A newsletter for pork producers

PigBytes

Issue 33 April 2017

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Reminder – sow stall use restricted

Jayce Morgan

As most people are aware the pork industry voted (2010) to voluntarily phase out sow stalls by 2017.

APIQ√ statistics reveal that 70% of sows on APIQ√ accredited farms are now sow stall free.

The Model Code of Practice for the Welfare of Animals Pigs 3rd Edition states:

"From 10 years after endorsement of the Code a sow must not be confined in a stall for more than six weeks of any gestation period. An exception is for individual sows that are under veterinary advice or special care by a competent stock-person."

The 10 year period ended 20th April 2017.

In NSW the 'Animal Welfare Code of Practice – Commercial Pig Production' is a relevant code of practice under the Prevention of Cruelty to Animals (General) Regulation 2006.

Use of sow stalls is restricted by law:

'*From July 1 2017 a producer must not:*

a) Confine a pregnant sow, or
b) Authorise a pregnant sow to be confined,

In a stall for more than 6 weeks in any gestation period'

Exemptions only apply if the sow is undergoing veterinary treatment or if the sow requires special care in the form of nutritional or health treatments.

So this reminder is important for those farms still relying on the use of sow stalls for sow housing.

Information and publications on group housing sows can be found on the Pork CRC website.

There are 2 publications for download from the Pork CRC website:

Feeding Pregnant Sows in Group Housing Systems – an update
and
Mixing sows how to maximise welfare
The APL website also has a publication available for download

Group Housing Case Studies

For anyone also seeking alternatives to farrowing accommodation for sows there is also the publication Alternative Lactation Housing on the Pork CRC website

Separation distance between pig and poultry farms

Jayce Morgan

Planning and development enquiries are very common these days. Sometimes we get questions that require a bit more research than usual.

Separation distance between pig and poultry farms is one such query. There exists a conundrum of science, biosecurity, land use rights, different perspectives and regulations.

Regulations

Currently there is no separation distance specified in the regulations within NSW for pig farm to pig farm or pig farm to poultry farm.

The National Environmental Guidelines for Piggeries 2010 have no reference to buffers or separation distances from other pig farms or poultry farms based on biosecurity or pig health.

A poultry farm development becomes 'designated development' if they are located within 500 m of another poultry farm (Environmental Planning and

Assessment Regulation 2000 Schedule 3 (21) Livestock Intensive Industries).

Best practice guidelines for poultry farms suggest separation of 1km between production farms but a separation distance of 5km is recommended for breeder farms.

There is a guideline in Victoria for a separation distance of 3 km for pig to pig farm. This is based on the potential for aerial spread of Enzootic pneumonia (EO) in cool misty conditions of up to 3 km.

Planning and development assessment

The planning and development assessment process in NSW aims to balance the needs of community and business while protecting the environment.

The State Environmental Planning Policy for Intensive Livestock – SEPP30 requires development consent for feedlots and piggeries. Determination of consent requires the 'consent authority' to consider impacts and mitigation strategies for environmental protection, the suitability of the selected site and whether the applicant intends complying with relevant industry codes for health and welfare of animals.

Biosecurity codes of practice for pigs and poultry are referenced on the Animal Health Australia website.

The National Farm Biosecurity Manual for Pork Production makes no reference to separation distances but does state that

"Commercial poultry operations should not be present on the same property, or if they are should be completely separated from the pig operation with an adequate buffer zone"

Identify the risk

There are some diseases that can be shared between pigs and poultry (and humans) such as influenza and salmonella. Mycoplasma and coccidiosis can also be found in pigs and poultry.

However the method of transmission is important – if you can prevent transmission of the pathogens from occurring, the risk of disease is minimised.

Avian Influenza (AI) is considered most serious of the diseases mentioned due to its status as an Emergency Animal Disease (EAD), its ability to mutate into forms that cause illness and death in humans and develop pandemic potential.

Pigs are considered to be a 'mixing vessel' for the virus because they can be infected by human and poultry influenza viruses.

