APRIL ANNUAL REPORT 2020

Australasian
Pork Research
Institute Ltd
APRIL

CONTENTS

WELCOME TO APRIL

THE PORK INDUSTRY HAS ACKNOWLEDGED THE NEED FOR CONTINUED INVESTMENT IN COLLABORATIVE RESEARCH AND DEVELOPMENT AND SO APRIL WILL ONCE AGAIN INVEST AND MANAGE:

- **COLLABORATIVE RESEARCH AND DEVELOPMENT**
- **EDUCATION AND TRAINING**
- **EXPLORE COMMERCIAL-ISATION OPPORTUNITIES**

FOR THE BENEFIT OF THE AUSTRALASIAN PORK INDUSTRY

THE AUSTRALASIAN PORK RESEARCH INSTITUTE LTD. (APRIL) OPERATED THE HIGHLY SUCCESSFUL CRC FOR AN INTERNATIONALLY COMPETITIVE PORK INDUSTRY FROM JULY 2005 TO JUNE 2011.

BACKGROUND

APRIL was succeeded by the CRC for High Integrity Australian Pork (Pork CRC Ltd.), which completed its objectives on 30th June 2019.

The CRC for an Internationally Competitive Pork Industry and the CRC for High Integrity Australian Pork have delivered on research, education, training and commercialisation objectives to deliver a wide range of relevant research outcomes for the Australasian pork industry.

In total, these CRC programs represented a combined total investment of more than $210 million into the pork industry. Their establishment reinvigorated pork industry research and development and education and training in Australia and demonstrated the value of collaborative research investment to Australasian producers and ancillary businesses.

In addition to research outcomes directly applicable on farm and post-farm gate, the CRCs have delivered numerous commercial outcomes that will generate financial returns to APRIL into the future.

The Industry has acknowledged the need for continued investment in collaborative research and development that complements Australian Pork Limited's work, and so APRIL will once again invest and manage collaborative research and development, education and training and explore commercialisation opportunities for the benefit of the Australasian pork industry, using the significant intellectual capital and facilities established by the two CRCs.

VISION

Collaborative, timely and effective industry-funded and directed research, education and training, and commercialisation activities focused on priorities and deliverables that ensure the sustainability of Australasian pork production.

MISSION

Facilitation of high priority research, education and training programs, and commercialisation opportunities, allied to effective investment management to generate optimal returns for all pork industry stakeholders.

MESSAGE FROM THE CHAIR

THE PANDEMIC IN 2020 HAS OVERWHELMED BUSINESS AND SOCIETAL NORMS ACROSS THE WORLD.

It is difficult to even think that it was almost half-way through the year under review before we heard the term "novel coronavirus". Biosecurity was already at the top of the industry's agenda with African Swine Fever outbreaks moving closer to our borders. Ironically, the virtual shutdown of air travel into Australia has reduced one of the biggest risk factors.

In the face of these emergencies, APRIL has tried to make our contribution and to work as much as possible with the research sector to minimise disruption. As the pandemic has progressed, more projects have had to be delayed as researchers have had difficulty resuming their work. As partners in the research process, APRIL seeks to accommodate those realities as much as possible.

THE PORK INDUSTRIES OF AUSTRALIA AND NEW ZEALAND ARE REALLY WELL SERVED BY THE EXCELLENT TEAMWORK OF THE RESEARCH COMMUNITY AND THE INDUSTRY PLAYERS. IT IS A UNIQUE ASSET THAT WE MUST CONTINUE TO BUILD ON.

Our Commercialisation program has not progressed at the pace we planned. The African Swine Fever impact on China has meant that roll out of AusScan Online in that country is virtually impossible for the time being. It has been more pleasing to see researchers working with APRIL to achieve greater leverage on our investments through schemes like the Australian Research Council's Linkage Program, where we were again successful, and the Cooperative Research Centres' Projects, where we were not. We must keep building on these leveraging efforts to deliver the maximum impact to our industry.

I am very grateful to the Directors and Staff of APRIL for their consistent efforts. I particularly thank Wayne Hein, Edwina Beveridge and Kenton Shaw who have finished their service on the Board, and each made great contributions. John Pluske has led our small APRIL team very expertly with excellent support from Charlie Rikard-Bell and Geoff Crook. The pork industries of Australia and New Zealand are really well served by the excellent teamwork of the research community and the industry players. It is a unique asset that we must continue to build on.

Under the trying conditions of 2020, which are by no means over, we can be grateful that our industry has coped better than many. APRIL is pleased to play our part and very grateful to our Members for your ongoing support.

Dr Tony Peacock

MESSAGE FROM THE CEO

THE PAST 12 MONTHS HAVE SEEN APRIL CONTINUE WITH ITS OVERALL OBJECTIVE OF ENHANCING THE AUSTRALASIAN PORK INDUSTRY BY INVESTING IN RESEARCH AND DEVELOPMENT, EDUCATION AND TRAINING, AND COMMERCIALISATION ACTIVITIES FOCUSED ON PRIORITIES AND DELIVERABLES THAT ENSURE THE SUSTAINABILITY OF AUSTRALASIAN PORK PRODUCTION.

The period has been one not only of continuation and consolidation of activities commenced in 2018–19, but also one of progress towards furthering the overall objectives of APRIL.

Sadly, the Covid-19 pandemic occurred early in 2020 and along with it, interruptions and disturbances the like none of us have ever seen or experienced before. I distinctly remember leaving my second home (PARKROYAL, Melbourne Airport) on March 13 to catch a flight to my real home in Perth, and being amazed by the lack of people in the airport at 4:30 pm on a Friday afternoon. Little did I/we realise at the time what would subsequently unfold and will continue to do so. Despite myriad of challenges and obstacles presented by Covid-19 to the researchers, technical/support staff and (or) students involved in APRIL-funded projects, I am highly appreciative of the efforts made to continue the research. Some projects, unavoidably, have been delayed or not even been able to commence as a result of restrictions. We have continued to monitor projects impacted by Covid-19 and respond affirmatively to requests for variations and extensions, wherever possible.

APRIL received numerous Final Reports during the reporting period, mainly from projects funded initially through the Pork CRC but contracted and completed through APRIL. These are mentioned, and major outcomes highlighted, later in the Annual Report. The reports (available at http://apri.com.au/research/final-reports/) cover a range of topics from work developing remote monitoring methods for early detection of respiratory disease caused by *Actinobacillus pleuropneumoniae*, to the pre-farrowing assessment of health and welfare in sows, further work on feeding a single diet (as opposed to 'phase-feeding' multiple diets) to growing-finishing pigs, and a resource summarising the considerable work done by the Pork CRC in human nutrition-related research.

A major undertaking in the year was the preparation and submission of a Cooperative Research Centre-Project (CRC-P) application, *Pathways to rearing pigs with tails to maximise returns for pork producers*. This was identified as a Transformational Project within APRIL's Strategic Plan. With APRIL as the Lead Applicant and involving The University of Queensland, The University of Melbourne and the University of New England, as well as strong industry involvement and support from Rivalea (Australia) Pty Ltd., SunPork Farms and Australian Pork Limited, this project sought funding to allow for a transformational, industry-led research program that would establish factors associated with tail biting, resulting in commercialisation of a decision support tool to enable Australian producers to eliminate routine tail docking.

Unfortunately, the consortium was advised in July that although the application displayed merit against the assessment criteria and was suitable for funding, it was

A MAJOR UNDERTAKING IN THE YEAR WAS THE PREPARATION AND SUBMISSION OF A COOPERATIVE RESEARCH CENTRE-PROJECT (CRC-P) APPLICATION, *PATHWAYS TO REARING PIGS WITH TAILS TO MAXIMISE RETURNS FOR PORK PRODUCERS.* THIS WAS IDENTIFIED AS A TRANSFORMATIONAL PROJECT WITHIN APRIL'S STRATEGIC PLAN.

less competitive than some other applications received in this round and was not able to be funded. This funding round of the CRC-P scheme (Round 9) was extremely competitive, having ~ 8% success rate. This topic remains a key Transformational Project for APRIL.

The other key Transformational Project identified in APRIL's Strategic Plan addresses *Enhanced antimicrobial stewardship in the Australasian pork industry through targeted reduction of in-feed medications without adverse health consequences*. A project administered through The University of Queensland, *How to make antimicrobials in pig feed redundant, naturally*, was submitted to the Australian Research Council (Linkage scheme) in December 2019. Other partners in the project were The University of Melbourne, the SunPork Group, DSM Nutritional Products, and APRIL. In July 2020, it was announced that the project was supported. Further details are provided later in the Annual Report, but this is an excellent example of APRIL partnering with its Members to successfully leverage external funding for a major research project of critical industry-wide importance. Congratulations to everyone involved in pulling this grant together.

Innovation Projects funded during the reporting period are now all (mostly) underway with some nearing completion, and five Industry Priority Projects were supported by the Board in April 2020 addressing a number of key industry issues such as heat stress and heat tolerance, food waste, and novel thermographic technology to detect reproductive state in sows. Further details are available later in the Annual Report.

INNOVATION PROJECTS FUNDED DURING THE REPORTING PERIOD ARE NOW ALL (MOSTLY) UNDERWAY WITH SOME NEARING COMPLETION, AND FIVE INDUSTRY PRIORITY PROJECTS WERE SUPPORTED BY THE BOARD IN APRIL 2020…

A highlight of the year was the Stakeholders' Day held in Adelaide in November 2019. This provided not only a terrific snapshot of the breadth and array of projects and activities being undertaken by APRIL, but also a timely reminder of aspects of the vision and mission of APRIL. Presentations from Professor Robert van Barneveld and Mr. Kenton Shaw were directed fairly and squarely at encouraging greater innovation in the pork industry along the entire value chain. Their presentations provided researchers and industry with a variety of research ideas and opportunities for the future; however, and to quote from Professor van Barneveld, "Whatever the innovation, the application needs to be cost-effective, seamless and practical".

The audience also heard a wonderful presentation from Hayley Clifford, who was an Industry Placement Program (IPP) Awardee initially through the Pork CRC, but then through APRIL. Hayley provided the audience with an overview of her experiences in the program as a nutritionist with Alltech Lienert Australia. In this regard, APRIL was pleased to announce Lauren Staveley as another IPP recipient, joining Dr Jessica Craig at Rivalea (Australia) Pty Ltd. Lauren commenced her IPP with the SunPork Group in South Australia in July 2020, and envisages that the IPP award will allow her to gain more in-depth knowledge of pork production whilst facilitating her involvement in reproduction and welfare experiments. Another APRIL IPP award is planned for 2020–21.

Commercialisation remains a key priority and objective for APRIL. A complete Commercialisation Report from Dr Charles Rikard-Bell (Manager, Commercialisation and Research Impact) can be found later, but I just wished to point out here that APRIL does not expect, nor could it expect, every project it co-invests in to provide a commercial return. There are some projects that simply do not lend themselves to such a possibility yet can still have substantial industry impacts. To this end, APRIL has a dedicated Commercialisation Project scheme open all year, for people/organisations interested in pursuing potential commercialisation activities with us.

In the year ahead, APRIL will continue our progress towards the core strategies in the Strategic Plan. We will be encouraging even greater collaboration and initiative, as exemplified through the Kickstart initiative that is aimed at supporting the preparation and submission of a specific, targeted and agreed major external funding application (or applications) in partnership with APRIL and other partners. It will be a challenging time as the repercussions of Covid-19 continue. Finally, I would like to thank the APRIL staff in Dr Charles Rikard-Bell and Mr Geoff Crook (Company Secretary) for their sterling efforts to assist with APRIL's functions and objectives. I would also like to thank staff at Australian Pork Limited, and in particular Glenn Eppelstun, Nikki Watson, Gemarie Luzaran and Damien Howse (past APRIL Company Secretary), for their assistance and advice in assisting APRIL during the reporting period. Thanks, finally, to the APRIL Chair Dr Tony Peacock and fellow Directors for their support, feedback and encouragement during the year.

Professor John Pluske

STRATEGIC PL

STRATEGIC IMPERATIVES AND VALUES

TO ACHIEVE APRIL'S VISION AND MISSION, APRIL HAS DEFINED THE FOLLOWING STRATEGIC IMPERATIVES THAT FORM THE FOUNDATIONS OF APRIL'S STRATEGIC PLAN (2019–2022):

RELEVANCE means APRIL must be robust, agile and current in developing its research, education and training, and commercialisation programs and initiatives.

Research should be a balance of applied versus basic and short versus long-term research, as well as meeting stakeholder expectations.

LEVERAGE means APRIL is a catalyst for innovation and will always seek to leverage its limited funds against additional investment in priority research, education and training, and commercialisation programs to achieve necessary scale.

ALIGNMENT means APRIL is aligned with Australian Pork Limited's activities and residual Pork CRC Ltd. functions to avoid overlaps and duplication.

INVESTMENT AND GROWTH means APRIL is not a final funder (it is a co-funder) and will only actively invest in programs whose objectives cannot be achieved without our support.

COLLABORATION means APRIL will ensure its activities are collaborative, inclusive and informed across the stakeholder base.

RETURNS means measurable returns to stakeholders through research outcomes.

IN APPLYING THESE STRATEGIC IMPERATIVES, APRIL WILL APPLY THE FOLLOWING VALUES:

INNOVATION

APRIL always look for solutions

FOCUS

APRIL's members and the pork industry are the highest priorities

EXCELLENCE

APRIL strives for the best in research, management, education and training, and commercialisation activities

OPPORTUNITY

APRIL strives for the best in research, management, education and training, and commercialisation opportunities

NETWORKS

APRIL will collaborate locally, nationally and internationally to enhance capacity to solve local challenges and meet goals

COMMUNICATION

APRIL will build strong relationships through open communications

AN SUMMARY

CORE STRATEGIES

BASED ON APRIL'S STRATEGIC IMPERATIVES AND VALUES, THE FOLLOWING CORE STRATEGIES HAVE BEEN DEVELOPED:

1. Prepare a 3-year strategic plan for APRIL and a base research and development investment framework

Target Date: 30 June, 2019

Status: Achieved

2. Ensure existing and future commercialisation processes are efficient and are generating optimal returns

Target Date: Ongoing

Status: See Commercialisation Report

3. Develop organisational and research management models that utilise existing APL resources while maintaining operational independence for APRIL

Target Date: Ongoing

Status: Achieved

4. Seek additional investment in relevant research programs through strategic funding opportunities (e.g. Australian Research Council schemes; CRC-P program; State and Federal Regional Growth and Development Funds; international funding sources)

Target Date: Ongoing

Status: 2 ARC linkage grant applications have been successful. Total value $5.5m

5. Initiate a communication framework that effectively disseminates the objectives of APRIL and the outcomes from relevant research programs

Target Date: Ongoing

Status: See Communication report

6. Develop research priorities and balance strategic research domains with innovative research opportunities, low and high-risk projects, and projects with high potential for APRIL commercial income versus direct stakeholder returns

Target Date: Ongoing

Status: See Research reports

7. Assist with human capacity building in the Australasian pork Industry

Target Date: Ongoing

Status: See Education and Training Report

8. Key deliverables and indicators to measure the overall performance of APRIL as a business and the effectiveness of the research program

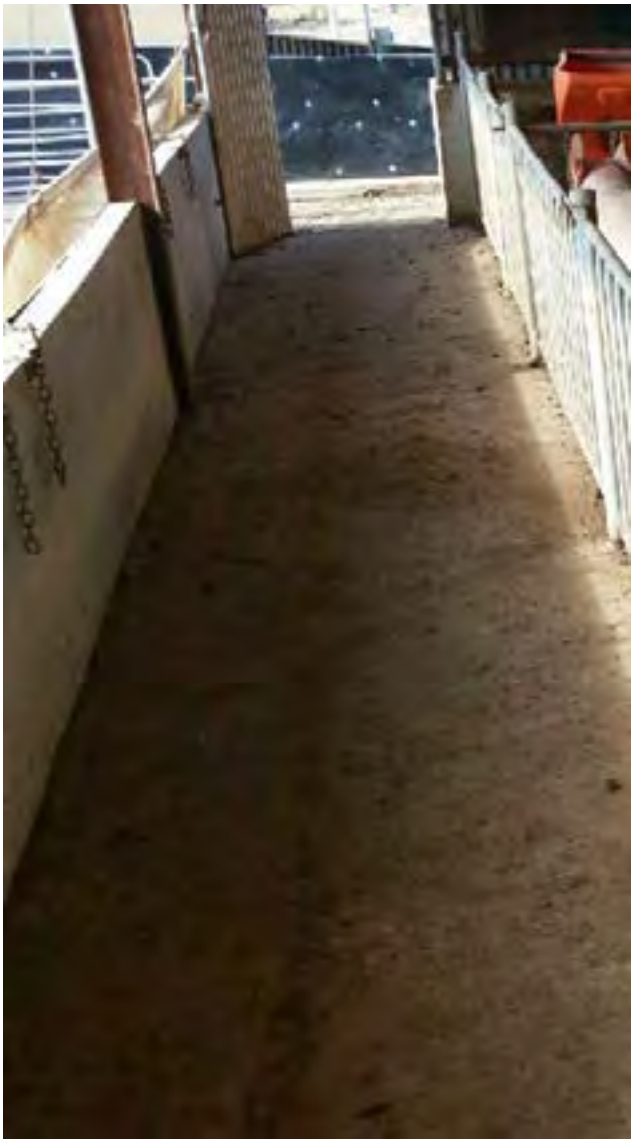
Target Date: Ongoing

Status: Measures are in place and reviewed regularly

COMMERCIALI
REPORT

SATION

THE APRIL BOARD DIRECTS COMMERCIAL DECISIONS REGARDING IP AND STRATEGY, SUBSEQUENTLY THE COMMERCIALISATION AND ADOPTION ACTIVITIES ARE REPORTED DIRECTLY TO THE APRIL BOARD. IN TERMS OF COMMERCIALISATION REVENUE AND ACTIVITIES, THE FOLLOWING OUTCOMES AND OPPORTUNITIES WERE ACHIEVED AND/OR DEVELOPED IN THE REPORTING PERIOD:



1. AUSSCAN ONLINE (AUSSCAN)

In this period, AusScan has continued to be the main source for APRIL commercialisation income. The agreement between Aunir and APRIL was reviewed and the companies have agreed upon a tiered pricing scheme from January 2020, which enables Aunir to grow the business globally. AusScan online exceeded 10,000 scans in the first three quarters of the reporting period which was a first; however, total scan numbers for all four quarters indicated a 2.6% reduction in scans compared to 2018/19. Regardless, the online system recorded in excess of 40,000 scans for the second consecutive year. The reduced scan numbers in the final quarter has been attributed to the effects of Covid-19 on laboratories' capacity to scan due to reduced labour or a period of being shut down.

