AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Annual Operating Plan 2022–2023

Transforming the red meat processing sector

Australian Meat Processor Corporation (AMPC)

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Cover: Spot was manufactured by Boston Dynamics
Photo credit: The Casino Food Co-op

Person trialling immersive reality googles at Beef Week 2021

The Australian Meat Processor Corporation (AMPC) is the specialist research and development (R&D) provider for Australian meat processors – wherever they are, whatever their markets, no matter their size. AMPC's mandate is to provide research, development, and extension (RD&E) services that improve the sustainability and efficiency of the sector.

Our 2022-2023 Annual Operating Plan outlines our activities during the year and aligns to our five-year strategic plan.

Contents

Advanced manufacturing

Human product handling is halved through technology advancement to reduce injury rates, maximise yield and processing efficiency by 2030

Carcase primal profitability optimisation

Carcase scribing and robotic boning

- Evaluate new concepts and perform on-site trials for semi-automated primal cutting and scribing applications including carcase marking, AI driven and remotely operated systems.
- Progress developments and raise awareness through engagement activities on site and through AMPC events and conferences.
- On-plant development and evaluation of early working prototypes to demonstrate potential uses in primal cutting tasks.
- Drive adoption through on-site development and installation of non-X-Ray (AI driven) automated beef scribing systems.
- Progress development of small footprint DEXA to enable cost effective sensing options for cutting and boning tasks.

Carcase cut calculator and optimisation tools

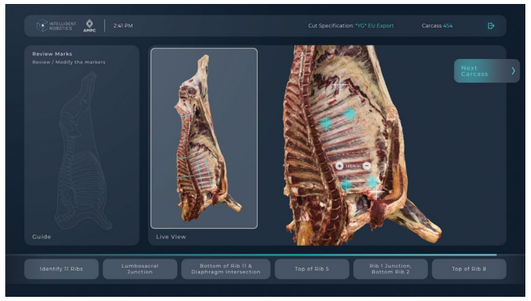
- Continue to support processors to evaluate and implement the carcase cut calculator and optimisation tools.

Objective carcase measurements

- Encourage and support processors to evaluate and implement new objective carcase measurement sensing systems and tools.

Boning room traceability

- Evaluate and further develop new primal and carcase marking, and traceability technologies.
- Further develop and test AI technologies in boning rooms for naked primal, packaged primals and carton primals to enhance traceability and automated packing capabilities.



Remote operation and semi-automated beef scribing interface
Credit: Intelligent Robotics

Adoption

Adoption

- Encourage and support processors to adopt economically viable technology.
- Develop an Australian red meat processing 'Factory of the Future' concept.
- Develop tools to help processors evaluate R&D and adoption of advanced manufacturing innovations.
- Evaluate adoption of past R&D to encourage processors to adopt technology and explore different funding models.
- Assist members with grant funding to help with technology adoption.

AGV – automated guided vehicle
Credit: TME Systems

Hands-off processing

Remote operation processing

- Further investigate and develop gamification for use in training employees to use remote operated technology.
- Progress development and raise awareness through engagement activities on site and through AMPC events and conferences.
- Continue evaluating new technology that enhances remote operation performance and addresses industry needs
- In-plant evaluation of early working prototypes of remote operation platforms and technology to demonstrate potential uses in processing tasks
- Drive adoption of remote operation technologies

Manual handling

- Evaluate and test Automated Guided Vehicle (AGV) technologies on processing sites to determine potential uses and promote their adoption.
- Take learnings from carton handling and storage best practice project evaluations to do further investigative work and drive adoption of carton handling solutions.
- Progress prototype developments such as container loading.

Automated boning

- Evaluate options and support early concepts that provide automated lamb and beef boning.
- Support on-plant development and evaluations of early working prototypes and new semi-auto and automated boning developments.

Automated processing

- Evaluate and test new washdown capable robotic technologies on processing floor environments.
- Evaluate and test collaborative robotic technologies on processing floor environments to determine potential uses.
- Investigate development of dual tool technology to assist line speed requirements for slaughter floor automation.

