

## **Pork CRC Initiatives APN August 2016**

**By Dr Roger Campbell, Pork CRC CEO**

### **Value adding grains and protein meals using AusScan**

AusScan and particularly AusScan Online has enabled us to see plenty of interesting results for grains and protein meals globally, while confirming the need to know what pork producers are using.

Globally, AusScan has been used to determine the faecal and ileal DE on thousands of grains and lysine and other amino acids on nearly 2000 soyabean meal samples, largely through the efforts of AB Vista which runs the service for their customers.

The numbers are not quite as impressive in Australia and I'm not sure what that says about our nutritionists and mills. Some do have the calibrations on their machines but we're not privy to their results or those received by nutritionists on behalf of their clients. However, we're fortunate that Denis McGrath, on behalf of the Feed Grain partnership, has assessed hundreds of wheats and barleys from the 2015-16 harvest.

#### **Global outcomes**

For global wheats the median faecal DE value was 13.7 MJ/kg. The range was 13.0 to 14.5 MJ/kg, with a couple of outliers at 14.65 MJ/kg.

For global barleys the median value was 12.4 MJ/kg. The range was 11.9 to 13.0 MJ/kg.

#### **Australian outcomes**

The variability in the DE of wheat from the 2015-16 harvest was much lower than that for global wheats and the average DE value somewhat higher than the global median value. Of the few hundred samples tested across Australia by Denis, the average DE was 14.15 MJ/kg and the range was 13.8 to 14.45 MJ/kg.

The average for Australian barleys was 13.0 MJ/kg and the range was 12.6 to 13.5 MJ/kg. Such differences are worth knowing, but the range in DE for both grains is somewhat lower than I had expected.

#### **Lysine levels**

The total and reactive lysine levels for 1400 soybean meal samples and 120 canola meal samples are shown in the table below. The reactive lysine value reflects the amount of lysine available to the pig and the ratio of reactive to total lysine reflects heat damage during processing. The latter, however, is probably an underestimate of heat damage as the level of total lysine also falls as heat damage increases. Nevertheless, the reactive lysine value is what is available to the pig and the value to compare samples and differences between protein supplements on. The median reactive lysine level for canola meal was only 66% of that for soyabean meal. This is indicative of the value of each material, although your computer program will provide a more complete overall assessment by account for all amino acids and other nutrients in the meals – but the bottom line is that soyabean meal is a better source of available lysine and other amino acids than canola meal. AusScan provides information for all amino acids in both meals.

Interestingly, however, reactive lysine content of soyabean meal was more variable than canola meal and ranged from 1.96 % to 3.2%. The ratio of reactive lysine to total lysine ranged from 80% to 100%.

For canola meal the ratio of reactive lysine to total lysine did not exceed 89%, suggesting the processing of canola is somewhat more severe than for soy bean meal. The range, however, was narrower, from 82% to 89%, suggesting damage during processing is being limited to some extent.

Both meals also had a reasonable number of outlier samples all on the lower end of the scale. For soyabean meal the lower levels of reactive lysine were around 1.6% and the percentage of reactive lysine to total lysine below 70%.

For canola meal there were fewer outliers between 1.15% and 1.35% reactive lysine, with the reactive to total lysine ratio ranging from 75% to 80%.

These so called outliers are probably real values for meals subjected to rather harsh processing conditions, but they were a small percentage of the total samples tested.

### Variation reaction

The variation in the reactive lysine content of soyabean meal was much larger than I expected and it is obvious from the table that using average or book values to formulate with could lead to quite significant undersupply or wastage of this most essential of all amino acids for pigs.

The risk of a deficiency or over supply using canola meal would appear to be considerably less, but the number of samples is limited and for both protein meals using AusScan to ensure animal performance is optimised and diet formulation is most cost effective is clearly the way to go.

**Table – AusScan total and reactive lysine levels in soy bean meal and canola meal**

Item	Median value	Upper value	Lower value
<b>Soy bean meal (1430 samples)</b>			
Total lysine (g/kg)	28.2	32.0	24.4
Reactive lysine (g/kg)	26.8	32.0	19.6
Reactive lysine/total lysine (%)	94.2	100	80.4
<b>Canola meal (132 samples)</b>			
Total Lysine (g/kg)	20.6	21.9	17.0
Reactive Lysine (g/kg)	17.6	19.0	14.7
Reactive lysine/total lysine (%)	85.4	88.8	82.3

AusScan Online is available through Elizabeth Owens ([EOwens@symbioalliance.com.au](mailto:EOwens@symbioalliance.com.au)) at Symbio Laboratories <https://www.symbiolabs.com.au> and Ian Wickham ([IanWickham@feedcentral.com.au](mailto:IanWickham@feedcentral.com.au)) at Feed Central <https://www.feedcentral.com.au>.

To create an AusScan Online account, visit [www.aunir.com/products/ausscan-online](http://www.aunir.com/products/ausscan-online) and follow the links. A full list of available calibrations can be found on the Aunir website [www.aunir.com/products/ausscan-online](http://www.aunir.com/products/ausscan-online).

### Sow stories

There has been quite a few articles recently on the feeding and general management of sows.

The main take-home message is to maximise intake in lactation and I sent producers some information on this about a month ago. The information was from Swine Management Services, which has tracked the wean to service interval for their benchmark herds for 10 years. They noted the trend, which had been flat for five years, started to drop in late 2011 and has subsequently been declining. They believe the improvement coincides with producers paying more attention to feeding in lactation by increasing the number of feedings per day, running the drop feed systems longer or adding new feeders or retrofitted feeders with ad-lib feeders with storage hoppers. The same benchmarking results showed that litter size was maximised in sows mated 3-5 days after weaning.

