MEAT & LIVESTOCK AUSTRALIA

2022–2023
**ANNUAL
OUTCOMES
REPORT**

Delivering consumer
confidence in eating quality

MEAT STANDARDS AUSTRALIA
GRADED
®

Contents

Meat Standards Australia (MSA) is the world's leading eating quality grading program for beef and sheepmeat, developed to improve the eating quality and consistency of red meat.

The system is based on over **1.7 million consumer taste tests** by over **250,000 consumers** from **13 countries** and takes into account the factors that affect eating quality from the paddock-to-plate.

Beginning in 1998, MSA enables over 30 years of research and development through commercial outcomes and involves participation along the entire Australian red meat supply chain.

MSA also includes an adoption program, which seeks to support both on-farm and off-farm stakeholders to adopt eating quality principles to generate considerable value.

The Australian red meat industry has acknowledged that meeting consumers' eating quality expectations is a strong driver of demand, which has been delivered through the MSA program.

MSA can also be linked to other intrinsic purchasing drivers such as animal welfare and sustainability, for example, through best management practices that optimise both eating quality and animal welfare.

The MSA program

MSA is the world's leading eating quality grading program for beef and sheepmeat

It ensures quality and consistency for consumers of Australian beef and sheepmeat and advises the correct cooking method for each cut

It provides detailed feedback on eating quality to producers and processors

MSA equips producers with information and tools to make on-farm management decisions to improve eating quality of their livestock

Price differentials for MSA-compliant cattle improve profitability for producers

MSA provides the opportunity for brand owners to differentiate product in the market and underpins confidence in, and consistency of, their brands

Program manager's report

David Packer

MSA Program Manager

This year marks 25 years since the establishment of Australia's world-leading eating quality grading program, Meat Standards Australia (MSA) to benefit the red meat industry and consumers.

In this milestone year, the program's value and benefits are reflected through the red meat supply chain, from producers through to end users.

The program delivered a record $259 million in estimated additional farm gate returns to MSA beef producers in 2022–23.

This is a significant increase from the previous estimated high of $204 million delivered in 2021–22 and is a direct result of the year-on-year growth of the program and value captured and shared along the supply chain.

MSA graded cattle continue to represent more than half of the national adult cattle slaughter at 54% in 2022–23, similar to 55% recorded in 2021–22.

More than 3.39 million cattle were presented for MSA grading through 39 Australian beef processors in 2022–23, with 3.23 million cattle meeting the minimum requirements to be graded MSA.

Producers continue to improve their MSA performance. In 2022–23, the average MSA Index for MSA compliant carcases was 57.52, an increase of 0.15 from the national average MSA Index of 57.37 in 2021–22, and an increase of 0.48 from 10 years ago.

An additional 2,882 cattle and/or sheep producers became MSA

registered in 2022–23, taking the total number of MSA producers to 49,688.

In 2022–23, more than 2.31 million sheep followed MSA pathways through 14 MSA-licensed processing facilities across New South Wales, Victoria and Western Australia, which was 200,000 more than 2021–22. Of the total lambs processed in Australia, 71% were processed through MSA-licensed processing plants that follow processes to improve eating quality.

MSA delivered a range of training workshops and information sessions across the country, enabling more than 1,200 beef and sheepmeat producers to participate in 17 workshops or information sessions in 2022–23. This included a range of MLA supported events, supply-chain workshops, webinars, and other producer-focused meetings and activities.

Key supply chain stakeholders also demonstrated an appetite for MSA education and training, with over 700 industry service providers, processor representatives, advisors and livestock agents, attending events. In addition to this, 810 students attended MSA events throughout the year.

The program delivered a record $259 million in estimated additional farm gate returns to MSA beef producers in 2022–23.

End users continued to endorse the value of MSA. In 2022–23, consistency and quality remained the top two reasons independent butchers and wholesalers stock MSA product, and the motivation behind the continued year-on-year growth in the volumes they stock.

MLA has been undertaking research with Australian independent butchers and wholesalers for over a decade to understand their perceptions of, and satisfaction with, MSA graded meat. Survey results for 2022–23 show 78% of butchers rated their satisfaction with MSA-graded meat as 'very good to excellent', up from 73% in 2021–22.

There are now 211 MSA-licensed brands in the market.

Beyond MSA's work in the domestic market, expanding awareness of MSA on the international stage continues to be a focus, which is a key component of the *MSA Strategic Plan 2020–25*.

In 2022–23, MSA worked with six large supply chains in international markets, delivering 19 online and in-person workshops to over 400 participants.

MSA education, often delivered in collaboration with the MLA International Markets teams, focuses on the importance of ensuring eating quality consistency, how eating quality can underpin brands and building confidence of sales and marketing staff to promote MSA and differentiate their product.

> Producers continue to improve their MSA performance. In 2022–23, the average MSA Index for MSA compliant carcases was 57.52, an increase of 0.15 from the national average MSA Index of 57.37 in 2021–22.

Also in export markets, the United States Department of Agriculture (USDA) again approved MSA as a Process Verified Program (PVP) to support brand owners to use the USDA PVP shield alongside the MSA logo on their brands. This assists with marketing their MSA product in the United States, through a familiar and trusted identification to consumers.

Investments into MSA research and development (R&D) continued in 2022–23, with the aim to make all cattle and sheepmeat eligible for MSA, as well as focusing on new technologies and traits to ensure consistent consumer outcomes.

Among the R&D projects underway is a project aimed at determining the beef eating quality impact of rail transport, potentially opening up a new MSA pathway for beef producers in extensive production regions. The creation of a rail pathway for MSA would increase the number of MSA eligible cattle and deliver an estimated additional $50 million per year in supply chain returns.

MSA carried out benchmarking activities with 10 sheepmeat supply chains which comprise 68% of national lamb slaughter, to understand the range in eating quality of the commercial flock through these supply chains. Benchmarking highlights the value proposition of the MSA sheepmeat cuts-based model, which will ultimately allow processors and brand owners to apply eating quality segregation within their supply chains.

As it moves towards commercialisation, the exciting prospects of the MSA sheepmeat cuts-based model is just one way the MSA program continues to extract value for the Australian red meat industry.

Beef brand owners continue to take an increasingly sophisticated approach to using the MSA program to underpin their brands and deliver value throughout the supply chain, with 194 beef brands currently MSA-licensed. The program gives them the confidence to differentiate their brands not only in the domestic market, but also on the international stage.

These international market opportunities further reinforce the vital role the MSA program has in achieving the red meat industry's 2030 goal of doubling the value of Australian red meat sales and ensuring continued trust in Australian red meat.

2022-23 highlights

MSA delivered a record estimated **$259 million in additional farm gate returns** to beef producers

2,882 producers became MSA registered

57.52 national average MSA index

2,870 producers used the myMSA feedback system **14,362 times**

54% of the national adult cattle slaughter were presented for MSA grading, or **3.39 million cattle**

2.31M sheep followed MSA pathways, representing **10% of total lambs** processed in Australia

11,320 beef producers consigned cattle for MSA

1,200 beef and sheep producers received MSA education

95.1% compliance to MSA requirements for beef

194 beef brands **22** sheep brands **now MSA-licensed**

Program integrity

Throughout 2022–23, 321 audits were conducted on MLA licencees from saleyards and processors, through to retailers, wholesalers, independent boning rooms, supermarkets and foodservice outlets.

MSA also conducted 96 integrity checks with MSA-licensed processors to support their continued success in utilising the MSA Standards. MSA completed 241 MSA grader checks on active MSA graders around Australia to ensure consistency in carcase grading.

In 2022–23:

- four or 3% of end user outlets audited received corrective action requests (CARs)
- no saleyards audited received CARs
- four or 4% of processors received CARs
- no independent boning rooms (IBRs) received CARs.

MSA retained certification to ISO 9001:2015 Standard as part of its internal Quality Management System (QMS) to ensure the reputation and integrity of the MSA program. This is the internationally recognised standard that specifies the requirements an organisation or company must implement and meet for a QMS.

In export markets, the United States Department of Agriculture (USDA) again approved MSA as a Process Verified Program (PVP) with four brand owners utilising the USDA PVP shield on their MSA product in the United States.

321 MSA audits conducted

241 grader checks undertaken

MSA conducted 96 integrity checks with MSA-licensed processors to support their continued success in utilising the MSA Standards.

