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Pig Tales

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Contents

Paylean®, pST or a combination?

By Karen Moore, DAFWA, 08 9368 3636

Ractopamine (Paylean®) and porcine somatotropin (pST) are used in the Australian pig industry to improve growth performance and increase lean meat deposition. They have traditionally been used separately but are now used in combination by some producers for the last two weeks pre-slaughter.

Our aim was to compare the effect of Paylean® and/or pST used either individually or in combination on the growth performance and carcass quality of castrated male pigs.

The four management strategies used in our experiment were:
1. Control diet
2. Paylean® (5 ppm ractopamine included in the diet for 28 days)
3. pST (5 mg administered daily for 28 days)
4. Paylean® and pST (Paylean®+pST) (5 ppm ractopamine included in the diet for 28 days and 5 mg pST daily for the last 14 days).

The management strategies commenced when the pigs were 68 kg liveweight and were fed for 28 days prior to slaughter. The Control and Paylean® diets were formulated to contain 13.5 MJ DE/kg and 0.56 g Available Lys/MJ DE while the pST and Paylean®+pST diets contained 14.2 MJ DE/kg and 0.65 g Available Lys/MJ DE as per normal commercial practice.

Table 1: Growth performance and carcass data for castrated pigs using four different management strategies for 28 days pre-slaughter.

Parameter	Control	Paylean®	pST	Paylean® +pST	SED	P-value
LW slaughter (kg)	102.0	104.3	103.8	104.5	1.51	0.526
Daily gain (kg/day)	1.22	1.36	1.32	1.37	0.052	0.066
VFI (kg/day)	3.78[a]	3.78[a]	3.27[b]	3.38[b]	0.12	0.002
FCR	3.11[a]	2.79[b]	2.47[c]	2.47[c]	0.13	0.002
Dressing %	66.1	66.9	65.9	66.1	0.81	0.617
Carcass weight (kg)	67.6	69.7	68.4	69.1	1.11	0.430

[abc]Means in a row with different subscripts differ significantly (P<0.05).

Continued on Page 3

Coming events

Pig Industry Seminar – Friday 7th May

A date to note in your diary is **Friday the 7th May at Technology Park in Perth**. Mick Hazzeldine is a Director of Premier Nutrition, a company involved in a wide range of research and consulting activities in the UK, and will be spending the first two weeks of May working in WA as part of a DAFWA Distinguished Visitor Award. As well as being actively involved in the conduct of on-farm research, Mick is currently involved in the establishment of a large piggery in Russia. He comes with a wide range of experiences in pig production. More details on the subject area that Mick will be discussing will be available early next month. Anyone wanting to meet with Mick while he is in Perth should contact Bruce Mullan as soon as possible.

Pan Pacific Pork Expo

PPPE 2010 will be held from 16-17th June 2010 at the Gold Coast Convention & Exhibition Centre, QLD. The theme is New Generation Pork – Finding the Balance.

The plenary sessions are:

1. Industry 'Champions' Forum
2. Next Generation Pork – Finding the Balance
3. Next generation Scientists

The concurrent sessions are:

1. Future Nutrients
2. Next Generation Farmers
3. Pork Power

Further information is available at www.australianpork.com.au/pppe or contact the PPPE Secretariat, Leanne Gollasch on 02 6285 2200 or free call 1800 789 099.

DAFWA's Pork Group have gone online

We have recently updated our website. The new website of the Pork R&D Group can be found at:
http://www.agric.wa.gov.au/PC_93860.html?s=1658443747,Topic=PC_91756
or go to www.agric.wa.gov.au and click on the link to Livestock and then Pork Group.

The website contains information about the pork industry in WA, the people in the Pork R&D Group, our current and recently completed projects and our publications. The website will be updated regularly as new projects are commenced and the results from recently completed projects become available.

We would welcome any feedback that you have on the website (karen.moore@agric.wa.gov.au; ph. 9368 3636).