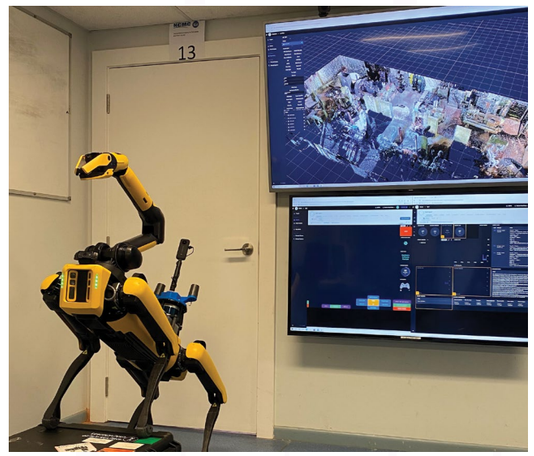
Digitisation

3D printing/additive manufacturing

- Evaluate mobile non-metal and in-situ metal industrial 3D printing solutions with processing plants.
- Understand the benefits of 3D printing technology in assisting prototype development, plant and equipment maintenance.

Industry 4.0 – the internet of things

- Complete Industry 4.0 studies at processing sites to enable further understanding of the benefits of Industry 4.0 to the industry in Australia.
- Progress on-site pilot programs to investigate how Industry 4.0 thinking can assist businesses.
- Assess Industry 4.0 opportunities and benefits for processing plants.
- Assist on-site integration of systems across meat processing plants to enable data analytics for better management incorporating machine learning and AI technologies.
- Continue trials at processing plants using artificial intelligence tools for refrigeration systems and equipment maintenance.
- Validate use of improved digital photorealistic visual technologies, in association with 3D rendered visualisation 'digital twins' and simulated operational production systems.
- Validate use of 'digital twins' and simulated operational production systems to deliver demonstrable and measurable results.



Boston Dynamics Spot Enterprise Robot
– an automated guided vehicle with articulated legs.
Credit: The Casino Food Co-op

Sustainability

By 2030, Australian processors are recognised as global leaders in environmental stewardship and acknowledged as responsible businesses with positive economic and social impacts on their communities

Waste

Zero waste to landfill challenge

- Quantify landfill reduction, clean energy production, and life cycle emissions reduction based upon the results of a new to industry pilot technology.
- A cost benefit analysis will be provided for participants to realise the business case for adopting a new to sector "zero waste to landfill" system as a pilot.

Wastewater treatment and bio-solids recovery for a circular economy

- This project funds the first stage in a three-stage study to help establish feasible methodologies for re-processing bio-solids as an upgrade treatment for commercial off-takers of bio-based fertilizers.
- The project adopts a circular economy approach for collaborative outcomes that help reduce risk.

EPA landscape comparison for state compliance

- State-based EPA requirements concerning the production, transport, treatment, and disposal of animal effluents (i.e. solid wastes such as paunch, manure, sludges and crusts) are becoming more stringent.
- This project will provide members with updated and illustrated guidelines on current regulations and compliance strategies across each state jurisdiction.

Water

Water stewardship and drought resilience

- Introduction to water stewardship practices for red meat processors in Queensland.
- Members will be introduced to water stewardship concepts, thinking and practices to help adopt a more sustainable approach to water use and its effect on their community.

Waterless knife solution

- Development of a second solution that reduces the water and energy used for knife and other equipment sterilisers, while not impacting on Australia's red meat processing audited HACCP procedures.

Optimise energy and water intensity benchmarking

- Upgrade of the Sectoral Energy and Water Benchmarking tool so that it achieves recognised exemplar status and provides tangible value, with smart guidance for processors looking to improve their energy and water performance.

Wastewater treatment and bio-solids recovery
Credit: Tessele

Energy

Refrigeration as a Service

- The project aims to illustrate the viability and feasibility of Refrigeration as a Service (RaaS).
- RaaS is an alternative to conventional plant ownership of refrigeration assets, and is a performance-based service that can enable immediate energy efficiency savings.