MSA beef

In 2022–23, more than 3.39 million cattle were presented for MSA grading through 39 Australian beef processors, with more than 3.23 million cattle meeting the MSA minimum grading requirements.

MSA graded cattle continue to represent more than half of the national adult cattle slaughter, at 54% in 2022–23.

The proportion of non-grainfed cattle grew in 2022–23, representing 41% of MSA graded cattle – an increase of 3% from 2021–22.

Grainfed cattle represented 59% of MSA graded cattle in 2022–23.

The proportion of non-grainfed and grainfed cattle has shifted over the past 10 years, with both averaging 50% each over that timeframe.

The increase in the proportion of non-grainfed cattle in 2022–23 reflected broader national slaughter trends. Following years of post-drought herd rebuilding and the retention of cattle, non-grainfed beef producers turned off higher numbers of finished cattle in 2022–23.

Supporting this growth was the introduction of one new MSA beef brand, bringing the total number of beef brands underpinned by MSA to 194.

Processors representing 54% of MSA graded carcases are utilising the Eating Quality Graded (EQG) cipher in their business to describe beef products by an eating quality outcome. This is the equivalent of 15 businesses across 17 sites.

By volume, Queensland processed the greatest number of MSA graded cattle with 1.7 million head.

South Australia had the highest compliance to MSA minimum requirements at 97.2%.

An additional 2,642 beef producers became MSA registered in 2022–23, taking the total number of MSA registered beef producers to 40,754. MSA registered beef producers now represent 26% of Livestock Production Assurance (LPA) accredited cattle properties.

A total of 11,320 beef producers consigned cattle for MSA grading at MSA-licensed processing plants, an increase of 1,400 on the total number of beef producers who consigned cattle in 2021–22.

> By volume, Queensland processed the greatest number of MSA graded cattle with 1.7 million head.

59%
of MSA graded cattle in 2022–23

41%
of MSA graded cattle in 2022–23

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 1: MSA proportion of slaughter by state (2022–23)

WA
62%

QLD
56%

SA
88%

NSW
66%

VIC
29%

TAS
66%

Total national slaughter 6,290,100

NSW	1,353,200	**TAS**	201,400
QLD	2,940,700	**VIC**	1,254,400
SA	144,200	**WA**	396,200
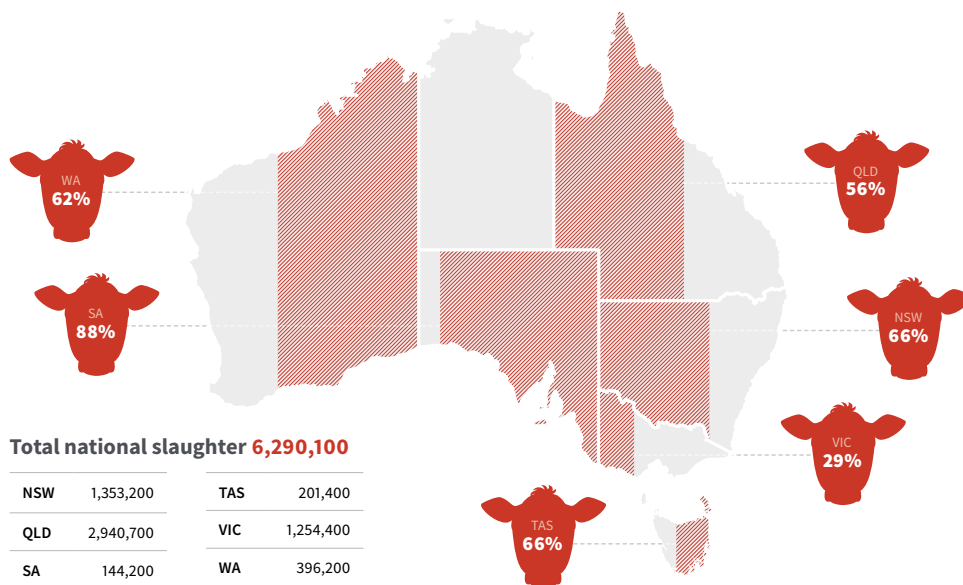
Figure 2: National MSA beef grading numbers (2022–23)
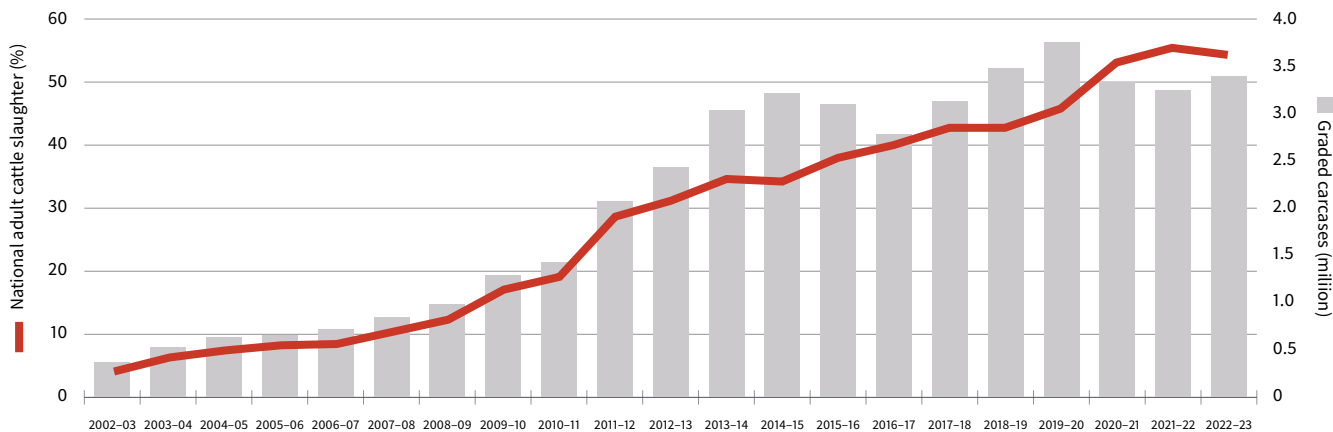
Figure 3: MSA graded carcases by state 2017–18 to 2022–23

☐ 2018–19 ☐ 2019–20 ☐ 2020–21 ☐ 2021–22 ☐ 2022–23
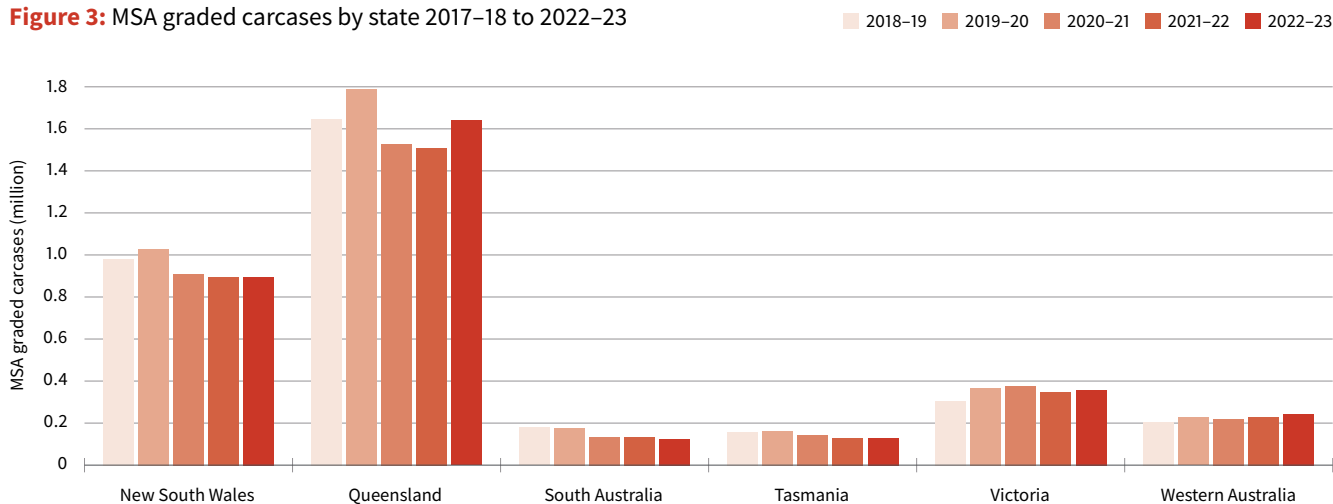
MSA beef carcase compliance

Compliance rates vary throughout the production regions of Australia according to seasonal conditions.

