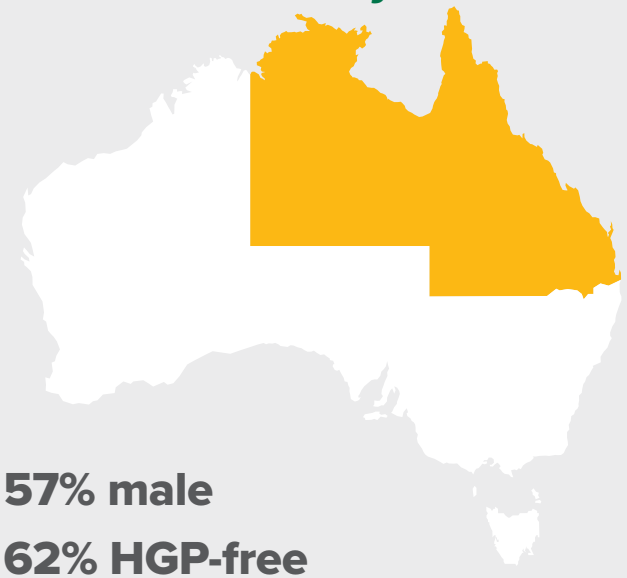


Figure 30. NSW & ACT MSA Index performance 2017-19

Table 8. Carcase attributes of MSA carcases in NSW & ACT 2017-19

	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
TOP 5%	421	35	120	520	16	63.73
AVERAGE	311.8	65	170	360	8	57.86
BOTTOM 5%	231	95	250	210	4	52.04

Queensland and Northern Territory



57% male

62% HGP-free

62% grainfed

More than 2.9 million MSA cattle were consigned from Queensland and the Northern Territory, representing 45% of all MSA-graded cattle in Australia 2017-19.

15% of MSA-registered cattle producers reside in Queensland and the Northern Territory. This equates to 7,000 MSA-registered beef producers, with more than 3,000 of these producers consigning cattle to the program in 2017-19.

Figure 31. QLD & NT MSA grading volume 2017-19

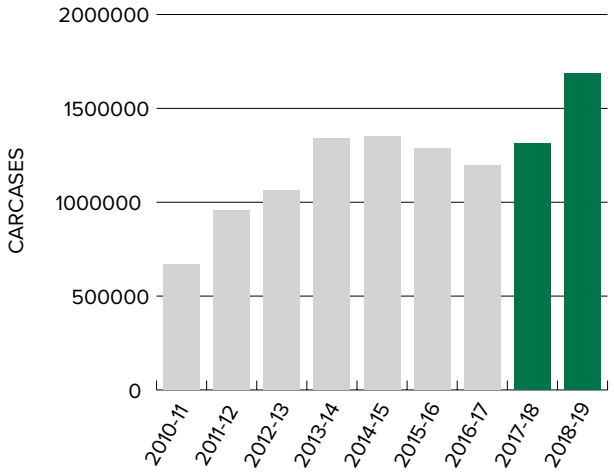


Figure 32. Proportion of adult cattle slaughtered in QLD & NT and presented for MSA grading 2017-19

