

## Annual Operating Plan 2023–2024 Supporting the red meat processing industry





The Australian Meat Processor Corporation (AMPC) is the specialist Research and Development Corporation (RDC) for the red meat processing industry in Australia.

AMPC is the red meat processing industry's trusted partner in innovation and its purpose is to invest in research and development and marketing initiatives that improve the competitiveness, profitability and sustainability of the industry.

Investments are funded by statutory levies, private contributions, and the Australian Government and are designed to deliver a range of benefits for the industry and the broader Australian community.

AMPC engages with leading research organisations and marketing providers and funds joint activities with our value-chain partners to address the priorities of the red meat processing industry.

Many of AMPC's investments are multi-year projects and you will see some similar themes as previous years.

Importantly, in the 2023-24-year AMPC will modernise our R&D funding model to ensure the sustainability of our industry and to increase the transparency of our funding decisions. We are replacing the increasingly outdated Plant Initiated Projects funding model with a more flexible, transparent approach to funding that delivers better industry wide outcomes. The decision to change the funding model was informed by an independent ACIL Allen report commissioned by the Board. The shift will bring us into line with industry best practice and our Research and Development Corporation peers.

Under the new model, our funding decisions will be guided by public, transparent criteria that will be applied individually to each project. The pool of funding will not decrease and there will be more opportunities to scale projects.

The new model will ensure the funding decisions we make are for the benefit of the whole industry, providing increased opportunities for processor participation and collaboration on R&D activities and facilitating greater uptake of successful R&D.

Our 2023-24 Annual Operating Plan outlines our activities during the year and aligns to our five-year strategic plan.

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Cover: Research Scientist Scott Choi demonstrating the Veritide BluMax Camera Scanner Left: Veritide's Gerard Kilpatrick and AMPC's Lauren Smith trialling the Veritide BluLine Scanner

# Advanced manufacturing

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



ntelligent Robotics' Andrew Martchenko with the semi-automated scribing robot

#### CARCASE PRIMAL PROFITABILITY OPTIMISATION

#### Carcase scribing and robotic boning

- Develop and evaluate new automated and semi-automated cutting and boning technologies
- Progress developments and raise awareness through engagement activities on-site and through AMPC events and conferences
- On-plant development and evaluation of early working
   cutting and boning prototypes to demonstrate capabilities
- Adoption through on-site development and installation of non-X-Ray (Al driven) automated beef scribing systems

#### 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 measurement sensing systems and tools
- Further develop full carcase contamination detection tools with on plant production trials

#### 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 primals, packaged primals and carton primals, to enhance traceability and automated packing capabilities

#### 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 processors to access external funding to enable technology adoption



Mimeo industrial shadow robot

#### HANDS-OFF PROCESSING

#### Remote operation processing

- 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 development of remote operation technologies for meat processing

#### Manual handling

- Evaluate and test a range of Automated Guided Vehicle (AGV) technologies on processing sites to determine potential uses and promote their adoption
- · Progress prototype developments such as container loading
- Further develop through in-plant production trials and installation of automated primal packing solutions
- Evaluate new magnetic conveyor technologies on plant and in production environments

#### Automated boning

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

#### 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 new technologies and concepts that support
   throughput 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

- Encourage technology providers to develop equipment with Industry 4.0 capabilities and encourage processors to adopt Industry 4.0 capable technologies
- 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 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



Konica Minolta's Bob Bentley showing a lightweight mounting bracket 3D printed in stainless steel

# 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



Beam Solar's Richard Pienaar with a solar PV panel

#### COMMUNITIES

#### Measuring social impact

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

#### Decarbonisation pathways — triannual update

- The Environmental Performance Review 2022 results will be illustrated to show the red meat processing industry's progress on decarbonisation
- The industry emissions trajectory will be compared to Paris Agreement and CN30 target pathways. It will compare the mix of carbon reduction activities, cost and Net Present Value (NPV) of investments required along each pathway

#### Market imposed environmental disclosures

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

#### Industry reputation research

 Ongoing research on the community's knowledge and perception of the red meat processing industry's reputation and communicating the industry's positive economic and social impacts to regional communities and key stakeholders

#### ENERGY

# Superior energy efficient refrigeration business model and Industry 4.0 demonstration

- Superior energy efficient refrigeration has proven difficult to maintain our industry
- This project demonstrates a novel funding structure, with Industry 4.0 monitoring and management to verify performance, cost savings, and carbon reduction

# Emissions Reduction Fund (ERF) — registration, carbon credit creation, and management case study

 This project will provide a documented case study on how processors can use the ERF to assist their transition to clean energy

# 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 industry 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



All Energy's Gareth Forde inside the AMPC water recycling unit

## Working with hydrogen — applications for red meat processor stationary energy

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

#### WATER

#### Water stewardship and drought resilience

- Provide water stewardship recommendations to processor participants, and guidelines for industry
- Present findings to Future Drought Fund and Drought Resilience Hubs