To be compliant for MSA grading, carcases must have a minimum of 3mm rib fat, adequate fat coverage, a maximum pH of 5.70 and other requirements.

In 2022–23, overall compliance to MSA minimum requirements was 95.1% nationally, slightly down from the record-breaking level of compliance of 95.5% achieved in both 2020–21 and 2021–22.

Non-compliance was the highest in June 2023 at 6.1%, up from the previous high of 5.4% non-compliance rate set in September 2021.

MSA compliance for non-grainfed cattle was 91.1% in 2022–23 – a slight decrease of 0.62% from 2021–22.

MSA compliance for grainfed cattle remained unchanged at 97.9% in 2022–23.

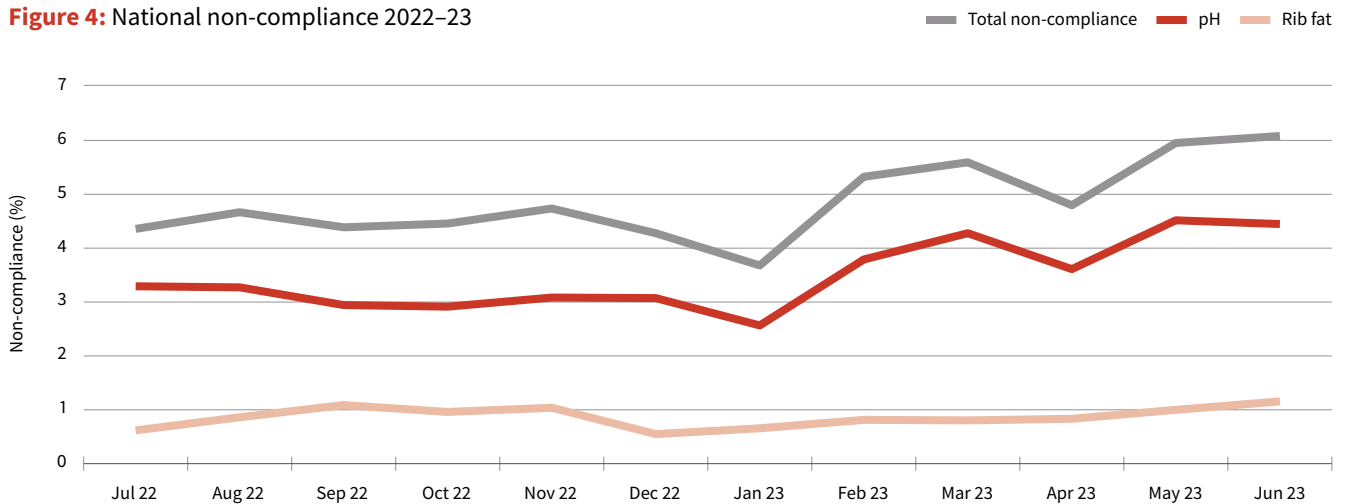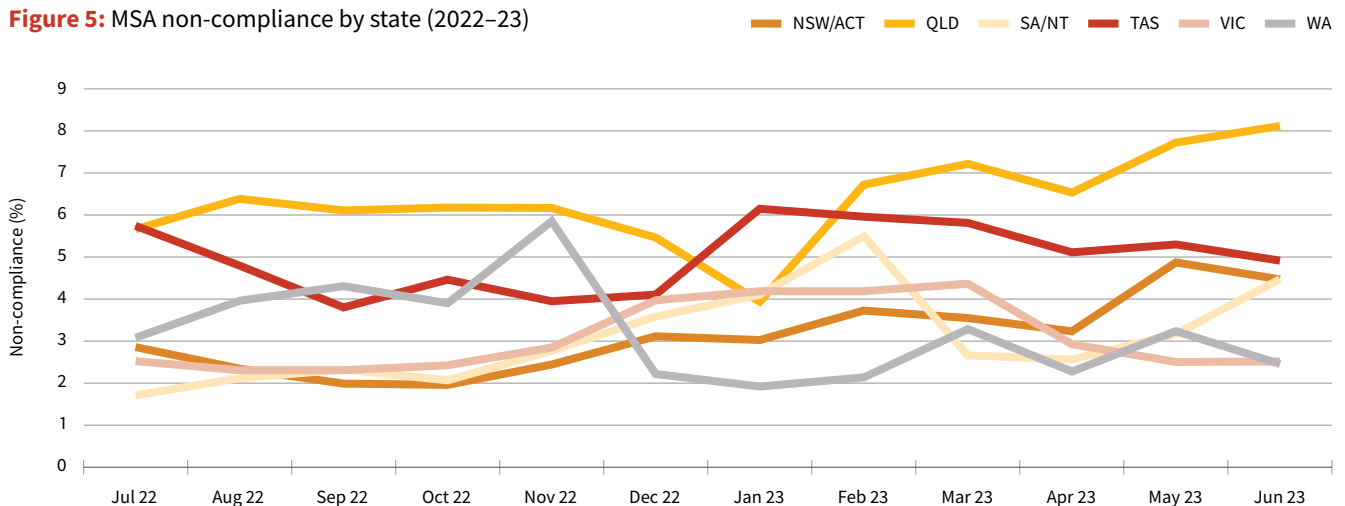**Figure 4:** National non-compliance 2022–23

Legend: Total non-compliance — pH — Rib fat

Figure 5: MSA non-compliance by state (2022–23)

Legend: NSW/ACT — QLD — SA/NT — TAS — VIC — WA

MSA Index

In 2022–23, the average Index for MSA compliant carcases was 57.52, an increase of 0.15 from the national average MSA Index of 57.37 in 2021–22, and an increase of 0.48 from 10 years ago.

- The average MSA Index for non-grainfed cattle was 57.94 – a decrease of 0.26 from the previous year.
- The average MSA Index for grainfed cattle was 57.26 – an increase of 0.37 from the previous year.

The decrease in the MSA Index for non-grainfed cattle can be attributed to a range of key factors influencing grading results, including an increase in females with higher ossification scores from some regions.

Using the MSA Index percentile bands

MSA Index percentile bands provide producers with an indication of where their average MSA Index sits in comparison to the performance of others, ranking national data from the bottom 1% to the top 1%.

For example, if your average MSA Index results were equivalent to or higher than 61.23 **(Table 1)**, then your cattle fall into the top 25% for national MSA Index for MSA graded cattle.

Table 1: MSA Index percentile bands

Percentile	National Index	Non-grainfed Index	Grainfed Index
Top 1%	68.25	66.22	68.62
Top 5%	65.84	63.79	66.69
Top 10%	63.96	62.71	65.00
Top 25%	61.23	61.04	61.49
Top 50% (median)	57.97	59.03	56.99
Bottom 25%	54.21	55.55	53.52
Bottom 10%	49.78	51.43	49.28
Bottom 5%	47.99	48.43	47.87
Bottom 1%	45.37	44.14	45.89

Table 2: Effects of carcase attributes on the MSA Index

Carcase input	Relative importance of trait influencing MSA Index
HGP status	Very high
Milk-fed vealer	Very high
Saleyard	Very high
MSA marbling	High
Hump height	High
Ossification score	High
Rib fat	Medium
Hot standard carcase weight (HSCW)	Low
Sex	Low

myMSA – The home of carcase feedback

myMSA is an online portal where producers can easily access their MSA grading and carcase data, in addition to housing a suite of feedback and benchmarking tools. Through the portal, MSA producers can also complete refresher training, access the electronic National Vendor Declaration (eNVD) system and other relevant tools and fact sheets.

In 2022–23, 2,870 producers utilised the myMSA feedback system 14,362 times.

Since the platform's update in 2020, myMSA continues to provide producers with easy-to-use features to measure and monitor eating quality performance and compliance. Access to carcase data, benchmarking tools, the MSA Index calculator and customised reports enable producers to improve decision making on-farm.