Refrigeration area in a meat processing plant

Transport emissions, efficiency, and sustainability roadmap

- This project is the first step in transitioning away from fossil fuels to clean fuels (i.e. hydrogen) in red meat processor heavy transport applications.
- It will complete sectoral heavy transport mapping, a participant diesel baseline, identification of clean fuel opportunities, and cost benefit analysis including environmental, economic, social, and animal welfare benefits that may be possible from a transition to clean fuels.

Working with hydrogen – applications for red meat processor stationary energy

- Scope, design, and demonstrate feasible hydrogen applications for offsetting fossil fuels used in several on-plant stationary energy tasks e.g. irrigation pumps, pond aeration, 5G towers, peak shaving and UPS.
- It will make recommendations around next steps for further development of the AMPC Clean Fuels Roadmap.

Developing a culture of energy efficiency in red meat processing

- Best practice energy efficiency requires superior energy measurement, supported by targets, insights, assigned responsibilities, and a management culture of recognising and rewarding responsible employees.
- The above protocol will be integrated into the sectoral benchmarking tool upgrade and demonstrated in workshops.

Packaging

Divert packaging from landfill

- Conduct a detailed analysis of plastics use in packaging processes and identify the potential for reduction, re-use or re-cycling of plastic packaging currently used by red meat processors.
- Help establish clearer understandings of the packaging supply and waste chain in meat processing, with suggested business models to develop more viable pathways supporting less packaging waste.

Industrial transformation training centre for R&D on bioplastics and bio composites in red meat processing

- Support from postdoctoral researchers to undertake industrial training on biopolymers and bio composites.
- Support R&D collaboration between universities, red meat processors, and industry providers on identifying transformational pathways for biopolymers and bio composites.

Communities

Measuring social impact

- Establish a social impact measurement for the red meat processing sector to help communities better understand processor role and value.

Environmental performance review

- The 2022 review will develop new case studies on environmental leadership.
- The review is the flagship sectoral environmental performance report relied upon by industry for over 20 years.

Market imposed environmental disclosures

- Red meat exporters to certain markets will be required to better disclose product environmental footprint in the future.
- This project will define what is the expected under these market-imposed disclosures, the timeframe, and how processors can prepare.

People and culture

By 2030, the processing sector is seen as a diverse, safe and attractive industry of choice for employment

Attraction

Attraction

- Scope a program of work to attract people to the vast opportunities in the red meat processing sector, with an emphasis on highlighting the career path opportunities.
- Develop an industry platform that seeks to showcase the diversity of opportunities in the red meat processing sector.
- Develop a schools program starting with secondary school students to introduce them to all the opportunities that the processing industry has to offer.

Virtual tours

- Development of interactive virtual tours of red meat processors from lairage to packaging.
- Releasing to university students to provide them with detailed information on the process and the level of technology deployed in processing, and as an aid to attract them to a career in meat processing.

Strategic policy research

Workforce project

- Deep dive into current state of industry workforce, projections for labour supply, policy solutions and industry strategy.

Development

Leadership development

- Run the AMPC graduate Certificate in Agribusiness for AMPC members.
- Continue to support the Australian Rural Leadership program and the Australian Rural Agribusiness program.
- Support the development of leadership programs in-plant as part of the retention and systems innovation projects.
- Develop a wholistic multi- year capabilities plan to continue to develop technical and leadership skills.

Business continuity training

- Develop a human transmissible disease management plan for red meat processors.

Capability development

- Capability development within plants through innovation managers on site.

Immersive training goggles and console
Credit: Virtually There

AMPC Jemma Harper helping attendee at Beef Week 21 put on an exo-skeleton

Safety and wellbeing

Knife safety

- A systematic and collaborative approach with processing plants to improve knife safety and analysing IOT technology in the red meat industry.

The implementation of robotic and exoskeletal devices

- Review several different exoskeletons and evaluate them against a number of different tasks across industry.
- Develop guidelines on what to consider when purchasing exoskeletons.

Wellbeing project

- Understanding what industry requires in the wellbeing area and creating a tool to assess wellbeing and develop resources.

