

Pork CRC Initiatives APN May 2016

By Dr Roger Campbell, Pork CRC CEO

Pork CRC progressing on all fronts

It's been a busy first few months of 2016, as we establish Australasian Pork Research Institute Ltd (APRIL), refine and finalise new projects supported in Pork CRC's 2016-2017 investment round and ensure our R&D and training programs continue to meet industry and participant expectations.

This has made us reflect on the research program and what's likely to be delivered to producers and participants in the medium and longer term. I have covered some of these this month.

Pleasing program

I'm extremely pleased with our current R&D program and expect our researchers to deliver some exciting commercial and industry outcomes in 2016. These include vaccines against some common but serious pathogens; new work on establishing and improving the welfare and contentment of sows in farrowing crates; new work on improving eating quality; the first Life Cycle Assessment (LCA) of Australia's pork industry; an on-farm herd health/immunity kit; an update on indicators of the welfare of group housed sows and major projects on better understanding the control of feed intake in grower-finisher pigs and how that information can be used to markedly improve feed efficiency.

Enrichment products

Our development of enrichment blocks for group housed sows and a performance enhancer for newly weaned pigs are also on schedule and both products will be introduced at this year's Pan Pacific Pork Expo (PPPE) on the Gold Coast, May 25-26. These projects are managed by our Commercialisation and Research Impact Manager, Dr Charles Rikard-Bell, who is working with Ridley and SunPork researchers on the enrichment blocks and with Dr Eugeni Roura (University of Queensland) and BEC on the performance enhancer. Make a point of catching up on both products at PPPE. If you can't track down Charles, who we affectionately call 'the albatross', because he spends so much time in the air and rarely lands, his mobile is 0439 513 723.

The Pork CRC/APL farrowing system index publication for producers will also likely be launched at PPPE. It covers research outcomes and expert and producer experiences and opinions on reduced confinement type farrowing and lactation systems. The index compares (scores) the relative merits of some alternative systems for sows, piglets and producers against conventional farrowing crates.

In summary, some of the alternative systems may have behavioural advantages for the sow, but are outweighed by adverse effects on the piglet, generally reflected in increased mortality, or adverse effects on the producer, reflected in considerably higher costs (investment and labour) and OH&S issues.

NZ conclusions

Our findings are very much in line with the recent review of farrowing crates by the New Zealand National Animal Welfare Advisory Committee (NAWAC), which was asked to review the use of farrowing crates by the NZ Minister of Primary Industries in 2014. The recently released review concluded that using farrowing crates in pig farming is the best system available. The review included an assessment of NZ and international research and practice and international standards and NZ's Animal Welfare Code.

The review stated “NAWAC does not consider there is any practical alternative system that provides comparable levels of piglet welfare, while better meeting the welfare needs of sows.”

Pork CRC has several innovative projects on establishing and enhancing the welfare and contentment of sows in farrowing crates. The outcomes will be delivered over the balance of 2016 and in early 2017.

Details of the review can be accessed on NZ Pork’s website (www.nzpork.co.nz).

Big thanks

I think you can judge the effectiveness of a research organisation from its research portfolio and I couldn’t be happier with our’s. I thank all our participants, researchers, students and other collaborators for their contributions to our programs.

Let’s ensure we maintain the enthusiasm and innovativeness through to the end of the Pork CRC in 2018-2019 and into APRIL, which will likely commence this year and take over from Pork CRC in 2019-2020.

New investments

The R&D Committee and board have made their decisions on Round Seven research investments for 2016-2017.

It was a competitive round, with 14 projects approved from 38 applications. While some proposals are still being finalised, most new agreements have been circulated for signing. The outcomes across the four programs are summarised here. You will see we went with health (Program 2) in the latest round. There are new projects on potential new APP serotypes in the industry; development of an immune test for selecting sires for the survival of their progeny; development of a vaccine against swine dysentery; peptide based antimicrobial gels; alternatives to antibiotics and their effects on antimicrobial resistance and the gut microbe population; a project on a new additive with antibacterial and feed efficiency improvement potential and a project on a product with potential to reduce respiratory pathogen loads in pig sheds and maybe to reduce enteric pathogens if supplied via the water. An exciting outcome I think and we will provide more detail on the various projects as they are signed off.

All the supported proposals are novel and offer the industry improvement across most aspects of production and the supply chain in general. Outcomes of these projects will be delivered in 2017-2018.

I thank everyone who submitted applications. We all continue to rely on researchers’ ideas and innovativeness. I also thank all who took part in the review process and a special thanks to Donna Schmid and others from APL and F1 Solutions for smoothing the transition from our previous project management system to PigNet.

The new projects will be added to Pork CRC’s website once agreements are signed.

R&D Proposals submitted and supported across Pork CRC’s four programs for 2016-2017

Program	1	2	3	4	TOTAL
Proposals received	9	17	7	5	38
Cash requested (\$)	883,991	3,280,716	1,107,337	907,315	6,179,359
Proposals supported	2	7	3	2	14
Cash approved (\$)	75,700	455,000	210,000	330,000	1,070,700

Two innovation proposals, one on packaging and eating quality of Australian pork and the other on the feeding behaviour and the performance and welfare of group housed sows, were also supported in the same period. Both projects are with the University of Melbourne.