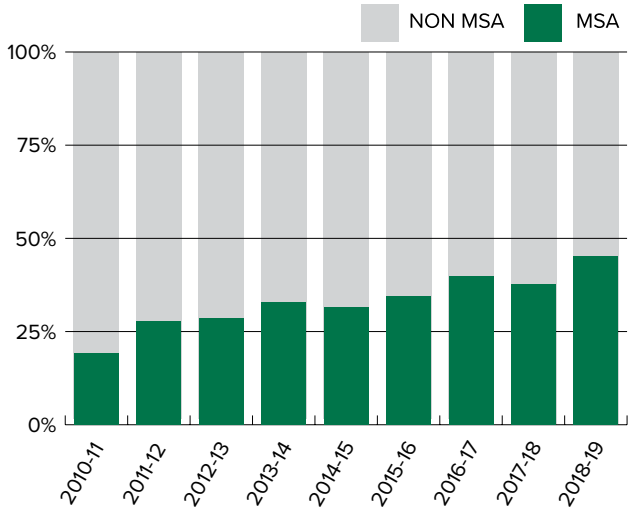


Figure 33. QLD & NT MSA non-compliance 2017-19

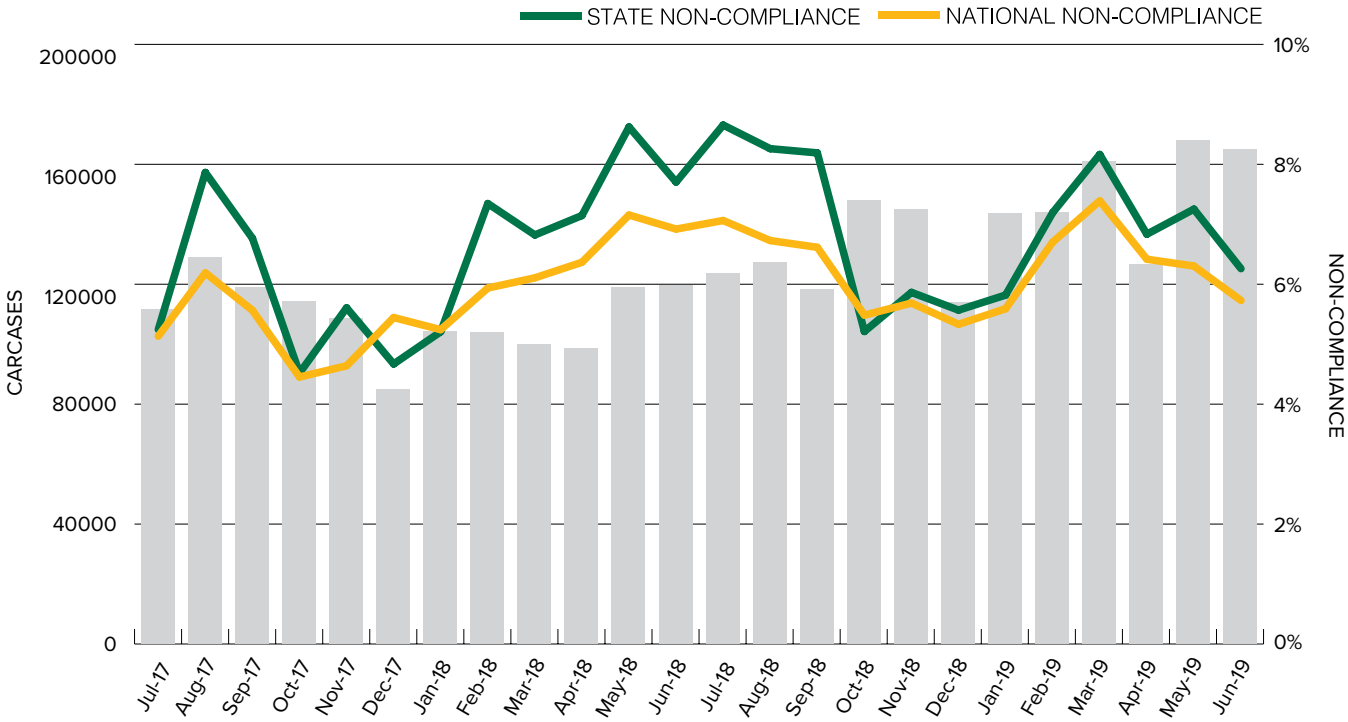


Figure 34. Proportion of QLD & NT HGP-treated MSA graded cattle 2017-19

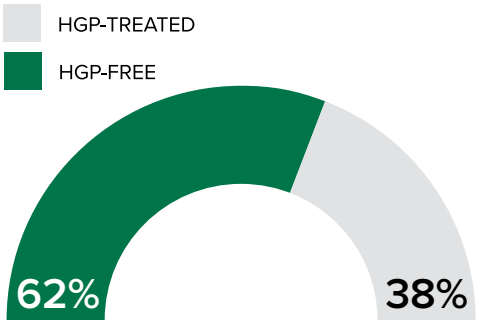


Figure 35. QLD & NT compliance to MSA minimum requirements 2017-19

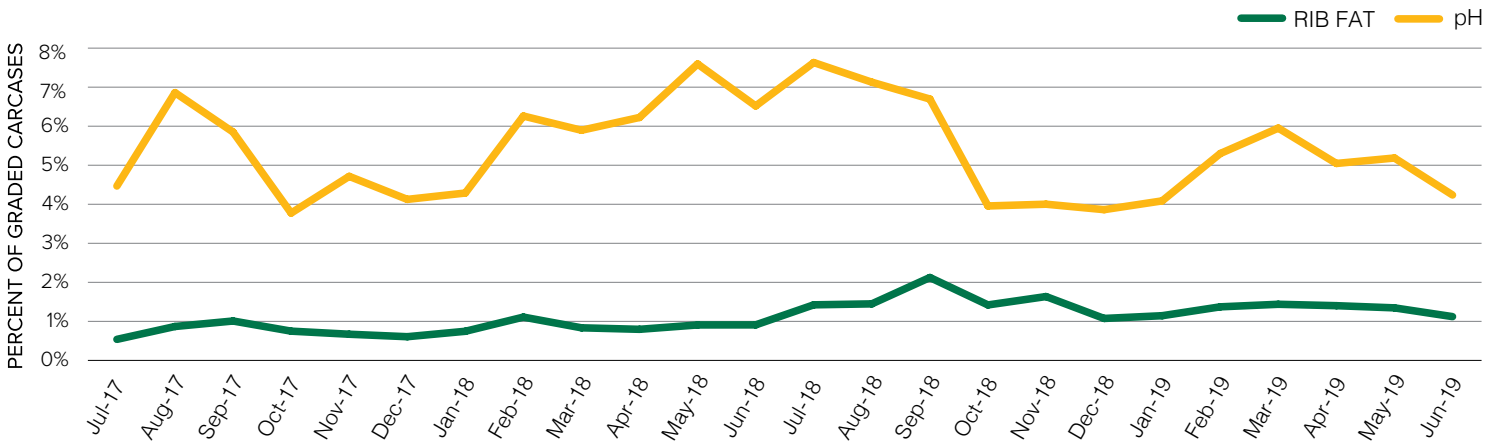


Figure 36. QLD & NT MSA Index performance 2017-19

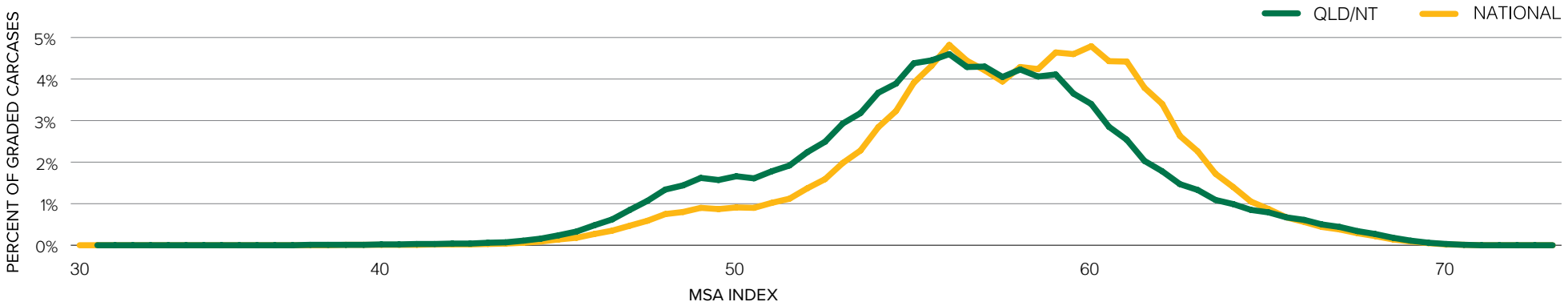
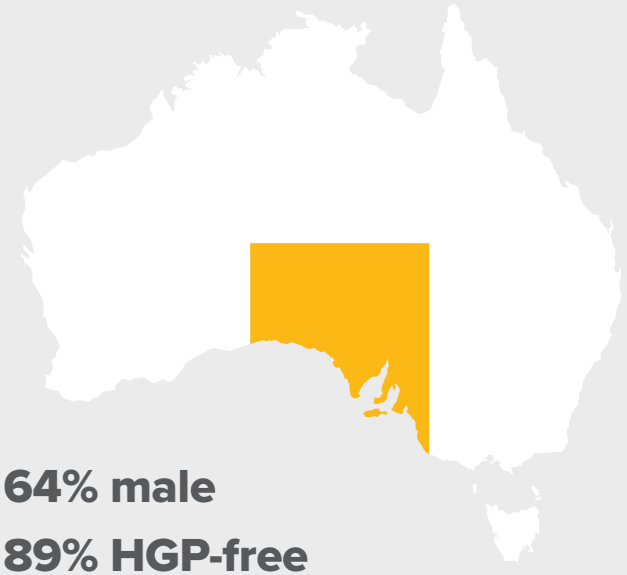


Table 9. Carcase attributes of MSA carcases in QLD & NT 2017-19

	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
TOP 5%	428	50	120	590	18	64.18
AVERAGE	305.3	85	170	340	8	56.26
BOTTOM 5%	217.1	140	230	180	3	48.05

South Australia



64% male

89% HGP-free

35% grainfed

More than 390,000 MSA cattle were consigned from South Australia, representing 6% of all MSA-graded cattle in Australia in 2017-19.

12% of MSA-registered cattle producers reside in South Australia. This equates to 5,500 MSA-registered beef producers, with more than 900 of these producers consigning cattle to the program in 2017-19.

Figure 37. SA MSA grading volume 2017-19

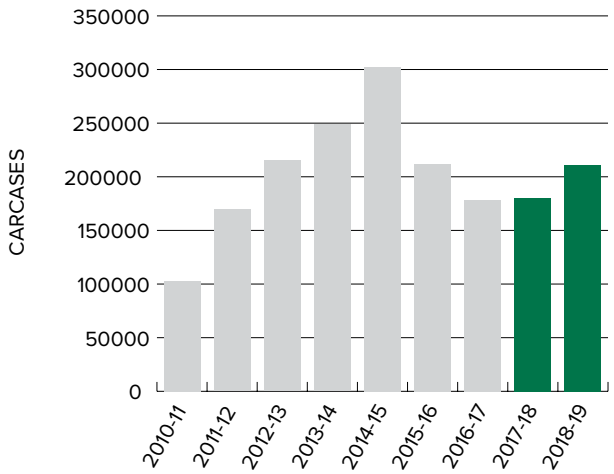


Figure 38. Proportion of adult cattle slaughtered in SA and presented for MSA grading 2017-19

