



Specials

Vol 5 Issue 15

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Autumn 2010

From the Top Shelf by Dr Roger Campbell, CEO, Pork CRC

Work on our bid to extend the Pork CRC into a second term is gathering momentum.

Comprising four programs, the rebid targets ethical pork production, while equipping Australia's pork industry to meet increasing local and international demand for food, without incurring collateral costs associated with inefficient resource use, animal welfare and carbon 'pollution'.

Program One: will use breakthrough technology developed by the University of Sydney in the current Pork CRC relating to inducing oestrus in lactation. The new technology, which has the potential to improve reproduction and reduce sow turnover, should also allow industry to reduce the time sows spend in stalls and enable the development of new sow and piglet management systems that enhance the health and welfare benefits of the sow and her progeny. This exciting area will require input from all Pork CRC researchers involved in reproduction, weaner management and behaviour. It will be a truly innovative and collaborative program.

Program Two: will focus on improving animal health and reducing antibiotic use, by engaging new technologies associated with diagnosing pathogen loads, novel alternative therapies and selecting pigs for performance as a population, rather than as individuals. It will involve international collaboration with USA and European organisations and researchers with unique resources and expertise in immunity. These collaborations will enable us to strategically use gene markers

to search for traits for survival, robustness and reproduction. The international collaboration will also facilitate researcher and student exchanges.

Program Three: will further enhance our knowledge of the human health attributes of pork and develop links with high-end Asian markets to help develop systems and products that appeal to pork users in these markets.

Program Four: will target pork production that generates only 1 kg of carbon dioxide per kg of pork produced (versus current estimates of 3-6kg). This ambitious, but achievable target uses novel feed ingredients based on 'designer' algae and lateral thinking around nutrient inputs and outputs in pork production.

A well constructed, visionary education component will be embedded within each program and the international collaborations will help develop innovative exchange programs and the strategic placement of post-docs. Training programs for production staff in the new management systems likely to arise from the extended Pork CRC will also be developed.

We have unprecedented interest and investment in the rebid and Dr Robert van Barneveld and his rebid team have done a great job developing a fresh proposal and generating national and international interest.

While I acknowledge that the rebid process is arduous and it will be extremely competitive, our proposal will meet all of the guidelines and has a few novel and unexpected twists.



Dr Roger Campbell, CEO, Pork CRC

Our rebid is based on two realities, the first being that the pork industry needs the Pork CRC to be extended and that the timing is perfect for addressing environmental and welfare costs associated with pork production. The second is that this will be the last Pork CRC (CRCs have a maximum life of 15 years) and the industry needs to develop an alternative R&D model over the life of the extension if the rebid is successful. Our proposal takes this into account.

We look forward to your contribution to the development and refinement of the proposal and to your thoughts and input into implementing the activities and achieving the outcomes of the new Pork CRC.

If we're as successful as we've been in the current Pork CRC, the future of the Australian pork industry will be markedly enhanced on all fronts.

EXPOnential Potential

In keeping with the 2010 Pan Pacific Pork Expo (PPPE) theme, 'Next Generation Pork – Finding the Balance', the Pork CRC is sponsoring 'Pork Power' a concurrent session on day two which will analyse the importance of maintaining healthy pork for a healthy market.

Pork CRC CEO, Dr Roger Campbell said he encouraged robust discussion around the latest research and trends into the inherent health attributes of pork.

"We must ensure Australian pork is the best possible quality and that our R&D can identify and verify the nutrients in pork that promote the health and well-being of pork consumers.

"We'll best achieve this through consistent and reliable research, innovation, quality assessment and market analysis," he said.

The Pork CRC runs three main programs, each designed to enhance the Australian pork industry: 'Securing more reliable and consistent supplies of protein and energy for pig diets', managed by Dr Ray King; 'Improving herd feed conversion efficiency', managed by Professor Frank Dunshea and 'Enhancing capacity to deliver nutrients that promote health and well-being through pork', managed by Heather Channon.