Recent publications by the Pork Group

* **KL Moore**, RG Campbell, **RR Nicholls** and **BP Mullan**

Entire male and female pigs have different available lysine:energy requirements from 20 to 50 kgs liveweight

2009 Manipulating Pig Production XII, Ed. RJ van Barneveld, pg. 76.

*** M Trezona**, JR Pluske, FR Dunshea and **BP Mullan**

Adding straw to finisher pig diets does not affect objective pork quality

2009 Manipulating Pig Production XII, Ed. RJ van Barneveld, pg. 188.

* **HG Payne**, **KL Moore**, A Gardiner, AJ Gardiner, J Gardiner, E Loudon and GM Cronin

Piglet survival in farrowing pens in a hoop structure versus in farrowing crates in an environmentally controlled building

2009 Manipulating Pig Production XII, Ed. RJ van Barneveld, pg. 138.

If you would like a copy of any of these papers please e-mail Karen at karen.moore@agric.wa.gov.au

Paylean, pST or a combination?

Continued from Page 1

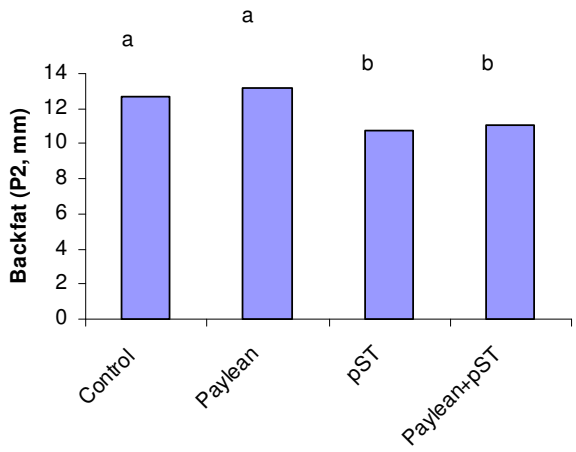

Figure 1: Backfat thickness when four different management strategies were used pre-slaughter.

To summarise

- Growth performance was improved by the use of either Paylean®, pST or Paylean®+pST compared to the control.
- The use of either pST or Paylean®+pST reduced feed intake and further improved FCR compared to Paylean®.
- The pST and Paylean®+pST strategy decreased backfat by approximately 2 mm compared to the Control and Paylean® strategy.

Take home messages

- While pST or Paylean®+pST appear to give similar responses in this experiment, the combined approach has its advantages because of only having to administer pST for half the length of time.
- There are management strategies available that can reduce FCR and P2 in castrated male pigs.

In the next edition of Pig Tales we will feature the pork quality results when moisture infusion and ageing were used in conjunction with these on-farm management strategies.

The Agricultural Produce Commission – Pork Producers Committee are thanked for their financial support. The supply of pST by Zamira Life Sciences is also acknowledged.

Correction – Captive Bolt

It was incorrectly reported in the December 09 edition of Pig Tales that a firearm licence is not required to own a captive bolt gun in Western Australia. However, a captive bolt gun is a Category E firearm and to own a firearm of this type in Western Australia you must have a Firearm Licence and have approved storage facilities. The captive bolt gun is also required to be registered. If you have any further queries then please contact Police Licensing Services on 1300 171 011.

Capacity of piggeries, Standard Pig Units (SPUs), National Pollutant Inventory (NPI) Reporting and SPU equivalents

By Hugh Payne, DAFWA, 08 9368 3576

Traditionally, the capacity of piggeries has been defined by sow numbers. This system worked well in the past when most piggeries were farrow-to-finish operations. However, the system is not applicable to breeder units that sell or transfer some or all weaners produced to other sites, or to grow-out units that do not run any breeding animals.