An important part of the AusScan Strategic Plan this year was to launch the China Agency, an agreement between AusScan and AoBo Biotechnology Pty Ltd, Laoling, China, to deliver an AusScan Online service to the Chinese pig industry and ancillary feed industries. The agreement was finalised with scanning expected to start in July 2019. Unfortunately, severe disruptions to the Chinese pig industry throughout 2019 as a result African Swine Fever coupled with restrictions on business to business trade in domestic agriculture due to Covid-19 have resulted in a minimum 12 month delay in the launch of AusScan's China Agency.

Improving and upgrading the AusScan calibrations is required in order to keep the calibrations relevant to the industry. This year improvements were made to the canola meal reactive lysine calibration in which 24 samples were added to the current data set, resulting in an improvement in accuracy and robustness. Similarly, APRIL imported 19 samples of full-fat soybean meal from the UK to further strengthen the calibration. It has also been agreed that the next pig digestible energy (DE) study will include maize grains from the United States of America. The study has been put out to tender with a decision to be made by the APRIL Board in November 2020. APRIL will import sufficient amount of whole grain maize samples to include in the next broiler AME study. The inclusion of overseas grains in the cereal calibrations greatly improves the relevancy of the *in vivo* energy calibrations in larger overseas markets such as the USA and China.

Finally, it has been a successful year for the implementation and adoption of the Ingot Check QA system in Australia with all enrolled laboratories contributing data for assessment of NIR machine and calibration accuracies. This year included a separate report on AusScan's reactive lysine and cereal energy calibrations. There are currently nine laboratories enrolled in Ingot Check, which includes two new laboratories.

2. RIDLEY ENRICH – POURED BLOCKS TO ENHANCE THE ENRICHMENT OF GESTATING SOWS

Commercial sales of the Ridley Enrich block to group-housed sows was similar to last year indicating repeat orders but minimal growth in this sector of production. Producers using electronic sow feeding systems have noted reduced aggression around the feeder entry point when sows are provided Enrich blocks.

The growth in Enrich block sales, though, will most likely be in grower finisher systems. The APRIL commercialisation study 8C–011 to determine whether the Enrich block effectively prevents tail biting in grower

finisher pigs is expected to provide a unique data set for both national and international markets. The study has completed five replications of a minimum of 10 required for analysis, and APRIL is expecting outcomes from the project in early 2021.

A greater commercial return to APRIL will be the successful uptake of enrichment block technology around the world, in particular Europe and the USA. As such, APRIL has liaised with Dr Jeremy Marchant-Forde, a leading Animal Behaviourist within the USDA, with the intention of instigating US-based research on the sow enrichment block. In early December 2019 Ridley exported a pallet of the enrichment block to the Agricultural Research Station (ARS) Farm Animal Behaviour Laboratory, West Lafayette, Indiana USA. Dr Marchant-Forde has programmed some sow behaviour research within ARS, and there is also opportunity to do some commercial research with larger commercial operations managing different sow housing systems. Applied research within the USA will be an invaluable data set for producers when they assess the Ridley Enrich block for commercial adoption. Additionally, Dr Marchant-Forde recently assessed the current enrichment "toys" available to grower-finisher operations within the USA, a study commissioned by Tyson Farms and Nestle. There may be opportunity for the Enrich block to become part of Phase 2 of this research. As has been the case with most applied research during the Covid-19 pandemic, projects have unavoidably been delayed due to lockdowns at Purdue University and the USDA-ARS Farm.

The Enrichment block has an international patent pending and is currently under examination by the European, USA and Canadian patent offices.

3. PIGLET BUDDY (FEED ENHANCER)

In 2018/19 the product averaged 7.5 tonne per quarter and in the 2019/20 period this has been reduced to less than 2 tonne per quarter, due initially to ASF in early 2019. This left the distributor with excess stock, but secondly, there was also the loss of a key customer. BEC have renewed the supply agreement with their Korean distributor who is confident product sales will improve from a very tough 12-month period.

4. LAWSONIA qPCR

APRIL has signed an exclusive license agreement, with accompanying milestones, for national and international distribution, with Apiam Animal Health. The *Lawsonia intracellularis* (LI) quantitative polymerase chain reaction (qPCR) diagnostic test is now available to Australian pork producers. The diagnostic test is the outcome of many years of Pork CRC- and APRIL-supported research and development by Dr Alison Collins, Senior Research Scientist with the New South Wales Government's Elizabeth Macarthur Agricultural Institute.

Dr Collins developed a qPCR diagnostic assay that can determine LI numbers in pig faeces and distinguish between clinical and sub-clinical disease. Pigs clinically and sub-clinically affected by ileitis show reduced weight gains, poor feed efficiency and increased days to slaughter, which can reduce net revenue in Australia by as much as $8 to $13 per pig.

Apiam Animal Health veterinarian Dr Hugo Dunlop applied the LI qPCR diagnostic test in several field trials. Dr Dunlop's trials confirmed the test could diagnose clinical and sub-clinical disease, evaluate treatment regimes, and validate on-farm management procedures such as disinfection or changes in management practices.

APRIL also commissioned a successful research project to develop commercial standards for use in diagnostic laboratories world-wide, allowing the diagnostic test to be made available internationally. On the national level, Australian producers can submit pooled-pen faecal samples for LI qPCR testing directly to Elizabeth Macarthur Agricultural Institute (EMAI) or through ACE Laboratory Services.

5. SEMI-MOIST EXTRUDED CREEP FEED

During this reporting period Ridley has completed the commissioning of the trial extruder at Narangba and successfully produced over 500 kg for trial work on a large integrated pork producer. The product is expected to be introduced into the industry late 2020. Further research into optimal pellet size (APRIL study 6A–103) will be determined in 2021.

6. RACTOPAMINE IN LACTATION

In this reporting period the license agreement between APRIL and Elanco Animal Health for *"A method of increasing or maintaining the reproductive performance in sows"* was dissolved in June 2020. This decision was largely made as a result of a shrinking market for Paylean.

DR COLLINS DEVELOPED A qPCR DIAGNOSTIC ASSAY THAT CAN DETERMINE LI NUMBERS IN PIG FAECES AND DISTINGUISH BETWEEN CLINICAL AND SUB-CLINICAL DISEASE.

7. THE APRIL PIPELINE

There are several promising technologies in the pipeline for potential commercialisation:

The Commercialisation Project 8C–011 *The provision of a curative supplemental block provides enrichment, reduces mutilation and reduces the negative impact on production performance caused by tail and ear bite mutations in growing pigs*

This project will provide invaluable information for future Ridley Enrich products. A grower finisher Enrich block as a treatment for the prevention of tail and ear bite mutilation has potential nationally and internationally.

The Innovation Project 5A–101 *Real-time, In-Field Water Testing* has the potential to offer an immediate assessment of water quality and could be utilised across all livestock enterprises. An obvious application is to test water quality prior to medication to optimise dose and response. Currently, water assessments can take up to two weeks before results are known whereas the proposed innovation would take a matter of minutes. APRIL has explored potential commercial opportunities with the research parties, Hone Global and Ridley.

Future commercialisation projects to be pursued in 2020/21 include:

- *The assessment of a modified formulation of BONIFF in Semi-Moist Extruded Creep (SMEC) feed of weaning piglets under an enterotoxigenic* Escherichia coli *(ETEC) challenge model.* BONIFF is a bromelain-based formulation manufactured by Anatara Lifesciences Ltd. Another of Anatara's bromelain-based formulations, Detach is a registered product with the APVMA for the treatment of diarrhoea in piglets at both suckling and post-weaning stages.
- The application of near infrared (NIR) technology to detect skatole and androstenone, the compounds responsible for boar taint in carcasses. The Pork CRC study 3A–120 indicated that an NIR calibration for detecting boar taint may be possible. APRIL is in discussion with key researchers and stakeholders to progress the innovation towards a commercial pathway.

STRATEGIC PLAN DELIVERABLES

A summary of progress against the Strategic Plan deliverables is provided below:

CORE STRATEGY 2: ENSURE EXISTING AND FUTURE COMMERCIALISATION PROCESSES ARE EFFICIENT

TASK	KEY DELIVERABLES	STATUS
2.1 Review all existing commercialisation projects and ensure those with greatest potential are adequately resourced	Allocation of adequate resources to ensure commercial income is realised in a reasonable timeframe	✔ Achieved
	Targets: Commercial income available for reinvestment of $650,000 by July 2020, $750,000 by July 2021, $1.0 million by July 2022	● Delayed
2.2 Progress licensing of AusScan calibrations via Aunir in China	Capture a wider market using a Chinese base (i.e. Ao Bo Biotechnology Pte Ltd) and significantly increase income from AusScan technologies	● On target
	Development of a strategic partnership in China for delivery of other research outcomes	● Delayed
	Targets: More than 500 scans for DE and AME in cereals for pigs and poultry to Chinese customers by July 2021, and more than 3,000 reactive lysine scans for oilseeds for Chinese customers by July 2021	● On target
2.3 Grow AB Vista business and extend service to one additional product	Scans generated by AB Vista increase 10% annually from June 2018	● On target
	Agreement/licence for at least one other product by January 2021	● On target
2.4 Develop a commercialisation pipeline and process from project submissions to project delivery and beyond	Clear understanding of commercialisation potential from the existing and future research program	✔ Achieved
	Revised Commercialisation Project proposal (20% cash investment), to facilitate greater interest in commercialisation of research (and not just from the pork Industry)	✔ Achieved
	Formal Commercialisation Report becomes a Standing item at each APRIL Board meeting	✔ Achieved
2.5 Allocate some research resources towards product development with commercial partners	Commercial income of $100,000 from investment in product development that can be reinvested in the APRIL R&D program (by June 2021)	● Delayed

COMMUNICATI
REPORT

INTRODUCTION

APRIL has developed an over-arching communication framework as part of the Strategic Plan to ensure communications with all stakeholders provide relevant information at the right time. The framework also contains mechanisms for Members and other stakeholders to provide feedback to APRIL management and Board.

ON

THE KEY COMPONENTS OF THE COMMUNICATION FRAMEWORK ARE:

- **Present regular updates of APRIL's progress at producer and scientific forums.**
- **Implement the Director-Ordinary Member buddy system.**
- **Convene an annual Stakeholder's Day for all APRIL Members.**
- **Arrange annual one-on-one meetings with APRIL Members to understand needs and promote outcomes.**
- **Conduct an annual membership survey to ensure APRIL research remains relevant.**
- **Keep industry and stakeholders informed of research, education and training, and commercialisation activities and outcomes.**
- **Establish an independent website for promotion of APRIL activities.**

COMMUNICATION ACTIVITIES

PRESENT REGULAR UPDATES OF APRIL'S PROGRESS AT PRODUCER AND SCIENTIFIC FORUMS

Although Covid-19 has dramatically reduced the number of face-to-face meetings and other networking opportunities available for APRIL staff to attend, prior to the pandemic's effects, Chief Scientist John Pluske and Manager of Commercialisation and Research Impact, Dr Charles Rikard-Bell attended events such as the APL Delegates' forums, the AVA meeting, SA and WA Pig Industry Days, and the SunPork Annual Conference to promote APRIL research and allied activities.

IMPLEMENT DIRECTOR-ORDINARY MEMBER BUDDY SYSTEM

The Director-Ordinary Member buddy system is a standing agenda at each Board meeting, where Directors are expected to contact their allocated Ordinary Members to provide an opportunity for Members to raise any issues at a Board level.

CONVENE AN ANNUAL STAKEHOLDER DAY FOR ALL APRIL MEMBERS

The annual Stakeholders' Day provides an opportunity for all APRIL stakeholders to join together and discuss APRIL progress and issues. Updates are provided from an industry perspective, from project leaders and students as well as APRIL management.

A highlight for APRIL in 2019 was the Stakeholders' Day at the Adelaide Hilton on 16 November 2019, just prior to the Australasian Pig Science Association meeting (of which APRIL was Joint Principal Sponsor along with APL). The Stakeholders' Day was attended by in excess of 70 people, and attendees enjoyed presentations in relation to project updates, the role of 'innovation' in pork production, an industry perspective from an Industry Placement Program awardee, an overview from APL, and a robust question and answer session at the end of the forum. Thanks to everyone who presented.

The next Stakeholder's Day will be held as a virtual meeting on 20 November 2020.

ARRANGE ANNUAL ONE-ON-ONE MEETINGS WITH APRIL MEMBERS TO UNDERSTAND NEEDS AND PROMOTE OUTCOMES

During the reporting period, Chief Scientist John Pluske met or communicated with a representative (or representatives) from all APRIL members prior to the Covid-19 travel restrictions. This continued as best as possible after this time.

CONDUCT AN ANNUAL MEMBERSHIP SURVEY TO ENSURE APRIL RESEARCH REMAINS RELEVANT

The first annual membership survey will be conducted in 2021 and will provide another opportunity for members to provide feedback on APRIL's operations.

KEEP INDUSTRY AND STAKEHOLDERS INFORMED OF RESEARCH, EDUCATION AND TRAINING, AND COMMERCIALISATION ACTIVITIES AND OUTCOMES

In conjunction with the activities listed above and the APRIL website, Chief Scientist John Pluske achieves this through regular articles in Australian Pork Newspaper and through the APRIL member Newsletter and APRIL Announcements. Six editions of the Newsletter/Announcements have been produced and each edition contains information and updates of interest with regard to the research program (e.g., funded projects, project Final Reports), education and training (e.g., student awards) and commercialisation (e.g., AusScan Online updates), a Research Snapshot from completed or ongoing projects, and provides news and events of relevance and importance to APRIL Members and associates.

ESTABLISH AN INDEPENDENT WEBSITE FOR PROMOTION OF APRIL ACTIVITIES

The APRIL website apri.com.au has been completely revamped and revitalised and contains a wealth of information regarding all APRIL's funding opportunities as well as results of APRIL research. The website also holds the Final Reports from the two Pork CRC programs (2005–2019), as well as a host of other CRC content.

STRATEGIC PLAN DELIVERABLES

A summary of progress against the Strategic Plan deliverables is provided below:

CORE STRATEGY 5: INITIATE A COMMUNICATION FRAMEWORK

TASK	KEY DELIVERABLES	STATUS
5.1 Present regular updates of APRIL's progress at producer and scientific forums	Presentation of APRIL objectives and research outcomes to representatives of a wide pig producer base in Australia and New Zealand, and to international forums (where appropriate)	✔ Achieved
	Present at a minimum of two member-based conferences, by November 2019	✔ Achieved
5.2 Implement Director-Ordinary Member buddy system	Established as Standing item on Board agenda (June 2018)	✔ Achieved
5.3 Convene an annual Stakeholder Day for all APRIL members	Direct contact with APRIL members to extend latest results and receive direct feedback on progress	✔ Achieved
	First Stakeholder day convened November 2018	✔ Achieved
5.4 Arrange annual one-on-one meetings with APRIL members to understand needs and promote outcomes	Face-to-face meetings (Chair, Board members and (or) the Chief Scientist) convened with all members at least annually (commenced June 2018)	✔ Achieved
5.5 Conduct an annual membership survey to ensure APRIL research remains relevant	First annual membership survey completed by November 2021, requesting feedback on the performance of APRIL	● On target
	Refined priorities for use in development of new research programs	● On target
5.6 Keep industry and stakeholders informed of research, education and training, and commercialisation activities and outcomes	Bi- or tri-monthly column in Australian Pork Newspaper	✔ Achieved
	Media releases (as appropriate)	✔ Achieved
	Quarterly newsletter to all members commencing June 2019	✔ Achieved
5.7 Establish an independent website for promotion of APRIL activities	APRIL website established and linked to the APL website in June 2018, for communication of research, education and training and commercialisation outcomes, and APRIL news	✔ Achieved
	APRIL to maintain the Pork CRC website (after July 2019)	✔ Achieved

A HIGHLIGHT FOR APRIL IN 2019 WAS THE STAKEHOLDERS' DAY AT THE ADELAIDE HILTON ON 16 NOVEMBER 2019…

RESEARCH RE

TRANSFORMAT

PROJECTS

WHAT IS A TRANSFORMATIONAL PROJECT?

APRIL Transformational Projects address major issues for the Australasian pork industry that, if successfully implemented, are likely to result in a step-change. Transformational Projects are highly collaborative, multi-disciplinary, and by their very nature require considerable resources and time to execute. Consequently, Transformational Projects require significant external investment and are targeted at, but not restricted to, the Australian Research Council schemes and the Cooperative Research Centre-Project (CRC-P) scheme.

PORT
TIONAL

KEY THEMES

APRIL has identified two key themes for Transformational Projects as follows:

6.1.1 ENHANCED ANTIMICROBIAL STEWARDSHIP IN THE AUSTRALASIAN PORK INDUSTRY THROUGH TARGETED REDUCTION OF IN-FEED MEDICATIONS WITHOUT ADVERSE HEALTH CONSEQUENCES

Judicious use of antibiotics is a high priority for the Australasian pork industry. One of the best ways to reduce total use of antibiotics in pig production systems is to limit the use of in-feed medications. When antibiotics are included in feed, every pig on that feed receives a dose whether they need it or not, and dosage continues until the batch of feed is consumed. Arguably, this contributes to elevated overall use of antibiotics, an increased number of doses per pig and potentially an increase in the mg of active constituent administered per kg of pork produced. While antibiotic use in agriculture has not contributed significantly to antimicrobial resistance to date, the Industry does have an obligation to minimise any chance that application of antibiotics in pork production systems renders any registered agents or high or medium importance ASTAG (Australian Strategic and Technical Advisory Group on Antimicrobial Resistance)-classified antibiotics unsuitable for use in human medicine.

This priority has been identified as a transformational project because of the multidisciplinary nature of the challenge. Reduction of in-feed medications will potentially require a higher reliance on vaccines, novel use of other nutritional mechanisms to control disease, enhanced capacity to apply pulse water medications, better systems for disease surveillance, capacity for targeted individual pig treatments, better piggery hygiene, higher health status herds and sources of genetics and, if in-feed antibiotics are not used, systems that allow efficient and targeted application of other antibiotics.