Retention

Training – immersive reality

- Expand the suite that AMPC offers in this area.
- Develop resources to help support the delivery of meat inspection and bandsaw safety.
- Develop technology further to mimic movement easier (3 year project).

Immersive training goggles and console

Technical market access and markets

By 2030, Australia is the preferred trading partner for premium red meat products globally, with unrivalled access to high value markets

Products

AMPC Academy of Meat Engineers

- This academy is a revolutionary program is designed to change the way processors think about new products, to create new opportunities for product line expansion and profit growth.
- The academy will work with a small, exclusive cohort of industry participants to revitalise the art of artisan value-adding to sheep, cattle and goat, using state of the art modern processing equipment.

Beef fat and trim separation process project

- This project is about evaluating opportunities to separate fat from meat and the benefits this provides.

Kilcoy innovation hub project

- In 2021 AMPC supported the development of the Kilcoy Innovation Hub in collaboration with Kilcoy and MLA. AMPC is providing an ongoing commitment to using the new product development space for AMPC's Academy of Meat Engineers.

AMPC's first cohort of students complete the Academy of Meat Engineers

Kilcoy Innovation Hub

Marketing and promotion

Marketing and promotion

- AMPC provides funding to MLA as part of a joint industry investment program to fund important industry and product marketing, and promotional activities.

Market access

Market access investment with MLA

- AMPC provides funding to MLA as part of a joint industry investment program to fund important market access activities .

Future work on non-tariff barriers (NTBs)

- AMPC is working with meat processors and government to understand the NTBs that have been identified as impacting most on market access in the years since the Harris report's release, and to prioritise and undertake research projects to assist in addressing these NTBs.

Remoting auditing

- AMPC will work with the industry and providers to investigate infrastructure initiatives to support remote auditing. We will pursue technology to enable streaming of video, including in real time, of audits to support regulatory requirements.

Label verification

- AMPC will investigate technology that could be used to verify that labels on boxes match the product in the box. This initiative will assist in reducing rejections and other actions by importing countries because of labelling errors.

Efficacy of electrical stunning/halal

- AMPC will evaluate the efficacy and quality outcomes of high frequency electrical stunning in grain fed cattle to meet halal requirements. The work will gather animal and neurophysical data to support a submission to regulators and Islamic bodies.

An AMPC project will determine labels on boxes match products in the box

Remote auditing in action
Credit: Bondi Labs and Wagstaff

International competitiveness

COVID-19

- Economic and policy implications of COVID-19 on industry – stage 2.

Global competitiveness project

- A post COVID-19 review of the influence of government on the red meat supply chain's global competitiveness (vis a vis NZ and the US) including a review of costs (direct and indirect such as labour, utilities, fuel and meat specific costs and charges) as well as government subsidies and assistance.

Product and process integrity

The Australian red meat industry maintains and further enhances its international reputation for safe, sustainably-sourced, wholesome red meat products

Animal welfare

Lairage R&D

- Research project to further the industries understanding of industry leading developments and innovation in the areas of receivals, lairage automation, welfare, livestock flow and knocking box developments.
- New stealth (low noise) knocking boxes are being trialled for beef processing with the aim of improving animal welfare and worker safety outcomes at this point in the slaughter process.

Animal Welfare Standards

- AMPC will continue the awareness and training programs for the industry-owned AAWACS and assist in the development of a national animal welfare standard to support AS 4696.

Knocking box

- AMPC has started a project, working with CSIRO and Jarvis, to trial a 'stealth knocking box' to improve animal welfare outcomes. The aim is to reduce noise and animal stress at the knocking box. The trial will also consider the effectiveness of electrical stunning in conjunction with the use of the stealth knocking box to improve animal welfare at this early stage in the meat production process.

Televet – remote vet anti-mortem

- This work will look at the opportunities for veterinarians to undertake anti-mortem inspections, remotely, to meet regulatory requirements. It will identify the technological and regulatory impediments to these inspections and recommend further work in this area.