Standard Pig Units (SPU) can be used to estimate the capacity of any production system based on volatile solids (VS) output. The National Environmental Guidelines for Piggeries (APL, 2006) states the manure and waste feed produced by one SPU contains the amount of volatile solids (VS) typically produced by an average size grower pig (90 kg VS/yr). Multiplier factors for other classes of pigs shown in Table 1 are based on their comparative VS production. The numbers of pigs in each class are multiplied by the appropriate SPU factors and then summed to determine the SPU capacity of the piggery (Table 1). This information is generally required for environmental management plans and for regulatory purposes.

Table 1. SPU Conversion factors from the National Environmental Guidelines for Piggeries (APL, 2006) and the NPI Emission Estimation Technique Manual for Intensive Livestock – Pig Farming, Version 2.0 (Department of the Environment and Water Resources, 2007).

Pig class	Weight range (kg)	Age range (weeks)	SPU multiplier factor for estimating VS production	**SPU equivalent**[1] multiplier factor for estimating ammonia production
Gilt	100-160	24-30	1.8	1.314
Boar	100-300	24-128	1.6	1.600
Gestating sow	160-230	-	1.6	1.520
Lactating sow with litter of 10 piglets	160-230	-	3.5	5.425
Weaner	8-25	4-10	0.5	0.425
Grower (1 SPU)	**25-55**	**10-16**	**1.0**	**1.000**
Finisher	55-100	16-24	1.6	1.600

[1]Developed by Department of the Environment and Water Resources for pig classes where the ratio of nitrogen excretion to volatile production differs by more than 5%.

Table 2. Number of pigs required to trigger the reporting threshold for ammonia from Emission Technique Manual for Intensive Livestock – Pig Farming, Version 2.0 (Department of the Environment and Water Resources, 2007).

Pig type	Number of SPU equivalents required to trigger reporting		
	Conventional piggery	Deep-litter piggery - stockpiling litter on farm	Deep litter piggery - removal of litter from farm
Gilt	865	1586	5435
Boar	711	1303	4465
Gestating sow	748	1371	4700
Lactating sow (with litter)	210	385	1317
Weaner	2674	4902	16807
Grower (1 SPU)	**1137**	**2084**	**7143**
Finisher	711	1303	4465

Piggeries are required to report ammonia emissions to the NPI if they emit over 10 t/yr of ammonia. The Department of the Environment and Water Resources (2007) provides guidelines for estimating ammonia emissions for conventional and deep-litter piggeries and the number of SPU for each class of pigs that will trigger reporting responsibilities (Table 2). The **SPU equivalent** multiplier factor shown in Table 1 is used to calculate the number of SPUs required to trigger the ammonia reporting threshold. A conventional piggery with a capacity of 1100-1200 SPU (approx. 100 sow farrow-to-finish) is likely to trigger responsibilities for reporting ammonia. A deep litter piggery that stockpiles spent bedding on-farm triggers reporting responsibilities at a capacity of about 2000 SPU (approx. 2000 pig places from wean-to-finish) while a deep litter piggery that does not stockpile spent bedding would trigger reporting responsibilities at a capacity of about 7100 SPU (approx. 7100 pig places from wean-to-finish).

Examples of how to calculate your ammonia emissions to determine if you trigger the reporting level to the NPI are given in the Emission Technique Manual for Intensive Livestock – Pig Farming which is available at www.npi.gov.au/publications/emission-estimation-technique/pubs/pork.pdf.

References:

National Environmental Guidelines for Piggeries (2006). http://www.australianpork.com.au/pages/images/National%20environmental%20guidelines%20for%20piggeries%20-%20final%20print.pdf

Department of the Environment and Water Resources (2007). Emission Technique Manual for Intensive Livestock – Pig Farming, Version 2.0. http://www.npi.gov.au/publications/emission-estimation-technique/pubs/pork.pdf

Control of boar taint

By Bruce Mullan, DAFWA, 08 9368 3578

Boar taint, an objectionable odour and flavour detected in the cooking of pork from entire male pigs, has become a limitation to the consumption of and demand for Australian pork. As slaughter weight increases so does the concentration of androstenone and skatole, the two major components that contribute to boar taint.

