

Pork CRC Initiatives October 2016

Keep your cool this summer

It happens once a year and while the outcomes differ year to year, summer infertility remains a problem for many businesses.

It's therefore best to start thinking now about strategies for this summer. How well you prepare for a likely hot summer will reflect positively in your pigs and your profitability.

The Pork CRC/APL publication 'PREPARING FOR THE SUMMER MONTHS SEASONAL INFERTILITY AND BEYOND' is a good place to start. The manual is quite comprehensive and is accessible on the front page of our website (www.porkcrc.com.au) through to the end of February. I urge you not to leave it until then, as it might be too little too late.

Messages from the manual and globally are.

1. Boar stimulation for gilts and weaned sows is critical and should commence the day of or day after weaning.
2. Include Betaine at 2.0 kg/tonne in lactation diet. Discuss with your nutritionist the use of Betaine and additional vitamins in the gestation diet during summer.
3. Attempt to maximise intake in lactation and discuss with your nutritionist raising the amino acid level of the lactation diet to minimise body protein loss during lactation.
4. Ensure sows have feed available overnight and are fed first thing in the morning.
5. High level feeding from weaning to remating.
6. Use every trick you know to keep sows cool.
7. Minimise/avoid vaccinating sows when feed intake needs to be maximised (sows in lactation and weaned sows).
8. Pay particular attention to P1 sows as they have lower lactation intakes and are more sensitive to elevated temperatures and more prone to summer infertility – less room for a decline in intake. See graphs on page 8 of the manual.
9. Read the manual.
10. Look for take-home messages, then take them home!

Intriguing results

A Pork CRC project (1C 103) started by Prof Paul Hughes and completed by Dr Kate Plush and others from SARDI with assistance from one of our PhD students, Emma Greenwood, has thrown up some interesting findings.

Designed to investigate how to reduce aggression in group housed pregnant sows, it was conducted at the Roseworthy piggery in SA.

Floor space

The researchers found that providing sows with more space (they compared floor spaces of 2, 4 and 6m²) had no effect on average aggression or most other measures of sow behaviour. However, injury scores were higher for the lower ranking sows on the day of mixing at the lowest floor space (2m²). Time after mixing had the biggest impact on aggression, with aggression significantly higher the day of mixing than days 1-4 after mixing (**See Table 1**). The results are similar to those of other Pork CRC projects, confirming that sows adapt rapidly (in this case very rapidly) to mixing and suggest that for sows familiar with group housing, floor space between 2 and 6 m² has little effect on overall welfare,

but reduced space may have short term adverse effects on the welfare of lower ranking sows. There were no effects of floor space on sow reproduction.

Table 1: effect of day after mixing on behaviour and free cortisol levels of group housed sows.

Day after mixing	0	1	3	4	Significance
Fight Number	13.8 ^a	4.2 ^b	5.3 ^b	5.5 ^b	P<0.005
Fight Duration	20.5 ^a	6.5 ^b	8.0 ^b	7.8 ^b	P<0.00005
Time spent eating (%)	5.8 ^a	7.3 ^b	9.1 ^c	9.8 ^c	P<0.0005
Free cortisol (ng/ml)	9.4 ^a	10.8 ^a	7.6 ^b	6.5 ^b	P<0.05

Pheromone effective

The researchers tested how a pheromone (porcine appeasing pheromone - PAP) dispersed from diffusers hung above the mixing pen affected sow aggression. The results are shown in **Figure 1**. Sows in the PAP treatment exhibited significantly less aggression on the day of mixing and through to day seven (when the diffusers were removed) than control animals.

I think the results are surprising and perhaps even amazing. This may be real technology for favourably modifying sow behaviour in a range of group housing situations and during farrowing and lactation and would be worth trying in ESF systems, although, as one producer questioned at the recent SA Pig Day, how effective might the diffusers be in naturally ventilated sheds – probably worth a try. The diffusers are available commercially in France and the EU in general and used in weaner and grower facilities and we’re looking at who might be interested in considering them commercially in Australia. It is the only thing I have seen so far, apart from additional space and time, that can reduce aggression at mixing in group housed sows.

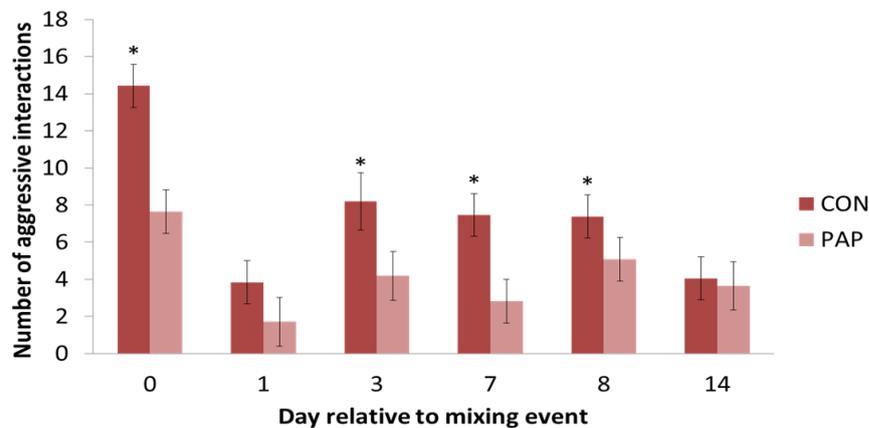


Figure 1: effects of porcine appeasing pheromone (PAP) on aggression in sows at and after mixing

*Denotes significant difference between treatments

Aggressive reproduction

Possibly the most intriguing outcome from the project was the results of a study in which the researchers looked at the effects on aggression and sow welfare at and after mixing in sows mixed at weaning (WEAN), after AI (MAI), or which were placed in groups of six (2m² floor space) and separated from their piglets for seven hours per day during the last seven days of lactation (SEP) or placed in groups of six with their litters for the last seven days of lactation (MS-multi suckled). All sows were weaned at day 28.