6.1.2 ELIMINATION OF THE NEED FOR TAIL DOCKING IN AUSTRALASIAN PORK PRODUCTION SYSTEMS

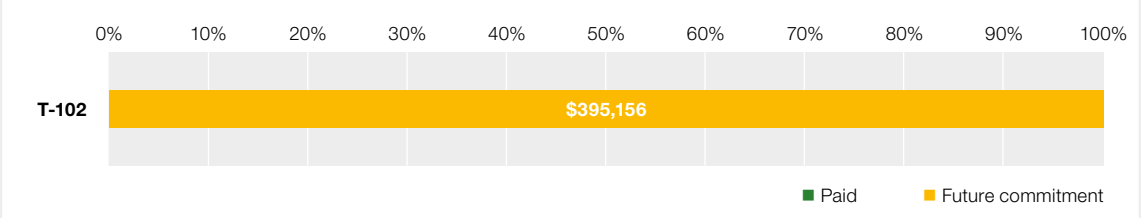
Tail biting is an insidious and costly manifestation that can occur without warning and indiscriminately within commercial pork production systems. Occurrence extends across the entire industry. The cause of tail biting is not understood but is likely to be an interaction between behaviour, environment, management, nutrition, housing and health status, among others, with no one factor necessarily contributing more than another. Costs of tail biting extend to compromised pig welfare, negative behavioural traits, sub-optimal growth rates and feed conversion efficiency, carcase damage and loss of a potentially marketable product (i.e., the tail). Current interventions for the control of tail biting are generally effective yet inconsistent but involve the removal of all or a portion of the tail shortly after birth without the use of anaesthesia. Other invasive husbandry procedures such as teeth-clipping and ear notching have largely been eliminated from many production systems already, and there is increasing pressure to cease tail docking.

However, to date, the industry has resisted without any alternative approach to eliminate tail biting. As a priority, the pork industry should be focussed on understanding the causal factors and interactions that contribute to tail biting with a view to eliminating or managing these factors, as opposed to investing in research that justifies tail docking based on minimal pain responses or through the introduction of anaesthesia options. The significant current and future costs of tail biting and its management should not be underestimated, nor should the multi-faceted challenge of understanding the causal factors, which is why APRIL has identified elimination of the need for tail docking in commercial production systems as a transformational project.

PROJECTS

NO.	PROJECT NAME	LEAD PARTY
T-101	Pathways to rearing pigs with tails to maximise returns to pork producers	APRIL
T-102	How to make antimicrobials in pig feed redundant, naturally	The University of Queensland

TRANSFORMATIONAL PROJECT COMMITMENTS



T-101: PATHWAYS TO REARING PIGS WITH TAILS TO MAXIMISE RETURNS TO PORK PRODUCERS

In March 2020, APRIL (as Lead Party) submitted a Round 9 CRC-P application *Pathways to rearing pigs with tails to maximise returns to pork producers*. The application involved researchers from The Universities of Queensland, Melbourne and New England, as well as strong industry involvement from Rivalea (Australia) Pty Ltd., SunPork Farms, and Australian Pork Limited. Unfortunately, the round was extremely competitive (8% success rate) and APRIL's application was unsuccessful.

APRIL will be meeting with the current collaborators to determine next steps towards another application.

APRIL has also introduced the "Kickstart" funding program that is intended to help with the effort involved in writing and submitting such complex applications.

T-102: HOW TO MAKE ANTIMICROBIALS IN PIG FEED REDUNDANT, NATURALLY

In July 2020, the Australian Research Council (Linkage scheme) announced that it has supported The University of Queensland-administered project 'How to make antimicrobials in pig feed redundant, naturally'. Other organisations involved in the successful grant are The University of Melbourne, the SunPork Group, DSM Nutritional Products, and APRIL.

Chief Investigators in the project are Professor Eugeni Roura (The University of Queensland), Professor Frank Dunshea (The University of Melbourne), Professor Mike Gidley (The University of Queensland), and Associate Professor Pat Blackall (The University of Queensland).

Total cash funding for the 4-year project is $1,931,233, with the Australian Research Council contributing $852,000 and partners contributing an additional $1,079,233, of which $359,223 derives from APRIL.

The total value of the project (cash plus in-kind contributions) is $3,835,847.

This is a great example of APRIL partnering with its members to successfully leverage external funding for a major research project of critical industry-wide importance.

THIS IS A GREAT EXAMPLE OF APRIL PARTNERING WITH ITS MEMBERS TO SUCCESSFULLY LEVERAGE EXTERNAL FUNDING FOR A MAJOR RESEARCH PROJECT OF CRITICAL INDUSTRY-WIDE IMPORTANCE.

STRATEGIC PLAN DELIVERABLES

A summary of progress against the strategic plan deliverables is provided below:

CORE STRATEGY 6: RESEARCH PRIORITIES

6.1: TRANSFORMATIONAL PROJECTS

TASK	CONTEXT AND KEY DELIVERABLES	STATUS
6.1.1 Enhanced antimicrobial stewardship in the Australasian pork industry through targeted reduction of in-feed medications without adverse health consequences	Outcomes from this research portfolio will result in a demonstrable and sustained reduction in the number of in-feed doses of antibiotics administered by the Australasian pig industry each year	● On target
6.1.2 Elimination of the need for tail docking in Australasian pork production systems	Outcomes from this research will include a detailed understanding of the causal factors that interact to induce tail biting (and arguably be able to demonstrate that tail biting can be induced experimentally), mechanisms to predict and control tail biting, total elimination of the need for routine tail docking in commercial production systems, enhanced pig welfare, growth rates and feed conversion, and increased carcase yield	● Delayed

RESEARCH REPORT

INDUSTRY PRIORITY PROJECTS

WHAT IS AN INDUSTRY PRIORITY PROJECT?

APRIL has prioritised several industry challenges that if solved will assist in improving Australasian pork production. Industry Priority Projects are shorter-term, more focussed projects directed at solving these challenges through investments in collaborative research projects.

KEY THEMES

The priority challenges that APRIL has identified following the submission of applications in late 2019/early 2020 are:

- Effective monitoring of foreign disease incursions in Australasia.
- Novel approaches to allow increased use of food wastes in pig diets.
- Making pigs more tolerant to heat.
- Improved water quality for use/re-use on-farm and in processing facilities.
- Alternate methods to control/eradicate endemic diseases.
- Development of real time monitoring and surveillance technologies under commercial conditions.
- Detecting sow reproductive state more efficiently and effectively.
- Establish pork as an integral part of a healthy lifestyle.
- Reducing variation in lifetime performance.
- Biodegradable packaging solutions for pork products.
- Heavier carcasses.

PROJECTS

APRIL has invested in the following projects addressing the "Making pigs more tolerant to heat", "Reducing variation in lifetime performance", "Detecting sow reproductive state more efficiently and effectively" and "Novel approaches to allow increased food wastes in pig diets" priorities:

6A–101 HEAT TOLERANCE (HT) IN LACTATING SOWS: DIETARY STRATEGIES, METABOLIC BIOMARKERS AND MICROBIOME SIGNATURE

PROJECT LEADER: PROFESSOR EUGENI ROURA, THE UNIVERSITY OF QUEENSLAND

- Test selected dietary supplements to increase the heat tolerance of the lactating sow.
- Identify individual variations in metabolism between heat tolerant and less heat tolerant sows during lactation (metabolic and microbiome markers in resilient compared to the most vulnerable individuals).

6A–102 HOT AND BOTHERED! LONG TERM IMPACTS OF LATE PREGNANCY HEAT STRESS ON SOWS AND PROGENY

PROJECT LEADER: DR KATE PLUSH, SUNPORK FARMS

- Demonstrate that heat stress results in a longer duration of farrowing.
- Identify the impacts longer farrowing duration has on (a) the sow and (b) the piglet, and how this impacts impact long term performance.
- Test dietary/water additives for reducing farrowing duration during times of heat stress and determine the production advantages at a commercial level.
- Conduct a cost:benefit analysis and assessment of farrowing room cooling in the hotter months.

6A–103 EASING THE WEANING TRANSITION: LARGE PIGLETS FROM LARGE PELLETS

PROJECT LEADER: MR ROBERT HEWITT, SUNPORK FARMS

- Reduce weight variability around weaning through combining two complimentary technologies, large pellets and semi-moist extruded feed, to improve feed intake in the period immediately post-weaning, sustaining weight gain.

6A–104 USE OF THERMOGRAPHIC TECHNOLOGY TO DETECT REPRODUCTIVE STATE IN SOWS AND IMPROVE PIGLET PERFORMANCE IN A COMMERCIAL FARROWING HOUSE

PROJECT LEADER: DR JESSICA CRAIG, RIVALEA (AUSTRALIA) PTY LTD

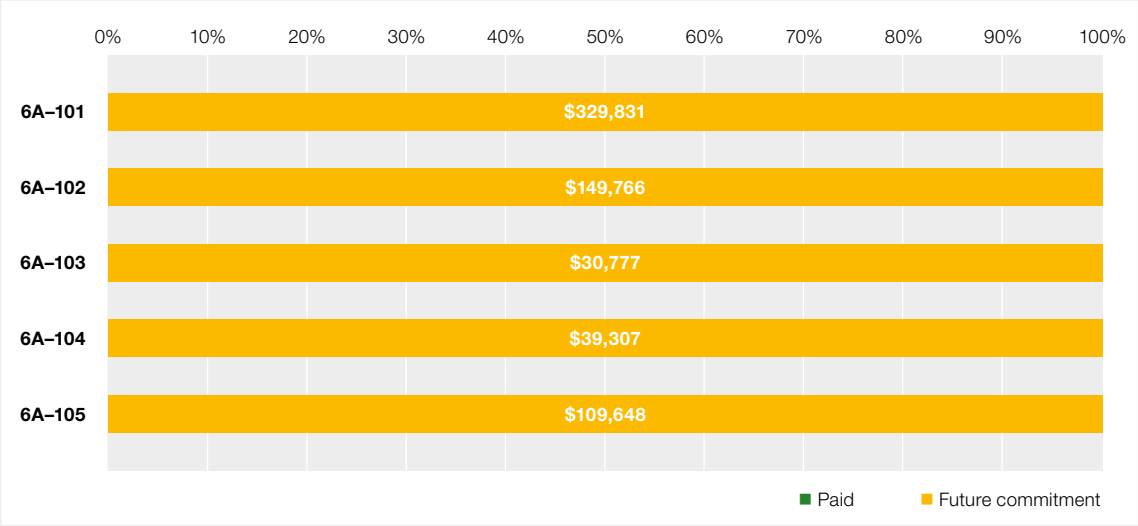
- Identify the optimum position on the sow for surface temperature measurements in order to predict success in lactation of sows, their health status, as well as the viability of their piglets at birth.
- Early detection of at-risk piglets, farrowing difficulties, and/or MMA to provide producers with the tools for early intervention for sows and piglets at risk.

6A–105 FOOD WASTE TO PIG FEED – SAFE AND BIO-SECURE

PROJECT LEADER: DR VALERIA TOROK, SARDI
A JOINT PROJECT WITH THE FIGHT FOOD WASTE CRC

- Address novel approaches to allow increased use of food wastes in pig feed.
- Identify food safety/biosecurity risks and strategies to mitigate perceived risks of utilising food waste streams into pig feed.
- Identify waste streams with the least variability in quality and quantity.
- Determine the economic feasibility of utilising food waste for pig feed in key regional production areas.

NO.	PROJECT NAME	LEAD PARTY
6A–101	Heat Tolerance (HT) in lactating sows: dietary strategies, metabolic biomarkers and microbiome signature	The University of Queensland
6A–102	Hot and Bothered! Long term impacts of late pregnancy heat stress on sows and progeny	SunPork Farms
6A–103	Easing the transition: large piglets from large pellets	SunPork Farms
6A–104	The use of thermographic technology to detect reproductive state in sows and improve piglet performance in a commercial farrowing house	Rivalea (Australia) Pty Ltd
6A–105	Food waste to pig feed – Safe and Bio-secure	Fight Food Waste CRC



APRIL INDUSTRY PRIORITY PROJECT COMMITMENTS

STRATEGIC PLAN DELIVERABLES

A summary of progress against the Strategic Plan deliverables is provided below:

CORE STRATEGY 6: RESEARCH PRIORITIES

6.2: INDUSTRY PRIORITY PROJECTS

TASK	KEY DELIVERABLES	STATUS
6.2.1 Effective monitoring of foreign disease incursions in Australasia	Develop new diagnostics and tools / adapt existing diagnostic and tools, to reduce risks of foreign diseases entering commercial herds	● Delayed
	Joint funding applications with Australian Government/APL	● Delayed
6.2.2 Novel approaches to allow increased use of food wastes in pig diets	Establish sustainable and cost-effective methods for recovery of energy and nutrients from human food waste streams	● On target
	Better application of manufacturing / additive technologies to generate and (or) conserve energy and nutrients from food waste streams	● On target
	Maintenance and (or) improvement in feed conversion efficiency	● On target
	Joint funding applications with the CRC Fight Food Waste/other partners	✔ Achieved
6.2.3 Making pigs more tolerant to heat	Enhanced resilience of pigs (especially sows) to heat	● On target
	Enhanced productivity and welfare of pigs (especially sows and litters) caused by greater heat tolerance	● On target
6.2.4 Improved water quality for use/re-use on-farm and in processing facilities	Establish optimum water quality standards for better productivity and health under commercial conditions	● On target
	Optimise the quality of water as a delivery mechanism for water soluble additives	● On target

TASK	KEY DELIVERABLES	STATUS
6.2.5 Alternate methods to control/ eradicate endemic diseases	Alternative management methods/technologies to reduce the presence of economically significant diseases in commercial herds	Delayed
6.2.6 Development of real time monitoring and surveillance technologies under commercial conditions	More efficient feeding/management systems and (remote) monitoring of the environment, performance, feed consumption (and waste), and health and welfare of pigs	Delayed
	Early detection of health and welfare challenges	Delayed
6.2.7 Detecting sow reproductive state more efficiently and effectively	Establish/validate new methods/technologies that reliably and cost effectively confirm reproductive state in sows	On target
6.2.8 Establish pork as an integral part of a healthy lifestyle	Greater awareness of the role of pork as a key food component in a healthy lifestyle	Delayed
6.2.9 Reducing variation in lifetime performance	Establish/validate new reproductive and (or) management technologies, strategies and nutrient requirements that reduce weight variability from birth to finish	On target
	Improved feed conversion efficiency	Delayed
6.2.10 Biodegradable packaging solutions for pork products	Develop cost-effective, biodegradable packaging products for pork	Delayed
6.2.11 Heavier carcasses	Optimising the value of carcasses from heavier pigs	Delayed
	Establishing customer acceptance and value pathways for rind-off products, larger primals and export competitive pieces	Delayed

RESEARCH REPORT

INNOVATION PROJECTS

WHAT IS AN INNOVATION PROJECT?

The overall purpose of APRIL Innovation Projects is for the support of “out of the box” ideas for smart, new approaches to tackle current and emerging challenges for the Australasian pork industry.

Innovation Projects must demonstrate originality, uniqueness and creativity, establish new concepts or challenge existing ones, address significant challenges or critical barriers to progress, and be able to improve or apply new theoretical concepts, methodologies or tools that will benefit industry.

PROJECTS

APRIL has invested in the following Innovation Projects, with the following aims:

5A–101 REAL TIME, IN-FIELD WATER TESTING

PROJECT LEADER: DR LOUISE EDWARDS, RIDLEY AGRIPRODUCTS PTY LTD

- To determine if portable spectral-based hardware is compatible for the development of a real-time, in-field multi-parameter water testing device.

5A–102 INSECT MEAL FROM PORK PROCESSING DERIVED MATERIAL

PROJECT LEADER: DR KRISTY DIGIACOMO, THE UNIVERSITY OF MELBOURNE

- To measure the growth performance of black soldier fly larvae (BSF) on a range of pork processing waste varying in nutrient content to optimise waste substrates for BSF bioconversion.
- To measure the nutrient composition of BSF and frass fertilizer derived from pork processing waste.
- To evaluate any microbial risks associated with insect meal derived from pork processing waste.
- To evaluate any chemical risks (such as heavy metals) associated with insect meal derived from pork processing waste.

5A–103 DEVELOPMENT OF A *STREPTOCOCCUS SUIS* VACCINE VIA MEASUREMENT OF IMMUNE RESPONSES TO FOUR DIFFERENT *STREPTOCOCCUS SUIS* VACCINE PREPARATIONS, USING AN AUSTRALIAN CPS2 ST25 STRAIN

PROJECT LEADER: DR MARK O'DEA, MURDOCH UNIVERSITY

- Produce the precursor to a vaccine combination targeting the major strains of *S. suis* associated with disease in Australia.
- Adopt serologic monitoring to better determine the effect of vaccines in a more robust manner than clinical signs alone.
- Determine the effectiveness of different bacterial inactivation methods, which have had little exploration in *S. suis* vaccine production, and which may have more effect in maintaining antigen structure and potency.

5A–104 LOW DOSE DIETARY STRATEGIES IN LATE GESTATION TO ENHANCE BORN ALIVE AND PIGLET SURVIVAL AND PERFORMANCE

PROJECT LEADER: DR JESSICA CRAIG, RIVALEA (AUSTRALIA) PTY LTD

- To evaluate the effects of supplementation of 0.5% arginine and three novel feed additives, B-hydroxy ß-methyl butyrate (HMB), N-Carbamylglutamate (NCG), and Calcium nitrate, on litter characteristics at birth when fed from day 90 of gestation.
- To assess each treatment for piglet vitality, number of still born, number born alive and weaned as well as subsequent reproductive performance of all sows.
- Provide the industry with effective strategies for improving the efficiency of reproduction and progeny performance.

5A–105 ORAL MEANS OF INCREASING ENDOGENOUS GROWTH HORMONE LEVELS AND ENHANCING THE PERFORMANCE AND CARCASS CHARACTERISTICS OF GROWING PIGS

PROJECT LEADER: DR FAN LIU, RIVALEA (AUSTRALIA) PTY LTD

- Validate the effects of NCG and HMB supplementation at two levels (0.15% and 0.3%) when fed to finisher pigs from live weight 60–100 kg for feed intake, growth rate and feed efficiency.
- Validate the effects of NCG and HMB supplementation to enhance commercial carcass traits (carcass weight, dressing percentage, loin muscle depth and back fat thickness) and IGF-1 secretion.
- Determine whether NCG is more potent than feeding arginine itself in increasing blood arginine concentration by measuring arginine plasma levels in control; 1% arginine supplementation and the NCG treatments.
- Determine for treatments that significantly alter either increased growth, feed efficiency, loin eye depth or reduced backfat thickness the magnitude of change in plasma amino acid profiles, and urea nitrogen.