Education Training

The Pork CRC also increasingly focuses resources and attention on a fourth program, 'Education and Training', managed by Dr Will van Wettere.

Several Pork CRC supported students will participate in the 2010 PPPE Day One Plenary Session, titled 'Next Generation Scientists', where they will showcase their undergraduate and post-graduate

studies and research to industry and prospective employers.

Dr Campbell described the 2010 PPPE as the ideal forum for pork producers, researchers and other industry stakeholders to not only network, but also to help direct and drive Australia's pork industry as it confronts the tough challenges of the next decade.

Critical Challenges

He identified some of the critical challenges as: improving reproductive performance; lifting the number of pigs sold/sow/year; increasing the weight of pork sold/sow/year; investigating alternative management systems for sows; using novel strategies to enhance immunity and reducing medication use and costs; and better matching feed grains with feeding pigs.

Program Two Progress

By Manager, Professor Frank Dunshea

Although there has been considerable focus in the Pork CRC on improving the growth performance of the weaned piglet, including investigating how to increase growth performance by using creep feeding, results have varied.

A recent experiment, conducted as part of Megan Edwards' PhD at the University of New England, was designed to assess two novel feed ingredients available to Australian pork producers i.e. spray dried porcine plasma and a yeast-based protein meal. Overseas experience is that these ingredients may increase feed intake and growth performance, possibly through stimulating the immune system and promoting beneficial intestinal environments.

Growing Bodies

Preliminary observations suggest spray dried porcine plasma increases growth performance of progeny from gilts and sows, while the yeast supplement increases growth in progeny from gilts over that of conventional medicated creep feed.

Another study, in WA, addressing the post-weaning growth check, investigated whether adding nucleotides, inositol, glutamate or a combination of these to the diet for three weeks after weaning could improve pig performance and indices of gut development and immune function.

While daily gain and feed intake were not affected by diet ($P > 0.05$), pigs fed the combined diet had a lower feed conversion ratio than those fed the control, inositol and nucleotides diets ($P = 0.028$). Villous height in the duodenum was increased in pigs receiving the combined diet, compared to the control and inositol diets ($P = 0.029$).

Also, immunoglobulin G levels were increased in pigs receiving the inositol and glutamate diets, compared to the control and nucleotides diet on Day 21 ($P = 0.034$). The optimum rearing conditions after weaning may have reduced the stressors that the pigs were exposed to and limited the impact of the dietary treatments on the indices measured.

Gutsy Effort

With the use of in-feed antimicrobial growth promoters to control post-weaning diarrhoea (PWD) banned or limited in much of Europe, due primarily to consumer concerns about transferring resistant pathogens to humans, numerous dietary and management strategies have been introduced and implemented.

Despite the efforts of many research groups around the world, poor gut health of pigs after weaning, when fed an antibiotic-free diet, compromises potential growth of pigs.

Gut health of weaned piglets is influenced by many factors, including nutritional, physiological and psychological stressors, immune functions, hygiene conditions, intestinal barrier functions and diet composition.

One strategy to control PWD is pharmacological use of zinc oxide (2500-3000 ppm ZnO) and it is being used worldwide as an alternative for antibiotics. However, the strategy is criticised because high levels of zinc are excreted into the environment through the effluent system.

Recently, a microencapsulated zinc oxide product was released on the market and the lipid-coated ZnO has been claimed to dramatically decrease inclusion of ZnO from 2500-3000 ppm to 100 ppm to achieve the same effect on PWD. Therefore, the microencapsulated zinc oxide was evaluated as a solution for the environmental issue as well as controlling PWD.

Results showed that including 100 ppm microencapsulated ZnO suppressed the expression of PWD in enterotoxigenic *E. coli* (ETEC) challenged and non-challenged pigs and kept the plasma and faecal zinc levels to levels found in the pigs fed a control diet without additional ZnO supplementation. This experiment suggests that expression of PWD can be reduced by supplementing 100 ppm microencapsulated ZnO in the diets for weaner pigs without compromising faecal zinc excretion levels.