Look out for myFeedback in 2024

Work is underway to develop a single system which brings together data from multiple sources into one single login for producers, processors and brand owners.

myFeedback will combine the functionality of Integrity System Company's (ISC) Livestock Data Link (LDL) with the myMSA benchmarking system, bringing together carcase, eating quality and disease and defect data.

myFeedback will be available to all producers with linked LPA property identification codes (PICs) to their myMLA account. There will be options to also add associate users to your own account, such as farm employees, agents, advisors, and veterinarians.

myfeedback.mla.com.au

MSA sheepmeat

All sheep following MSA pathways have met strict criteria to optimise eating quality to meet consumer expectations.

In 2022–23, more than 2.3 million sheep followed MSA pathways through 14 MSA-licensed processing facilities across NSW, Victoria, South Australia and Western Australia. That's an increase from the 2.1 million sheep who followed MSA pathways in 2021–22.

The 2.3 million represent 10% of total sheep processed in Australia and of these, 86% were trademarked MSA.

Of the total sheep processed in Australia, 71% were processed through MSA-licensed plants that follow steps to improve eating quality, for example, electrical stimulation.

1,045 sheep producers became MSA registered in 2022–23, taking the total number of MSA registered sheep producers to 26,360. MSA registered sheep producers now represent 33% of LPA accredited sheep properties.

By volume, Victoria processed the greatest number of sheep through MSA pathways at 1.2 million head.

Western Australia had the greatest increase in sheep through MSA pathways with an additional 37,923 head or 8% increase.

A total of 97% of all sheep presented for MSA met the program's minimum requirements – a slight decrease of 0.4% on the previous year.

> By volume, Victoria processed the greatest number of sheep through MSA pathways at 1.2 million head.

Figure 6: National MSA lamb numbers 2013–14 to 2022–23 including proportion trademarked MSA
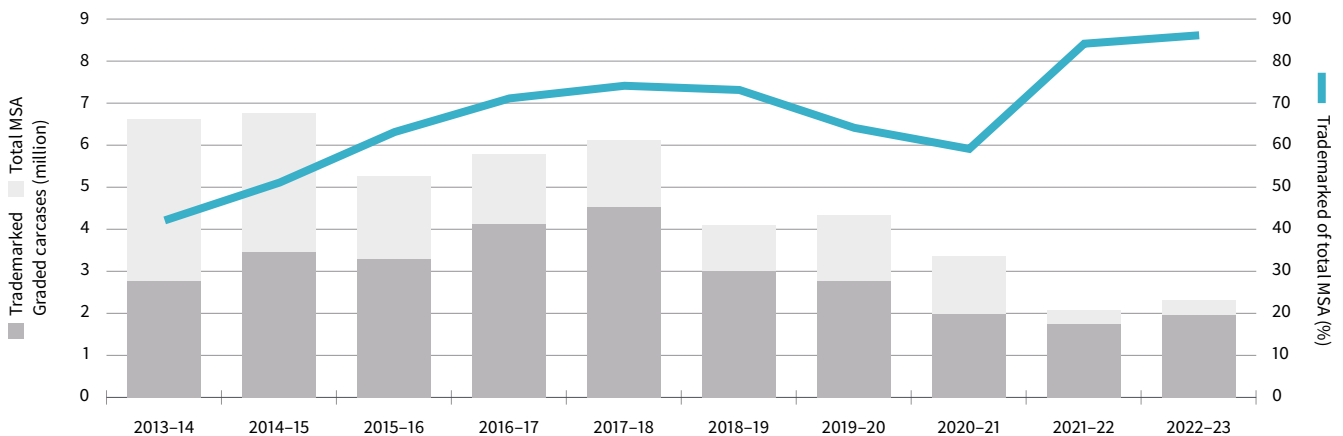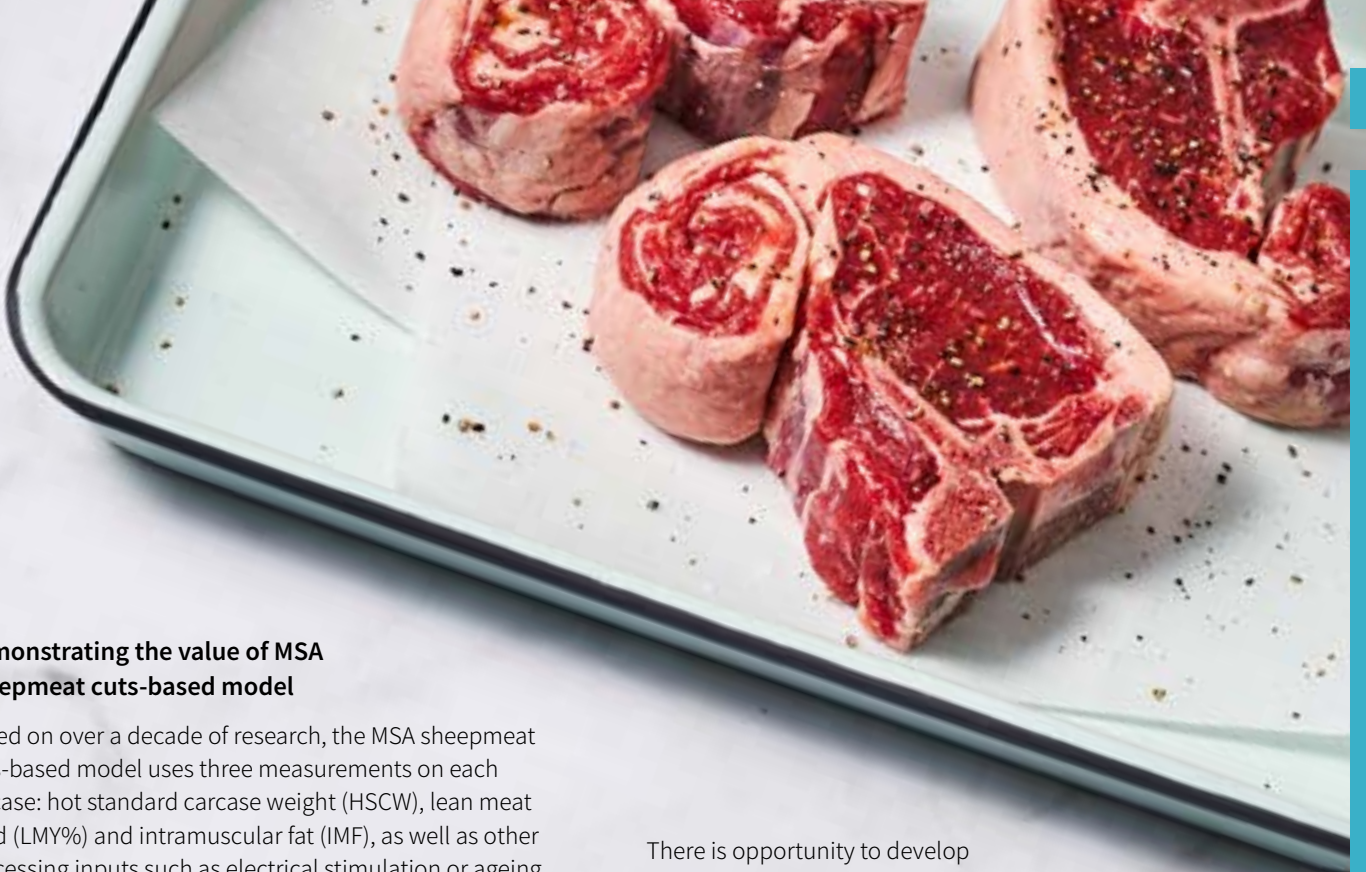
## Demonstrating the value of MSA sheepmeat cuts-based model

Based on over a decade of research, the MSA sheepmeat cuts-based model uses three measurements on each carcase: hot standard carcase weight (HSCW), lean meat yield (LMY%) and intramuscular fat (IMF), as well as other processing inputs such as electrical stimulation or ageing.

The MSA model then predicts the eating quality of nine cut-by-cooking method outcomes (grill and roast) for each carcase.

The commercialisation of the model is underway and will underpin transformational change to the sheepmeat industry.

As part of the steps towards commercialisation of the MSA sheepmeat cuts-based model, benchmarking activities have been conducted with 10 sheepmeat supply chains which comprise 68% of national lamb slaughter, to understand the range in eating quality of the commercial flock through these supply chains.