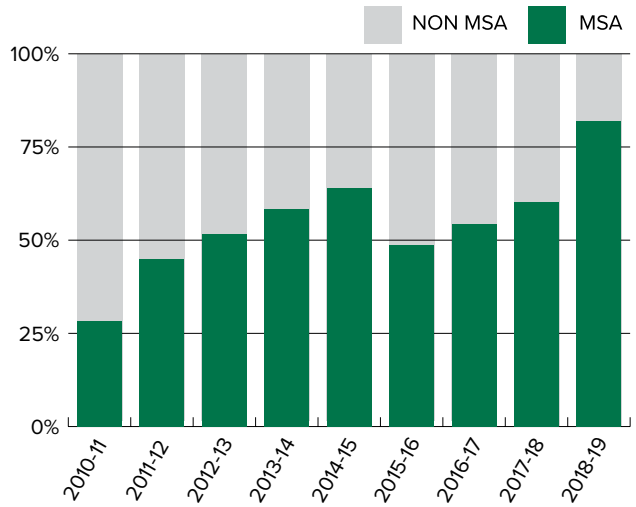


Figure 39. SA MSA non-compliance 2017-19

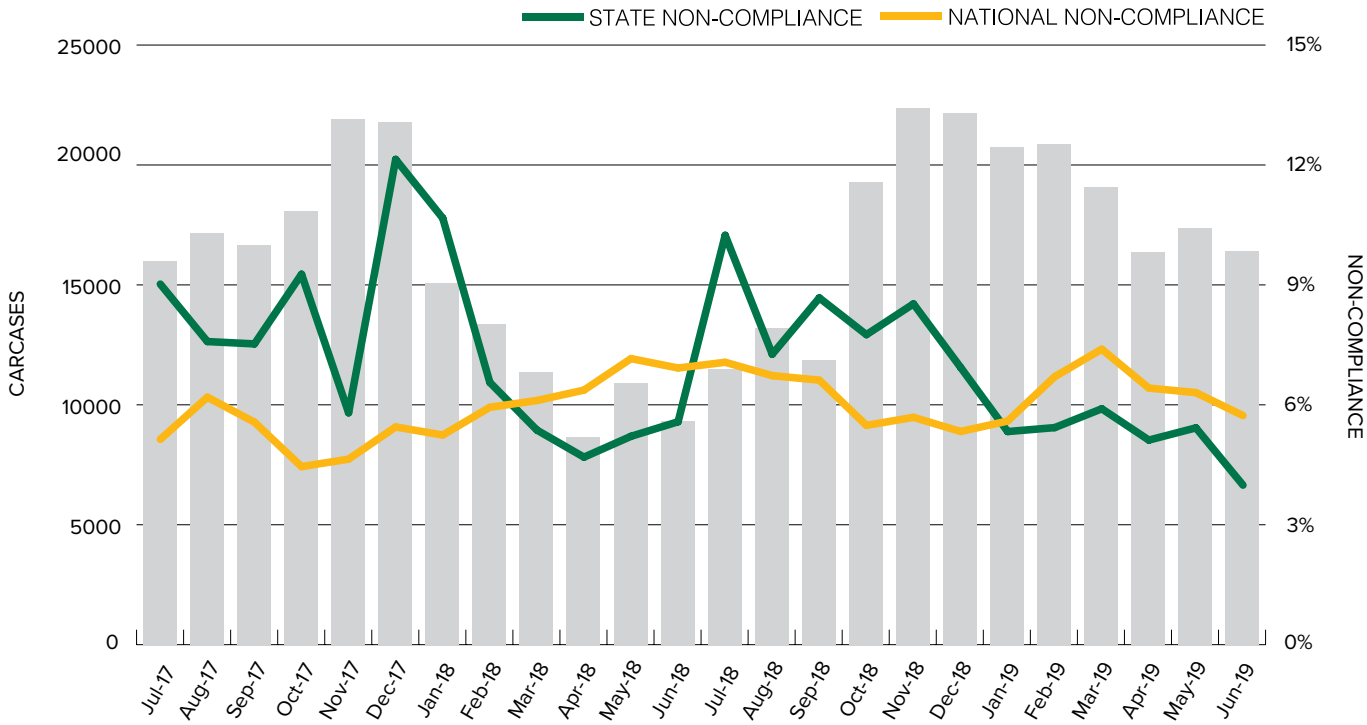


Figure 40. Proportion of SA HGP-treated MSA graded cattle 2017-19

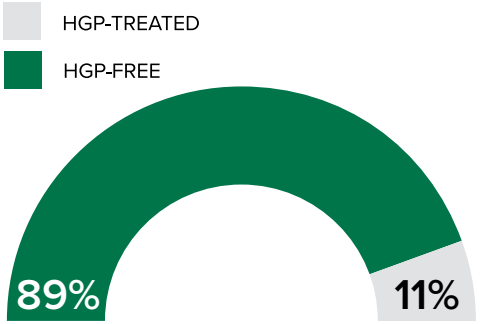


Figure 41. SA compliance to MSA minimum requirements 2017-19

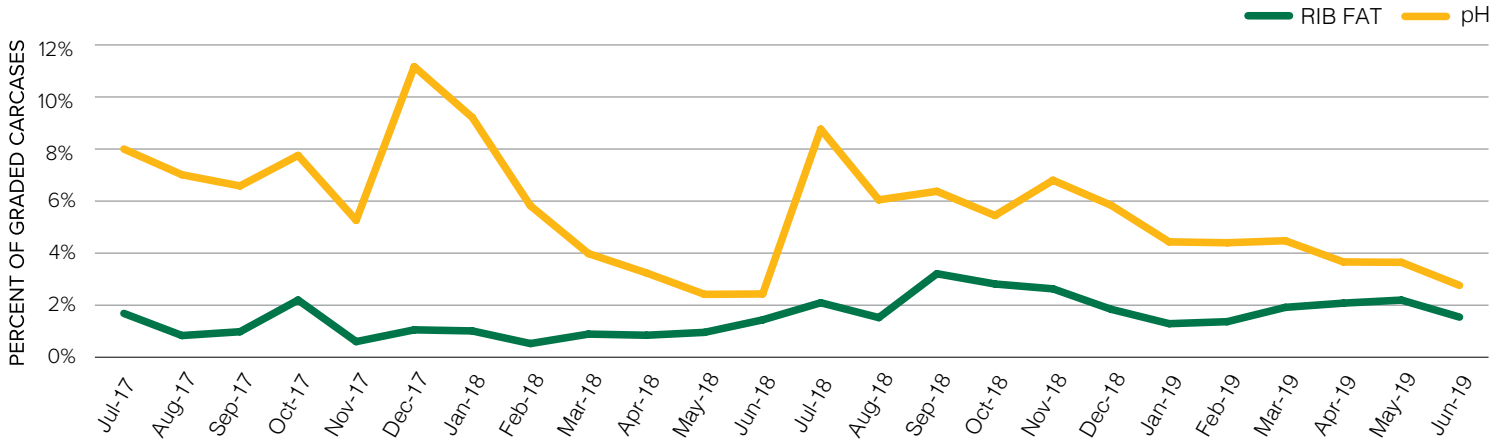
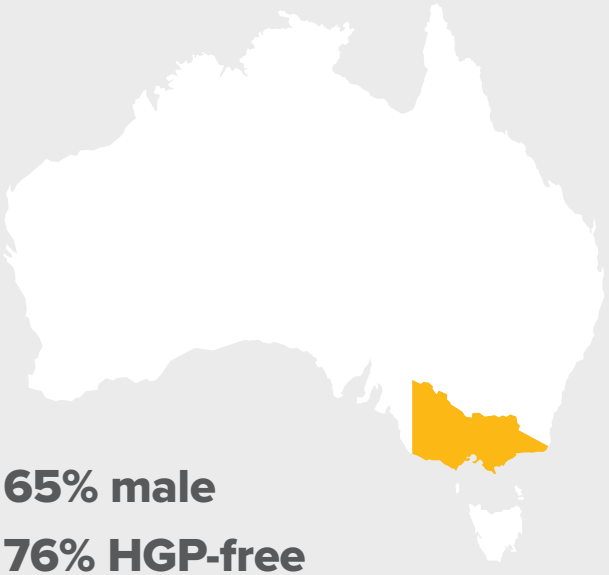


Figure 42. SA MSA Index performance 2017-19

Table 10. Carcase attributes of MSA carcases in SA 2017-19

	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
TOP 5%	402.2	40	110	560	17	65.27
AVERAGE	307.2	55	160	370	9	60.07
BOTTOM 5%	232.6	85	200	230	3	53.31

Victoria



65% male

76% HGP-free

38% grainfed

More than 610,000 MSA cattle were consigned from Victoria, representing 9% of all MSA graded cattle in Australia in 2017-19.

17% of MSA-registered cattle producers reside in Victoria. This equates to 7,700 MSA-registered beef producers, with more than 2,000 of these producers consigning cattle to the program in 2017-19.