Metabolic Matters

Within the Pork CRC there's also a focus on improving the growth performance of the grower finisher pig. Strategies investigated include alternative deliveries of established metabolic modifiers, such as porcine somatotropin (pST) and ractopamine as well alternative strategies such as chromium, medium chain fatty acids and cysteamine.

One study, conducted by Dr David Miller of Murdoch University, compared growth and plasma hormone responses of dietary MCFA and cysteamine hydrochloride for 4-5 weeks. Average daily gain and feed conversion were not affected by the dietary treatments, however MCFA pigs had 19% lower ($P < 0.005$) and CSH pigs had 14% lower ($P < 0.05$) P2 backfat depths compared to the controls. Plasma concentrations of pST, IGF-1, insulin and other blood metabolites were not affected by the dietary treatments, but the MCFA treatment group had 20% higher plasma concentration of active ghrelin (a stimulator of pST) than the control pigs (approaching significance at $P = 0.12$).

Although there was no stimulation of the endogenous somatotropin and no effect on weight gain or feed intake, by the MCFA or CSH treatments, the decreased backfat depth indicated there was improved lean meat yield. This latter finding encourages further investigation of these nutritional alternatives or perhaps adjuncts to current metabolic modifiers.

Lysine Lookout

Early 1980s studies suggested that protein deposition potential and lysine requirements of grower boars (up to 60 kg) was slightly higher than in gilts. However, studies during the 1990s and beyond suggested that although the protein deposi-



Pork CRC Program Two Manager,
Professor Frank Dunshea.

tion and growth potential of boars is greater than gilts, there was little difference in the lysine requirements of grower and finisher boars and gilts. Some of the confusion may have related to endpoints used to assess lysine requirements e.g. protein deposition, feed efficiency, daily gain and carcass gain.

Recently, there's been renewed interest in whether there were differences in lysine requirements of the available improved genotypes and, if so, how early these differences occur. Two just completed studies looked at the lysine requirements of two genotypes (PIC and Rivalea). The first, by Karen Moore at DAFWA's Medina, WA research station, found entire males had a higher lysine requirement than females from 20 to 100 kg live weight. Importantly, these differences occurred much earlier than anticipated and also suggest lysine requirements for contemporary Australian pigs may be higher than the levels currently used.

A study at Rivalea by Charles Rickard-Bell confirmed that the lysine requirements of entire males were greater than females between 65 and 95 kg liveweight.

Collectively, these studies show that entire males grow faster (8-12%) and are more feed efficient (10-15%) and leaner (5%) than females at the same weight and that the lysine requirements may be around 0.1 g available lysine per MJ ME greater. Also, the differences in requirements to maximise daily gain are less than to maximise feed efficiency.

Pork CRC Program Two: 'Improving herd feed conversion efficiency'

Diary Dates 2010

June 16-17: Pan Pacific Pork Expo, Gold Coast, contact Leanne Gollasch APL, Freecall 1800 789099

June 18: Pork CRC Board Meeting, contact Suzanne Merry, Tel 08 8303 7685

August 12: Pork CRC R&D, contact Graeme Crook, Tel 08 8303 7973

August 25-26: Pork CRC Board Meeting, contact Suzanne Merry, Tel 08 8303 768

Hunger Growing for Feed Grains



Perenjori, WA grain grower, Deb Mason is excited about the potential of the work the Pork CRC is doing to improve supply relationships for new feed grain varieties.

Deb Mason of NE Brown & DJ Mason is a large grain grower, supporting a range of triticale varieties on her Perenjori, WA, farm.

She says her latest seed is currently on order and she looks forward to trialling **Berkshire**, the Pork CRC's new triticale variety, this season. Ms Mason says while wheat price forecasts are low, grain growers are looking to other crops such as lupins and triticale. However, she says more trials of new varieties are needed to ensure grain growers can be confident in getting the best value for their money.

"It would be great to see these new varieties in local trials to validate that they will perform in our climate and soil types.

"While we don't have some of the diseases of the eastern states, we need to see if the variety can stand up to new conditions."