Benchmarking highlights the value proposition of the MSA sheepmeat cuts-based model, which will ultimately allow processors and brand owners to apply eating quality segregation within their supply chains. This aims to capture further value to be shared across the supply chain.

Figure 7 shows there is significant variation in eating quality of grilled loin and topside, and demonstrates the value proposition of the MSA sheepmeat cuts-based model.

There is opportunity to develop brands that segregate cuts by eating quality, which aim to extract further value for the consumer to be shared across the supply chain.

For producers, it demonstrates there is scope to improve eating quality as variation exists, but without the need to make significant changes to their management practices.

Producers aiming to include eating quality as part of their flock's breeding and production objectives can do so by using Australian Sheep Breeding Values (ASBVs) and selection indexes (for terminal breeds) which include production and eating quality traits. A selection index combines a number of ASBVs targeting a particular production system and/or market.

> There is scope to improve eating quality and extract more value, but without the need to make significant changes to management practices.

Figure 7: Range in eating quality of grilled loin and topside at five days ageing of commercial lamb carcases
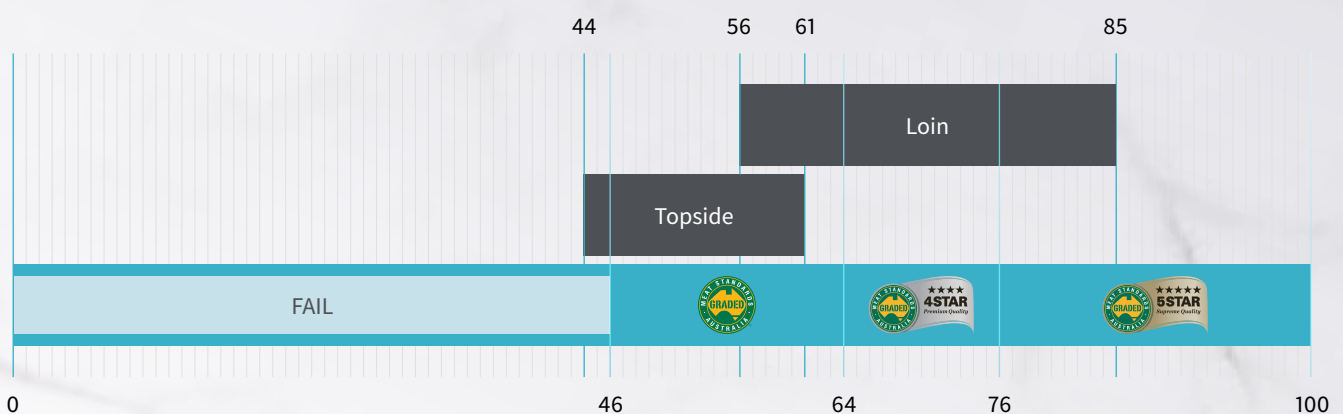
Eating quality

The eating quality score is out of 100 and is generated by the MSA cuts-based model.

Supply chain impact

The MSA program delivers benefits to stakeholders throughout the supply chain from producers through to end users. To maintain and extend the reach of the MLA program, a number of initiatives were held throughout 2022–23 with producers, processors, livestock agents, advisors, industry service providers and students.

Farm gate returns increase for beef producers

In 2022–23, the MSA program delivered a record $259 million in estimated additional farm gate returns to MSA beef producers – an increase from the previous record high of $204 million delivered in 2021–22.

This is a result of the year-on-year growth of the program, increasingly sophisticated use of the MSA program by processors and brand owners to capture more value and share along the supply chain, and producers continuing to improve their MSA performance.

Average hot standard carcase weight (HSCW) of MSA graded cattle in 2022–23 was 334kg, an increase from the 2021–22 average of 327kg.

For non-grainfed cattle, the average HSCW in 2022–23 was 307kg, up from 304kg in 2021–22.

For grainfed cattle, the average HSCW was 353kg, up from 341kg in 2021–22.

The average price differential for MSA young cattle (excluding grainfed cattle) across all weight ranges was $0.40/kg, up from $0.32/kg in 2021–22.

The average price differential for MSA cattle that met grainfed standards was $0.15/kg, up from $0.14/kg in 2021–22.

Based on average HSCW of MSA cattle and price differentials in 2022–23, MSA beef producers potentially received an estimated $123 per head in additional returns for young, non-grainfed cattle and $53 per head for grainfed cattle.

Education

More than 1,200 beef and sheepmeat producers participated in 17 workshops or information sessions throughout Australia in 2022–23. This included a range of MLA supported events, supply-chain workshops, webinars, and other producer-focused meetings and activities.

Supply chain stakeholders also demonstrated an appetite for MSA education and training, with 699 industry service providers, advisors, livestock agents, and processor representatives attending events.

In addition to this, 810 students attended events throughout the year.

19 international workshops were held in collaboration with brand owners and in-market stakeholders.

Supply chain end users including wholesalers and retailers participated in training, resulting in 73 people receiving training and seven new end user licenses.

A five-day MSA Meat Science course held in November 2022 and June 2023, was completed by 22 people. The comprehensive course explains the scientific factors affecting the eating quality of beef and sheepmeat all the way from production through to the consumer.

The course is a requirement of licensing for MSA processors but is also suitable for producers, lot feeders, livestock agents, traders, industry consultants and anyone wanting to gain a more thorough understanding of the factors which impact red meat eating quality.

Figure 8: Over-the-hooks price differentials over time
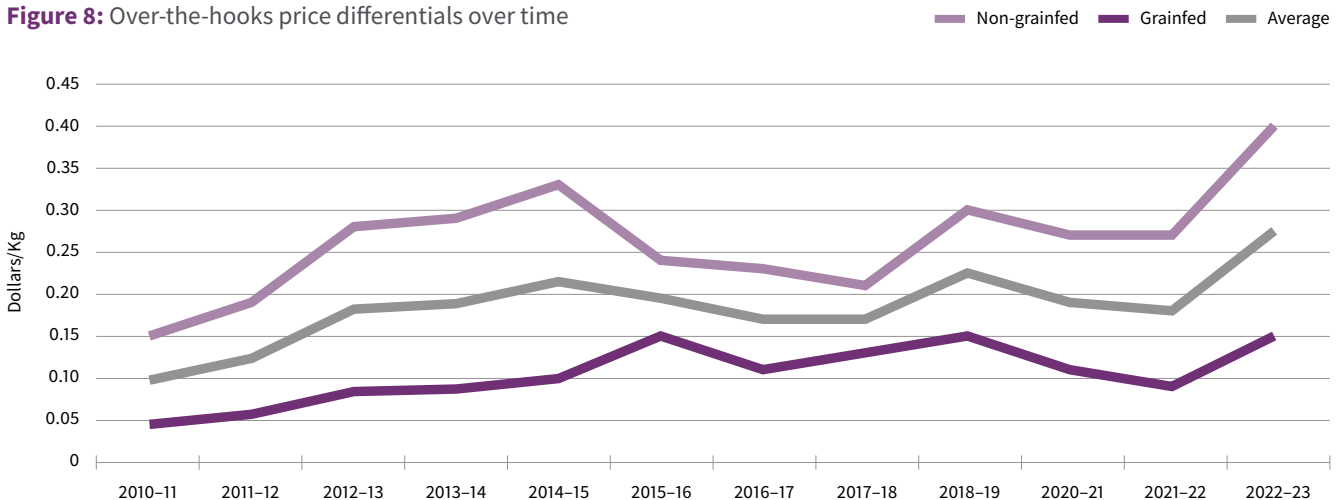
MSA beef producers potentially received an estimated

$123 per head
non-grainfed cattle

$53 per head
grainfed cattle

in additional returns

2,882
livestock producers
became registered to supply through the MSA program

22 people
completed the MSA Meat Science course

162 workers
completed independent boning room training

70 MSA graders
were trained and accredited

120 operatives
across 11 processors completed on-site MSA training on the impact of processing **on beef eating quality**

38 operatives
across three processors completed on-site MSA training on the impact of processing **on sheepmeat eating quality**

End users

Quality and consistency continue to be the key reasons independent butchers and wholesalers stock MSA product.

MLA has been undertaking research with Australian independent butchers and wholesalers for over a decade to understand their perceptions of, and satisfaction with, MSA graded meat.