Traceability and integrity systems

Smallstock EID project

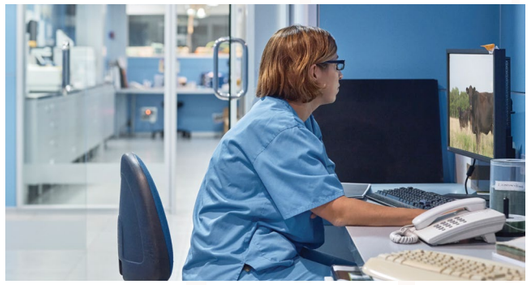
- This project will review the readers available for small stock RFID tags to determine which readers are most useful for small stock processors. It will consider the readers used in Victoria and assess their usefulness in other states.

RFID hook traceability

- This work seeks to assist processors in evaluating an RFID solution for tracing product through slaughter, chiller and the boning room. Previous RFID solutions used by processors have only been effective for a maximum of 12 months.

Tracing steaks derived from specific primals and vice versa

- AMPC will investigate and develop technologies to enable the tracing of steaks back to the specific primal from which they were produced, and the reverse, that is the tracing of all steaks that were produced from a specific primal.



A vet working remotely

Lamb cutlets on a supermarket shelf

Food safety

End of line carcase inspection

- AMPC will progress the re-evaluation and further development of approaches to 'end of line' carcase inspection with a view to developing options for full or semi-automated inspection and contamination removal. Benefits to the industry include reduced energy and/or water costs, reduced trimming, and reduced or more efficient use of labour.

Hygiene room

- AMPC is supporting the development of a state-of-the-art personal hygiene room which will protect both workers and product. The ante room will be fitted with behaviour monitoring equipment. Digital and high-volume traffic washers will be installed. High end equipment and a UV sanitising system will be installed for sanitising and cleaning equipment.

Heavy metal detection in offal

- This project is to determine the level of cadmium in livers and kidneys of sheep and cattle. The project will validate a raman probe to measure the levels of cadmium, with the aim of enabling processors to s alvage offal with acceptable levels of cadmium for human consumption. The current requirements are that livers and kidneys from sheep and cattle over a certain age and sourced from areas deemed to have high levels of environmental cadmium contamination cannot be used for human consumption.

Lamb shelf life 20 weeks

- This work explores the practical usefulness of different smart packaging technologies for preserving the organoleptic and retail-potential traits of lamb held chilled for up to 20 weeks.

Taenia saginata project

- This project looked at the levels of eggs of the human tapeworm, Taenia saginata, in treated waste water. It also considered the regulatory requirements of states and territories for managing waste water treatment and the compliance of their treatment plants with the Australian Water Recycling Guidelines.

  The findings of this project are being extended by AMPC and are now part of the considerations informing the development of the C.bovis risk management framework by the C.bovis steering group. While Taenia saginata eggs are not a human health issue, ingestion by cattle is part of the life cycle of this parasite. Ingestion leads to the development of C.bovis cysts in various organs, including the heart and the cheek muscles, and the condemnation of affected carcasses or parts thereof.

Engagement and extension

Work Health and Safety Conference

AMPC will deliver its first WHS Conference, where red meat processors will be exposed to new safety innovation ideas and technologies from leading manufacturing providers and industries in Australia.

The two-day event will be held from Wednesday 1 June to Thursday 2 June at the Pullman Brisbane King George Square and will bring together processors and industry participants from across Australia to broaden their knowledge of WHS innovation and provide them with the opportunity to network with like-minded people.

AMPC's Innovation Showcase conference

AMPC will deliver its inaugural Innovation Showcase, bringing together red meat processors and industry participants from across Australia to experience new innovative ideas and technologies from AMPC's research and development providers and hear and learn from world-class speakers, listen in to panel sessions, and participate in various workshops.

The three-day event will be held from Tuesday 11 October to Thursday 13 October at the Melbourne Showgrounds and will explore the theme of "The future of red meat processing" which highlights the importance of adopting innovative solutions to build a stronger and more sustainable red meat processing industry.

Stakeholder and member engagement

AMPC has a dedicated regionally based team of five co-innovation managers who liaise and work with up to 20 processing companies each. The team, based in New South Wales, Victoria, Queensland, and Western Australia, manage the levy payer relationship, extend R&D outputs directly with processors, encourage cross-fertilisation across the industry and share insights on challenges with the AMPC R&D team.