Traditionally boar taint has been controlled by physical castration within the first week of life, but compared to entire male pigs physical castrates are fatter and have poorer feed conversion efficiency. The development of the vaccine Improvac® is an effective means of controlling boar taint but has the production advantage in that the pig has all the performance attributes of an entire male up until it receives the second vaccination, recommended at four to five weeks before slaughter.

However, Improvac® treated boars have an increase in feed intake and weight gain following the second vaccination compared to entire males and as a consequence there may also be an increase in depth of backfat (Dunshea *et al.*, 2001) to the extent that it makes some producers question the cost effectiveness of the practice.

The aim of this experiment was to measure the response of entire males and the incidence of boar taint when the second Improvac® vaccination is given at different times before slaughter (0, 2, 3, 4 or 6 weeks).

Even when the second vaccination was given only two weeks pre-slaughter there was total control of boar taint, indicated by the concentrations of androstenone and skatole being below threshold levels (Figure 1). The sharp decline in testosterone levels indicated a cessation of testicular function, and there was a linear decrease in the weight and physical dimensions of testes in line with the time between second vaccination and slaughter (Figure 2). However, some individual animals that had been treated with Improvac® and were free of boar taint had testes of similar size to the control animals. Since testicle width and weight are used by processors in many countries to determine which carcasses might contain boar taint, other screening methods besides testes weight may be required to determine tainted carcasses when pigs are vaccinated close to the day of slaughter.

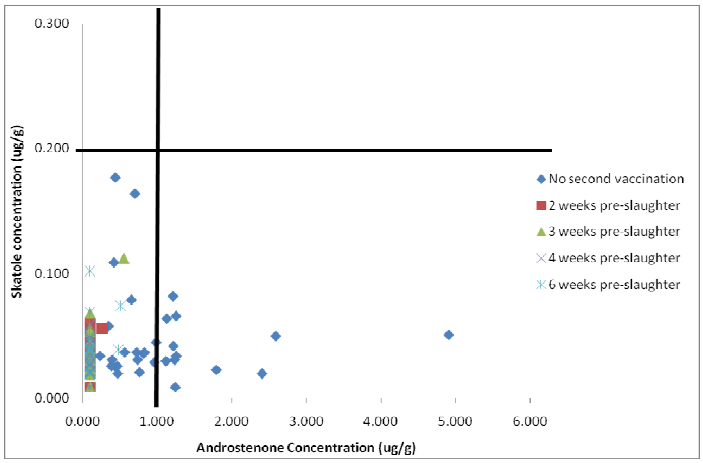

Figure 1. Relationship between fat concentration of skatole and androstenone for control boars and Improvac® treated boars given the second vaccination at alternate time before slaughter. Threshold values for detection of androstenone and skatole concentration by consumers are indicated.

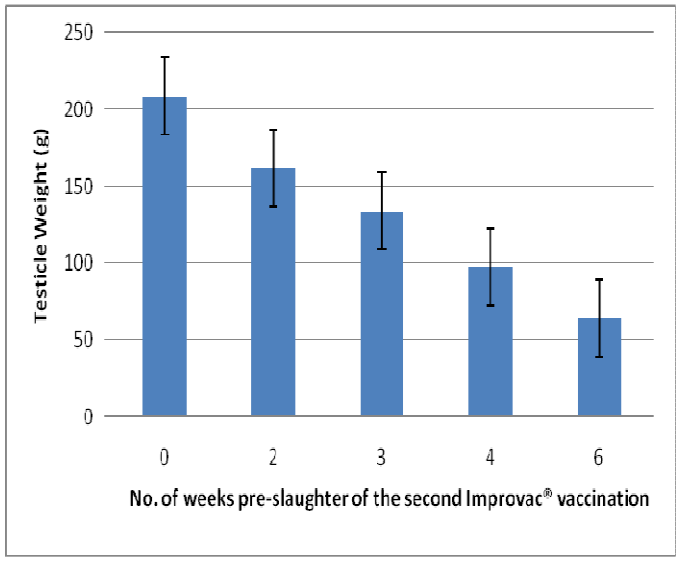

Figure 2. Individual testicle weight for pigs receiving the second vaccination of Improvac® at different times pre-slaughter.