Results from 2022–23 research involving 601 independent butchers and 78 wholesalers, reflected the strength of MSA in underpinning beef and lamb brands.

The survey found the proportion of independent butchers and wholesalers selling MSA graded products has remained stable over the last three years.

Almost nine out of 10 independent butchers now sell MSA brands.

MSA's reputation for quality product has consistently improved among independent butchers since 2020, with eight in 10 butchers rating MSA's quality as excellent or very good.

Butchers and wholesalers sell MSA products at a higher price differential than non-MSA products.

MSA beef continues to command a premium and the gap between MSA and non-MSA beef has slightly increased in the past 12 months. For lamb, a small price differential emerged in 2023.

Beef cube rolls continue to demonstrate the biggest margin on MSA beef with the biggest differential between MSA and non-MSA meat.

> **78% of surveyed butchers rate** their satisfaction with **MSA-graded meat** as 'very good to excellent', up from 73% in 2021–22.

> **63% of surveyed wholesalers** and **54% of surveyed butchers** found it important to have MSA as part of their product offering, similar to 2021–22.

Lamb leg roast has the biggest margin for MSA lamb cuts compared to non-MSA lamb cuts.

Margins on MSA beef for wholesalers are broadly similar to that of independent butchers, however margins for lamb among wholesalers are slightly higher than observed for butchers.

Most butchers stock MSA brands and out of the top 15 brands stocked by both butchers and wholesalers, only three are not MSA certified.

As of 30 June 2023, 1,141 end users representing 3,445 outlets, were licensed to promote and sell MSA products.

One new brand became MSA-licensed, taking the total of MSA-licensed brands to 211.

Figure 9: Average retail price differentials 2022–23 – MSA beef

Butchers	Wholesalers
NON-MSA $36.33	NON-MSA $24.55
MSA $39.13	MSA $27.57
7.2% differential	11% differential
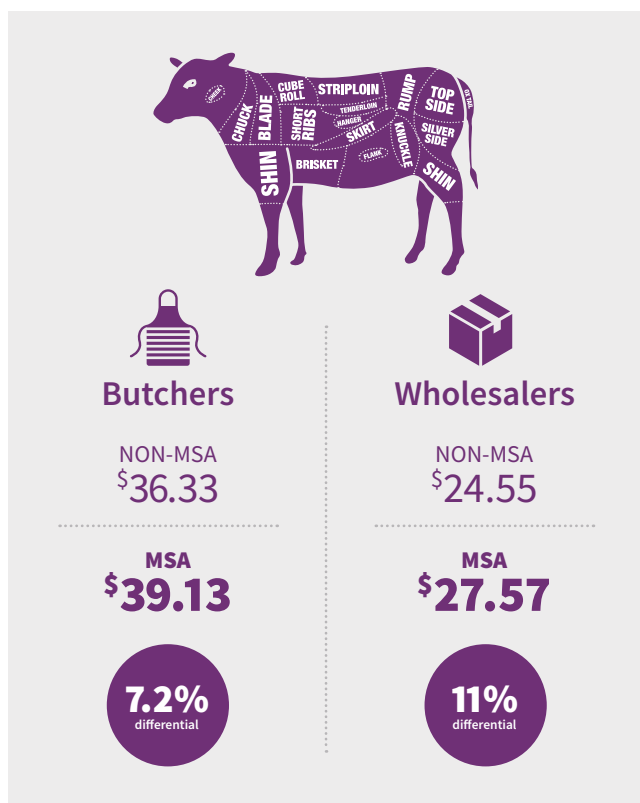
Figure 10: Average retail price differentials 2022–23 – MSA lamb

Butchers	Wholesalers
NON-MSA $32.96	NON-MSA $23.34
MSA $34.14	MSA $23.23
3.5% differential	-0.5% differential
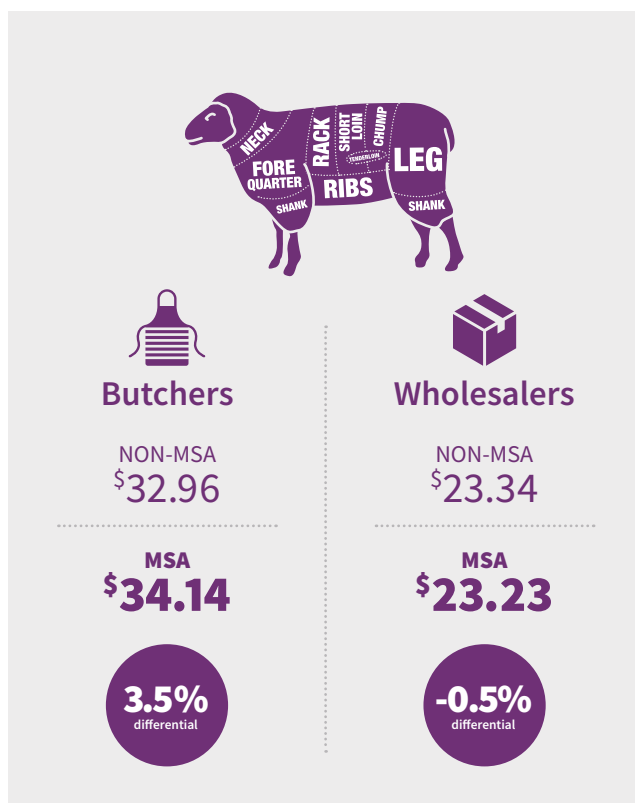
Case study

Genetics and nutrition underpin NKP's MSA win

Proven genetics combined with a focus on nutrition has seen south west Queensland grassfed beef producer, Cameron Smith, and his family among the winners in this year's Meat Standards Australia (MSA) awards.

Cameron, based at 4,505ha 'New Kooroon', 150 kilometres north west of Goondiwindi, and his parents David and Gwen, based at 'Donellen', North Star, operate NKP Pty Ltd .

Registered MSA producers since 2014, NKP has won the award for Queensland's Most Outstanding Non-grainfed Smaller Producer in the 2023 MSA Excellence in Eating Quality Awards.

Cameron Smith – 'New Kooroon', south west Queensland

NKP achieved an average MSA index of 60.59 and compliance of 98.6% for cattle consigned for MSA grading over the two -year period of 2021–23.

The Smiths run a self-replacing herd of 360 breeders at New Kooroon, supplying cattle for the Teys Grasslands range, and Coles and Woolworths, with steer carcase weights averaging 346kg off oats in 2022.

New Kooroon's annual average rainfall is 525mm, and its pastures comprise predominantly buffel grass on red loam soil types. If seasonal conditions allow, winters can be prolific with herbage of crowsfoot, lambs tongue, burr and cut-leaf medic.

Approximately 300ha of oats are planted in late March each year which rising two-year-old progeny are fed on throughout winter before being sent for processing.

"Our 2021 and 2022 oat crops were outstanding with 4.5 month and 5.5 month grazing windows, respectively. This gave the cattle time to reach their potential," Cameron said.

"We rotate our mobs of approximately 60 breeding cows between two allocated paddocks per mob to give the pastures a spell when it's needed or after a rainfall event.

"We run our steers and heifers in separate oat paddocks. If we have

to cut out some cattle from the mob to market them, we try to leave the balance of the mob for a fortnight before going again. Cattle have their mates in the mob and any disturbance can cause stress to them.

"We check the water troughs on the oats paddocks daily so the cattle become very familiar with having you around.

"The oats paddocks are in close proximity to our cattle yards so any trips in to weigh are short, low-stress occasions for them. We don't weigh them often, preferring to just let them do their thing and leave them alone as best we can.

"In recent years, we have been supplying a loose dry lick to the oats-fattened cattle, which has trace minerals of calcium, phosphorus, sulphur and magnesium. It helps the cattle settle on the oats and takes some of the restlessness out of them especially when they're first introduced to the oats.

"We also give a loose lick to the cows if it is dry or in winter if the grass is frosted."

Besides good nutrition, Cameron said the bulls they buy have a big impact on their MSA results.

"Our herd comprises predominantly Devon-Hereford cross females and some Shorthorn genetics," Cameron said.

"We don't want really big bulls. We look for soft coated, thick, deep-set bulls that carry their weight well and with

agility. A quiet temperament is most desirable. They also must have been prepared on a grass or forage crop.