Figure 43. VIC MSA grading volume 2017-19

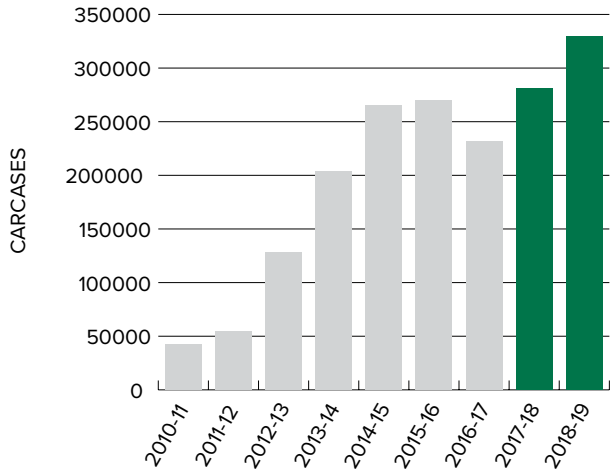


Figure 44. Proportion of adult cattle slaughtered in VIC and presented for MSA grading 2017-19

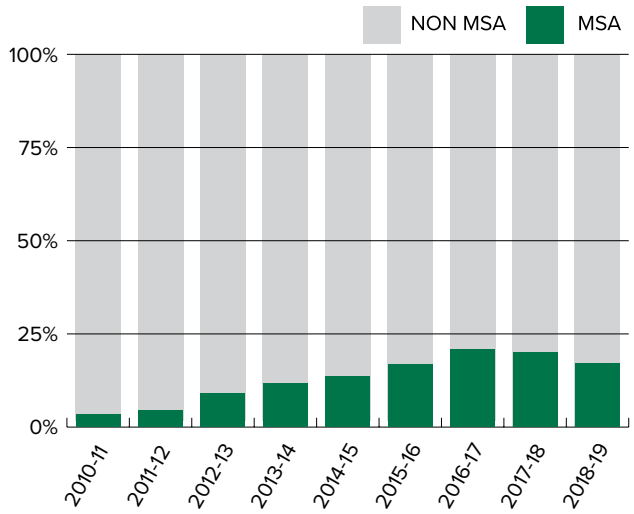


Figure 45. VIC MSA non-compliance 2017-19

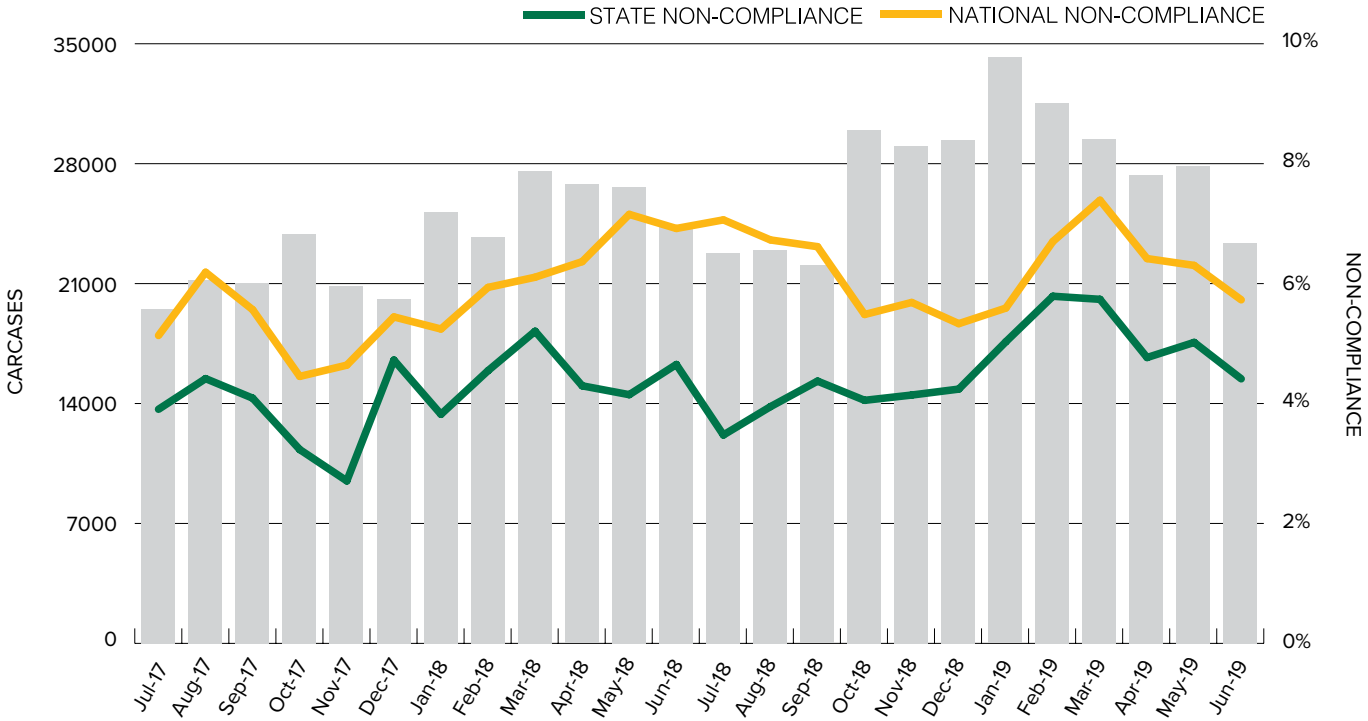


Figure 46. Proportion of VIC HGP-treated MSA graded cattle 2017-19

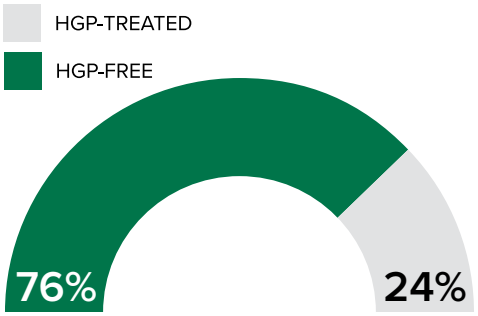


Figure 47. VIC compliance to MSA minimum requirements 2017-19

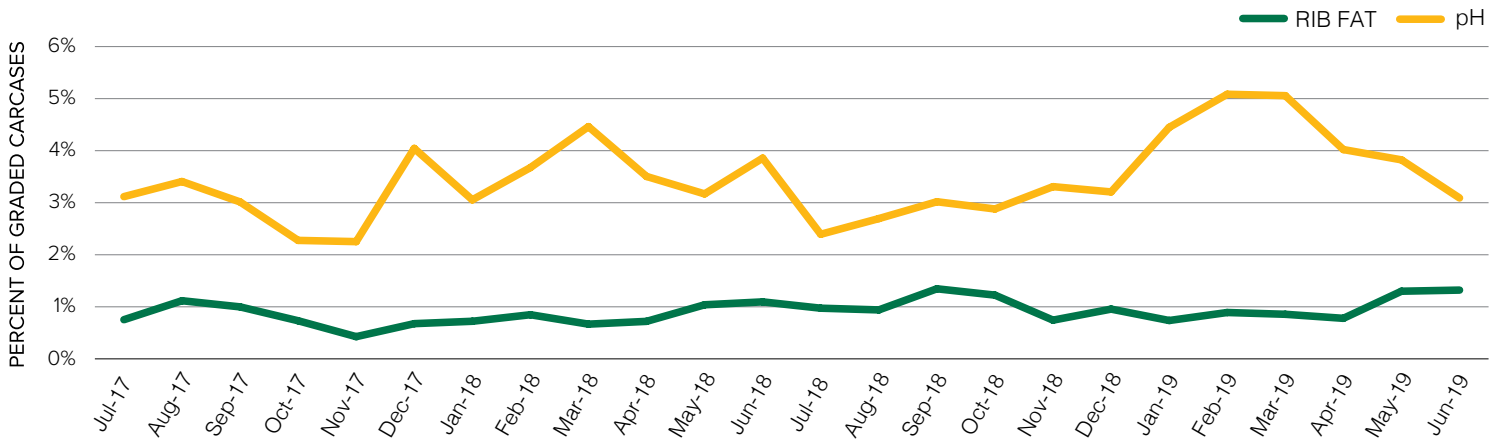


Figure 48. VIC MSA Index performance 2017-19

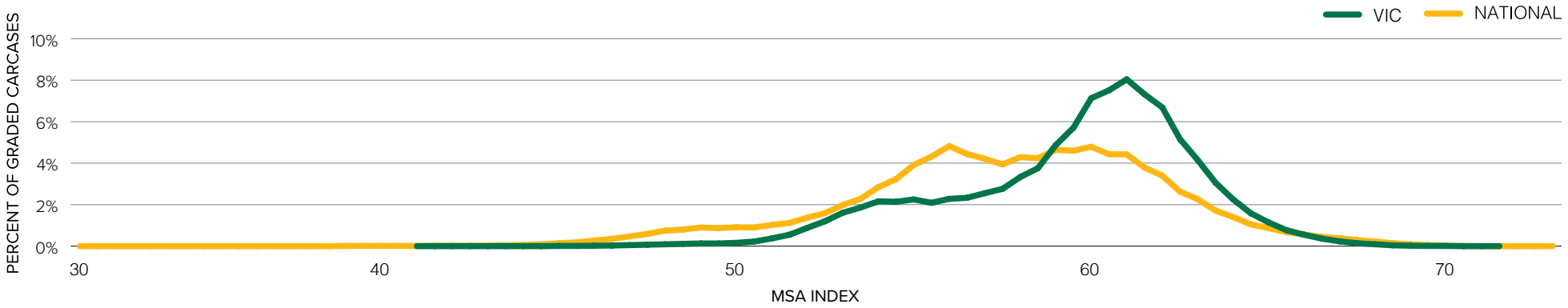
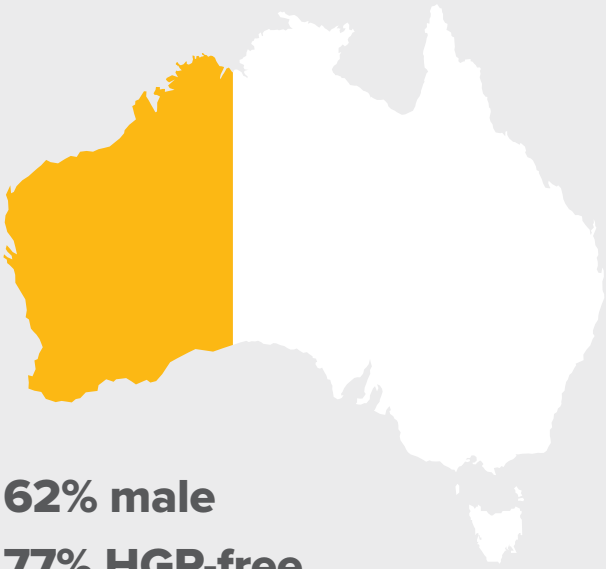


Table 11. Carcase attributes of MSA carcases in VIC 2017-19