#### Waterless knife solutions

 Development, testing, and verification of two solutions to reduce water and energy use for knife sanitisation, while not impacting Australia's red meat processing audited HACCP procedures

## Optimise energy, water and emissions intensity benchmarking

- Upgrade the industry energy, water and emissions
   intensity benchmarking tool
- Conduct individual workshops for processor participants
   in the Environmental Performance Review 2022
- Provide tailored guidance for each participant to help improve their environmental performance

## WASTE

# Program for wastewater treatment and bio-solids recovery in a circular economy

- A staged program of work that will demonstrate and help establish modern and integrated methodologies for wastewater treatment, bioenergy recovery, and re-processing of by-products for bio-based outcomes
- The program will utilise plant scale demonstration hubs and a circular economy approach for collaborative outcomes that assist funding and risk reduction

#### Anaerobic Codigestion (AnCoD) pilot

- This pilot project will build upon lab scale findings from the Wastes to Profit program
- It will demonstrate an anticipated threefold increase in biomethane productivity for new and novel feedstock combinations across agribusiness
- On-site trials will increase confidence and help scale capability for adoption

#### 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

# People and culture

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



Think Digital's Kat Bidstrup demonstrating washroom lobby immersive reality training

## ATTRACTION

## Attraction

- Scope a program of work to attract people to the vast opportunities in the red meat processing industry, with an emphasis on highlighting career path opportunities
- Develop an industry platform that seeks to showcase the diversity of opportunities in the red meat processing industry
- 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
   processing plants from lairage to packaging
- Releasing these tours 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



Risk and Injury Management Services' Bryony Fitzgerald and Chris Fitzgerald with ABC Landline's Pip Courtney trying on exoskeleton equipment

### SAFETY AND WELLBEING

#### Knife safety

 A systematic and collaborative approach with processing plants to improve knife safety and analysing Internet Of Things technology in the red meat industry

#### The implementation of exoskeletal device

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

### 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)

#### Retention

- Develop and deploy a tool for machine learning to help processors manage retention of the workforce
- Development of a knowledge hub for industry

#### DEVELOPMENT

#### Leadership development

- Run the AMPC graduate Certificate in Agribusiness for AMPC processors
- 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 holistic multi-year capability plans to continue to develop technical and leadership skills

#### **Capability development**

Capability development within plants through innovation
 managers on-site



An Australian processor trialling the Virtually There Training 3D-printed VR bandsaw



Guardian Bandsaw safety solution

# 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



Bondi Labs' Tristan Dubois wearing the remote auditing smart glasses

### PRODUCTS

### **Kilcoy innovation hub**

Continue to support the Kilcoy Innovation Hub together
 with MLA and Kilcoy Global Foods

#### Label verification

- AMPC is investigating 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

### INTERNATIONAL COMPETITIVENESS

#### Supporting a risk approach to meat inspection

- AMPC is leading a group that includes industry, government and scientific experts to develop a risk management framework that supports changes to meat inspection for *Cysticercus bovis* in cattle
- The inspection changes will be reflected in AS 4696:2023
- The risk management framework will help processors to identify high and low risk cattle and manage them appropriately
- Processors will no longer be required to incise the cheek muscles of low risk cattle and can provide this product for sale for human consumption
- Supporting materials being developed by the group will assist in communicating the risk management framework to commercial parties and regulatory authorities



Kilcoy Innovation Hub



Smart label IoT solution

#### 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

#### **Remote auditing**

- AMPC is working with industry, government and providers to investigate the opportunities and issues to support remote auditing
- AMPC will be assessing technologies to enable streaming of video, including in real time, of audits and inspections to support regulatory, and potentially also commercial requirements

#### Efficacy of electrical stunning/halal

- AMPC is evaluating the efficacy and quality outcomes of electrical stunning in a range of cattle breeds, ages and sexes
- The data is linked to the installation of stealth knocking boxes and measures animal welfare and meat quality outcomes as well as the efficacy of electrical stunning

### Market access investment with MLA

• AMPC provides funding to MLA as part of a joint industry investment program to fund important market access activities, particularly in the food safety area

#### Future work on non-tariff barriers (NTBs)

- AMPC is continuing to work with meat processors and government to understand the NTBs that impact most on our ability to access key markets
- NTB lists continue to be reviewed and amended as our priorities change
- Free trade agreements with the UK, the EU and India offer potential gains for our processors and changes in import conditions for these markets are being monitored closely so that benefits can be realised
- Current work includes investigating the cost of key importing country requirements and identifying regulatory alternatives that are less costly
- This work is part funded by the Department of Agriculture, Fisheries and Forestry

#### Residue investigation — semicarbazide (SEM)

- A scientific research project between the Department of Agriculture, Fisheries and Forestry and the red meat processing industry is being coordinated by AMPC with the aim of identifying the source of SEM contamination on the feet and hides of cattle
- The outcome of this work will be important in supporting the department's engagement with trading partners to ensure ongoing market access for beef feet to markets that have concerns about this residue