Ms Mason says right now is the ideal time for end users to promote the varieties they want to use in the long term. She added that growing specific feed grains for intensive animal industries, such as pork production, needed to be a win-win for both parties and she was optimistic a triticale such as **Berkshire**, developed with Pork CRC support, would do just that.

David Crowden

Farming 6000ha at Kalannie in WA's North East, where his 2010 cropping program comprises about 3000ha wheat, 200ha barley and 1300ha triticale, David Crowden has grown three or four varieties of triticale, citing yield as his sole reason for changing.

He says he therefore looks forward to the Pork CRC's latest triticale variety, **Berkshire**, which promises a higher yield and energy content than its predecessors.

"If its yield is similar to other triticales and there's no detriment to the grower, then it makes sense to invest in it.

"If it's only advantageous to the end user, but not the grower, then there's no point. I only want to grow a variety that gives me the best bang for my buck and if there's a premium in the market."



Kalannie, WA grain grower, David Crowden (centre) at the Pork CRC March 2010 feed grains seminar at Technology Park, WA, with Pork CRC Program One Manager and speaker, Dr Ray King and pork producer Errol Howard of Wannamal, WA.

Mr Crowden says the biggest challenge faced by grain growers is having to meet or better market expectations without compromising on quality, but often with no clear financial benefit in return.

"The problem is that some stock feed manufacturers want to source cheap grain, which can tend to downgrade the ultimate quality of the stock feed product and therefore its value to end users, such as intensive livestock industries.

"This is where the breeding and development of specific feed grain varieties, such as what the Pork CRC is doing with triticale, can become a win-win for grain growers and livestock producers, where both parties can enjoy real economic benefits."

Mr Crowden says he hopes better yielding varieties such as the Pork CRC's triticale, **Berkshire**, will demonstrate their worth to end users in the long term.

"People outside agriculture may disagree with me, but I think if you look at history, the bottom line is food is too cheap.

"People expect better quality at a cheaper price and it's that mentality that could eventually make Australia's food production industry unviable."

EDITOR'S NOTE: **Berkshire** was one of three new grain varieties from Pork CRC plant breeding projects released for commercial sowing during the 2009 season and now available for extensive release. The others were the field pea, **Maki** and the barley, **Shepherd**.

Berkshire, according to Pork CRC Program One Manager, Dr Ray King, at an average digestible energy (DE) content of 13.9 MJ DE/kg, contained about 0.5 MJ DE/kg more than the average energy in other triticale varieties, including Tahara.

The higher DE content of **Berkshire** was confirmed by AusScan feed analysis on samples of **Berkshire** collected from around Australia during the current 2009/10 harvest, making it similar to the 'average' wheat.

For more information on the new Pork CRC supported feed grains, **Berkshire**, **Maki** and **Shepherd**, interested grain growers and pork producers can contact Dr King, Mob 0412 322 047 or Email r.h.king@bigpond.net.au

For specific agronomic advice regarding **Berkshire**, including preferred growing zones, disease resistance and management of stripe rust, growers should contact Waratah Seeds via their website www.waratahseeds.com.au or email info@waratahseeds.com.au

Students Get Their Just Rewards

Pork CRC supported honours student, Amy Lealiifano of Murdoch University, WA, will present on day one of the Pan Pacific Pork Expo (PPPE) Rivalea sponsored session, 'Next Generation Scientists', alongside her Rivalea work colleagues, General Manager, Research and Innovation, Dr Brian Luxford and Research Scientist, Dr Cherie Collins.

Pork CRC CEO, Dr Roger Campbell is encouraging prospective employers to look to other similar Pork CRC graduates.

"You couldn't get better trained or smarter young people for your business and Ms Lealiifano is proof of that. If considering hiring in the technical, business or sales area, give our graduates serious consideration," he said.

Ms Lealiifano recently received a trophy and \$2000 cheque as winner of the Pork CRC Award

for best presentation at the 12th biennial conference of the Australasian Pig Science Association (APSA), Cairns, Queensland, for her research project into minimising boar taint.