AI virus is infective for almost all commercial, domestic and wild bird species. Infections in monkeys, pigs, ferrets, horses, cattle, cats, seals and whales have been reported. The significance of non-bird species in spreading HPAI viruses is not well understood, but their role appears to be minimal. (AUSVETPLAN Avian Influenza)

Biosecurity

Biosecurity is about managing disease risk and is an integral and proactive part of any successful pig production system. The main objectives in a biosecurity plan are:

1. Prevent the introduction of infectious disease agents to pigs
2. Reduce the spread of disease among pigs on premises already contaminated with a disease agent
3. Prevent the escape and spread of disease agents already present on pig premises to other uninfected livestock populations
4. Minimise the incidence and spread of microorganisms of public health significance

Documents on the Animal Health Australia website suggest:

1. An "adequate" buffer zone between pigs and poultry (National Farm Biosecurity Manual for Pork Production)
2. An employee biosecurity declaration which limits contact with pigs and poultry outside the workplace and specifies the need for hygiene practices such as shower and PPE before commencing work (National Farm Biosecurity Manual for Pork Production)
3. That non-bird species have a minimal role in the spread of the Avian Influenza virus. However pigs have been infected with different sub-types of the AI virus. (AUSVETPLAN Avian Influenza)

So what is adequate separation?

Perhaps in this case we should take our lead from the poultry industry since Avian Influenza is an EAD.

Best Practice poultry guidelines recommend separation of 1 km between poultry farms for production units and 5km separation for breeder units. New development piggeries would do well to consider these separation distances.

But there is nothing written for separation between pig and poultry farms. Disease risk is an animal health and veterinary concern but questions like these are appearing more and more in the planning sphere.

However, as a colleague commented to me – once you set a minimum separation distance it also becomes the maximum separation distance. The example used was the 100 m separation from a water course – no one plans to be 150 m away but they might try for 90 m.

Site selection and control of buffers (separation distances) remain the most critical factors in successful development applications for all size developments.

Floor cooling for sows to beat summer heat

Jayce Morgan

A trial in the USA to evaluate floor cooling to alleviate heat stress on lactating sows has delivered encouraging results.

The cooling pad had an aluminium plate surface, copper pipes and a high density polyethylene base. Ten sows were randomly distributed to 4 treatments:

- Control 0.00 water through pipes (4 sows)
- Low 0.25 L/min (2 sows)
- Medium 0.55 L/min (2 sows)
- High 0.85 L/min (2 sows)

Treatments lasted for 100 minutes and were initiated one hour after the temperature reached 35^{o}C.

Water temperature was monitored every 20 minutes to measure heat removal (watts) but the starting temperature of the water is not mentioned.

Sow respiration rate (RR), vaginal temperature (VT) and skin temperature 15cm posterior to the ear (ST) were measured before the trial, before cooling and every 20 minutes of the cooling phase.

Rectal temperature (RT) was recorded before the trial, prior to cooling and in the last 20 minutes.

The procedure was repeated 8 times (2 times /day for 4 days) and treatments were switched randomly.

Cooling pads reduced respiration rates, rectal temperature and vaginal temperature. Heat removal was significant (P<0.001).

Table 1: Cooling pads with Low, Medium and High water flow rates reduced vaginal temperature (VT), rectal temperature (RT) and respiration rate (RR) in lactating sows.

Treatment	VT (^{o}C)	RT (^{o}C)	ST (^{o}C)	RR	Heat removal (watts)
Control	40.1	40.0	39.4	122	
Low	39.5	39.5	39.0	76	192.7
Medium	39.4	39.2	38.9	67	320.7
High	39.2	39.0	38.6	45	364.8

Reference:

Cabezon FA, Schinckel AP, Marchant-Forde JN, Johnson JS and Stwalley RM 2017 “Effects of floor cooling on late lactation sows under acute heat stress.” *J. Anim. Sci. Vol.95, Suppl,2/J. Dairy Sci. Vol. 100, Suppl.1*

Can high fibre diets for gestating sows improve piglet survival?