# Product and process integrity

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



CSIRO's Dr Alison Small, Jarvis Australia's Kevin Robinson, Geoff Clarke, Robert Haworth and Geoffrey Lawrence with the Jarvis stunning box

## FOOD SAFETY

#### End of line carcase inspection

- AMPC is continuing to progress approaches to 'end of line' carcase inspection with a view to developing options for full or semi-automated inspection and contamination removal
- Benefits to industry include reduced energy and/or water costs
- Findings from this work are also expected to assist in informing discussions between governments about end of chain meat inspection

#### Hygiene room

- AMPC is supporting the development of a state-of-the-art personal hygiene room which will protect both workers and product
- 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 determining the level of cadmium in livers
   of cattle
- The project will validate a Raman probe to measure the levels of cadmium, with the aim of enabling processors to salvage 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 is exploring 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



Swinburne's Hadi Ghaderi, Felip Marti Carrillo, Liam Bradley and Prem Prakash Jayaraman with the RAMP RFID labelling and label checking solution

#### ANIMAL WELFARE

#### Lairage R&D

- Research project to further the industry's understanding of leading developments and innovation in the area 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 processing chain

#### Animal welfare standards

 AMPC is continuing to support the development of a regulated animal welfare standard by Australian governments to ensure that it reflects current science and practicalities of plant operations

#### **Knocking box**

- AMPC is rolling out a project to trial a stealth knocking box and assess improvements in animal welfare outcomes in a range of plants processing different ages and breeds of cattle
- The box is insulated to reduce noise and animal stress
- The trial is also considering the effectiveness of electrical stunning and information from this work will inform a broader project assessing the effectiveness of high frequency electrical stunning in reducing the occurrence of ecchymoses

#### TRACEABILITY AND INTEGRITY SYSTEMS

#### Cysticercus bovis project

- This project is developing a risk management framework to support the change to risk-based inspection for cattle concerning their exposure to the eggs of the human tapeworm, Taenia saginata, in treated sewage water
- 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
- The new standard for meat inspection AS 4696:2023 includes risk based inspection for *C. bovis* and means that cheek muscles from cattle that have not been exposed to worm eggs are not routinely incised and can be harvested for human consumption

#### Smallstock EID project

- This project is reviewing the readers available for small stock RFID tags to determine which readers are most useful for small stock processors
- It is considering the readers used in Victoria and assessing their usefulness in other states
- As the uptake of small stock EID increases, towards mandatory application in 2025, this project will be increasingly relevant

# **Engagement and extension activities**



Wammco International's Rob Davidson listening to TME's Bryan Emmerson demonstrate a shadow robot AMPC has executed stakeholder engagement agreements with Meat and Livestock Australia (MLA) and the Australian Meat Industry Council (AMIC) which set out shared behaviours, principals of engagement and principals for matched funding and joint activities. AMPC also has an overarching stakeholder engagement framework which sets out principles guiding AMPC's engagement processes.

In 2022 AMPC moved 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. This new model began in the 2022-23 financial year.

AMPC engages with government through regular meetings with the Department of Agriculture, Fisheries and Forestry, and CEO meetings with the minister.

Our framework is available on the AMPC website.

AMPC plans to attend industry events in the 2023-24 year including EvokeAg, ABARES and will showcase our R&D at Beef Week in Rockhampton in 2024.

Our team of regionally based co-innovation managers will be engaging directly with processing plants throughout 2023-24.

# **Balanced portfolio**



# Budget

Income	RD&E	Marketing	Total
Levies	\$10,816,990	\$7,211,327	\$18,028,317
Interest	\$264,600	\$176,400	\$441,000
Government matching	\$26,037,579	_	\$26,037,579
Partner contributions	\$17,000,757	_	\$17,000,757
Total	\$54,119,925	\$7,387,727	\$61,507,652

Expenditure	RD&E	Marketing	Total
Advanced manufacturing	\$16,795,132	_	\$16,795,132
Sustainability	\$11,353,244	\$2,000,000	\$13,353,244
People and culture	\$9,694,291	\$1,615,661	\$11,309,952
Technical market access and markets	\$4,814,173	\$3,669,732	\$8,483,905
Product and process integrity	\$7,552,152	\$1,214,608	\$8,766,760
Other project expenses	\$685,290	\$173,320	\$858,610
Total	\$50,894,282	\$8,673,320	\$59,567,602

Corporate costs	RD&E	Marketing	Total
Corporate member services		\$615,584	\$615,584
Direct corporate costs	\$3,380,875	_	\$3,380,875
Indirect corporate costs	_	\$3,650,190	\$3,650,190
Total	\$3,380,875	\$4,265,774	\$7,646,649

Reserves movements	RD&E	Marketing	Total
Opening reserves	\$5,155,232	\$9,551,367	\$14,706,599
Budget net income	-\$155,232	-\$5,551,367	-\$5,706,599
Closing reserves	\$5,000,000	\$4,000,000	\$9,000,000

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