	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
TOP 5%	414.5	35	110	550	16	64.24
AVERAGE	309.5	55	160	360	8	59.52
BOTTOM 5%	235	85	200	230	3	53.06

Western Australia



62% male

77% HGP-free

39% grainfed

More than 420,000 MSA cattle were consigned from Western Australia, representing 6% of all MSA-graded cattle in Australia in 2017-19.

9.7% of MSA-registered cattle producers reside in Western Australia. This equates to 4,500 MSA-registered beef producers, with almost 2,000 of these producers consigning cattle to the program in 2017-19.

Figure 49. WA MSA grading volume 2017-19

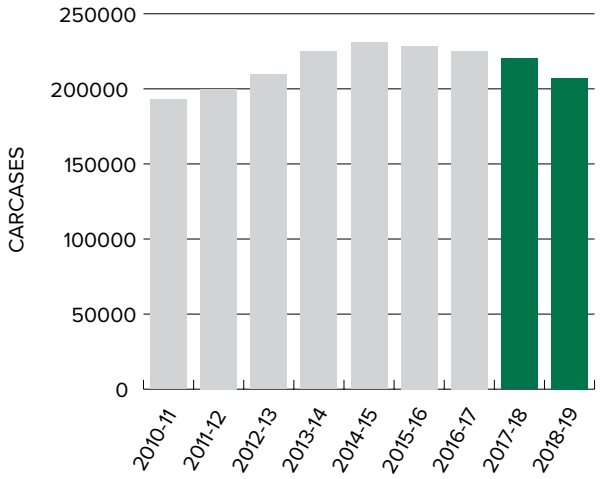


Figure 50. Proportion of adult cattle slaughtered in WA and presented for MSA grading 2017-19