5A–107 USING ALGAL EXTRACTS TO IMPROVE WEANER GROWTH PERFORMANCE AND DIGESTIBILITY

PROJECT LEADER: SARAH HABERECHT, RIDLEY AGRIPRODUCTS PTY LTD

- Analyse the effect of supplementing weaner pig diets with different algal extracts on:
  1. Growth, feed efficiency and rate of digestion.
  2. The incidence of diarrhoea.
  3. The change in gut microbial populations and inflammation response markers, when compared to conventional weaner pig diets.

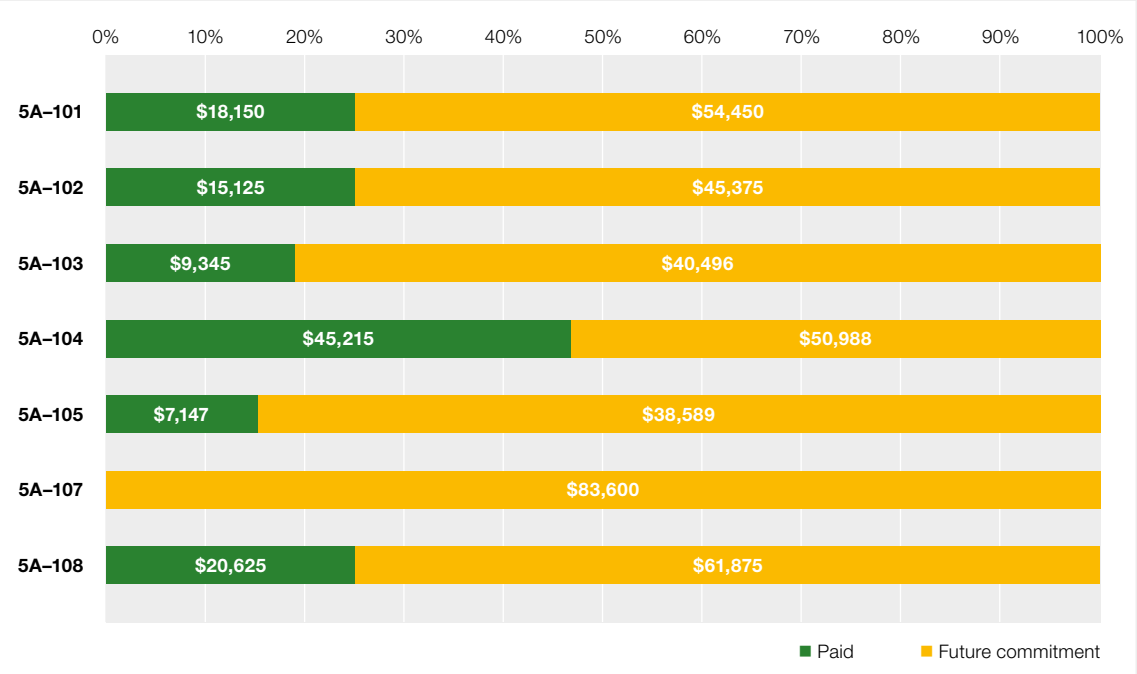
5A–108 WHAT SENSORY ATTRIBUTES ARE MOST CRITICAL FOR CONSUMER EVALUATION WITHIN AN AUSTRALIAN PORK EATING QUALITY PROGRAM?

PROJECT LEADER: PROFESSOR FRANK DUNSHEA, THE UNIVERSITY OF MELBOURNE

- Investigate what are the most critical sensory attributes influencing acceptability (overall liking) of Australian pork with Australian consumers.
- Identify what attributes should be used within an Australian pork eating quality program.
- Assess the effectiveness of the Check all that apply (CATA) rapid sensory method for discriminating sensory properties between six different Australian pork products.

NO.	PROJECT NAME	LEAD PARTY
5A–101	Real time, in-field water testing	Ridley Agriproducts Pty Ltd
5A–102	Insect meal from pork processing derived material	The University of Melbourne
5A–103	Development of a *Streptococcus suis* vaccine via measurement of immune responses to four different *Streptococcus suis* vaccine preparations, using an Australian cps2 ST25.strain	Murdoch University
5A–104	Low dose dietary strategies in late gestation to enhance born alive and piglet survival and performance	Rivalea (Australia) Pty Ltd
5A–105	Oral means of increasing endogenous GH levels and enhancing the performance and carcass characteristics of growing pigs	Rivalea (Australia) Pty Ltd
5A–107	Using algal extracts to improve weaner growth performance and digestibility	Ridley Agriproducts Pty Ltd
5A–108	What sensory attributes are most critical for consumer evaluation within an Australian Pork eating quality program?	The University of Melbourne

APRIL INNOVATION PROJECT COMMITMENTS



RESEARCH REPORT

LEGACY PROJECTS

WHAT IS A LEGACY PROJECT?

Legacy projects fall into two main categories – Pork CRC projects contracted through APRIL because they were not due to finish before the close of the Pork CRC, and APRIL Investment Round 1 projects approved prior to adoption of the Strategic Plan in 2019.

KEY THEMES

PORK CRC PROJECTS

Pork CRC projects followed the Pork CRC program structure:

- Program 1 – Reduced confinement of sows and piglets
- Program 2 – Herd health management
- Program 3 – Healthy pork consumption
- Program 4 – Carbon conscious nutrient inputs and outputs
- Commercialisation projects

APRIL INVESTMENT ROUND 1 PROJECTS

APRIL Investment Round 1 projects were structured into three programs, as follows:

PROGRAM 1 – RESILIENCE

Under the Resilience program, APRIL sought proposals on the more judicious use of antibiotics targeted at:

- Reduction in the use of in-feed medications or more conservative delivery of in-feed medications (pulse medication post-feed mixing, in line blending of medications).
- Non-antibiotic alternatives (i.e. vaccines, nutritional strategies, microbiome, effective additives, and "natural" products).
- Elimination of critical antibiotics from the production system.
- Reduction in antimicrobial resistance.
- Development of "sentinel" pig systems that provide alerts to the early onset of disease or give an indication of the overall immune status of the herd.
- Novel diagnostics.

APRIL SOUGHT NEW SCIENCE AND TECHNOLOGIES TO ENHANCE MARKEDLY THE REPRODUCTIVE PERFORMANCE OF AUSTRALIAN SOWS WITHOUT THE NEED TO IMPORT FOREIGN GENETICS.

PROGRAM 2 – COST

Under the Cost program, APRIL sought proposals which will help the Australasian industry reduce its reliance on the more conventional feed ingredients and help divorce the industry from the global grain and soybean markets.

This encompassed ideas on, but not limited to:

- Enhancing our capacity to utilise grain alternatives including milling co-products and pulses. Maintaining development of NIR calibrations for DE and available lysine in cereals and oilseeds, respectively.
- Developing effective means of measuring feed intake and wastage in pigs through all production phases.
- Enhancing methods for recovery of waste phosphorus and other high-demand nutrients. Improving application of enzyme and other feed additive technologies to conserve nutrients.
- Developing nutrient profiling and feeding practices of alternative or novel feed sources.

PROGRAM 3 – RETURN ON ASSETS

Program 3 was further divided into two sub-programs – Program 3A – Reproduction, and Program 3B – Progeny

REPRODUCTION

APRIL sought new science and technologies to enhance markedly the reproductive performance of Australian sows without the need to import foreign genetics.

New ideas and science were sought but not limited to the following areas:

- Optimisation of intake during lactation and management of sow body condition to maximise/enhance subsequent reproduction.
- Relationship between seasonal fertility versus infertility.
- Quantification of methods to control seasonal market supply through breeder management.
- Investigate and review new reproductive technologies and nutrient requirements that optimise piglets weaned/sow and reduce litter weight variability.
- Develop alternatives to importation of genetics to facilitate faster rate of genetic gain in Australasia.

PROGENY

APRIL sought new science and technology to improve the efficiency and survival of pigs from weaning to sale. New ideas and science were sought but not limited to the following areas:

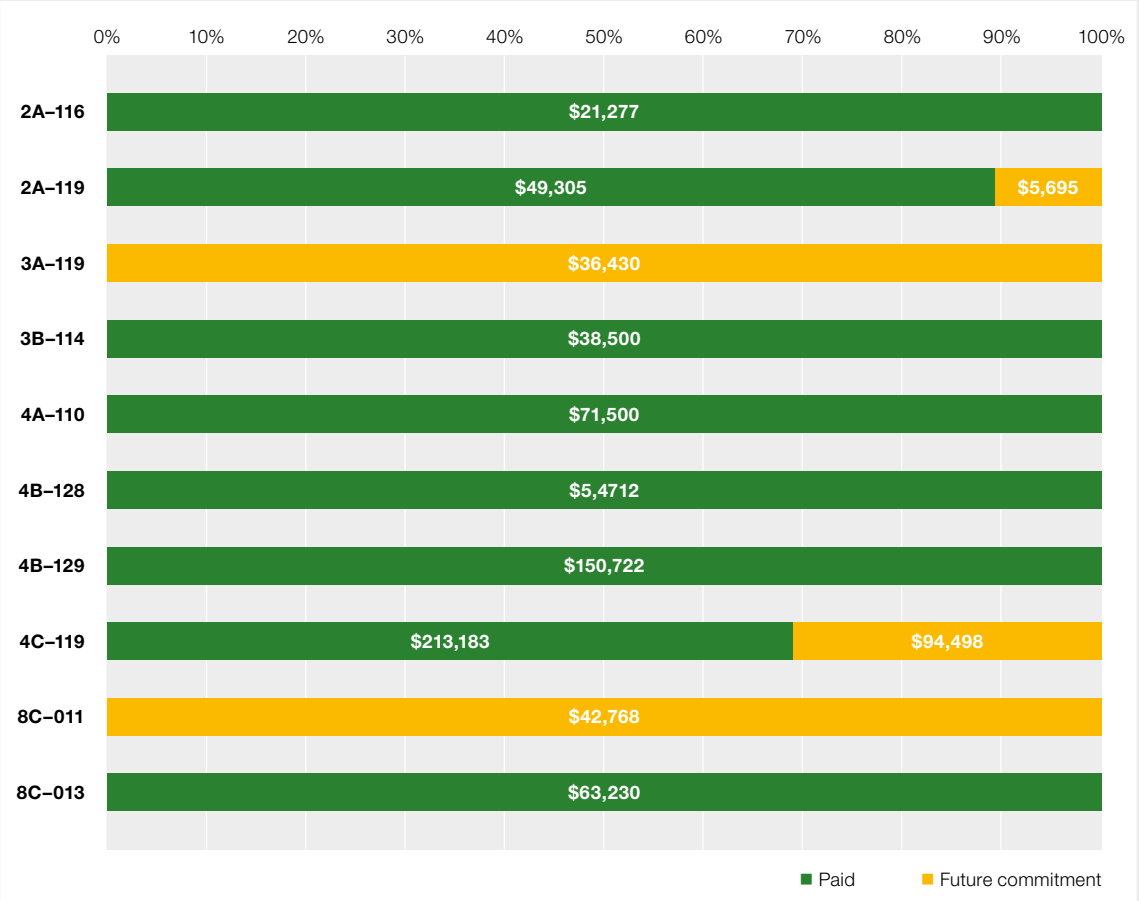
- Growth enhancement to improve inherent feed efficiency.
- Manipulation and monitoring of feed intake.
- Control and manipulation of carcass quality and variability.
- Measurement and reduction of feed wastage.
- Early detection of health challenges and improved control of sub-clinical health issues.
- Appropriate revision of nutrient requirements.

PROJECTS

PORK CRC PROJECTS

NO.	PROJECT NAME	LEAD PARTY
2A–116	Pre-farrowing health and welfare assessment of sows	Animal Genetics and Breeding Unit, University of New England
2A–119	Development of a quantitative PCR test for swine dysentery	Murdoch University
3A–119	On line lean meat yield measurement of pig carcases – commercial validation	Australian Pork Limited
3B–114	Development of a 'healthy pork' resource for use by consumers, health professionals and regulatory bodies: summary and dissemination of Pork CRC human nutrition research	The University of South Australia
4A–110	Integrated wastewater treatment plant (iWWTP) data collection	Flinders University
4B–128	The use of 15N as a biomarker for feed conversion efficiency (FCE) in pigs using blood and hair samples	The University of Melbourne
4B–129	Grain collection, storage and distribution, and data management for 4B subprogram projects	The University of Sydney
4C–119	Bio-upgrading piggery biogas by growing algae, for value-add end uses	The University of Queensland
8C–011	The provision of a curative supplemental block provides enrichment, reduces mutilation and reduces the negative impact on production performance caused by tail and ear bite mutations in growing pigs	SunPork Farms
8C–013	An assessment of an attenuated live streptomycin-dependent *Actinobacillus pleuropneumoniae* (APP) vaccine (serovar 15) delivered either intranasal or as a combination of intranasal and intramuscular injection	Rivalea (Australia) Pty Ltd

PORK CRC PROJECT COMMITMENTS



FEATURE PROJECT: 3B–114

DEVELOPMENT OF A 'HEALTHY PORK' RESOURCE FOR USE BY CONSUMERS, HEALTH PROFESSIONALS AND REGULATORY BODIES: SUMMARY AND DISSEMINATION OF PORK CRC HUMAN NUTRITION RESEARCH

PROJECT LEADER:
Dr Karen Murphy, University of South Australia

PROJECT STATUS:
Completed

AIMS AND OBJECTIVES

The Pork Co-operative Research Centre funded 16 projects under the 'Healthy Pork Consumption' program from 2005 to 2019 with the aims to explore potential health benefits of pork and drivers and barriers to increased consumption. This project specifically aimed to summarise this information in order to:

1. Provide an updated dossier of the nutritional composition of fresh pork.
2. Determine levels of consumption of fresh pork amongst the community.
3. Provide information in relation to consumption of fresh pork on different aspects of human health and cognition.
4. Provide information to be used to educate dietitians and health professionals on the benefits and lack of adverse effects of consuming fresh lean pork as part of a healthy dietary pattern.
5. Provide scientifically substantiated information to regulatory bodies on the health benefits of including fresh lean pork in diet for consideration when revising dietary guidelines and diets and health-related messages.

KEY FINDINGS

Collectively, this research showed that there were no adverse effects of fresh pork consumption, but fresh pork consumption may help with cardiometabolic health and blood pressure management of Type 2 diabetes, weight loss and preservation of cognition as part of a healthy dietary pattern. Including fresh lean pork in a healthy dietary pattern, in moderation, fits with latest dietary guidelines for good health

APPLICATIONS TO INDUSTRY

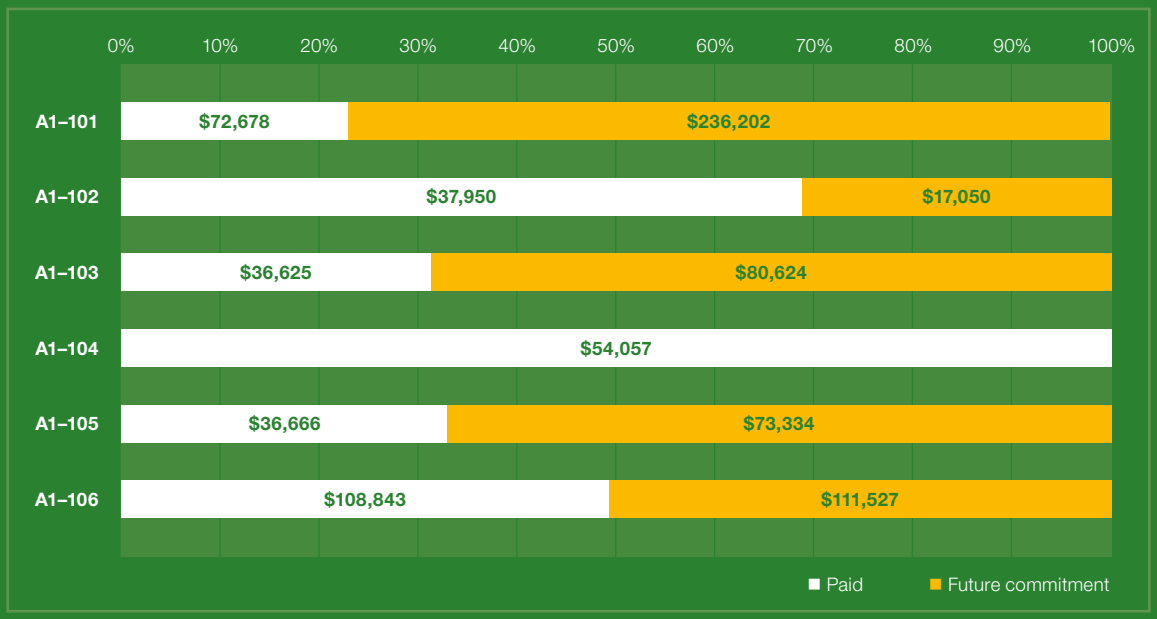
This project provides new, valuable and up-to-date information for the Australasian pork industry and offers new opportunities for the promotion and marketing of fresh pork.

FRESH PORK CONSUMPTION MAY HELP WITH CARDIOMETABOLIC HEALTH AND BLOOD PRESSURE MANAGEMENT OF TYPE 2 DIABETES, WEIGHT LOSS AND PRESERVATION OF COGNITION.

PROJECT COMMITMENTS
APRIL ROUND 1 PROGRAM 1

APRIL ROUND 1 PROGRAM 1 PROJECT COMMITMENTS
PROGRAM 1 – RESILIENCE

NO.	PROJECT NAME	LEAD PARTY
A1–101	Novel approaches for reducing antimicrobial resistant and pathogenic Gram-negative bacteria in the porcine gut	Murdoch University
A1–102	Proof of concept: Oral Fluids and quantitative assessment for Porcine Chronic Respiratory Disease (PCRD) in Australian field conditions	Rivalea (Australia) Pty Ltd
A1–103	Improving enteric health, understanding impact on gut microbiome and weaner performance through the use of protease enzymes	SunPork Farms
A1–104	Developing remote monitoring methods for early detection of respiratory disease in pigs	The University of Melbourne
A1–105	Early stress experiences and stress resilience and emotionality in pigs	The University of Melbourne
A1–106	A lab on a chip for real time pain and animal welfare biomarker measurement	The University of Adelaide



FEATURE PROJECT: A1–104

DEVELOPING REMOTE MONITORING METHODS FOR EARLY DETECTION OF RESPIRATORY DISEASE IN PIGS

PROJECT LEADER:
Dr Ellen Jongman, The University of Melbourne

PROJECT PARTICIPANTS:
The University of Melbourne, Rivalea (Australia) Pty Ltd

PROJECT STATUS:
Completed

This project had the aims of:

- Validating the proposed algorithms to measure Heart Rate (HR) and Respiration Rate (RR) in pigs.
- Identifying whether these technologies would be able to detect physiological changes (eye-temperature, HR and RR) before sick animals display clinical signs that would be detected by farm workers.