### **Target talk**

Talking with producers and some of our Pork CRC benchmark participants, it seems that the target wean to remating interval should be 5.5 days.

We saw similar results from a large Danish study with Danbred sows – in this case they reported that for sows rearing 14 piglets and weaned at 26 days, subsequent litter size and reproduction in general was positively linked to sow feed intake in lactation and negatively linked to sow body weight loss in lactation.

### **Embryo survival**

At APSA 2015, Pork CRC supported student Alice Weaver and her co-authors compared ovulation rate and embryo survival in sows which lost less or more than five percent body weight in lactation. She found that weight loss had no effect on ovulation rate (22.5) but embryo survival was significantly higher in sows with the lower body weight loss (64.5% vs 57.0%).

We have always known this and feeding sows will be the emphasis of the next South Australian Pig Day, which will be held on September 16. However, the situation is rather complex, as feed intake in lactation is affected by how the sow is fed in gestation, how fat she is, her parity, dietary nutrient content, lactation length, litter size and shed and environmental temperature and they rarely approach maximum intake if fed twice daily.

### **Japanese progress**

The complication was nicely outlined in a recent article in Pig Progress (July 27) in which a research team at Meiji University, Japan, looked at 21 day preservice mean daily temperatures on farrowing rate. They found that temperatures above 20 degrees Celsius during this period reduced farrowing rate and that the decline in farrowing rate between 20 and 30 degrees was largest in parity 1 sows. The results are shown in Figure 2 which is copied from the article.

The poorer subsequent reproduction of parity 1 sows during warmer weather is thought to be associated with their relatively low feed intake during lactation and it seems that during summer, diets of higher nutrient content might assist these sows (maybe all sows), as might reducing their suckled litter size – to whatever extent possible. Cooling the lactation room would also improve summer reproduction of these and other sows, as lactating sows are under immense metabolic 'stress' and their upper critical temperature is quite low, as was pointed out by Caleb Smith at this year's PPPE (check presentation on APL website).

### **Piglet strategies**

If you look at piglet health and survival, the sows and piglets that need to be given greatest attention in the farrowing room are gilts and parity 7 and older sows. Piglets born to these young and older sows tend to suffer more hypoxia during birth and it is where strategies such as the use of

magnesium before farrowing should be directed. We await results of a Pork CRC supported commercial study evaluating different Magnesium strategies before farrowing and I will let you know the outcomes.

The bottom line, however, would seem to be that different parity sows have different needs and constraints and, depending on what parameter you are interested in, improving efforts should be directed at the sows most likely to be affected.

Figure 2 - Increased outside temperature reduces farrowing rate (%) – especially during parity 1.

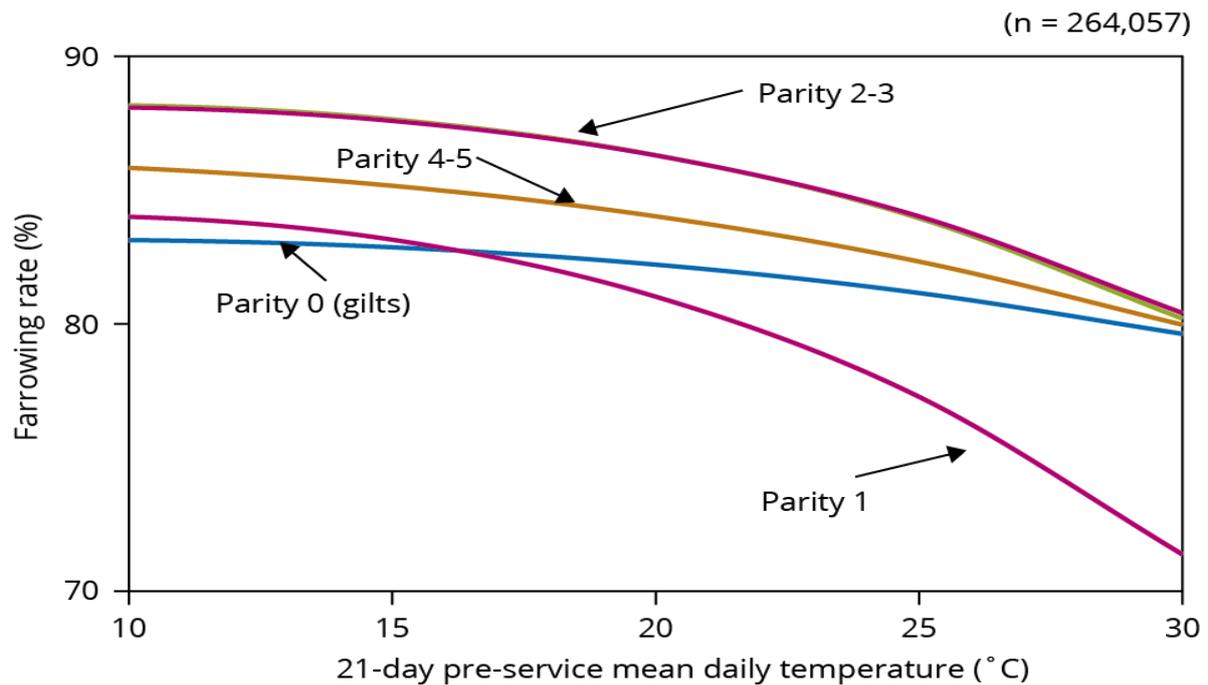


Figure copied from Pig Progress report on sows – July 27 2016.

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