Meanwhile, we have recently received several final reports, a couple of which I've summarised here.

Reducing ZnO

Project 2C-118: 'Using microencapsulated ingredients to enhance efficacy and improve production efficiency within an integrated health strategy'

The project investigated the effects of an encapsulated zinc oxide (ZnO) and protected essential oils on weaner performance and health and was conducted by Robert Hewitt at Sun Pork's Westbrook weaner facility.

The pigs were weaned at 21 days (5.8 kg) and allocated across five treatments – a negative control diet without ZnO, a positive control diet containing 3,000 ppm ZnO, the same diet containing 1 kg/tonne of encapsulated ZnO, the same diet containing 1 kg/tonne of encapsulated essential oils (EO) and the same diet containing both encapsulated materials. The study ran for 28 days.

Effects of treatments on live weight and feed conversion ratio (FCR) over four weeks post weaning

Treatment	Negative Control	ZnO 3000	Encapsulated ZnO (1kg/t)	Encapsulated EO (1 kg/t)	Enc. ZnO and EO	P
Week 1						
Weight (kg)	6.3	6.5	6.4	6.5	6.5	NS
FCR	2.32	2.01	2.05	2.27	2.40	NS
Week 2						
Weight (kg)	7.7c	8.3a	8.0bc	7.9bc	8.1ab	0.002
FCR	1.35	1.25	1.36	1.25	1.30	NS
Week 3						
Weight (kg)	9.9c	10.9a	10.3bc	10.3bc	10.5b	<0.001
FCR	1.39b	1.33ab	1.34b	1.29a	1.39b	0.043
Week 4						
Weight (kg)	13.2c	14.3a	13.6bc	13.6bc	13.9ab	0.008
FCR	1.37bc	1.40c	1.36b	1.28a	1.31ab	0.002

Both sources of ZnO supported similar performance and numerically better feed efficiency than other treatments in the first week after weaning, with the conventional ZnO supporting higher feed intake and growth rates than all other treatments in weeks two and three, after which (week four) pigs on all treatments exhibited similar growth rates.

In week three the encapsulated oils tended to support better feed efficiency than all other treatments, except the high level ZnO. In week four, pigs offered the diet containing the encapsulated oils were 7.0% more feed efficient than those on the negative control diet and 9% more feed efficient than pigs offered the diet containing 3000 ppm ZnO.

The results support the use of two diets in the first four weeks after weaning and suggest that the protected ZnO could replace conventional ZnO in the first two weeks after weaning with minimal effect on performance, but reduce Zn excretion by some 66%. The protected oils seem to have potential as a performance enhancer in second stage weaner diets.

The report and one page summary are available on our website www.porkcrc.com.au and both have been sent to all nutritionists.

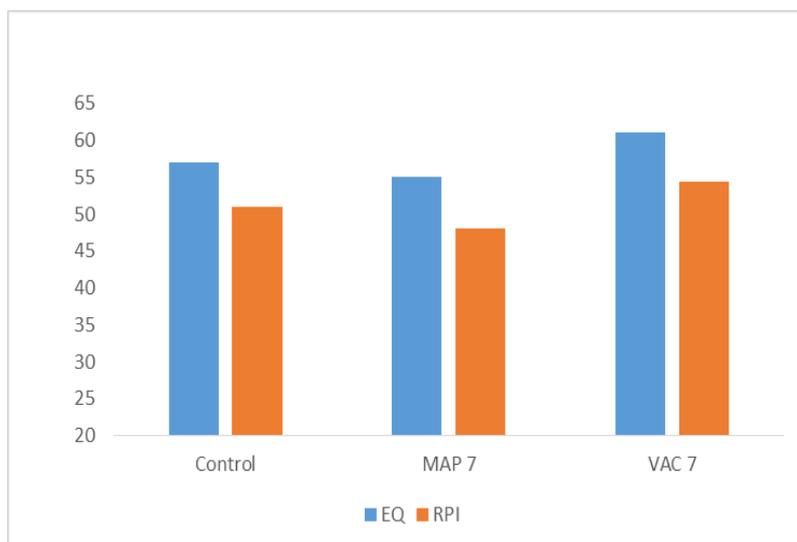
Eating quality

Two University of Melbourne student projects have illustrated what might be causing some of the problems we've continually experienced with eating quality of Australian pork.

They investigated the effects of modified atmospheric packing and vacuum packaging on the tenderness of the loin steak, measured using shear force (a machine) and consumer preference tests.

The results, some of which are summarised in the figure here, showed that tenderness measured using a Warner-Bratzler machine improved considerably with time (ageing) with vacuum, but not modified, atmosphere packaging. In the consumer tests, loin steaks vacuum packed and aged for seven days were perceived and scored by consumers to have significantly higher eating quality and to have a higher repurchase intention than those aged in modified atmosphere packing.

A new Pork CRC project to investigate packing will soon commence, but the results may help explain why we have previously seen little effect of ageing on pork eating quality.



Effects of ageing for seven days and modified atmosphere packing (MAP) and vacuum packaging (VAC) on consumer perceptions (%) of eating quality (EQ) and repurchase intention (RPI) for loin steaks.

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