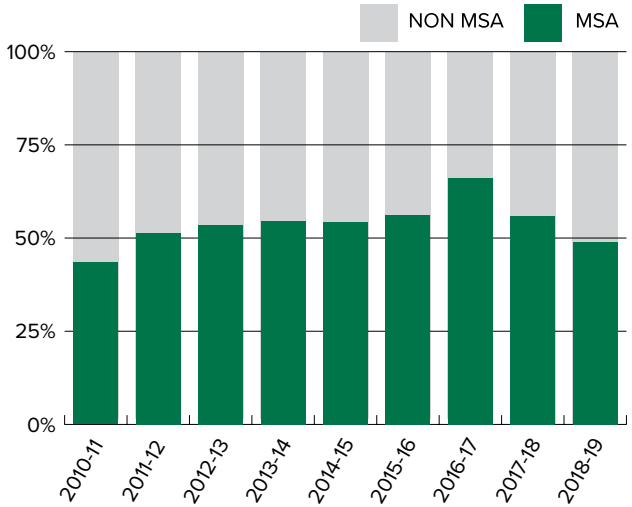


Figure 51. WA MSA non-compliance 2017-19

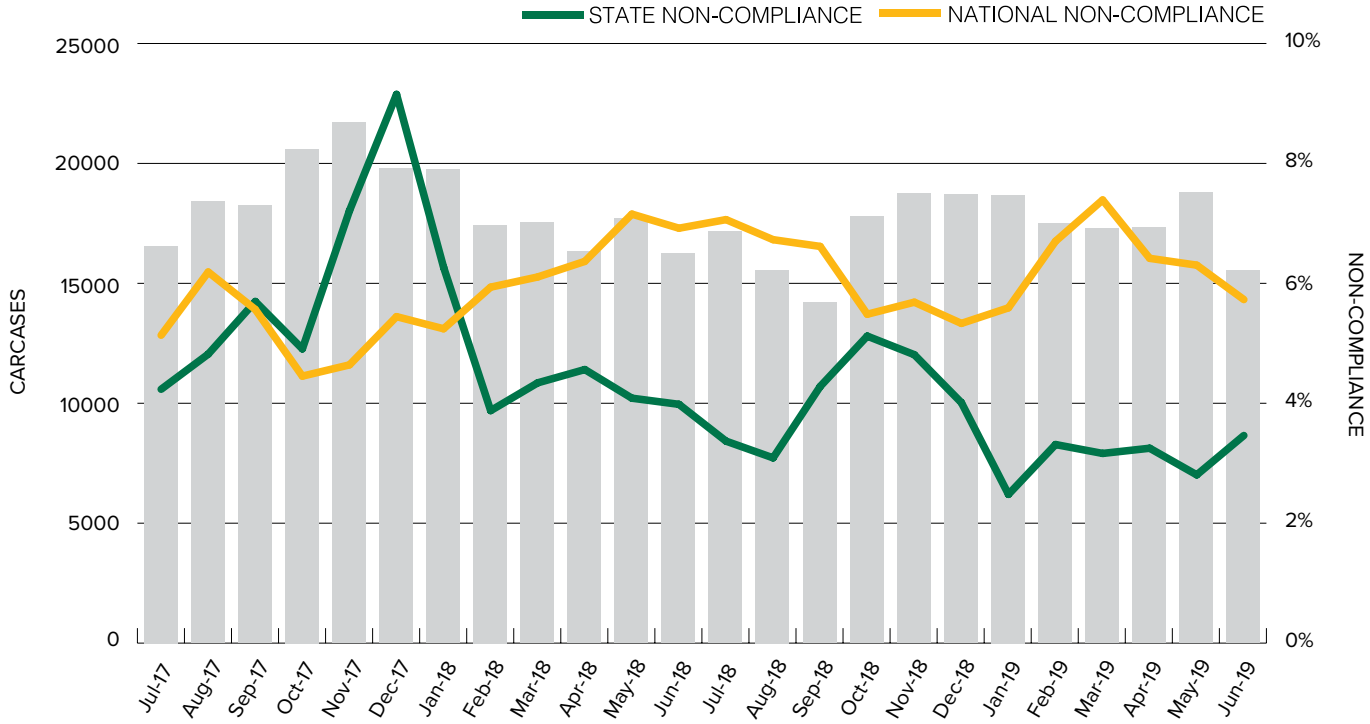


Figure 52. Proportion of WA HGP-treated MSA graded cattle 2017-19

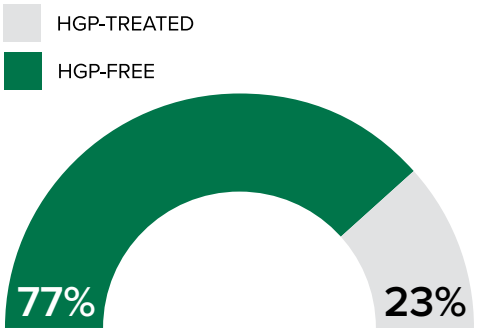


Figure 53. WA compliance to MSA minimum requirements 2017-19

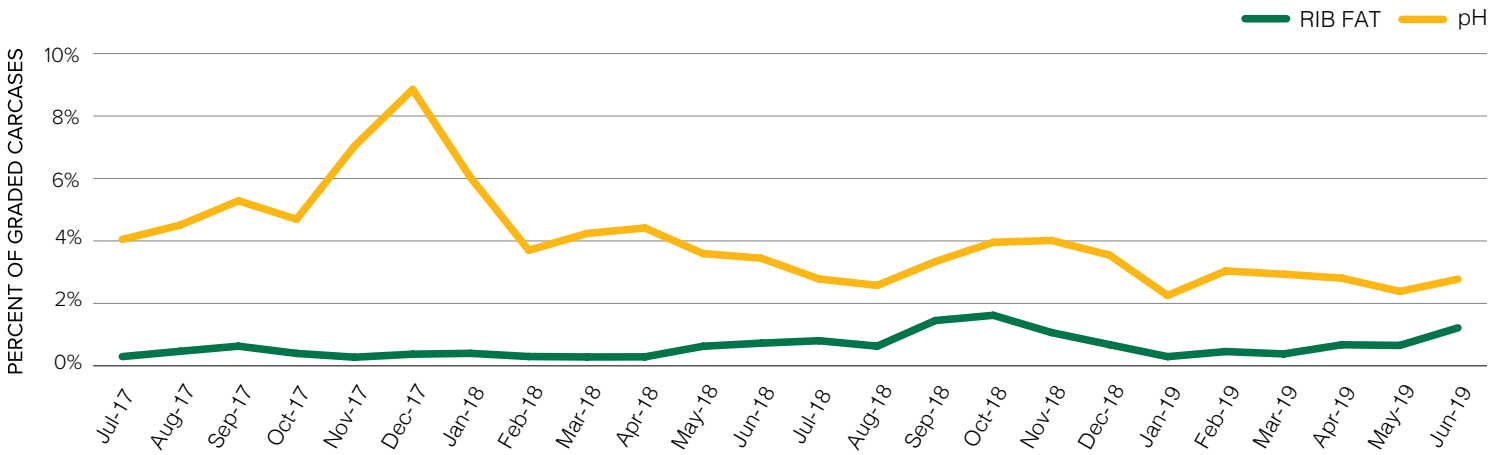


Figure 54. WA MSA Index performance 2017-19

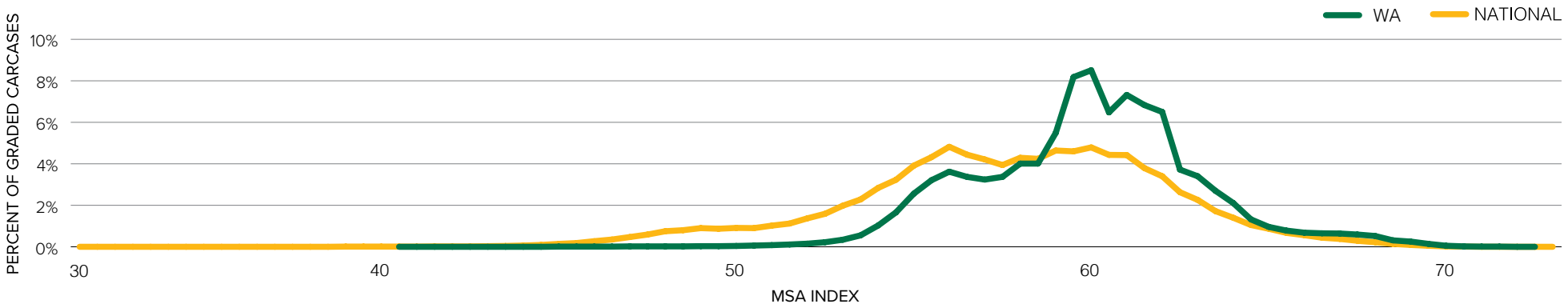
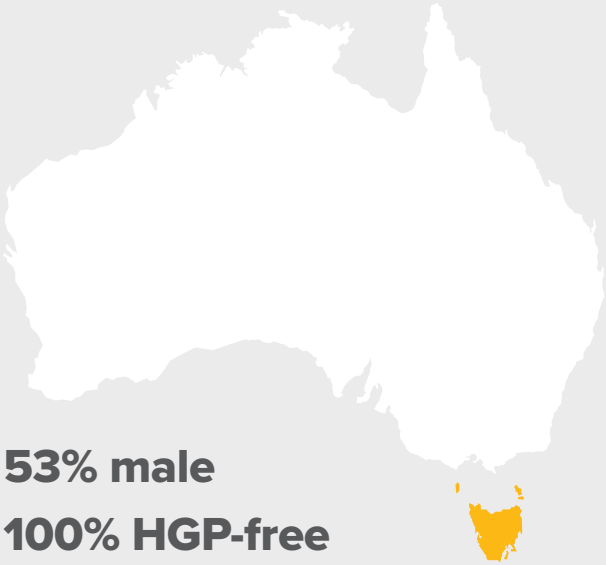


Table 12. Carcase attributes of MSA carcases in WA 2017-19

	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
TOP 5%	353.8	45	110	450	15	65.05
AVERAGE	271.6	60	150	330	9	59.90
BOTTOM 5%	209.8	75	180	260	3	54.87

Tasmania



53% male

100% HGP-free

More than 270,000 MSA cattle were consigned from Tasmania, representing 4% of all MSA-graded cattle in Australia in 2017-19.

8% of MSA-registered cattle producers reside in Tasmania. This equates to 3,700 MSA-registered beef producers, with more than 2000 of these producers consigning cattle to the program in 2017-19.

Compared to other states, Tasmania has a greater proportion of carcases graded with ossification scores greater than 300. This is a reflection of the utilisation of older female cattle that are able to meet MSA minimum requirements and provide cuts that meet MSA quality thresholds. Figure 59 illustrates the differences in MSA Index performance of these cattle.

Figure 55. TAS MSA grading volume 2017-19

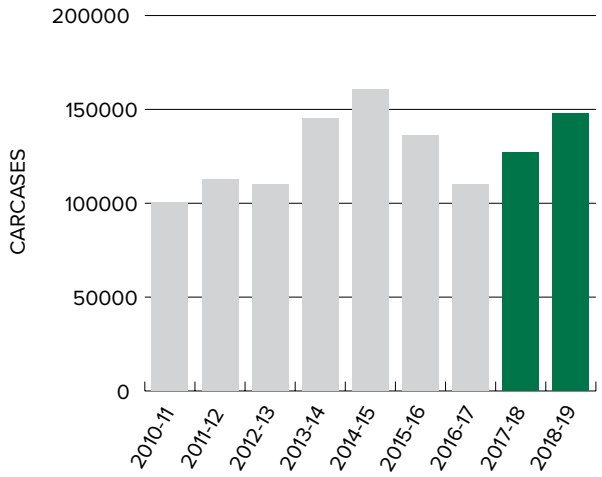


Figure 56. Proportion of adult cattle slaughtered in TAS and presented for MSA grading 2017-19