Describing her APSA presentation as first class and professionally delivered, Dr Campbell added that the Pork CRC was extremely proud to have her as an honours student.

"Amy demonstrated excellent understanding of her subject and succinctly spelt out the scientific and commercial implications of her research. That she won the APSA medal on top of the Pork CRC award underlines her valuable skills as a scientist and communicator," he said.

Ms Lealiifano's research was supervised by Dr Bruce Mullan, DAFWA, Professor John Pluske, Murdoch University and Professor Frank Dunshea, University of Melbourne.

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Premier Nutrition Seminar

Pork CRC Commercialisation and Adoption Manager, Dr Rob Wilson, overviewed the CRC's three main programs during a DAFWA seminar at Technology Park, Bentley, WA, on Friday, May 7.

Dr Wilson emphasised, in particular, positive outcomes from Program One ('Securing more reliable and consistent supplies of protein and energy for pig diets'), particularly how pig-specific feed grains had been developed and delivered by the Pork CRC and its collaborators, which promised to improve the bottom line of grain growers and pork producers.

Keynote speaker was Mick Hazzledine, recipient of the DAFWA Visiting Specialist Award for

2009-2010 and Director of Premier Nutrition in the UK and leader of that company's pig team.

He started his career in research before moving to the commercial world where he has worked mainly in Europe and North America. He has a particular interest in applying new research and is actively involved in on-farm research in Canada and parts of Eastern Europe.

Mr Hazzledine gave two presentations concentrating on pork production in the EU, before he covered more specific topics, including boar taint, which he said was not a significant issue for UK consumers. Indeed, boars were fed to 100kg and sold without penalty and Improvac was not allowed.

This contrasted with Australia, where Improvac is used to suppress boar taint.

APL General Manager, Research and Innovation, Dr Darryl D'Souza also presented, reporting on: Pork CRC rebid; Productivity Commission Inquiry into Rural RDCs, which includes APL; progress of the review into APIQ; animal welfare research; biogas developments and opportunities.

WAPPA Executive Officer Russell Cox promoted and outlined WAPPA's 'Pig Day Out' at DAFWA's Medina Research Station on June 11, which will include presentations on: APL's marketing activities; animal welfare; product traceability; effluent management. The day's theme is 'The Pig Industry's Healthy Future in WA'.



At the DAFWA nutrition seminar at Technology Park, WA, were Pork CRC Sub-Program Manager, Dr Bruce Mullan of DAFWA and keynote speaker Mick Hazzledine, UK animal nutritionist and Director, Premier Nutrition.



Dr Rob Wilson, Manager, Commercialisation and Adoption with the Pork CRC, relaxes in the audience before he updated attendees on outcomes from the Pork CRC's programs.



At the DAFWA nutrition seminar were (L to R) Hugh Payne of DAFWA and Emalyn Loudon and Dr Darryl D'Souza, both of APL.



WAPPA Executive Officer, Russell Cox, presents at the DAFWA nutrition seminar.

Students Get Their Just Rewards ...continued from page 3

It measured the response of entire males and the incidence of boar taint when a second Improvac vaccination was given at different times pre-slaughter i.e. 0, 2, 3, 4 or 6 weeks.

"While still recommended that the second vaccination is given four weeks pre-slaughter, our results mean that if producers find a proportion

of pigs have reached the target slaughter weight only two or three weeks after vaccination, they can safely sell them free of boar taint," Ms Lealiifano said.

The Pork CRC is sponsoring 'Pork Power', a concurrent session on day two of PPPE, which will analyse the importance of maintaining healthy pork for a healthy market.

For more information on the Pork CRC's honours graduate program and details of individual research projects of last year's graduates, contact Dr Will van Wettere, School of Animal and Veterinary Sciences, University of Adelaide, Tel 08 8303 7911.

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PUBLISHER'S DETAILS

Pork Specials is published on behalf of the Pork CRC by Brendon Cant & Associates Tel: 08-9384 1122 Email: brendon@iinet.net.au
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