Jayce Morgan

High fibre diets for pregnant sows have been recognised as beneficial to dry sows to increase satiety and reduce conflict among group housed sows. “…the high fibre diet reduced aggression after feeding in group housed sows by 75 per cent and increased the time sows spent feeding by 150 per cent.” (Pork CRC)

In this study the different diets were only fed from day 5 to day 34 after mating as they were only looking at sow aggression effects. The fibre was provided by addition of cereal straw, oat hulls and oats at levels of 40%, 14% and 13% of diet respectively to the high fibre diet. The high fibre diet was 25% crude fibre and the low fibre diet was 5% crude fibre.

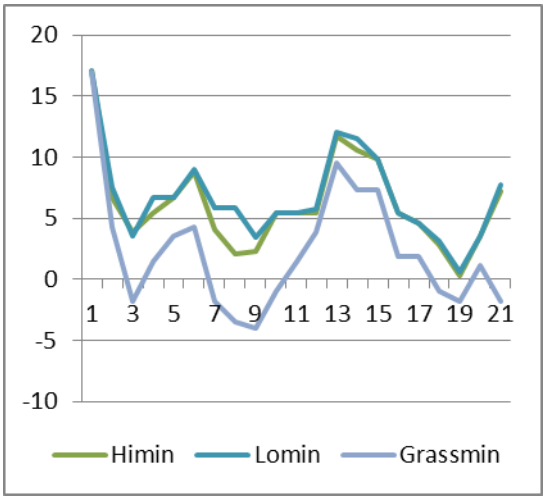
Is it possible a high fibre diet could also improve piglet survival and alter colostrum composition?

In July/August 2016 curiosity about piglet survival in outdoor herds led to a 3 week monitoring of

temperature conditions within a sow farrowing hutch on a piggery at Denman NSW.

Over this period night time temperatures within the hutch were mostly <15°C and often <5°C. Yet sows were farrowing and piglets were surviving – several sows raised 13 or 14 piglets in these conditions.

Graph 1: Temperature graph from loggers in a farrowing hutch July August 2016. Minimum temperatures are from loggers set high and low within the hutch (Himin and Lomin respectively) and the temperature of the outside grass (Grassmin)



Records are lacking so I don't know the herd's overall performance; however the litters of 14 piglets surviving-and-thriving got me wondering.

Figure 1: Litter of piglets in farrowing hutch on an outdoor pig farm.

Were these 'super' sows?

Did the piglets have some mechanism that allowed them to survive in these harsh conditions – harsh because recommendations for creep area temperatures are usually around 30°C?

Or was there some dietary component or environmental effect on the sow's diet that gave her 'magic' colostrum?

(These sows were outdoors and fed purchased feed as well as whatever was in the pasture.)

Two potential avenues of investigation are:

- Piglet physiology and whether high fibre diet of the sow during gestation allowed development of more 'brown' fat reserves in the piglets which allowed them to survive the cold?
- Sow diet (high fibre) and its effects on the colostrum quality or quantity?

A quick review of the literature revealed that it is pretty well accepted that piglets have little in the way of reserves of body fat of any kind.

Brown fat supplies energy and heat to newborns and hibernating animals. It is different in structure and function to normal white fat. Piglets have limited fat reserves at birth thus the need to suckle as soon as possible.

Adequate colostrum intake and a cosy creep were necessary for piglet survival. (Of course the other great danger to survival is overlay by the sow.)

But I still wonder if there are differences between breeds and cross breeds, between individual pigs, genetic lines and different diet effects.

What about sow diet? Outdoor pigs have access to and eat a lot more fibrous materials – pasture and straw bedding for example.

Two studies from 2009 (Quesnel *et al*) and 2013 (Loisel *et al*) respectively did show some interesting effects after sows were fed increased dietary fibre in gestating sow diets.

Both studies used gilts with Large White/Landrace genetics. Dry sow diets were based on barley and wheat; the extra fibre for both diets came from soybean hulls, wheat bran, sunflower meal and sugar beet pulp.