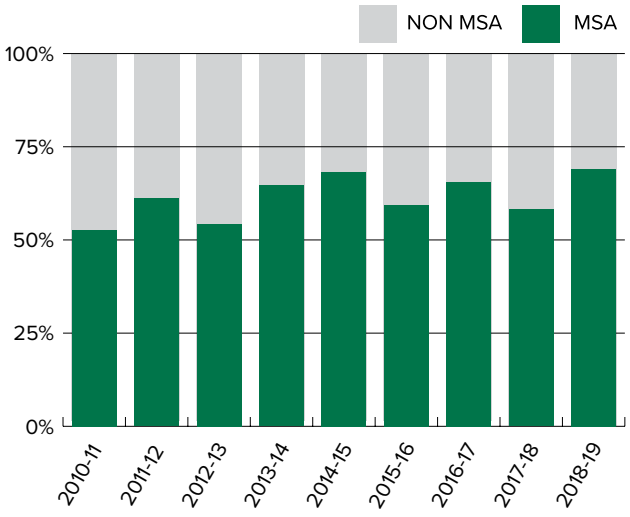


Figure 57. TAS MSA non-compliance 2017-19

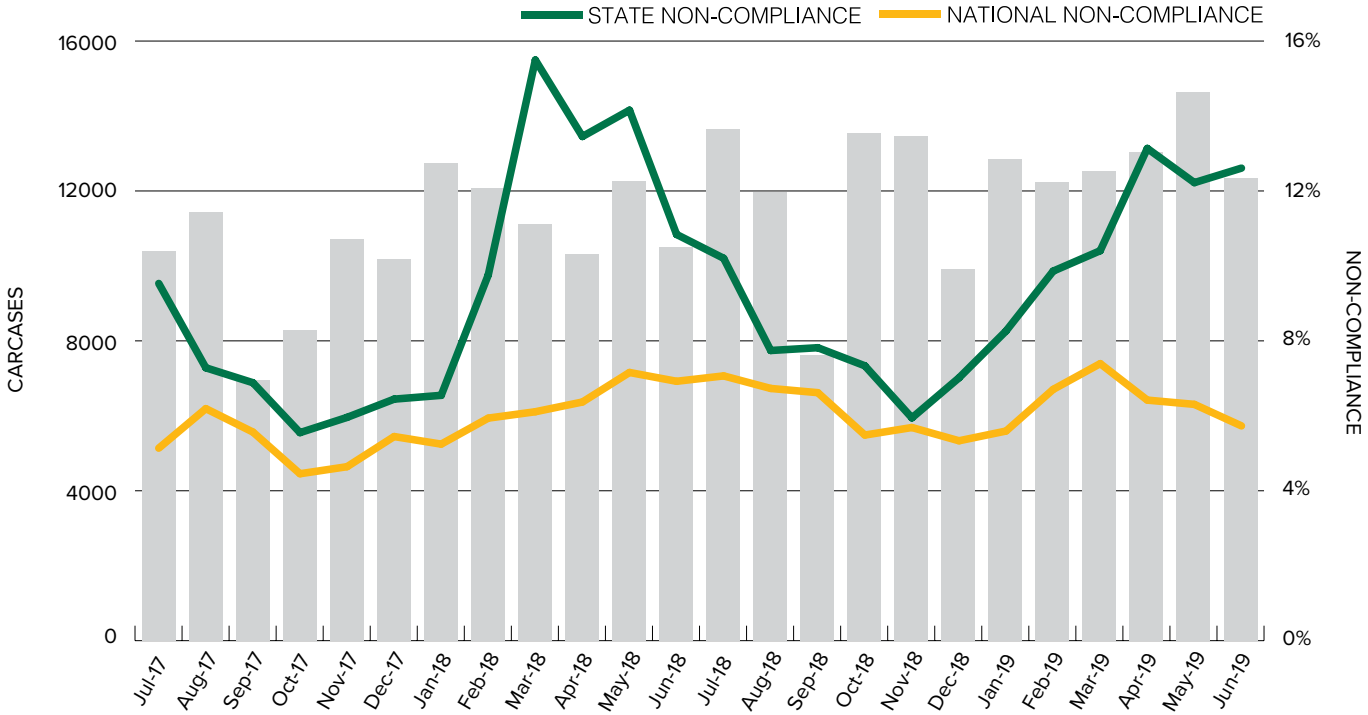


Figure 58. TAS compliance to MSA minimum requirements 2017-19

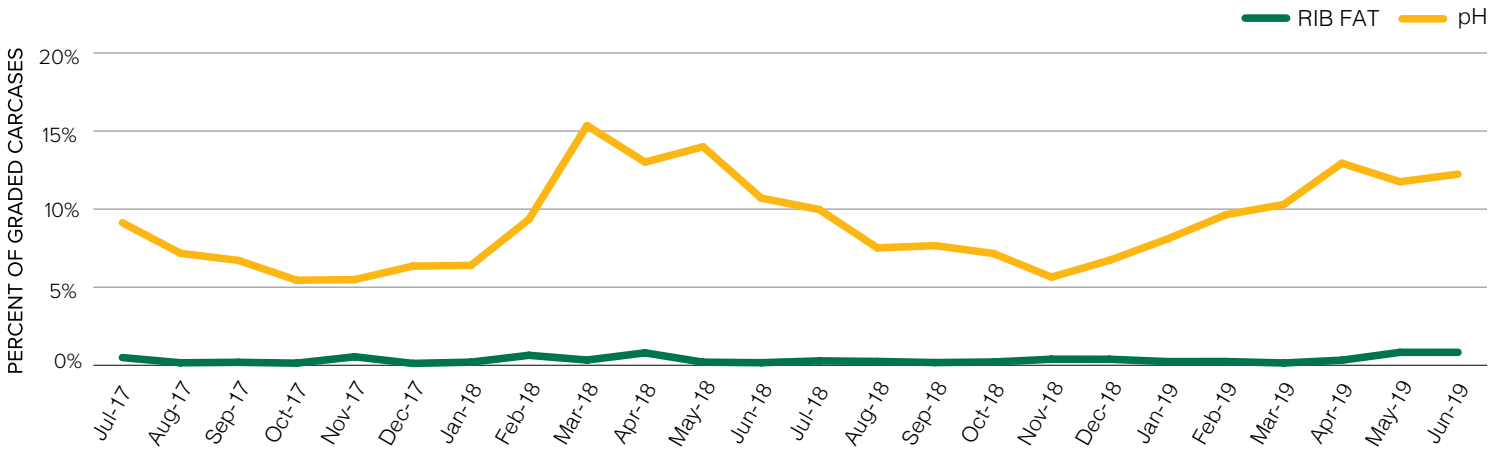


Figure 59. TAS MSA Index performance 2017-19

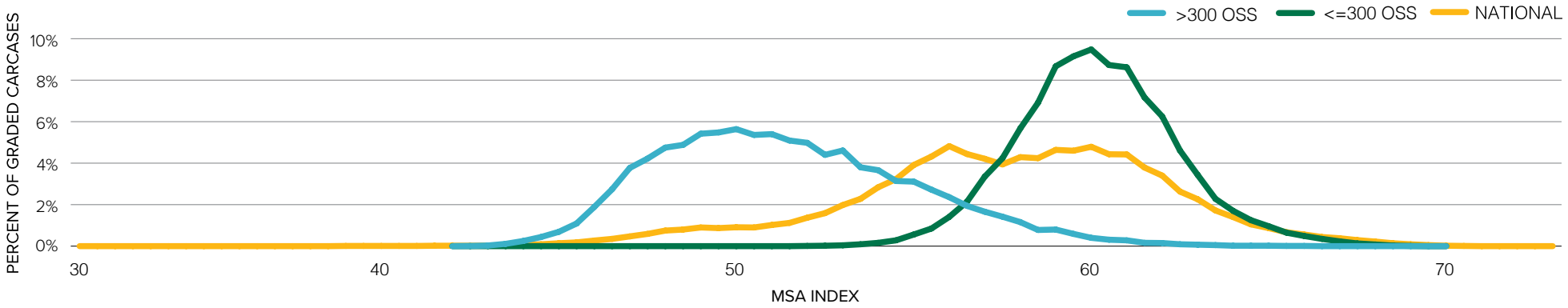


Table 13. Carcase attributes of MSA carcases in TAS 2017-19

	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)	MSA INDEX
TOP 5%	390.2	35	130	570	16	63.85
AVERAGE	298.6	60	200	360	9	59.34
BOTTOM 5%	227.0	90	590	210	5	51.29

Eating quality benchmarks for MSA graded cattle

Identifying opportunities for improvement

The Benchmarking tables summarise all attributes impacting on the MSA Index, distinguished by feed type and HGP status. Producers can use the tables to identify their herd's performance compared to similar cattle.