AMPC's plant-initiated projects program (PIP) is one of the most effective ways for AMPC to engage directly with processor members. It enables processors to co-fund and participate in R&D on their own plant and adopt solutions which meet their unique set of needs.

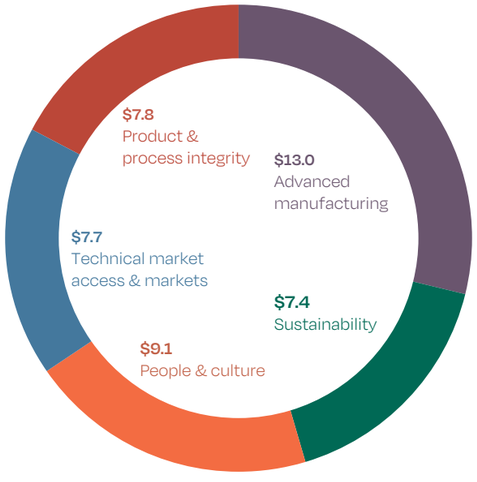
AMPC has executed stakeholder engagement agreements with Meat and Livestock Australia (MLA) and the Australian Meat Industry Council (AMIC).

In FY22, AMPC is moving to a twice per year consultation model where industry input is provided, and AMPC presents its progress. Rather than meeting with different stakeholders separately, this model enables AMPC to provide a detailed update to many stakeholders in one session, held twice per year.

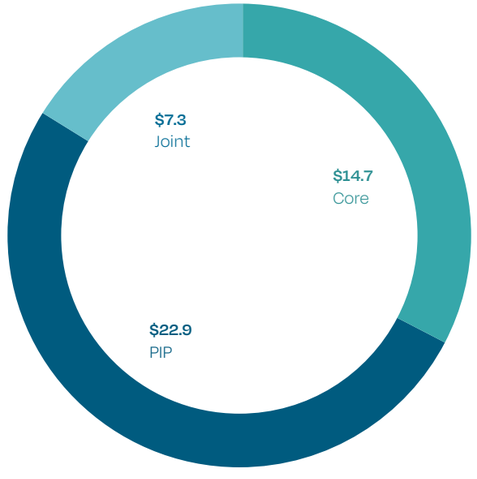
AMPC engages with government through regular meetings with the Department of Agriculture, Water and the Environment, and CEO meetings with the Minister.

Balanced portfolio

Expenditure by program ($m)



Expenditure by type ($m)



Budget

Income and expenditure

Income	RD&E	Marketing	Total
Levies	$10,706,901	$7,137,934	$17,844,835
Interest	—	$48,000	$48,000
Government matching	$18,729,548	—	$18,729,548
Partner contributions	$8,037,179	—	$8,037,179
Total	**$37,473,628**	**$7,185,934**	**$44,659,562**

Program expenditure	RD&E	Marketing	Total
Advanced manufacturing	$12,956,726	—	$12,956,726
Sustainability	$5,443,534	$2,000,000	$7,443,534
People & culture	$7,998,117	$1,061,564	$9,059,681
Technical access & markets	$3,983,202	$3,710,704	$7,693,906
Product & process integrity	$6,541,585	$1,227,733	$7,769,318
Total programs	$36,923,163	$8,000,000	$44,923,163
Corporate member fees	—	$615,584	$615,584
Direct corporate costs	$2,835,934	—	$2,835,934
Total program direct costs	$2,835,934	$615,584	$3,451,518
Total	**$39,759,097**	**$8,615,584**	**$48,374,681**

Corporate costs	RD&E	Marketing	Total
Indirect corporate costs	$2,265,170	$1,510,114	$3,775,284
Total	**$2,265,170**	**$1,510,114**	**$3,775,284**

Reserve movements

	RD&E	Marketing	Total
Opening Reserves	$10,553,916	$13,413,710	$23,967,626
Budget Net Income	-$4,550,639	-$2,939,764	-$7,490,403
Total	**$6,003,277**	**$10,473,946**	**$16,477,223**