All animals were fed to provide the same dietary energy levels so sows on high fibre (HF) diets had a larger allowance; 2.4 (LF) vs 2.8 kg/d (HF) for the 2009 study and 2.60 (LF) vs 2.93 kg/d (HF) for the 2013 study.

In the 2009 study dry sow diets were Control (LF) with 2.8% crude fibre and high fibre (HF) with11.0% crude fibre. This diet was introduced from day 26 gestation and fed until farrowing.

In the 2013 study the dry sow diets were LF 13.3% and HF 23.4%. The HF diet was introduced gradually from d91 – by d106 the HF sows were on the full experimental diet.

After farrowing all sows were fed a standard lactation sow diet. Farrowing in the 2009 study was natural; while in the 2013 study was induced at day113.

In both studies there were various hormone assays of blood and colostrum; and metabolite assays of bloods pre and post farrowing. For this article I have only focussed on the sow and piglet performance in terms of farrowing, differences in colostrum production and piglet growth.

Sow and piglet performance (2009 Quesnel *et al*.):

- Sows fed the HF diet during gestation consumed 0.94 kg/d more feed during lactation than the control sows
- No significant difference in colostrum production or composition between treatments
- Estimated mean DM yield of milk between farrowing and 21 d of lactation tended to be greater from sows fed the HF diet 1876 ± 96 vs 1702 ± 80 g/d
- Mean piglet body weight at birth, at 24 and 48 hours of age, and body weight gain during the first 48 hours did not differ between the 2 groups but
- Litters from sows fed the high-fibre diet during gestation grew faster than piglets from control sows and litters tended to be heavier by 8.2 kg at weaning.

Sow and piglet performance (2013 Loisel *et al.*):

- There were no differences between treatments in feed intake during lactation
- There were no significant differences for birth weight of piglets, rate of still born piglets, birth to suckle interval, piglet body weight gain between farrowing and 24 hrs, average colostrum intake or estimated colostrum yield.
- Colostrum composition was different between treatments. Colostrum from HF sows at 24hr contained more lipids and less IgG and IgA than colostrum from LF sows.
- The proportion of piglets that did not suckle within 45 minutes after farrowing was lower in litters from the HF sows
- Low birth weight piglets (600 to 900 g) were similar in number between treatments. Low birth weight piglets from the HF sows consumed more colostrum than low birth weight piglets from LF sows. Their body weight gain for 24 hours was76% greater than the low birth weight piglets from LF sows.
- Pre-weaning mortality was lower in litters from HF sows (6.2%) than LF sows (14.7%)
- Pre-weaning mortality for low birth weight piglets during lactation was 18% for HF treatment and 31% for the LF treatment.

As both studies conclude there is need for further investigation but increased fibre in gestating sow diets did improve piglet survival especially among light birth weight piglets (2013 Loisel *et al.*) and increased litter weight at weaning (2009 Quesnel *et al*.).

The type and amount of fibre will be important, and larger litter sizes tend to have more light weight piglets.

It would be a bonus if more piglets could survive simply through addition of more fibre in a sow gestation diet which also gave benefit to the sow during gestation as well.

However use of sugar beet pulp would not be cost effective in Australia. The special properties of this ingredient are thought to be the non-starch polysaccharides of pectin and hemicellulose; and no feed ingredients with similar properties have been identified at reasonable cost in Australia (Pork CRC)

It would be interesting to see if the diet used by the Pork CRC (addition of cereal straw, oat hulls and oats) in the reduced aggression study had any effect on piglets and sows performance.

More research…….

References:

Pork CRC Feeding pregnant sows in group housing systems – An Update

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Loisel F, Farmer C, Ramaekers P, Quesnel H “Effects of high fiber intake during late pregnancy on sow physiology, colostrum production and piglet performance” J. Anim. Sci. 2013.91:5269-5279 doi:10.2527/jas2013-6526

Reflections on VIV Asia, Bangkok, Thailand

Sara Willis

A visit to Bangkok, Thailand from Monday 13 to Thursday 16 March 2017 provided an insight into developments in the global pig and poultry industries.