Therefore, this project was divided into two parts. "Part I" refers to the study to validate these techniques, while "Part II" refers to the study which implemented these techniques for early detection of respiratory diseases in pigs under commercial conditions.

PART I: VALIDATION STUDY

A total of 28 post-weaned pigs, at 9 weeks of age, were grouped into two adjacent pens (2 m x 2.8 m). The procedures for this study were performed in November of 2019, four days after these pigs were placed in their respective pens. A camera (FLIR Duo® Pro R; FLIR Systems, Wilsonville, OR, USA) was located in a corner of each pen, attached at a height of 2.5 m and the camera lenses were directed to record the largest area of the pen possible. An area in the middle of the solid floor (close to the feeder) was selected as the place where pigs were individually held during the recording, which was at approximately 2.5–2.8 m from the camera.

The data from the comparison between the HR measured with stethoscope and the HR obtained from image processing from individual pigs showed good correlation, with similar correlation coefficients (r= 0.61 – 0.65) in both positions, being slightly higher when pigs were facing sideways of the camera (Table 1).

In the case of RR measures, these also showed good positive correlations between the standard and computer-based methods (r= 0.61 – 0.66), being slightly larger when the pigs faced towards the camera (Table 1).

DEVELOPING REMOTE MONITORING METHODS FOR EARLY DETECTION OF RESPIRATORY DISEASE IN PIGS

TABLE 1

Pearson correlation coefficients (r) between heart rate (HR) and respiration rate (RR) obtained with standard methods (stethoscope and visual observations respectively) and image processing. Two different animal positions (toward and sideways) relative to the camera are compared.

* ($p < 0.05$) ** ($p < 0.001$)

VARIABLE	ANIMAL POSITION	METHOD	RANGE	MEAN (SD)	CORRELATION COEFFICIENT (R)
HR (BPM)	Side	Stethoscope	134–228	165.89 (26)	0.65**
		C.V.	123–235	164.69 (30)	
	Front	Stethoscope	144–242	187.17 (29)	0.61*
		C.V.	152–291	201.32 (28)	
RR (BPM)	Side	Visual observation	39–53	46 (3)	0.61*
		C.V.	36–60	48 (6)	
	Front	Visual observation	36–53	42 (4)	0.66**
		C.V.	30–58	45 (9)	

TABLE 2

Summary of least significant difference (LSD) test between "sick" and "healthy" pigs, for eye-temperature (T), heart rate (HR) and respiration rate (RR). Indicating the difference between group during the day before (day -1) and the day when clinical signs were detected (day 0).

* Difference between groups is larger than LSD

VARIABLE	DAY	GROUP	MEAN	LEAST SIGNIFICANT DIFFERENCE (LSD)	*P-VALUE*
T (°C)	-1	Sick	38.97	0.39*	<0.001
		Healthy	37.81		
	0	Sick	39.11	0.35*	<0.001
		Healthy	37.78		
HR (BPM)	-1	Sick	83.62	3.12*	0.001
		Healthy	78.25		
	0	Sick	88.74	3.93*	<0.001
		Healthy	78.64		
RR (BPM)	-1	Sick	28.6	2.3	0.03
		Healthy	26.4		
	0	Sick	30.6	3.2*	0.006
		Healthy	26.4		

FEATURE PROJECT: A1–104

DEVELOPING REMOTE MONITORING METHODS FOR EARLY DETECTION OF RESPIRATORY DISEASE MONITORING IN PIGS

PART II: EARLY DETECTION OF RESPIRATORY DISEASES

Two groups of post-weaned pigs were recorded in two separate periods during 2019–2020. The first group comprised 20 pigs, which were divided and placed into two adjoining pens of 2 m x 2.8 m metres (10 pigs per pen) at 9 weeks of age. These pigs were recorded between 12 and 17 weeks of age (August–September). The second group comprised 28 weaned pigs, which were divided and placed into two adjoining 6 pens of 2 m x 2.8 m metres (14 pigs per pen) at 9 weeks of age. These pigs were recorded between the 9 and 20 weeks of age (November–January).

One camera, together with a storage system and an external hard drive, was located in each of the pens by attaching it in a corner of the pen at a height of 2.5 m. The location of the camera in the current study was chosen so that additional information on the behaviour of pigs could be collected, which can also potentially be used to identify clinical signs of disease.

Pigs were labelled as “sick” or “healthy” based on signs observed.

The physiological parameters remotely assessed were compared across all groups (Table 2).

When eye-temperature of “sick” and “healthy” pigs was analysed across all groups, the analysis of variance showed significantly ($p<0.05$) higher eye-temperature in ‘sick’ pigs than in ‘healthy’ pigs from one day before the clinical symptoms were detected (Table 2).

As eye-temperature has been suggested as a good indicator of core body temperature, this would indicate that pigs that are affected by respiratory infections have an increase in temperature around 24 hours before evident signs, such as cough, lethargy or anorexia are observed.

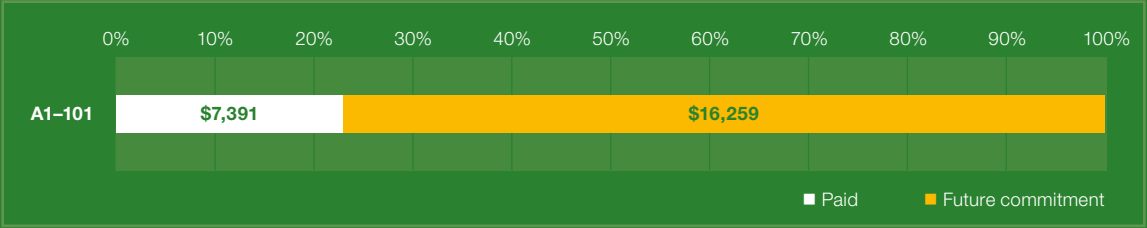
In the case of HR, the analysis of variance showed significant difference ($p<0.05$) of HR between “sick” and “healthy” pigs, across all groups. Similarly, to eye-temperature, the difference of HR also became significant from one day before the day when clinical symptoms were detected.

A different trend was observed in the RR measures within all groups. From the analysis performed across groups, the daily average of RR was not observed to significantly differ between “sick” and “healthy” pigs the day before clinical symptoms were detected.

PROJECT COMMITMENTS
APRIL ROUND 1 PROGRAM 2
APRIL ROUND 1 PROGRAM 3A

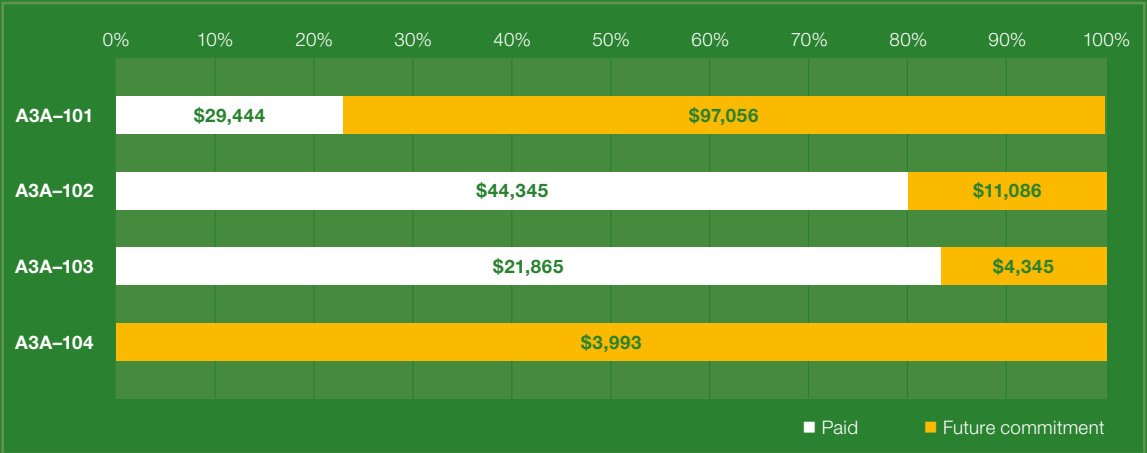
APRIL ROUND 1 PROGRAM 2 PROJECT COMMITMENTS
PROGRAM 2 – COST

NO.	PROJECT NAME	LEAD PARTY
A2–101	Protected vitamin and mineral premixes maintain performance of commercial pigs at reduced inclusion rates	SunPork Farms



APRIL ROUND 1 PROGRAM 3A PROJECT COMMITMENTS
PROGRAM 3A – REPRODUCTION

NO.	PROJECT NAME	LEAD PARTY
A3A–101	Improved feed efficiency, control of P2 back fat and maintenance of pork quality in finishing pigs fed bitter extracts	The University of Queensland
A3A–102	Review relationship between energy intake and protein deposition in 60–110 kg pigs with modern genetics using DXA scanner	Rivalea (Australia) Pty Ltd
A3A–103	Feeding a single diet to pigs in the grower/finisher stage to reduce feed costs and improve feed efficiency	Pork Innovation WA
A3A–104	Base-Funded Experiment: Feeding a single diet versus phase feeding to pigs in the growing-finishing stage	SunPork Farms
A3A–105	Base-Funded Experiment: Feeding a single diet versus phase feeding to pigs in the growing-finishing stage	Rivalea (Australia) Pty Ltd



FEATURE PROJECT: A3A–103

FEEDING A SINGLE DIET TO PIGS IN THE GROWER/FINISHER STAGE TO REDUCE FEED COSTS AND IMPROVE FEED EFFICIENCY

PROJECT LEADER:
Dr Karen Moore, Pork Innovation WA

PROJECT STATUS:
Completed

AIMS AND OBJECTIVES

To develop a feeding strategy which will reduce feed costs, improve intramuscular fat and which is easy to implement and adopt by producers.

HYPOTHESES

1. Feeding a single diet will reduce the cost of feeding pigs compared to the phase system without adversely affecting pig growth performance and carcass assessments.
2. Feeding a single diet targeted to meet lysine (Lys) requirements at either 60 or 70 kg liveweight will reduce the cost of feeding pigs compared to feeding a single diet targeted to meet Lys requirements at either 50 kg liveweight.
3. Pigs fed a single diet will have more intramuscular fat than those receiving the phase diet.

EXPERIMENTAL DESIGN

Four feeding strategy treatments (from approximately 23 to 100 kg liveweight (LW)):

1. Phase feeding – four diets fed from 23 to 100 kg LW.
2. Single diet formulated to meet requirements at 50 kg LW (Single 50).
3. Single diet formulated to meet requirements at 60 kg LW (Single 60).
4. Single diet formulated to meet requirements at 70 kg LW (Single 70).

KEY FINDINGS

1. No adverse effects of feeding strategy on performance, the carcass, intramuscular fat or backfat (Table 3).
2. A statistical trend for pigs who received the Single 60 or Single 70 diet to have an improved feed conversion ratio compared to those fed the Phase or Single 50 diet.
3. It was cheaper (Feed costs/kg LW gain) to feed pigs the Single 70 and Single 60 diets compared to the Single 50 and Phase diets (Table 3).

APPLICATIONS TO INDUSTRY

1. Grower-finisher pigs may be fed the same (single) diet (targeted to their Lys requirements at either 60 or 70 kg LW) with no negative effects on growth performance or carcass quality.
2. Feeding a single diet to pigs in the grower finisher stage has several advantages for feed manufacture, storage and delivery.
3. The LW range in this experiment was approximately 23 to 100 kilograms. Feeding a single diet over a different LW range and (or) under different feeding and management conditions might produce different results to those reported in the current study.

TABLE 3

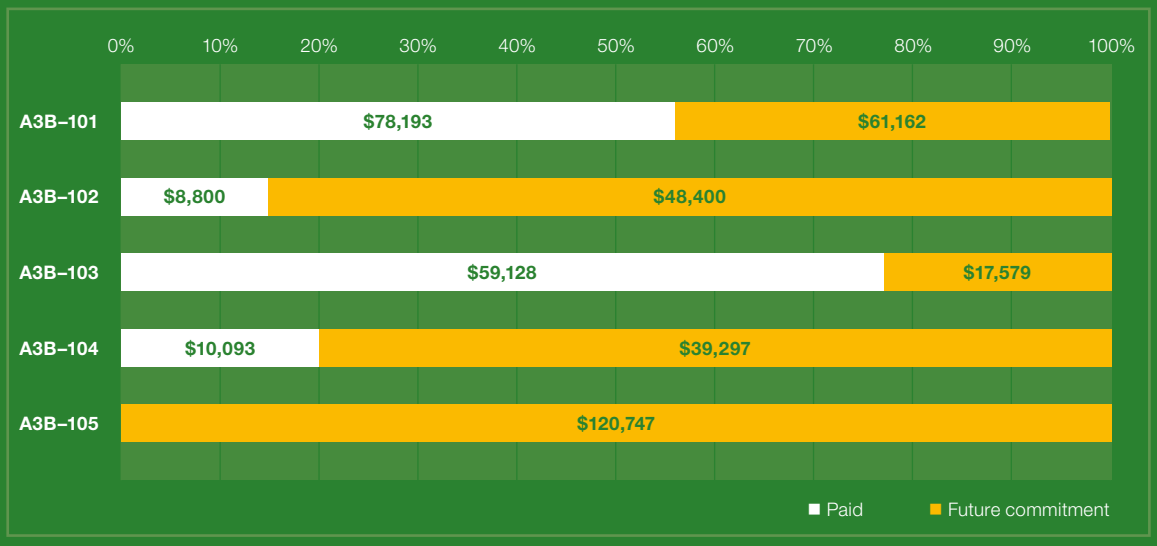
Carcass weight, backfat, intramuscular fat, the price received and feed costs per kg liveweight (LW) gain for female pigs fed one of four different feeding strategies in the grower-finisher period (n=7).

PARAMETER	PHASE	SINGLE 50	SINGLE 60	SINGLE 70	SED	P-VALUE
Carcass weight (kg)	72.1	72.5	72.2	72.4	0.420	0.632
Back fat (mm)	10.1	10.1	10.1	9.78	0.211	0.352
Intramuscular fat (g/100g)	1.69	1.58	1.88	2.14	0.282	0.227
Price per kg ($)	2.90	2.88	2.91	2.90	0.018	0.414
Price per pig ($)	208	208	210	210	1.44	0.537
Feed costs/kg LW gain ($)	1.28a	1.26a	1.20b	1.19b	0.029	0.010

PROJECT COMMITMENTS
APRIL ROUND 1 PROGRAM 3B

APRIL ROUND 1 PROGRAM 3B PROJECT COMMITMENTS
PROGRAM 3B – PROGENY

NO.	PROJECT NAME	LEAD PARTY
A3B–101	Using GnRH analogues for fixed-time AI and pregnancy support to address seasonal infertility in sows	The University of Adelaide
A3B–102	Nutritional supplementation to increase the number of pigs weaned and fertility of sows which farrow and are mated during summer / early autumn	The University of Adelaide
A3B–103	Identifying reciprocal chromosomal transloactions to reduce early embryo mortality	SunPork Farms
A3B–104	Seasonal fertility: a novel approach to alleviating seasonal infertility in sows	SunPork Farms
A3B–105	Effects of negative DCAD and vitamin D in transition diets to increase piglet weaning numbers, improve piglet weaning weight, and minimise sow condition loss during lactation	J.A.Braun Investments Pty Ltd



FEATURE PROJECT: A3B–103

IDENTIFYING RECIPROCAL CHROMOSOMAL TRANSLOCATIONS IN BOARS TO REDUCE EARLY EMBRYO MORTALITY

PROJECT LEADER:
Dr Darryl D'Souza, SunPork Solutions

PROJECT PARTICIPANTS:
Prof Tariq Ezaz and Mr Foyez Shams, University of Canberra

PROJECT STATUS:
Completed

AIMS AND OBJECTIVES

1. Validate a methodology involving molecular cytogenetic tools to screen boars for reciprocal chromosomal translocations (RCT) affecting early embryo survival.
2. From a sample of boars in a commercial stud, determine the incidence of hypoprolificacy.

EXPERIMENTAL DESIGN

Blood samples from 94 boars were collected from a commercial nucleus herd.

Pairwise arranging of chromosomes based on size and the centromere position was performed. A Zeiss Axioplan epifluorescence microscope equipped with a CCD (charge-coupled device) camera was used to capture images of DAPI stained chromosome spread.

Fluorescence *in situ* hybridisation (FISH) was carried out using a multi-probe device, specific to pigs, using sub-telomeric genes. The FISH images were captured using a Zeiss Axioplan epifluorescence microscope equipped with a charge-coupled device camera (RT-Spot) and the Zeiss fluorescence filter. The Isis imaging software was used for image capture and analysis.

KEY FINDINGS

- Successful establishment of a short-term blood culture protocol and preparation of high-quality metaphase chromosomes with high mitotic indices from 94 boars suitable for karyotyping.
- Successful karyotyping of all 94 boars (pairing homologous chromosomes), with data successfully validated using a proprietary Chromoprobe Multiprobe® System device.
- Identification of a high incidence (6.4%) of RCT in a commercial nucleus boar herd, with four types of RCT identified in six of the 94 boars tested.
- The incidence of RCT (6.4%) in this commercial stud was higher compared to the reported incidence from other countries (The Netherlands 0.7%, France 0.5%).
- Boars with RCT had a lower litter size compared to normal boars.

APPLICATIONS TO INDUSTRY

The closed genetic status of the Australian herd and consequently the limited genetic herd diversity may be a causative factor in the increased incidence of these RCT, and subsequently lower litter sizes.

The higher incidence of RCT is likely to be similar for other commercial Australian herds given the closed genetic herd and common ancestry.

THE INCIDENCE OF RCT (6.4%) IN THIS COMMERCIAL STUD WAS HIGHER COMPARED TO THE REPORTED INCIDENCE FROM OTHER COUNTRIES (THE NETHERLANDS 0.7%, FRANCE 0.5%).