"We look at Estimated Breeding Values (EBVs), particularly rib fat and P8, and refer to them when we're narrowing down a decision between two bulls for example.

"We have been using quality Devon bulls from Glen Innes for 21 years from a producer who does a tremendous job with presenting herd bulls that tick all the boxes for us. Their fingerprints are all over our herd.

"More recently we have been using Hereford bulls from a stud at Pinkett who present a great lineup of bulls. We have also selected some Shorthorn bulls from Tamworth.

"We all have our breed preferences and for us our Devon-Hereford-Shorthorn cattle measure up, all they need is the feed in front of them.

"It is a good feeling to be getting this feedback and recognition knowing the genetics in the cattle are able to perform well against all breeds in our environmental conditions.

"We're in the business of producing red meat protein. Getting involved in an objective assessment of your cattle like MSA with regards to eating quality makes sense.

"As a breeder/finisher, we want to deliver a top-quality product to the consumer and it's rewarding to know we are."

International markets

In 2022–23, MSA worked with six large supply chains in international markets including USA, Canada, Japan, Singapore and Vietnam, delivering 19 online and in-person workshops to over 400 participants.

A key component of the MSA *Strategic Plan 2020–25* is an increased focus on supporting business development activities with processors and brand owners, to expand awareness of MSA on the international stage, and increase confidence of brand owners to differentiate their product based on a world leading eating quality program. This is an important driver towards the industry's goal of doubling the value of Australian red meat sales.

With the continuous growth in adoption of MSA and more carcases MSA graded, so too has there been an increased appetite for MSA processors and brand owners to extract further value from the MSA program.

This has seen increased engagement from MSA with industry stakeholders, particularly importers, wholesalers, and Australian exporters requesting information about MSA and support with market challenges such as the comparison of MSA and USDA grading. The Aussie Meat Academy being delivered in international markets by MLA is also incorporating MSA education.

This stakeholder engagement has included working with brand owners to deliver workshops and education sessions with staff across their businesses including livestock, operations, sales, marketing, and management.

Through these activities, exporters are becoming more confident to discuss MSA as a point of differentiation with their customers, highlighting the importance of eating quality consistency as a fundamental part of their brands.

> In 2022–23, MSA worked with six large supply chains in international markets, delivering 19 online and in-person workshops to over 400 participants.

Case study

Graham Ayres takes home MSA Non-grainfed Larger Producer Award

An early adopter, Western Australian beef producer Graham Ayres has been MSA registered since its inception in 1998, driven by a commitment to quality and to give his business a competitive edge.

Based at Bornholm, Western Australia, Graham, alongside daughter, Ingrid, run 250 head of Angus-Friesian F1 cross breeders across the 540-hectare property, joined to Charolais bulls.

The Ayres have won the award for Western Australia's Most Outstanding Non-grainfed Band 1 Producer in the 2023 MSA Excellence in Eating Quality Awards.

The cattle the Ayres consigned for processing over the two-year period of 2021–23 achieved an average MSA Index of 66.33 and MSA compliance of 99%.

Being a MSA registered producer supports Graham's aim of delivering a quality and consistent product to his customers, and to attract premium prices for his cattle.

"Our milk calves are ideally sold between 10.5–11 months, with a minimum carcase weight of 220kg and an ideal target of 250kg," Graham said.

"We maintain a clover rye mix in the pasture, provide supplementary pasture hay, regularly topdress with fertiliser and lime, and invest in reseeding during autumn to ensure a constant supply of high-quality feed.

"We supply our cattle to Woolworths which has remained consistent over the last six to seven years, continually striving to get them the best-we-can-do product.

"MSA has helped us bring our best-quality product to market, setting us apart. And the financial rewards have been good.

"Our motto is clear: only the best of the best makes the cut. We critically evaluate each animal before they get on a truck.

Graham Ayres with his daughter Ingrid and granddaughter Caitlyn

"This focus on quality over time has helped us foster a good reputation and drive strong business relationships with customers over the years, knowing that they're getting not just a quality, but a consistent product."

Graham said the results speak for themselves.

"Particularly over recent years, MSA has been a factor that encouraged us to further evolve our cattle management approach," Graham said.

"It helped us look more closely and better assess cattle behaviour, emphasising the utmost importance of understanding and respecting our animals.

"This shift in perceptions has impacted our entire herd management strategy.

"So, whether we're in the yards or the paddock, our focus is on creating and maintaining a quiet environment for our livestock through our handling techniques, which has paid dividends.

"We introduced quiet Charolais bulls who are known for their muscling and docility, sourcing them from the same breeder for over two decades now because we know we're getting a consistent animal, with a good temperament.

"When purchasing bulls, we do look at Estimated Breeding Values (EBVs), mainly birth weight, as we like to target smaller framed bulls".

"And our cattle now know their routine well, which has helped eliminate the need for pre-transport preparation for example."

Graham said he has learned valuable lessons over the years.

"We just want to run the best herd and deliver the best product we can," Graham said.

"MSA has been a key factor in helping us bring our best to market, where we're now consistently delivering a quality product that's grading MSA, meeting specifications for customers, and getting a premium price.

"While we might not have a silver bullet to achieving good MSA outcomes, the results are starting to speak for themselves."

Research and development

Investments into eating quality research and development (R&D) aim to make all cattle and sheepmeat eligible for MSA, as well as focusing on technologies and traits to ensure consistent consumer outcomes.

In 2022–23, MSA continued to collaborate with research partners on the following key research projects.

Dairy beef

The objective of the dairy beef project was to validate the accuracy of the MSA model to predict eating quality of dairy breeds and determine if there was any difference in eating quality between beef and dairy breeds when raised under similar conditions in grainfed and non-grainfed systems.

Results showed that at equivalent hot standard carcase weight (HSCW), dairy carcases in the project typically had similar marbling and ossification, lower P8 and rib fat, and proportionally smaller eye muscle area (EMA) than the beef breed carcases.

Beef from dairy steers had equivalent eating quality to beef breeds when finished in feedlot or supplemented pasture-based systems. For dairy breeds, the highest eating quality and MSA compliance was achieved through an accelerated growth high carbohydrate ration (target growth rate of 1.5kg/day) fed from weaning that produced 300kg carcases at 14 months.

The project demonstrated the current MSA model adequately predicts the eating quality of all groups in this trial, which included Holstein, Jersey, Jersey x Holstein and beef breeds. The project also aimed to develop an MSA veal pathway, however, while the dairy veal calves achieved acceptable eating quality, they were non-compliant with existing MSA screening criteria for rib fat and ultimate pH, and potentially compromised by cold shortening reducing their eating quality potential. To create a commercially viable MSA veal model, novel screening criterion in association with alternative chilling regimes may be required.

Adoption of two increased growth rate pathways on a combination of pasture and feedlot and a novel high carbohydrate ration have the potential to produce comparable eating quality outcomes to beef breeds and superior carcase value to the current end points for dairy animals.

These results provide potential opportunities for particularly male dairy calves, especially those from pure dairy breeds.

The project also included the development of new MSA cooking protocols for schnitzel (SNZ). Additional consumer sensory testing was conducted on recently developed MSA cooking protocols for Texas BBQ (TBQ) with superior eating quality outcomes compared to existing grill and slow cook methods.

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Rail consignment MSA pathway

This research is aimed at determining the beef eating quality impact of rail transport, potentially opening up a new MSA pathway for beef producers in extensive production regions.

The creation of a rail pathway for MSA would increase the number of MSA eligible cattle and deliver an estimated additional $50 million per year in supply chain returns.

While cattle are transported to slaughter by rail through major Queensland rail centres, current MSA time-to-slaughter requirements render these cattle ineligible for MSA grading.

To date, there have been five groups of cattle processed with consumer sensory testing undertaken. These replicates include a comparison of cattle transported via road and rail, through rail systems at Quilpie in south west Queensland and Clermont in central Queensland.

The research has also included a study of transporting cattle long distances via road and rail and re-feeding them for 13 days and 30 days to replenish glycogen, before being slaughtered. The two timeframes will help evaluate the impact of various rest and recovery strategies.

The final replicate for this trial assessing the longer rail pathway has been delayed due to wet weather conditions in northern Queensland.

The project is due for completion at the end of 2024.