The visit included attendance at VIV Asia and the Trow Nutrition Conference 'New Concepts in Trace Mineral Nutrition'. VIV Asia is the largest international platform for Southeast Asia's booming animal protein production and processing industry.

The three day event held every two years attracted over 40 000 visitors and featured 1050 exhibitors from 53 countries including China, the USA, the Netherlands, France, Germany and those in the ASEAN community.

This year along with other visitors from Australia, I heard firsthand the issues influencing pig production including animal health, environment and nutrition.

The trade exhibits covered a range of businesses relevant to pigs, meat chicken, egg production, dairy cattle and aquaculture and show cased a vast array of technologies and innovations for the animal industries.

Displays covered animal breeding equipment, animal nutrition, egg processing, feed processing equipment, feed additives, meat processing equipment, meat products, milk processing, nutritional supplements, packaging and raw materials.

Under the theme “From Feed to Food”, a common thread for the seminar sessions was reducing antimicrobial use in food animals and antimicrobial alternatives.

Antibiotics are under scrutiny all over the world as overuse can lead to the occurrence of antimicrobial resistance.

An increasing number of reports on antibiotic-resistant bacteria in animals and humans have raised concerns about the use of antimicrobials, both as a treatment for humans and to combat disease in animals.

Antibiotic growth promoters have been banned from animal feed in the European Union (EU) since 2006 and other countries outside the EU are now following their example.

Denmark, Netherlands, Belgium and France now all formally aim at reducing the total amount of antimicrobial usage, some with specific reduction targets expressed as percentage of usage reduction measured at the national level.

Some countries intend to go one step further in that they aim to measure usage at individual farm level.

Denmark, a leader in the field of usage registration has introduced usage reduction targets. Under this policy, a farmer receives a “yellow card” if antimicrobials are used in a quantity two times higher than the national average.

The farmer then needs to take measures to reduce usage. This scheme has led to a reduction in antimicrobial use for therapy of almost 25% during the past two years. The Netherlands use a similar “traffic light” system.

During my visit to VIV Asia and attendance at the seminars, I heard from a number of leading international nutritional health companies promoting recent research and developments on potential dietary technologies to reduce the reliance on antimicrobials.

These included research on short and medium-chain fatty acids and other organic acids, prebiotics and fibres, probiotics, botanicals with a wide range of plant extracts and microbial derived additives from yeasts and fungi as well as trace mineral sources.

In general, these tools can be used to positively influence the gut microbiota and immune system in a specific, desired direction.

Other factors important for preventing disease that need to be considered include cleaning and disinfection of pens and sheds, temperature control, ventilation systems to improve air quality, reducing stocking density, consistent nutrition, high standards of biosecurity and staff training.

The opportunity to visit VIV Asia and attend the seminars provided insights on the challenge of reducing antimicrobial use and improving feed efficiency.

NSW Department of Primary Industries (NSW DPI) Pig Industry Group

Jayce Morgan
Development Officer Pigs.....02 6763 1257

Dr Amanda Lee
Senior Veterinary Officer (Pigs and Poultry)
…….....02 4640 6308

Alex Russell
Manager
Intensive Livestock Industries …… ...02 6881 1212

Victorian Department of Economic Development Jobs Transport and Resources (DEDJTR) – Pig Industry Group

Youssef Abs El-Osta
General Manager-Pig Centre……03 5430 4590

Patrick Daniel
Manager Pig Health Monitoring Service
(PHMS) ..... ……03 54304570

Queensland Department of Agriculture and Fisheries (DAF)

Sara Willis
Principal Extension Officer……07 4529 4214

PigBytes is a newsletter from the pig industry team at NSW DPI, Victorian ECODEV and Queensland DAF.

Editor: Jayce Morgan
jayce.morgan@dpi.nsw.gov.au

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ISSN 1836-974X

Published by the Department of Primary Industries.

Reference number pub17/210