All sows had 2m² floor space when grouped after weaning. The sows in the SEP and MS treatments were given boar exposure during the last seven days of lactation and mated if they expressed oestrus in lactation.

Aggression at and after mixing was lowest in the MS sows and they exhibited no fighting on days one and six after mixing. More interesting was that approximately 50% of the SEP and MS sows exhibited oestrus during lactation and had the same subsequent reproduction as sows mixed at weaning or after mating. The treatment results for subsequent pregnancy rate and total litter size are shown in Table 2. MS sows had a significantly bigger litter than MAI sows. Interestingly, further analysis showed that MS sows mated after weaning had significantly and markedly larger subsequent litter sizes than sows from either of the two weaning treatments. The results (Figure 2) are interesting and suggest there may be reproductive advantages associated with boar exposure of sows in late lactation and potentially in conventional farrowing systems.

Although based on limited numbers, the results warrant follow up and are probably worth investigating if similar results can be achieved by exposing lactating sows to boars in the last week of lactation. Perhaps the researchers have revealed a possible new system for reducing aggression at mixing and improving reproduction. The results need to be validated at a commercial level.

Table 2: reproduction of MS (multi-suckle), SEP (sow separation), WEAN (grouped after weaning), and MAI (grouped after insemination) sows. Means with differing superscripts a, b are significantly different from one another.

Treatment	MS	SEP	Wean	MAI	Significance
Pregnancy rate (%)	93.3	90.0	91.7	80.0	NS
Total born	13.8 ^a	12.2 ^{ab}	12.3 ^{ab}	11.0 ^b	<0.05

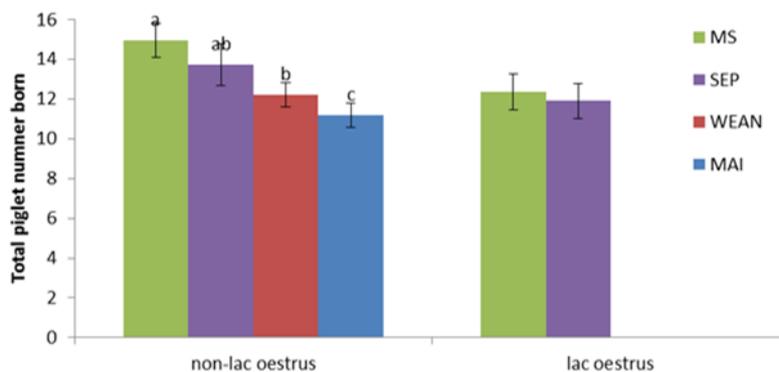


Figure 2: total number of piglets born to MS (multi-suckle), SEP (sow separation), WEAN (grouped after weaning) and MAI (grouped after insemination) sows and that were not mated in lactation (non-lac oestrus) and mated in lactation (lac oestrus). Different superscript letters denote significant differences between treatments.

So, some very fascinating research outcomes by a great group of scientists and students and I haven't even covered Emma's interesting findings on enrichment for group housed sows, but will do so in my November Pork CRC Initiatives column.

The report is one you should read. It's available on our website and I'm also happy to send you a copy if you'd prefer that, tel 08 83137683 or email roger.campbell@porkcrc.com.au

Canada commentary

I don't have time or space this month to cover in detail the more interesting lessons learned while recently in Canada, but I will do so next month. However, below is a snapshot of things worth noting:

- Canada and USA are preparing for a tough ending to 2016 and a scary 2017 as pig supply approaches packer (abattoir) capacity.
- Demand for pork in Canada has fallen over the past 15 years.
- COP in Canada and US in 2015 was \$2.28 and \$2.12 (AUD)/kg carcass weight. In Denmark and Netherlands COP was \$2.66 and \$2.95 (AUD)/kg carcass weight respectively.
- Issues and opportunities raised by industry – reduced antibiotic use (a big deal), group housing of pregnant sows and more exports to China.
- Evidence that sow body condition assessed with a calliper (more objective than condition scoring) has a marked effect on reproduction, with a narrow range for optimum reproduction. I will discuss the findings in some detail next month.
- Introduction of relationship based genetic selection by PIC has dramatically reversed the decline in birth weight with increasing litter size.
- The 2016 lactation targets proposed for commercial operations (in USA) by PIC are 15.7 TB, 14.7 BA, and 13.7 pigs weaned per farrowing, with a 14.3 lb. (6 kg) average weaning weight at 19–22 days of age. Pretty impressive.

Ovugel approved

We were informed at the SA Pig Day that Ovugel (by Pork CRC Participant, Elanco) has been registered by APVMA for use in Australia. Ovugel is designed to synchronise ovulation in weaned sows and enable one shot AI without oestrus detection.

This is great news and it has the potential, especially if used with post cervical AI, to markedly enhance reproductive efficiency in Australia. Based on previous Pork CRC research, it might even play a role in reducing summer infertility. Contact your Elanco rep for more details.

www.porkcrc.com.au