There was a significant linear trend for depth of backfat (P2) to increase as the time between the second vaccination and slaughter increased (Figure 3). However, there was no significant difference in growth rate or feed conversion efficiency related to the time of the second vaccination.

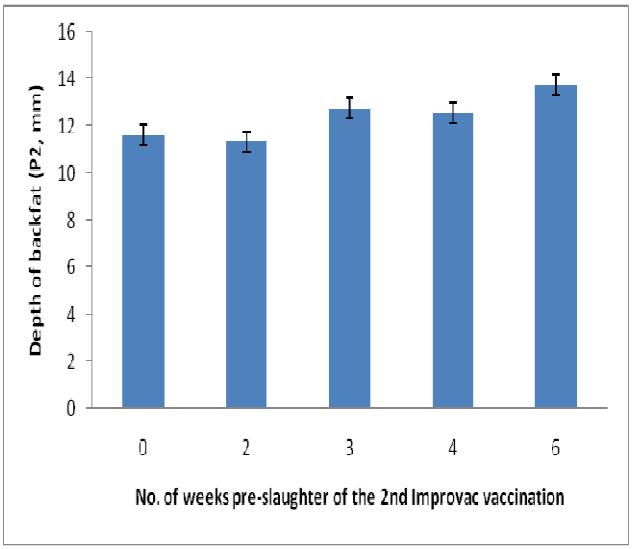

Figure 3. Depth of backfat for pigs receiving the second vaccination of Improvac® at different times pre-slaughter.

The second vaccination of Improvac® is currently recommended to be given four to five weeks before slaughter. The present results suggest control of boar taint can be achieved when the second vaccination is given as late as two weeks before slaughter. The latter strategy reduces the likelihood of an increase in backfat of Improvac® treated pigs compared to entire males and hence any decrease in payment by processors. This gives producers greater flexibility when selecting pigs vaccinated with Improvac® for slaughter provided no pigs are sold less than two weeks post-vaccination. Since the levels of skatole in this experiment were all below threshold levels, further research in a commercial piggery is required to be certain that both components of boar taint are eliminated when Improvac® is given two weeks before slaughter.

The major finding from this experiment was that the second Improvac® vaccination can be moved closer to slaughter and still prevent boar taint by reducing androstenone and skatole levels below threshold levels. If the increase in P2 with using Improvac® is a problem, then producers should certainly consult their veterinarian about reducing the time between second vaccination and slaughter because of the linear increase in P2 with increased time between second vaccination and slaughter. However, pigs should certainly not be sold any sooner than two weeks after the second vaccination as there is no data to support freedom from boar taint.

Amy Lealiifano was an honours student at Murdoch University and conducted this research at the DAFWA Medina Research Station with support from the Pork CRC. Amy went on to win several awards at the APSA conference late last year, including best oral presentation, and is now working for Rivalea as part of their graduate recruitment program. A copy of the Final Report for this Pork CRC project is available from Bruce Mullan or from the Pork CRC website (www.porkcrc.com.au).

PISC Review of Agricultural and Vet Chemical Regulation

By Barb Frey, Consistent Pork, 0400 298 258

This is the article full of acronyms: it's a sign that the topic must have something to do with government policy and regulation! Sure enough, the Primary Industries Standing Committee (PISC - a committee of the Primary Industries Ministerial Council) released a discussion paper last year on *A National scheme for Assessment, Registration and Control of Use of Agricultural and Veterinary Chemicals* seeking input from stakeholders by early this year. For the consultants hired for the task, this is code for "you better fix this mess".