EDUCATION AND TRAINING REPORT

APRIL EDUCATION AND TRAINING PROGRAM

APRIL is committed to helping build skilled human resources for the benefit of industry, whether it be through supporting tomorrow's researchers through undergraduate projects (e.g., Honours) and postgraduate support such as PhD scholarships and Doctor of Veterinary Medicine projects, or training highly skilled staff in pork production through the Industry Placement Program.

APRIL has a dedicated Education Advisory Committee that ensures APRIL's education and training programs are relevant and operating efficiently to meet these goals.

TOMORROW'S RESEARCHERS

Aa at 30 June 2020, APRIL has supported scholarships for the following undergraduate and postgraduate students:

...THE PHD STUDENTS INVOLVED IN THESE PROJECTS ARE WORKING ON REAL-WORLD ISSUES ON COMMERCIAL PRODUCTION UNITS...

STUDENT	UNIVERSITY	QUALIFICATION	STATUS
Brittany Silva	Murdoch University	DVM	Ongoing
Eva Vidacs	The University of Melbourne	Honours	Completed
Suzanna Jones	Murdoch University	Honours	Ongoing
Stephanie Shields	The University of Sydney	Honours	Ongoing
Tanya Laird	Murdoch University	PhD	Ongoing

In addition, a number of projects involving APRIL funding also provide student support. Examples include the Australian Research Council-Linkage projects involving APRIL as a Partner Organisation, titled *Early stress experiences and stress resilience and emotionality in pigs* and *How to make antimicrobials in pig feed redundant, naturally*. The nature of these projects, directly involving industry, means that the PhD students involved in these projects are working on real-world issues on commercial production units, meaning not only do they gain a PhD but also are well equipped to enter the workforce having a greater understanding and appreciation of production.

INDUSTRY PLACEMENT PROGRAM

APRIL supports an Industry Placement Program (IPP), similar to that successfully initiated in the Cooperative Research Centre for High Integrity Australian Pork.

The Pork CRC's IPP placed more than a dozen highly credentialed young people in industry positions where they leveraged their academic skills and qualifications to add value to their workplaces, and APRIL seeks to continue this valuable legacy.

As part of an IPP Award, APRIL will provide the successful business applicant with $70,000 over the first two years to help cover salary and other costs associated with training the awardee for three years.

As at 30 June 2020, APRIL has supported the following IPP students:

STUDENT	EMPLOYER	STATUS
Sofie Pridgeon	SunPork Farms	Completed
Dr Jessica Craig	Rivalea (Australia) Pty Ltd	Ongoing
Lauren Staveley	SunPork Farms	Ongoing

FOCUS ON INDUSTRY PLACEMENT PROGRAM STUDENT – DR JESSICA CRAIG

Dr Jess Craig is the first recipient of an APRIL IPP award to assist with her production training at Rivalea (Australia) Pty Ltd. Jess has a Bachelor of Animal and Veterinary Bioscience (The University of Sydney) and a Doctor of Philosophy (Murdoch University).

Jess has been involved in the development and planning of the following APRIL projects:

- **5A–104** Low dose dietary strategies in late gestation to enhance born alive and piglet survival and performance (as Project Leader).
- **A1–102** Proof of concept: Oral Fluids and quantitative assessment for Porcine Chronic Respiratory Disease (PCRD) in Australian field conditions (with Dr Greg Tuckett).
- **A3B–102** Nutritional supplementation to increase the number of pigs weaned and fertility of sows which farrow and are mated during summer / early autumn (with Dr William van Wettere).
- **6A–104** Use of thermographic technology to detect reproductive state in sows and improve piglet performance in a commercial farrowing house (as Project Leader).
- **6A–101** Heat tolerance (HT) in lactating sows: dietary strategies, metabolic biomarkers and microbiome signature (as a collaborator, project led by Professor Eugeni Roura of The University of Queensland, for which she will now be the primary Rivalea contact).
- **6A–102** Hot and bothered! Long term impacts of late pregnancy heat stress on sows and progeny (as a collaborator, project by Dr Kate Plush of SunPork Farms).

Jess is lead investigator for the APL project 2018.0025: *Developing a protocol for the use of feeding CLA in lactating gilts*, for which data is currently being analysed for the second experiment, and she is currently writing up the final report and best practice guideline for APL. Moreover, she assisted Dr Greg Tuckett in the data analysis and writing and submission of the final report for his APL project 2018.0027*: Biopolymer vaccine delivery for single injection A. pleuropneumoniae vaccine and duration of immunity*, in collaboration with Swinburne University and ACE Laboratories. Jess hopes to continue her work in this area by applying for additional project funding to further the research into this vaccine technology, working towards commercialisation of this single injection technology for pig vaccines.

Jess has also been attending APSA committee meetings in her role as an ordinary APSA Committee Member and is assisting in organising the 2021 conference. She has also peer reviewed a number of articles sent to her from scientific journals such as the *Journal of Animal Science*, *Translational Animal Science*, and the *Journal of Dairy Science*, and reviewed several papers for the 2020 AAAS Conference (now 2021). Jess has, along with her co-authors, recently had an article accepted for publication in the *Journal of Swine Health Production* ("*Increasing creep pellet size improves creep feed disappearance of gilt and sow progeny in lactation and enhances pig production after weaning*").

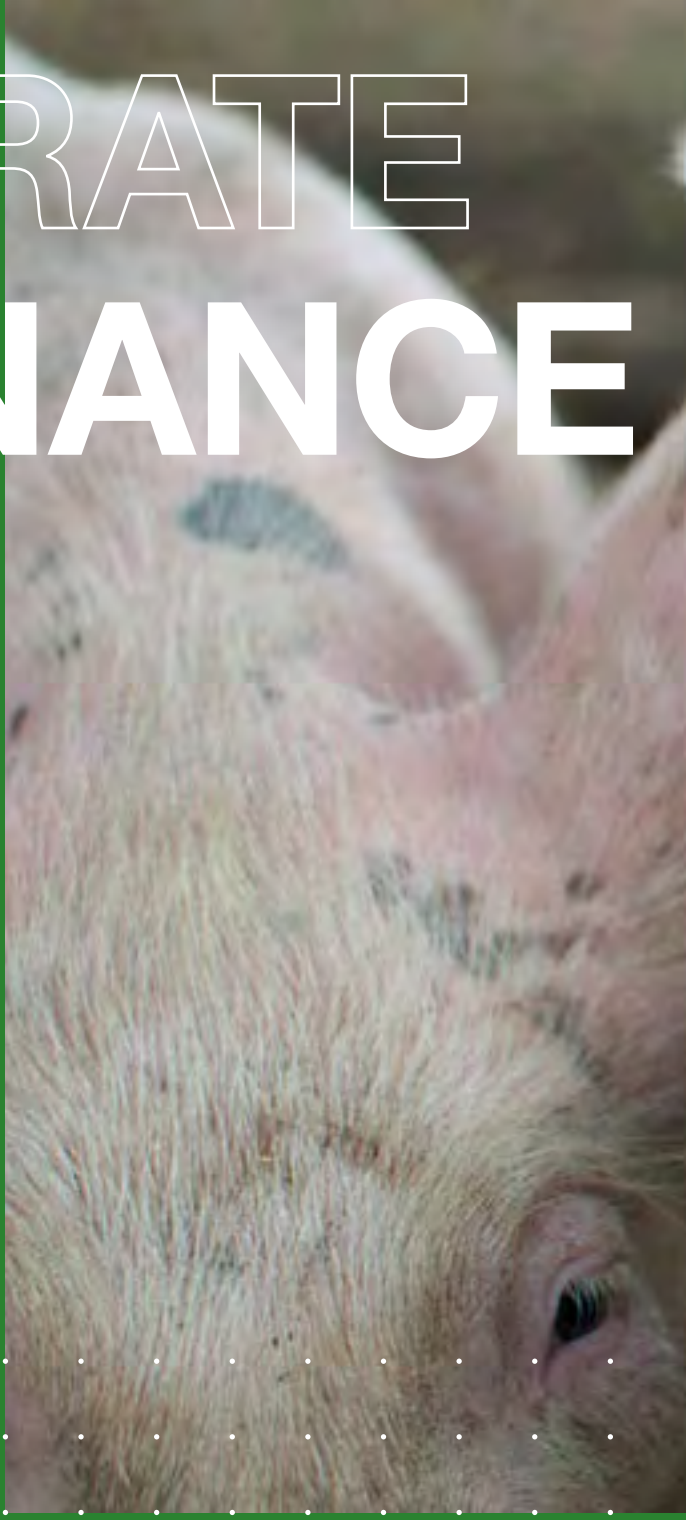
STRATEGIC PLAN DELIVERABLES

A summary of progress against the strategic plan deliverables is provided below:

CORE STRATEGY 7: ASSIST WITH HUMAN CAPACITY BUILDING IN THE AUSTRALASIAN PORK INDUSTRY

TASK	KEY DELIVERABLES	STATUS
7.1 Industry Capacity Building	APRIL support for PhD/MSc (MS), either through project support funds or 'top-ups'	✔ Achieved
	Two postgraduates being trained and (or) employed in industry by 2022	● On target
	Four undergraduate students completed their Honours degrees by June 2021 and six by 2022	● On target
	Postgraduate students embedded in APRIL research projects	✔ Achieved
	Investigate co-funding opportunities for postgraduate students (e.g., APRIntern)	● On target
	APRIL support of Honours students in APRIL and associated/related projects	✔ Achieved
	Continued support of the Industry Placement Program (first placements by February 2019)	✔ Achieved

CORPORATE GOVERNANCE



STRUCTURE

The Australasian Pork Research Institute Ltd ("APRIL") is a tax exempt Australian public not-for-profit company limited by guarantee.

APRIL has 15 Ordinary (voting) Members and five (non-voting) Associate Members.

There has been no change to this structure during the year under review.

GOVERNANCE

Board membership consists of:

- An independent Chairperson and one other independent Director nominated by the Board and appointed by vote of Ordinary Members at a general meeting.
- Two Directors appointed by Australian Pork Limited (APL).
- Four Directors appointed by vote of Ordinary Members at a general meeting from nominations provided by Ordinary Members.

All nominees must add skills to the Board in one or more of the following areas:

a. As a member of the australian institute of company directors or other appropriate qualifications or accreditations to be a director.
b. Pork production and processing.
c. Business management.
d. Finance and accounting and/or auditing.
e. Corporate governance.
f. Marketing.
g. Administration and commercialisation of research and development.
h. Environment.
i. Animal science and welfare.
j. Education.
k. Any other skills determined by the directors from time to time.

The Board has approved the Governance Manual and Code of Conduct which set out the expectations and responsibilities of directors under APRIL's governance framework.

Individual Directors have a right to obtain information necessary for them to discharge their duties from executives employed by APRIL.

Directors may seek independent professional advice, at the expense of the company if any Director wishes to do so, subject to prior agreement of the Chairperson.

THE BOARD IS RESPONSIBLE FOR DECISIONS RELATING TO THE INVESTMENT OF APRIL FUNDS, THE RESEARCH PROGRAM, PROTECTION AND COMMERCIALISATION OF INTELLECTUAL PROPERTY, AS WELL AS MANAGEMENT OF APRIL.

BOARD MEMBERS

APRIL's Board members are:

INDEPENDENT DIRECTORS

DR TONY PEACOCK (CHAIRPERSON)

SU MCCLUSKEY

APL APPOINTED DIRECTORS

MARGO ANDRAE

DR GERARD DAVIS

MEMBER NOMINATED DIRECTORS

PROFESSOR ROBERT VAN BARNEVELD

PROFESSOR FRANK DUNSHEA

NEIL FERGUSON

There is currently a vacancy for a member nominated director following the resignation of Kenton Shaw, which will be considered at the Annual General Meeting on 20 November 2020.

Details of each Director's skills and experience can be found in the Directors' report on page 61.

BOARD COMMITTEES

APRIL has constituted the following Board Advisory Committees:

- Research and Development Advisory Committee
- Education Advisory Committee
- Audit Committee

Further detail on the functions of these committees is provided below.

RESEARCH AND DEVELOPMENT ADVISORY COMMITTEE

Clause 38.6 of APRIL's constitution requires the Directors to establish a Research and Development Advisory Committee, and also permit each Ordinary Member to appoint a member of the committee by notice to the Company Secretary.

The committee's purpose is to advise and assist the Board of APRIL on all matters relating to the establishment, conduct and monitoring of Projects undertaken by or on behalf of the company.

The members of the committee as at 30 June 2020 are:

- Dr Tony Peacock (Chair)
- Dr Sam Abraham, Murdoch University
- Dr Kirsty Chidgey, New Zealand Pork Industry Board
- Dr David Cadogan, Feedworks P/L
- Dr Rebecca Athorn, Australian Pork Limited
- Dr Taya Clarke, Westpork P/L
- Dr Darryl D'Souza, SunPork Solutions
- Dr Hugo Dunlop, Apiam Animal Health Ltd
- Dr Jeremy Cottrell, The University of Melbourne
- Associate Professor Roy Kirkwood, The University of Adelaide
- Professor John Pluske, APRIL
- Dr Jane Ryan, Anatara Lifesciences Ltd
- Professor Eugeni Roura, The University of Queensland
- Ms Andree Rowntree, Windridge and Blantyre Farms
- Dr Rob Smits, Rivalea (Australia) P/L
- Dr Paul Verma, SARDI

The committee held one meeting during 2019/20 on 8 April 2020.

EDUCATION ADVISORY COMMITTEE

The Education Advisory Committee is established under clause 38.1(b) of the APRIL constitution as an Advisory Committee to advise and assist the APRIL Board in discharging its activities in relation to Education and Training within APRIL.

The members of the committee as at 30 June 2020 are:

- Professor Frank Dunshea, The University of Melbourne (Chair)
- Dr Tony Peacock, APRIL
- Professor Wayne Hein, The University of Adelaide
- Professor John Pluske, APRIL (CEO/Chief Scientist)
- Professor Eugeni Roura, The University of Queensland
- Dr Rebecca Athorn, Australian Pork Limited

The committee held two meetings during 2019/20 on 5 September 2019 and 2 March 2020.

AUDIT COMMITTEE

The Audit Committee is established under clause 38.1(b) of the APRIL constitution as an Advisory Committee to advise and assist the APRIL Board in discharging its responsibility for the general oversight of APRIL affairs in the areas of financial accounting and reporting, Government reporting, governance, risk management, and the underlying internal control environment.

The members of the committee as at 30 June 2020 are:

- Su McCluskey (Chair)
- Neil Ferguson
- Kenton Shaw
- Sandra Di Blasio
- Professor John Pluske

The Company Secretary also attends all Audit Committee meetings.

The committee held four meetings during 2019/20 on 10 September 2019, 11 November 2019, 17 March 2020 and 1 June 2020.

MANAGEMENT

T +61 8 9360 2012
M 0410 436 871
E j.pluske@april.org.au

CEO/CHIEF SCIENTIST

PROFESSOR JOHN PLUSKE
BSc (Agric) (Hons), PhD (UWA),
RAnNutr., R. Anim. Sci.

John Pluske is the inaugural Chief Scientist and CEO of Australasian Pork Research Institute Limited (APRIL).

Professor Pluske from Murdoch University, Western Australia, will commit more than half his time to APRIL, while maintaining academic roles and duties at Murdoch University. His research career, including many years as a Pork CRC subprogram leader, has focused on nutrition-gut disease interactions in pigs, growth and development, feed and ingredient evaluation.

T +61 8 8313 7973
M 0439 513 723
E c.rikardbell@april.org.au

MANAGER, COMMERCIALISATION AND RESEARCH IMPACT

DR CHARLES RIKARD-BELL
BSc.Agr, MSc, PhD

As Manager, Commercialisation and Research Impact for APRIL, Dr Rikard-Bell is responsible for the commercialisation of intellectual property (IP) generated by the company. Charles worked in UK, Belgium and USA as a pig geneticist before returning to Australia to work with a multinational animal health company for 11 years, holding technical, sales and marketing roles in Australia and Asia Pacific. Charles gained his PhD in nutrition and biology through the CRC for an Internationally Competitive Pork Industry.

COMPANY SECRETARY

MR GEOFF CROOK
BSc (Hons), FCA

Geoff has over 15 years' experience in senior financial roles in Australia. Geoff worked for the CRC for High Integrity Australian Pork as Business Manager, and as CEO for the final year of the CRC's operations. Prior to that Geoff held the roles of Business Manager and Company Secretary with the CRC for an Internationally Competitive Pork Industry, Finance and Compliance Manager with the Grape and Wine Research and Development Corporation and Chief Financial Officer and Company Secretary of an ASX listed software company.

MEMBERS

FOUNDATION MEMBERS

- Anatara Lifesciences Ltd
- Apiam Animal Health Ltd
- Australian Pork Limited
- Blantyre Farms Pty Ltd and Windridge Farms Pty Ltd
- Feedworks Pty Ltd
- Murdoch University
- New Zealand Pork Industry Board
- Ridley Agriproducts Pty Ltd
- Rivalea (Australia) Pty Ltd
- South Australian Research and Development Institute
- SunPork Farms
- The University of Adelaide
- The University of Melbourne
- The University of Queensland
- Westpork Pty Ltd

ASSOCIATE MEMBERS

- Flinders University
- Jefo Australia Pty Ltd
- DSM Nutritional Products Pty Ltd
- University of New England
- Elanco Australasia Pty Ltd

FINANCIAL STATEMENTS

AUSTRALASIAN PORK RESEARCH INSTITUTE LIMITED

ANNUAL REPORT FOR THE YEAR ENDED 30 JUNE 2020

THE AUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2020 ARE ATTACHED AND SHOW A SURPLUS FOR THE YEAR OF $365,654 (LAST YEAR $1,147,318), AND RESERVES OF $3,669,685 (LAST YEAR $3,107,1570).

The reduction in the surplus for the year is largely due to the receipt last year of approximately $1.2m of non-recurring project funding from Pork CRC.

However, the first-time adoption of the new accounting standards *AASB 15 Revenue from Contracts with Customers* and *AASB 1058 Income of Not-for-Profit Entities* has also played a part. The adoption of AASB 1058 has had two impacts.

Firstly, foundation fees received in prior years have previously been partly deferred, with the final amount due for recognition in 2019/20. The new Standard requires recognition of this income when received and so an adjustment to retained surplus has been made to remove the amount previously carried on the balance sheet, due for recognition in 2019/20. This is a one-off adjustment and will not recur in future years.