Benchmark table 1. Attributes of HGP-free, non-grainfed cattle

SEX	BAND	MSA INDEX	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)
Female	Bottom 1%	45.28	259.7	100	520	240	6
Female	Bottom 5%	49.21	267.8	70	500	280	6
Female	Bottom 10%	52.11	277.3	85	380	300	8
Female	Bottom 25%	56.14	259.1	75	240	290	7
Female	Middle 50%	58.61	259.1	60	170	310	7
Female	Top 25%	60.40	263.3	55	150	370	8
Female	Top 10%	61.90	265.7	55	150	410	9
Female	Top 5%	62.91	264.3	55	140	450	9
Female	Top 1%	64.87	254.9	55	140	500	11
Male	Bottom 1%	51.22	296.7	130	170	200	5
Male	Bottom 5%	53.47	305.3	120	160	250	6
Male	Bottom 10%	55.11	305.6	110	150	270	6
Male	Bottom 25%	58.11	300.0	85	150	280	6
Male	Middle 50%	60.12	304.5	65	150	320	7
Male	Top 25%	61.68	311.3	60	140	380	8
Male	Top 10%	63.13	315.2	60	130	430	9
Male	Top 5%	64.18	319.1	60	130	500	10
Male	Top 1%	66.81	272.6	60	120	460	11

Benchmark table 2. Attributes of HGP-free, grainfed cattle

SEX	BAND	MSA INDEX	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)
Female	Bottom 1%	51.68	253.0	115	230	240	7
Female	Bottom 5%	54.45	253.1	100	180	260	7
Female	Bottom 10%	55.78	248.7	90	170	280	7
Female	Bottom 25%	57.72	246.7	75	160	280	7
Female	Middle 50%	59.51	256.2	60	150	310	7
Female	Top 25%	61.29	282.7	60	150	420	10
Female	Top 10%	63.45	334.1	70	170	590	15
Female	Top 5%	65.25	390.9	75	180	790	20
Female	Top 1%	67.70	415.6	75	170	940	23
Male	Bottom 1%	53.19	307.6	135	160	240	7
Male	Bottom 5%	56.12	303.5	115	150	290	8
Male	Bottom 10%	57.74	291.5	90	150	280	7
Male	Bottom 25%	59.76	293.8	70	150	290	7
Male	Middle 50%	61.79	328.9	65	140	380	9
Male	Top 25%	63.75	366.3	70	140	520	12
Male	Top 10%	65.68	395.7	75	140	660	13
Male	Top 5%	66.84	420.4	75	150	800	15
Male	Top 1%	68.58	445.5	75	140	940	18

Benchmark table 3. Attributes of HGP-treated, non-grainfed cattle

SEX	BAND	MSA INDEX	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)
Female	Bottom 1%	41.89	250.9	105	490	260	6
Female	Bottom 5%	48.52	257.8	100	300	290	7
Female	Bottom 10%	51.30	259.1	75	210	290	6
Female	Bottom 25%	53.54	266.1	60	180	300	6
Female	Middle 50%	55.34	266.8	50	160	350	8
Female	Top 25%	56.66	266.1	50	150	390	9
Female	Top 10%	58.07	263.0	50	140	400	9
Female	Top 5%	58.78	266.8	50	130	410	9
Female	Top 1%	60.03	261.9	50	130	470	10
Male	Bottom 1%	45.92	292.2	135	200	200	5
Male	Bottom 5%	48.73	314.1	125	180	280	6
Male	Bottom 10%	51.22	316.1	105	170	300	7
Male	Bottom 25%	53.75	290.4	70	160	300	6
Male	Middle 50%	55.25	280.4	60	150	330	7
Male	Top 25%	56.36	284.8	55	140	370	8
Male	Top 10%	57.62	282.9	50	130	380	8
Male	Top 5%	58.18	283.8	55	130	400	9
Male	Top 1%	59.80	273.7	55	120	420	10

Benchmark table 4. Attributes of HGP-treated, grainfed cattle

SEX	BAND	MSA INDEX	CARCASE WEIGHT (KG)	HUMP HEIGHT (MM)	OSSIFICATION	MSA MARBLING	RIB FAT (MM)
Female	Bottom 1%	45.93	274.7	125	240	240	6
Female	Bottom 5%	48.89	289.0	120	190	290	8
Female	Bottom 10%	50.93	288.5	95	180	300	8
Female	Bottom 25%	53.41	280.6	70	180	300	7
Female	Middle 50%	55.11	280.8	55	170	350	8
Female	Top 25%	56.34	286.6	55	150	390	9
Female	Top 10%	57.62	285.9	55	150	430	9
Female	Top 5%	58.48	285.7	50	140	430	9
Female	Top 1%	59.84	301.5	55	140	530	10
Male	Bottom 1%	45.65	323.7	145	210	190	6
Male	Bottom 5%	47.46	334.6	145	200	260	7
Male	Bottom 10%	48.55	343.1	140	180	290	8
Male	Bottom 25%	51.49	353.2	120	180	320	9
Male	Middle 50%	54.77	356.1	80	180	350	10
Male	Top 25%	56.43	381.6	75	170	410	12
Male	Top 10%	57.78	393.3	75	170	460	13
Male	Top 5%	58.57	411.1	75	180	530	13
Male	Top 1%	60.22	429.2	75	180	660	15

Useful resources

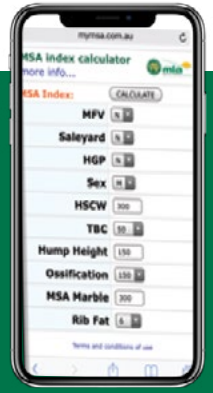
To assist producers to achieve their desired MSA Index score, MLA has developed the Tips & Tools Meat Standards Australia Beef Information Kit.

Next steps: Go to www.myMSA.com.au to access your carcase feedback and customised benchmarking data

MSA Index calculator

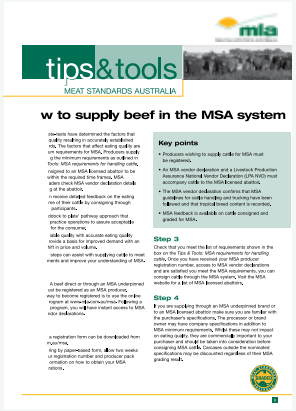
Use the MSA Index Calculator to see the impact of on-farm changes on the MSA Index at

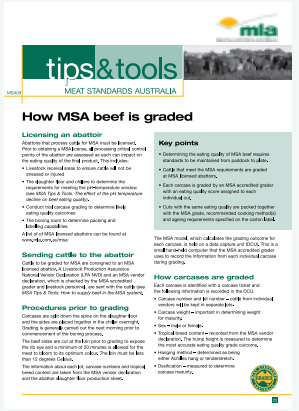
www.mymsa.com.au/msamobile



Tips & Tools Meat Standards Australia Beef Information Kit.

MSA01	What is MSA?
MSA02	How MSA grades are determined
MSA03	MSA requirements for handling cattle
MSA04	How to supply beef in the MSA system
MSA05	The effect of tropical breeds on beef eating quality
MSA06	The effect of ossification on beef eating quality
MSA07	The effect of marbling on beef eating quality
MSA08	The effect of pH on beef eating quality
MSA09	How MSA beef is graded
MSA10	The effect of the pH–temperature decline on beef eating quality
MSA11	How tenderstretch affects beef eating quality
MSA12	How ageing affects beef eating quality
MSA13	The effect of cooking on beef eating quality
MSA14	Fat distribution and eating quality
MSA15	Selling cattle through an MSA saleyard
MSA16	The effect of growth promotants on beef eating quality
MSA17	Maximising eating quality with tropical breed cattle
MSA18	Using the MSA Index to optimise beef eating quality





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