It is a mess – including:

- The drug registration process – takes forever, is expensive and prohibitive. It's not working on many levels.
- Inadequate and often conflicting legislation, primarily within state jurisdictions. This makes it hard for both vets and producers to ensure they comply with control of use requirements. Current legislation is spread across the state Health Dept, the APVMA (Australian Pesticides & Veterinary Medicines Authority) and the National Registration Authority (NRA). This includes access, labelling, off label use, documentation requirements, etc.
- Inconsistency of labelling of similar products – hard for producers to be sure they're getting it right.
- There are hazards and risks associated with use of some ag/vet chemicals which are not adequately addressed by any legislation including OH & S concerns.

This process stems from the Council of Australian Governments (COAG) identification of chemicals and plastics regulation as a regulatory 'hot spot'. This means they know it's a mess and significant resources have been put towards actually trying to fix it. This review was sparked by the report of the Productivity Commission on this topic completed in 2008.

Feedback to PISC was specifically sought on:

- Alternative ways to integrate agricultural/vet chemical assessment, authorisation and control of use.
- Advantages and disadvantages in the ways in which control of use is carried out.
- Improvements to priority setting and efficiency of agricultural/vet assessment and authorisation.
- The case for and against cost recovery of control of use regulation; and
- Where possible, evidence (examples and reasons) to support the positions and submissions of stakeholders.

Many stakeholders interpreted this process to be a thinly veiled attempt to lump it all together and pass on costs to the end user, be it companies seeking registration of new products or reassessment of existing products… and of course, the end users (us). However, in reading documentation provided during the process, and attending stakeholder meetings on behalf of the WA vet association, I believe the committee and certainly the consultants charged with the task appear genuinely committed to fixing the entire mess as best they can. This included a very clear invitation to stakeholders to let rip with well supported ideas on how to do it better.

Written comments on the discussion paper were due for submission in early February and are posted on the PISC webpage. The consultants assisting Product Safety and Integrity Committee (PSIC) will continue to consult and liaise with stakeholders during the process of developing the proposal for consideration by the Primary Industries Ministerial Council (PIMC) and eventual implementation by COAG.

A number of key organizations in WA including WAFF and the WA chapter of the AVA (Australian Veterinary Association) liaised extensively in identifying concerns and formulating their submissions. This included making a strong case for commonwealth funding in favour of user-pays, given the potential of farm inputs such as agricultural and veterinary chemicals, fertilizers, environmental contaminants/residues and animal feeds to affect the safety and integrity of primary production commodities and food, and the sustainability of primary production systems. Submissions by WAFF and AVA also included advocating for a risk-based approach to assessment and registration of new and existing products as a way to effectively address problems with the current system. Finally, most stakeholders are strongly in favour of streamlining and unifying the mess of existing control of use legislation to make it clear and simple to ensure that we're all doing the right thing.

What does this mean for pig producers?

It was interesting and enlightening to be part of the review and submission process. This included learning about the concerns as well as common practices of other livestock and agricultural production systems.

The pig industry is unique in that we were among the first to embrace QA systems. A substantial sector of our market is also export driven. This means that pig producers are much more familiar with the notion of HACCP-based management principles. For APIQ accredited farms, structures have already long been in place to deal with most aspects of documentation and compliance with use of controlled substances.

However, with this review, the landscape may now be changing, and it is unclear at this point how it will play out. It is hoped that the eventual outcome will be clearer structures, guidelines and regulations for the control and use of agricultural/vet chemicals. Fortunately, the pig industry is well placed to understand, adopt and integrate any changes that this review may bring.

Further reading:

More about the review can be found at:

- http://www.daff.gov.au/agriculture-food/food/regulation-safety/ag-vet-chemicals/domestic-policy/psic
- http://www.apvma.gov.au/

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