Secondly, annual subscription fees are also now recognised upon receipt, regardless of which financial year they relate to. Several members paid their 2020/21 annual subscription fees in June 2020, and so this income amounting to $375,000 has been recognised in the 2019/20 financial statements. This change is likely to impact on future years, depending on when annual subscription fees are received by the company.

The adoption of AASB 15 has resulted in project co-funding income being recognised later. Previously, this income was recognised in proportion to the completion of the project, measured by project expenditure. For example, if 50% of project expenditure had been paid by APRIL, then 50% of project co-funding income would also be recognised.

Under the new Standard, this income will be recognised upon publication of a final report or project summary – at the completion of the project, and so this income will be recognised later than previously, resulting in lower annual surpluses or larger deficits in the future.

Finally, Note 14 sets out future research commitments of approximately $1.6m plus GST, which should be taken into account when considering the reserves. This does not include $750k that the Board approved for the CRC-P application that was ultimately unsuccessful.

DIRECTORS' REPORT

30 JUNE 2020

YOUR DIRECTORS PRESENT THEIR REPORT, TOGETHER WITH THE FINANCIAL STATEMENTS FOR AUSTRALASIAN PORK RESEARCH INSTITUTE LIMITED, FOR THE FINANCIAL YEAR ENDED 30 JUNE 2020 AND THE AUDITOR'S REPORT THEREON.

The following persons were Directors of the Company during the financial year and are at the date of this report, except as otherwise stated:

APL-APPOINTED DIRECTORS

MR ANDREW SPENCER
BAgSc. (Melb), GAICD
(resigned 1 August 2019)

Mr Spencer was CEO of Australian Pork Limited from July 2005 until August 2019.

Prior to 2005, Mr Spencer worked over a period of ten years in France, South Africa and Germany in the agricultural biotechnology, seeds and chemicals business. He commenced his career in Australia in marketing and product management in the agricultural chemicals business sector after completing his studies in the mid 80's.

Through his tenure with APL, he has helped guide the industry through significant challenges, including the 2009 'Swine Flu' pandemic, large increases in imported pork volumes into Australia and two industry profitability crises.

Mr Spencer has an Agricultural Science degree from The University of Melbourne and is Chair of the Australian Farm Institute, is a Director of PorkScan Pty Ltd. Mr Spencer is a graduate member of the Australian Institute of Company Directors and a fellow of the Australian Institute of Managers and Leaders.

MS EDWINA BEVERIDGE
B.Com, GAICD
(resigned 13 March 2020)

Ms Beveridge is a pork producer from Young, NSW. She has significant industry involvement through the NSW Farmers Pork Committee, representing other farmers as an APL Delegate and on the APL Board. She has worked full-time in pig production since 2000 and operated a mixed farming business with her husband since 2007. She has a Bachelor of Commerce from The University of Sydney and qualified as a Chartered Accountant.

MS MARGO ANDRAE
(appointed 1 August 2019)

Margo joined APL on 1 August 2019. Prior to commencing with APL, Margo held positions with Cattle Council of Australia, CSIRO, University of NSW, Rural Industries Research and Development Corporation and QLD Local Government. She has extensive experience and networks across primary industries, regional Australia and research environments through these roles.

Margo has extensive experience in stakeholder engagement, marketing, communications, business development, operations and resource management and is currently completing her MBA through the Australian Graduate School of Management, UNSW.

DR GERARD DAVIS
BSc, Ph.D, MBA, GAICD
(appointed 13 March 2020)

Dr Gerard Davis is an executive with extensive experience in agribusiness, biotech and agtech and a demonstrated ability to derive value from commercialising technology in companies ranging from start-ups to multi-national global leaders. Dr Davis has experience consulting to a range of organisations from agtech start-ups such as Mastaplex, research consortiums such as the CRC for Food Agility as well as major agribusinesses and organisations such as the Bill and Melinda Gates Foundation. These appointments have included developing strategic, organisational and technology commercialisation plans. The work has involved projects across Australia, New Zealand, Africa and South Asia.

Dr Davis has previously held senior roles with a series of major Australian and global companies, with more than 15 years' experience in commercialisation of technology. Most recently he was General Manager of Innovation and Strategic Development at Australian Agricultural Company. Prior to that he held senior roles with ThermoFisher Scientific and Pfizer's Animal Health Division, now Zoetis. In these roles he has been instrumental in enabling commercial success from the development and implementation of technology in the livestock and agri-food industries. Dr Davis spent 11 years as a researcher with Australia's leading research agency, CSIRO.

INDEPENDENT DIRECTORS

DR TONY PEACOCK
BScAgr. (Hons) PhD FAICD FTSE
Independent Chair

Dr Peacock is the Chief Executive of the Cooperative Research Centres Association. He has 30 years' experience in research, research management and business development, 22 of those in CEO roles. Dr Peacock is an experienced company director and seed investor in a number of technology start-ups, including Wintermute Biomedical Inc, which is developing a unique antibiotic. He has extensive experience in regulatory and Government affairs.

Dr Peacock was appointed as the Independent Chair effective 1 July 2019.

SU MCCLUSKEY
FCPA, B.Com, MAICD
(appointed 1 July 2019)

Su is a Director of Australian Unity, the Foundation for Young Australians and Energy Renaissance, a Commissioner on the National Covid-19 Commission Advisory Board and a Commissioner for International Agricultural Research. Su was a member of the Review Panel for the Australian Charities and Not-For-Profits Commission Legislation and the Small Business Digital Taskforce. She was also a member of the Independent Review Panel for CPA Australia, the Harper Review of Competition Policy and the Regional Telecommunications Independent Review.

Su was the inaugural CEO of the Regional Australia Institute, taking it from a start-up company to be the leading voice on regional issues, underpinned by solid research and evidence-based policy. Prior to this, she was the CEO of the Council of Rural Research and Development Corporations and the Executive Director of the Office of Best Practice Regulation. Su has held senior positions with the Business Council of Australia, the National Farmers' Federation and the Australian Taxation Office. She was named the Westpac/Australian Financial Review Regional Women of Influence in 2013 and received the Women in Agribusiness award in 2014 for outstanding contribution to policy development. Su is also a beef cattle farmer at Yass, NSW.

ELECTED DIRECTORS

MR NEIL FERGUSON
BBus. (Agric)

Mr Ferguson is currently the Chief Executive Officer for Westpork Pty Ltd. and has had 22 years' experience in the pig industry. Mr Ferguson is an Australian Pork Limited Delegate, Chair of Agricultural Produce Commission of Western Australia – Pork Producers' Committee, and a member of Pork Innovation Western Australia and Pork Industry Training WA.

MR KENTON SHAW
BAppSc. GradDip ManMgt
(resigned 17 July 2020)

Mr Shaw is currently Director and General Manager – Agricultural Operations for Rivalea (Australia) Pty Ltd., having held the role since 2007. A graduate of The University of Queensland, Mr Shaw has had over 30 years' experience in the pig industry working across all areas of production including feedmilling. He is an Australian Pork Ltd delegate. While responsible for all pig production, feed milling, environmental management and agriculture at Rivalea, a major focus is on implementing sustainable production systems that enhance animal welfare and meet the needs of the public while ensuring long-term viability of the organisation and industry.

PROFESSOR ROBERT VAN BARNEVELD
B.Agr.Sc. (Hons), PhD, RAnNutr, FAICD

Professor van Barneveld is Group CEO and Managing Director of the SunPork Group of Companies which includes SunPork Farms, SunPork Fresh Foods, Swickers Kingaroy Bacon Factory and SunPork Solutions. In addition, Professor van Barneveld is a Non-Executive Director of the Ridley Corporation, and Chair of the Autism CRC Ltd. He is a former Director of Australian Pork Ltd, Roseworthy Piggery Pty Ltd, Social Skills Training Pty Ltd and Porkscan Pty Ltd. Professor van Barneveld has a PhD in pig nutrition and has worked as a consultant scientist and nutritionist in Australia and overseas for the past 25 years.

PROFESSOR WAYNE HEIN
Dip. Ag., BVSC, PhD
(retired 16 November 2019)

Professor Wayne Hein is currently Head of the School of Animal and Veterinary Sciences and Dean of Roseworthy Campus at The University of Adelaide.

Professor Hein began tertiary education at Roseworthy Agricultural College. He then obtained a degree in veterinary science at The University of Queensland and worked for a few years in veterinary public health before completing a PhD in immunology in the John Curtin School of Medical Research at the Australian National University. Over the next 13 years, he conducted basic research into the immune system of ruminants at the Basel Institute for Immunology, Switzerland. Following a move to New Zealand, his research interests focussed on basic and applied immunoparasitology. From 2007-2010 he was the Director of the Hopkirk Research Institute located at Massey University where research focussed on parasitic and infectious diseases of livestock. From 2011–2014 he was Professor and Head of the School of Veterinary and Biomedical Sciences and Dean of Veterinary Science at James Cook University, Australia. Professor Hein returned to South Australia as Head of the School of Animal and Veterinary Sciences and Dean of Roseworthy Campus at the University of Adelaide in February 2015.

Professor Hein has published extensively in basic and applied immunology, participated in numerous scientific advisory and review committees, given presentations at multiple national and international scientific conferences and held company director positions.

PROFESSOR FRANK DUNSHEA
B.Agric. Sci., PhD, FNSA, FAPSA, FASAP, RAnNutr
(appointed 16 November 2019)

Professor Frank Dunshea has had a research career spanning 35 years in farm animal and biomedical research. His area of expertise is in growth physiology and nutrition and understanding the interactions between the animal and the animal's environment. Frank has focused much of his recent research on biomedicine and functional foods. His research has had a high scientific impact and the results of much of his research have been rapidly adopted by industry. He has maintained a balanced approach to research, combining fundamental with applied research, providing commercial and public good outcomes. Frank is committed to ensuring that all animal industries operate in a responsible and sustainable manner and much of his work has focussed on improving efficiency through reducing inputs and outputs while maintaining product quality and consumer health.

DIRECTORS MEETINGS

The number of Directors' meetings (including meetings of Board Committees) and number of meetings attended by each of the Directors of the Company during the financial year are:

DIRECTOR		BOARD OF DIRECTORS	AUDIT COMMITTEE	R&D ADVISORY COMMITTEE	EDUCATION ADVISORY COMMITTEE
Mr Andrew Spencer	Eligible	0			
	Attended	0			
Ms Edwina Beveridge	Eligible	3			
	Attended	3			
Ms Margo Andrae	Eligible	5			
	Attended	5			
Dr Gerard Davis	Eligible	2			
	Attended	2			
Dr Tony Peacock	Eligible	5		1	2
	Attended	5		1	1
Ms Su McCluskey	Eligible	5	4		
	Attended	5	4		
Mr Neil Ferguson	Eligible	5	2		
	Attended	4	1		
Mr Kenton Shaw	Eligible	5	4		
	Attended	5	3		
Professor Robert van Barneveld	Eligible	5			
	Attended	4			
Professor Wayne Hein	Eligible	3			1
	Attended	2			1
Professor Frank Dunshea	Eligible	2			1
	Attended	2			1

PRINCIPAL ACTIVITIES AND OBJECTIVES OF THE COMPANY

The Company's objectives are focussed on enhancing the Australasian Pork Industry by investing in research, development, education and training, and commercialisation activities focused on priorities and deliverables that ensure the sustainability of Australasian pork production.

PERFORMANCE MEASUREMENT

The Company evaluates its performance against objectives, milestones and targets as set out in the strategic plan (available at http://apri.com.au/wp-content/uploads/2020/05/Strategic-Plan-APRIL-May-2019.pdf), and against the uptake of research outcomes, where appropriate, by Industry. Progress against activities is reported to Members annually.

MEMBERSHIP

The Company is limited by guarantee. As at 30 June 2020, 15 organisations continue as Ordinary Members and five organisations continue as Associate Members of the Company. In the event of a winding up where there are insufficient assets to pay all liabilities, each of the members are required to contribute $10 each which would result in total additional funds of $200.

LEAD AUDITOR'S INDEPENDENCE DECLARATION

The lead auditor's independence declaration is set out on the following page and forms part of the Directors' Report for the financial year ended 30 June 2020.

This report is made in accordance with a resolution of the Directors:

Dr Tony Peacock
Chair

14 October 2020
Canberra

INDEPENDENCE DECLARATION

30 JUNE 2020

RSM Australia Partners

Equinox Building 4, Level 2, 70 Kent Street Deakin ACT 2600
GPO Box 200 Canberra ACT 2601

T +61 (0) 2 6217 0300
F +61 (0) 2 6217 0401

www.rsm.com.au

AUDITOR'S INDEPENDENCE DECLARATION

As lead auditor for the audit of the financial report of Australasian Pork Research Institute Ltd for the year ended 30 June 2020, I declare that, to the best of my knowledge and belief, there have been no contraventions of:

(i) the auditor independence requirements of the *Corporations Act 2001* in relation to the audit; and

(ii) any applicable code of professional conduct in relation to the audit.

RSM AUSTRALIA PARTNERS

GED STENHOUSE
Partner

Canberra, Australian Capital Territory
Dated: 26 October 2020

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

FOR THE YEAR ENDED 30 JUNE 2020

	NOTE	2020	2019
		$	$
Revenue	**2**	2,054,269	2,869,781
Expenses			
Research programme and other costs		(912,555)	(1,187,512)
Management expenses	**3**	(493,625)	(387,258)
Other expenses	**4**	(331,796)	(192,771)
Surplus from operating activities		**316,293**	**1,102,240**
Financial income		49,361	45,078
Net financial income	**5**	**49,361**	**45,078**
Surplus before income tax		**365,654**	**1,147,318**
Tax expense		–	–
Surplus for the period		**365,654**	**1,147,318**
Other comprehensive income		–	–
Total comprehensive income for the period		**365,654**	**1,147,318**

The above statement of profit or loss and other comprehensive income should be read in conjunction with the accompanying notes

STATEMENT OF FINANCIAL POSITION

AS AT 30 JUNE 2020

	NOTE	2020	2019
		$	$
ASSETS			
Current assets			
Cash and cash equivalents	**7**	3,673,087	3,540,345
Trade and other receivables	**8**	567,779	281,940
Other assets	**9**	108,662	–
Total current assets		**4,349,528**	**3,822,285**
Total assets		**4,349,528**	**3,822,285**
LIABILITIES			
Current liabilities			
Trade and other payables	**10**	353,461	305,875
Unearned income	**11**	286,849	391,701
Provisions		24,892	11,144
Total current liabilities		**665,202**	**708,720**
Non-Current liabilities			
Provisions		14,641	6,408
Total non-current liabilities		**14,641**	**6,408**
Total liabilities		**679,843**	**715,128**
Net assets		**3,669,685**	**3,107,157**
Equity			
Retained surplus		3,669,685	3,107,157
Total equity		**3,669,685**	**3,107,157**

The above statement of financial position should be read in conjunction with the accompanying notes

STATEMENT OF CHANGES IN EQUITY

FOR THE YEAR ENDED 30 JUNE 2020

	RETAINED SURPLUS	TOTAL EQUITY
	$	$
Balance at 1 July 2018	1,959,839	1,959,839
Surplus after income tax expense for the year	1,147,318	1,147,318
Balance at 30 June 2019	**3,107,157**	**3,107,157**
Balance at 1 July 2019	3,107,157	3,107,157
Adopting new Accounting standards	196,874	196,874
Surplus after income tax expense for the year	365,654	365,654
Balance at 30 June 2020	**3,669,685**	**3,669,685**

The above statement of changes in equity should be read in conjunction with the accompanying notes

STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED 30 JUNE 2020

	NOTE	2020	2019
		$	$
CASH FLOWS FROM OPERATING ACTIVITIES			
Cash receipts from members and customers		2,081,062	3,441,991
Payments to suppliers and employees		(1,997,679)	(2,193,623)
Net cash from operating activities		**83,383**	**1,248,368**
CASH FLOWS FROM INVESTING ACTIVITIES			
Interest received		49,359	45,078
Net cash investing activities		**49,359**	**45,078**
Net increase in cash and cash equivalents		132,742	1,293,446
Cash and cash equivalents at beginning of financial year		3,540,345	2,246,899
Cash and cash equivalents at end of financial year	**7**	**3,673,087**	**3,540,345**

The above statement of cash flows should be read in conjunction with the accompanying notes

NOTE 1. SIGNIFICANT ACCOUNTING POLICIES

Australasian Pork Research Institute Limited is a public company domiciled in Australia. The financial statements are presented in Australian dollars, which is Australasian Pork Research Institute Limited's functional and presentation currency.

The Company is a not-for-profit entity.

The financial report was authorised for issue by the Directors on 14 October 2020.

The principal accounting policies adopted in the preparation of the financial statements are set out below. These policies have been consistently applied to all the years presented, unless otherwise stated.

NEW OR AMENDED ACCOUNTING STANDARDS AND INTERPRETATIONS ADOPTED

The company has adopted all of the new or amended Accounting Standards and Interpretations issued by the Australian Accounting Standards Board ('AASB') that are mandatory for the current reporting period.

Any new or amended Accounting Standards or Interpretations that are not yet mandatory have not been early adopted.

The adoption of the following Accounting Standards and Interpretations had a significant impact on the financial performance or position of the company.

AASB 1058 INCOME OF NOT-FOR-PROFIT ENTITIES

The entity has adopted AASB 1058 from 1 July 2019. The standard replaces AASB 1004 'Contributions' in respect to income recognition requirements for not-for-profit entities. The timing of income recognition under AASB 1058 is dependent upon whether the transaction gives rise to a liability or other related amount at the time of receipt. Income is recognised under this standard in the following circumstances:

- an asset is received in a transaction, such as by way of grant, bequest or donation; and
- there has either been no consideration transferred by the entity, or the consideration paid by the entity for the asset is significantly less than the asset's fair value; and
- the asset is provided principally to enable the entity to further its objectives.

For transfers of financial assets to the entity which enable it to acquire or construct a recognisable non-financial asset, the entity recognises a liability amounting to the excess of the fair value of the transfer received over any related amounts recognised. Related amounts recognised may relate to contributions by owners, revenue or contract liabilities recognised under AASB 15, lease liabilities in accordance with AASB 16, financial instruments in accordance with AASB 9, or provisions in accordance with AASB 137. This liability is brought to account as income over the period in which the entity satisfies its performance obligation.