Case study

Pastures key to MSA performance for leading Victorian producers

Running their grazing operation like a dairy farm to ensure a year-round supply of quality feed for their cattle has underpinned success for Gippsland beef producers, Neville and Karen Beecher.

The Beechers run a mix of Angus, Hereford, and Angus-Hereford cross cattle on their property at Churchill, and their MSA results led to them winning Most Outstanding Non-grainfed MSA Larger Producer in Victoria in the 2023 MSA Excellence in Eating Quality Awards.

The Beechers, who have been MSA registered producers since 2017, achieved an average MSA compliance of 99.7%, and average MSA Index of 63.51 across 2021–23.

With an average annual rainfall of approximately 800mm, the Beechers run their property like a dairy farm, growing as much ryegrass and clover as possible while maintaining a good supply of fodder to ride out tough seasons.

They sell the best of their silage to dairy farming clients with the rest kept on-farm for their cattle.

"We put down a base fertiliser on our paddocks and use the advice of our agronomist. We also re-sow ryegrass and clover each year to top up the paddocks and make sure we have feed for winter," Neville said.

The cattle are supplementary fed silage in autumn and have access to hay to feed on as necessary in winter.

"Cattle have a tendency to lose condition in winter, but we make sure they have plenty of grass and hay to keep them moving forward," Karen said.

"We don't have a set target weight for turning them off, but we aim for around 400kg carcase weight."

Rotational grazing is also used on-farm to carefully manage pastures and maintain weight gain.

"We don't graze our paddocks down to picking level, even in autumn," Karen said.

The Beecher family – Churchill, Victoria.

In the yards and during transportation, the focus on low-stress stock handling continues.

The Beechers transport their cattle themselves, supplying the Greenham Bass Strait Beef brand.

The Beechers are part of the Greenham Never Ever Beef Program, which specifies that cattle are grassfed, MSA certified, that no hormone growth promotants (HGPs) are used, no antibiotics are used, and the cattle are free from genetically modified organisms.

Their close proximity to Greenham means Neville and Karen can continuously select the best of their cattle for processing.

The Beechers look at their MSA feedback in myMSA and attribute their ongoing high rates of MSA compliance to their feeding regime.

"We look at the feedback in myMSA. We're not buying in the most expensive, top lines of cattle, but I think our results come down to how we feed our cattle and maintaining quality feed all year round," Neville said.

For the Beechers, the path to becoming award-winning MSA beef producers started as a sideline to their agricultural contracting business.

"Our approach to our cattle business has been more opportunistic, and dependent on the market and seasons," Neville said.

"We produce silage and pasture hay and provide cultivation services for clients. We used to run about 200 head, mainly for fodder management, but when drought hit about five years ago and cattle prices dropped, we increased our numbers to over 1,000 head.

"We were buying in steers and heifers at the right price and sold them at a good time.

"When we could see cattle prices getting high, we transitioned to cows and calves. As our calves are growing out to heavy heifers or bullocks, we are selling our cows and transitioning back to buying in steers, which is more a work/life balance decision.

"We have downsized to about 300 head now. We buy through AuctionsPlus and local store markets, to source weaners between 200–300kg from producers who we have bought from previously and had good results with."

Saleyard MSA pathway research

MSA undertook two separate saleyard projects in 2022–23 – one for cattle supply chains and one for sheep supply chains.

Cattle

The project aimed to quantify the eating quality impact of alternative cattle marketing practices, comparing four saleyard protocols to direct from farm to slaughter. The protocols included 48 hours without re-feeding, and 72 hours, seven days and 14 days with re-feeding post-saleyard.

While a MSA saleyard pathway exists, in practice it is rarely used due to time to slaughter and other MSA requirements.

The first trial was completed in NSW in 2022 and the second trial completed in northern Victoria in February 2023. Sensory testing was completed in June 2023 and data analysis and the final report is due in 2023–24.

Sheep

The first trial in NSW consisted of three treatment groups including direct consignment, saleyard, and saleyard plus five days of re-feeding prior to slaughter.

The second trial was undertaken in Western Australia in June 2023 under the same treatment groups.

Following consumer sensory testing, the final report for this project is expected to be delivered at the end of 2024.
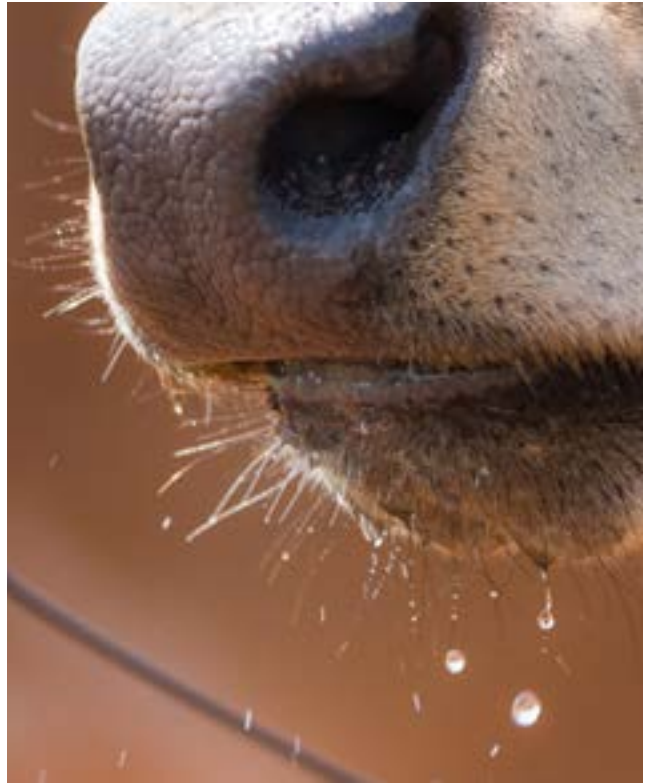
Biomarkers to predict high pH carcases

The biomarkers project is investigating whether specific proteins or biomarkers (biological measurable indicators) found in high pH meat can be detected in saliva prior to slaughter.

The aim is to develop tools to predict and therefore manage potential high pH (pH >5.70) animals in the weeks prior to slaughter. This would provide producers with the tools to make informed decisions before sending cattle to an abattoir and increase profitability by reducing the MSA non-compliance due to high pH.

Testing of candidate biomarkers has occurred in samples collected from 240 animals one month before slaughter and then at slaughter.

Results to date indicate there are some potential biomarkers linked to non-compliance due to high pH. Sample collection on a second supply chain has been completed and is under analysis.

> Pre-slaughter biomarker prediction tools would help producers to make informed decisions before sending cattle to an abattoir and increase profitability.

Wagyu effect

The objective of this project was to determine if there was a Wagyu breed effect on eating quality.

The project utilised animals fed longer than 200 days, and 300 days on feed, high content crossbred Wagyu, purebred Wagyu (unregistered) and Wagyu and Angus F1 animals.

Sensory testing with consumers in Australia and the United Arab Emirates (UAE) included a range of cuts including striploin, rump and chuck, and a range of cooking methods including grill, shabu shabu (thinly sliced meat cooked in a Japanese-style hot pot), and yakiniku (bite-sized pieces of meat grilled on an iron plate or grill net).

Results demonstrated that at times and for some cuts, Wagyu and Wagyu-cross cattle have superior eating quality outcomes to comparison cattle, however, this effect is not consistent. The effect varied across different cuts and variability occurred across the range of cooking methods.

They also showed the existing cut and carcase characteristics measured by MSA grading including marbling and ossification accounted for the majority of variation in eating quality.

The sensory testing showed Middle Eastern consumers have similar appreciation of the Wagyu grilled beef samples to Australian consumers, apart from the rump cap, which was scored lower by Middle Eastern consumers compared to Australian consumers.

Results concluded there was insufficient evidence of a consistent additional Wagyu effect, and therefore, no adjustments to the MSA model were required.

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Objective carcase measurement technologies

Support continued for the Objective Carcase Measurement (OCM) technologies, with a number of devices currently in use and development measuring traits which are included in both the MSA beef and sheepmeat grading models.

In 2022–23, MSA graders were involved in four accreditation grades for eight objective measurement devices.

The MSA team is also working with processors to support the use of the data generated by some of the OCM devices to improve both efficiencies and returns in the supply chain.