If the transaction does not enable the entity to acquire or construct a recognisable non-financial asset to be controlled by the entity, then any excess of the initial carrying amount of the recognised asset over the related amounts is recognised as income immediately

IMPACT OF ADOPTION

AASB 1058 was adopted using the modified retrospective approach and as such comparatives have not been restated. Funding of $196,874 was brought forward from prior periods. The impact of first time adoption of AASB 1058 requires the $196,874 to be recognised as income in the prior year. The adjustment was applied on opening retained surplus as at 1st July 2019.

AASB 15 REVENUE FROM CONTRACTS WITH CUSTOMERS

The entity has adopted AASB 15 from 1 July 2019. The standard provides a single comprehensive, contract-based revenue recognition model. The core principle of the standard is that an entity must recognise revenue to depict the transfer of promised goods or services to customers at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The standard introduces a new measurement approach that is based on an allocation of the transaction price. This is described further in the accounting policies below. Contracts with customers are presented in an entity's statement of financial position as a contract liability, a contract asset, or a receivable, depending on the relationship between the entity's performance and the customer's payment.

IMPACT OF ADOPTION

AASB 15 was adopted using the modified retrospective approach and as such comparatives have not been restated.

BASIS OF PREPARATION

These general purpose financial statements have been prepared in accordance with Australian Accounting Standards – Reduced Disclosure Requirements and Interpretations issued by the Australian Accounting Standards Board ('AASB') and the Corporations Act 2001, as appropriate for not-for-profit oriented entities.

HISTORICAL COST CONVENTION

The financial statements have been prepared under the historical cost convention.

GOODS AND SERVICES TAX ('GST') AND OTHER SIMILAR TAXES

Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the tax authority. In this case it is recognised as part of the cost of the acquisition of the asset or as part of the expense.

Receivables and payables are stated inclusive of the amount of GST receivable or payable. The net amount of GST recoverable from, or payable to, the tax authority is included in other receivables or other payables in the statement of financial position.

Cash flows are presented on a gross basis. The GST components of cash flows arising from investing or financing activities which are recoverable from, or payable to the tax authority, are presented as operating cash flows.

Commitments and contingencies are disclosed net of the amount of GST recoverable from, or payable to, the tax authority.

NOTE 1. SIGNIFICANT ACCOUNTING POLICIES (continued)

CURRENT AND NON-CURRENT CLASSIFICATION

Assets and liabilities are presented in the statement of financial position based on current and non-current classification.

An asset is classified as current when: it is either expected to be realised or intended to be sold or consumed in the company's normal operating cycle; it is held primarily for the purpose of trading; it is expected to be realised within 12 months after the reporting period; or the asset is cash or cash equivalent unless restricted from being exchanged or used to settle a liability for at least 12 months after the reporting period. All other assets are classified as non-current.

A liability is classified as current when: it is either expected to be settled in the company's normal operating cycle; it is held primarily for the purpose of trading; it is due to be settled within 12 months after the reporting period; or there is no unconditional right to defer the settlement of the liability for at least 12 months after the reporting period. All other liabilities are classified as non-current.

EMPLOYEE BENEFITS

SHORT-TERM EMPLOYEE BENEFITS

Liabilities for wages and salaries, including non-monetary benefits, annual leave and long service leave expected to be settled wholly within 12 months of the reporting date are measured at the amounts expected to be paid when the liabilities are settled.

OTHER LONG-TERM EMPLOYEE BENEFITS

The liability for annual leave and long service leave not expected to be settled within 12 months of the reporting date are measured at the present value of expected future payments to be made in respect of services provided by employees up to the reporting date using the projected unit credit method. Consideration is given to expected future wage and salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the reporting date on national government bonds with terms to maturity and currency that match, as closely as possible, the estimated future cash outflows.

WAGES AND SALARIES

Liabilities for wages, salaries and annual leave that are expected to be wholly settled within 12 months of reporting date, represent present obligations resulting from employee's services provided to reporting date, are measured as the undiscounted amounts based on remuneration wage and salary rates that the Company expects to pay as at reporting date including related on-costs.

Non-accumulating non-monetary benefits are expensed based on the net marginal cost to the Company as the benefits are taken by the employees.

PROVISIONS

A provision is recognised in the Statement of Financial Position when the Company has a present legal or constructive obligation as a result of a past event, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money of the risks specific to the liability.

RESEARCH PROJECT COSTS

Expenditure on research activities, undertaken with the prospect of gaining new scientific or technical knowledge and understanding, is recognised in the Statement of Profit or Loss and Other Comprehensive Income as an expense as incurred.

FOREIGN CURRENCY TRANSLATION

FOREIGN CURRENCY TRANSACTIONS AND BALANCES

Foreign currency transactions are translated into the functional currency of the Company, using the exchange rates prevailing at the dates of the transactions (spot exchange rate). Foreign exchange gains and losses resulting from the settlement of such transactions and from the re-measurement of monetary items at year end exchange rates are recognised in profit or loss.

FAIR VALUE MEASUREMENT

When an asset or liability, financial or non-financial, is measured at fair value for recognition or disclosure purposes, the fair value is based on the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date; and assumes that the transaction will take place either: in the principal market; or in the absence of a principal market, in the most advantageous market.

Fair value is measured using the assumptions that market participants would use when pricing the asset or liability, assuming they act in their economic best interests. For non-financial assets, the fair value measurement is based on its highest and best use. Valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, are used, maximising the use of relevant observable inputs and minimising the use of unobservable inputs.

CRITICAL ACCOUNTING JUDGEMENTS, ESTIMATES AND ASSUMPTIONS

CORONAVIRUS (COVID-19) PANDEMIC

Judgement has been exercised in considering the impacts that the Coronavirus (COVID-19) pandemic has had, or may have, on the company based on known information. This consideration extends to the nature of the products and services offered, customers, supply chain, staffing and geographic regions in which the company operates. Other than as addressed in specific notes, there does not currently appear to be either any significant impact upon the financial statements or any significant uncertainties with respect to events or conditions which may impact the company unfavourably as at the reporting date or subsequently as a result of the Coronavirus (COVID-19) pandemic.

The preparation of the financial statements requires management to make judgements, estimates and assumptions that affect the reported amounts in the financial statements. Management continually evaluates its judgements and estimates in relation to assets, liabilities, contingent liabilities, revenue and expenses. Management bases its judgements, estimates and assumptions on historical experience and on other various factors, including expectations of future events, management believes to be reasonable under the circumstances. The resulting accounting judgements and estimates will seldom equal the related actual results.

NOTE 2. REVENUE

	2020	2019
	$	$
Research and project co-funding	165,766	1,654,227
Membership fees	1,375,000	501,875
Other contributions & Government grant	26,331	-
Licence fees	-	196,565
Commercialisation income	487,172	517,114
	2,054,269	**2,869,781**

ACCOUNTING POLICY

GRANTS

Grant revenue is recognised in profit or loss when the company satisfies the performance obligations stated within the funding agreements.

If conditions are attached to the grant which must be satisfied before the company is eligible to retain the contribution, the grant will be recognised in the statement of financial position as a liability until those conditions are satisfied.

LICENSING AND COMMERCIALISATION REVENUE

Revenue is recognised at an amount that reflects the consideration to which the company is expected to be entitled in exchange for transferring goods or services to a customer. For each contract with a customer, the company: identifies the contract with a customer; identifies the performance obligations in the contract; determines the transaction price which takes into account estimates of variable consideration and the time value of money; allocates the transaction price to the separate performance obligations on the basis of the relative stand-alone selling price of each distinct good or service to be delivered; and recognises revenue when or as each performance obligation is satisfied in a manner that depicts the transfer to the customer of the goods or services promised.

INTEREST REVENUE

Interest is recognised using the effective interest method.

MEMBERSHIP REVENUE

Membership fees comprise annual subscription fees, application fees, and contribution fees.

NOTE 3. MANAGEMENT EXPENSES

	2020	2019
	$	$
Management fees	493,626	387,258
	493,626	387,258

Australian Pork Ltd and Murdoch University charges the Company management fees on a reimbursement basis which is calculated based on the time spent by each of the organisation's employees on providing corporate services to the Company.

NOTE 4. OTHER EXPENSES

	2020	2019
	$	$
Legal fees	14,034	9,308
Directors fees	40,000	46,024
Travel	46,294	32,994
Communication costs	5,262	24,592
Commercialisation costs	192,797	31,978
Other	33,409	47,875
	331,796	**192,771**

NOTE 5. FINANCIAL INCOME

Interest income from cash and cash equivalents	49,361	45,078
	49,361	**45,078**

ACCOUNTING POLICY

Interest income is recognised in the Statement of Profit or Loss and Other Comprehensive Income as it accrues, using the effective interest method.

NOTE 6. INCOME TAX EXPENSE

The Company is a non-profit scientific institution and as such the Company's constitution prohibits the distribution of income and assets to members. Accordingly, the Company is not subject to income tax.

NOTE 7. CASH AND CASH EQUIVALENTS

Cash at bank	700,875	1,815,037
Term deposits – maturing in 3 months or less	2,972,212	1,725,308
	3,673,087	**3,540,345**

The Company holds term deposit with interest rates of between 0.9% and 1.17%

ACCOUNTING POLICY

Cash and cash equivalents comprise cash balances, at call deposits and term deposits with an original maturity of 3 months or less. Bank overdrafts that are repayable on demand and form an integral part of the Company's cash management are included as a component of cash and cash equivalents for the purpose of the Statement of Cash Flows.

NOTE 8. TRADE AND OTHER RECEIVABLES

	2020	2019
	$	$
Trade receivables	422,788	152,016
Other receivables	144,991	129,924
	567,779	**281,940**

ACCOUNTING POLICY

Receivables are stated initially at their fair value and subsequently measured at their amortised cost less for any allowance for expected credit losses.

NOTE 9. OTHER CURRENT ASSETS

Prepayments	108,662	-
	108,662	**-**

NOTE 10. TRADE AND OTHER PAYABLES

Trade and other payables	325,114	240,072
GST payable	28,347	65,803
	353,461	**305,875**

ACCOUNTING POLICY

Trade and other payables are initially measured at fair value and subsequently measured at amortised cost. Trade payables are normally settled on 30 day terms.

NOTE 11. UNEARNED INCOME

Current		
Contract liabilities	286,849	194,826
Member contributions	-	196,875
	286,849	**391,701**

ACCOUNTING POLICY

CONTRACT LIABILITIES

Contract liabilities represent the company's obligation to transfer goods or services to a customer and are recognised when a customer pays consideration, or when the company recognises a receivable to reflect its unconditional right to consideration (whichever is earlier) before the company has transferred the goods or services to the customer.

NOTE 12. KEY MANAGEMENT PERSONNEL DISCLOSURES

The following were key management personnel of the Company for the entire reporting period, unless otherwise stated:

DIRECTORS

1. Mr Andrew Spencer BAgSci, GAICD (resigned 1 August 2019)
2. Ms Edwina Beveridge B.Com, GAICD (resigned 13 March 2020)
3. Ms Margo Andrae (appointed 1 August 2019)
4. Dr Gerard Davis – BSc, Ph.D, MBA, GAICD (appointed 13 March 2020)
5. Dr Tony Peacock – BScAgr(Hons), PhD, FAICD, FTSE – Independent Chair
6. Ms Su McCluskey – FCPA, B.Com, MAICD (appointed 1 July 2019)
7. Mr Neil Ferguson – B.Bus (Agric)
8. Mr Kenton Shaw – BAppSci, GradDip ManMgt (resigned 17 July 2020)
9. Professor Robert van Barnevald – B. Agr.Sc. (Hons), PhD, RAnNutr, FAICD
10. Professor Wayne Hein – Dip. Ag., BVSC, PhD (retired 16 November 2019)
11. Professor Frank Dunshea B. Agric. Sci, PhD, FNSA, FAPSA, FASAP, RAnNutr (appointed 16 November 2019)

EXECUTIVES

Professor John Pluske – Chief Executive Officer, BSc (Agric) (Hons), PhD (UWA), RAnNutr, R. Anim.Sci

Dr Charles Rikard-Bell – Manager, BSc. Agr, MSc, PhD

Mr Geoff Crook – Company Secretary, B.Sc. (Hons), FCA

KEY MANAGEMENT PERSONNEL TRANSACTIONS WITH THE COMPANY

During the year the Company transacted with entities for which key management persons hold positions that result in them having control or significant influence over the financial or operating policies of these entities. The terms and conditions of the transactions with key management personnel and their related parties were no more favourable than those available, or which might reasonably be expected to be available, on similar transactions to non-key management personnel related entities on an arm's length basis.

NOTE 13. RELATED PARTY DISCLOSURES

TRANSACTIONS WITH DIRECTOR RELATED ENTITIES

In the following table, superscripts refer to the director affiliations (from the numbered list of directors in Note 12) with each related party.

Net transactions with the Company by director related entities were as follows:

	2020	2019
	$	$
Project and program expenditure:		
Australian Pork Limited (2,3,4)	552,072	633,630
SunPork Group (9)	31,961	75,879
Pork CRC Ltd (1,8,9)	–	118,670
The University of Adelaide (10)	–	11,312
The University of Queensland (9)	47,342	–
The University of Melbourne (11)	124,976	–
Australasian Pig Science Association (11)	7,663	–
Pork Innovation WA Management Committee (7)	5,322	17,374
Rivalea (Australia) Pty Ltd (8)	125,185	87,835
Current receivables:		
Trade receivables from related parties	275,000	7,043
Current payables:		
Trade payables to related parties	15,130	14,373

Transactions with director related entities consist of the receipt of membership fees and commercialisation income, and the payment of research costs and costs related to the Company's Industry Placement Program.

Terms and conditions

All transactions were made on normal commercial terms and conditions and at market rates.

NOTE 14. COMMITMENTS

The Company has entered into Research and Development contracts which require the Company to make future cash payments to counterparties once certain obligations have been performed by those counterparties.

At 30 June 2020 these commitments (excluisive of GST) total $1,654,406 (2019: $1,358,680) and will be funded by cash balances and future receipts from member and research participant contributions.

NOTE 15. SUBSEQUENT EVENTS

The impact of the Coronavirus (COVID-19) pandemic is ongoing and while it has not financially impacted the company up to 30 June 2020, it is not practicable to estimate the potential impact, positive or negative, after the reporting date. The situation is rapidly developing and is dependent on measures imposed by the Australian Government and other countries, such as maintaining social distancing requirements, quarantine, travel restrictions and any economic stimulus that may be provided.

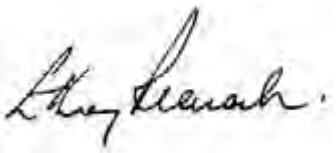
No matter or circumstance has arisen since 30 June 2020 that has significantly affected, or may significantly affect the Company's operations, the results of those operations, or the Company's state of affairs in future financial years.

DIRECTORS DECLARATION

IN ACCORDANCE WITH THE RESOLUTION OF THE DIRECTORS OF AUSTRALASIAN PORK RESEARCH INSTITUTE LIMITED MADE PURSUANT TO SECTION 295(5)(A) OF THE CORPORATIONS ACT 2001, THE DIRECTORS DECLARE THAT:

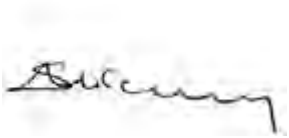
- the attached financial statements and notes comply with the Corporations Act 2001, the Australian Accounting Standards – Reduced Disclosure Requirements, the Corporations Regulations 2001 and other mandatory professional reporting requirements;
- the attached financial statements and notes give a true and fair view of the company's financial position as at 30 June 2020 and of its performance for the financial year ended on that date; and
- there are reasonable grounds to believe that the company will be able to pay its debts as and when they become due and payable.

On behalf of the Directors



Dr Tony Peacock
Chair

14 October 2020
Canberra



Ms Su McCluskey
Audit Committee Chair

14 October 2020
Canberra

INDEPENDENT AUDITOR'S REPORT

RSM Australia Partners

Equinox Building 4, Level 2, 70 Kent Street Deakin ACT 2600
GPO Box 200 Canberra ACT 2601

T +61 (0) 2 6217 0300
F +61 (0) 2 6217 0401

www.rsm.com.au

INDEPENDENT AUDITOR'S REPORT

TO THE MEMBERS OF

AUSTRALASIAN PORK RESEARCH INSTITUTE LTD

Opinion
We have audited the financial report of Australasian Pork Research Institute Ltd (APRIL), which comprises the statement of financial position as at 30 June 2020, the statement of comprehensive income, the statement of changes in equity and the statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, and the directors' declaration.

In our opinion, the accompanying financial report of APRIL is in accordance with the Corporations Act 2001, including:

(i) giving a true and fair view of APRIL's financial position as at 30 June 2020 and of its financial performance for the year then ended; and

(ii) complying with Australian Accounting Standards – Reduced Disclosure Requirements and the Corporations Regulations 2001.

Basis for Opinion
We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of our report. We are independent of APRIL in accordance with the auditor independence requirements of the Corporations Act 2001 and the ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* (the Code) that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

We confirm that the independence declaration required by the Corporations Act 2001, which has been given to the directors of APRIL, would be in the same terms if given to the directors as at the time of this auditor's report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other Information
The directors are responsible for the other information. The other information comprises the information included in APRIL's annual report for the year ended 30 June 2020, but does not include the financial report and the auditor's report thereon.

Our opinion on the financial report does not cover the other information and accordingly we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial report or our knowledge obtained in the audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the Directors for the Financial Report
The directors of APRIL are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards – Reduced Disclosure Requirements and the Corporations Act 2001 and for such internal control as the directors determine is necessary to enable the preparation of the financial report that gives a true and fair view and is free from material misstatement, whether due to fraud or error.

In preparing the financial report, the directors are responsible for assessing the ability of APRIL to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate APRIL or to cease operations, or have no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Report
Our objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of this financial report.

A further description of our responsibilities for the audit of the financial report is located at the Auditing and Assurance Standards Board website at: http://www.auasb.gov.au/auditors_responsibilities/ar4.pdf. This description forms part of our auditor's report.

RSM

RSM AUSTRALIA PARTNERS

Canberra, Australian Capital Territory
Dated: 26 October 2020

GED STENHOUSE
Partner

AUSTRALASIAN PORK RESEARCH INSTITUTE LTD

PO Box 466
Willaston SA 5118

JS Davies Building
University of Adelaide
– Roseworthy Campus
Mudla Wirra Road
Kangaroo Flat SA 5371

APRI.COM.AU

Australasian
Pork Research
Institute Ltd
APRIL