Rearing pigs without antibiotics

Conference Report

Holistic management is essential for successfully rearing pigs, particularly in systems that aim to minimize antibiotics. The method emphasizes the interconnectedness of various factors contributing to sustainable pig health and productivity. Some of the key components of this holistic management were discussed by Dr. Seksom.

Sow lifetime productivity

Suggested targets for sow lifetime productivity are

- >70 marketed fattening pigs
- At least 6 parities with at least 10.5 pigs marketed per parity
- 25 fattening pigs/sow/year (2.4 parities/year x 10.5 fattening pigs)

To achieve these targets, we need 29.2 born alive piglets/sow/year (or 12.2 born alive piglets/parity), and it is essential to control losses during each production period: <10% pre-weaning, <3% during nursery, and <2% in fattening.

Since the occurrence of African swine fever (ASF), with improved genetics, we can now produce pigs with 120 kg+ bodyweight at slaughter without carcass problems and reach about 3 tons of bodyweight/sow/year, compared to around 2 tons before.

Modern pig genetics and subsequent problems

Despite the advancements in modern pig genetics leading to improved production and bigger litters, several ensuing problems have emerged:

- Less average body weight of piglets at birth
- Large number of piglets born with less than 1.0 kg (target <5%)
- High pre-weaning mortality
- High post-weaning mortality and morbidity

Dr. Seksom highlighted that birthweights decrease with increasing sow prolificacy. He stated that “piglets should be divided into groups with similar body weights at weaning” and that “a key objective for successful weaning is a piglet that weighs a minimum of 6-6.5 kg at three weeks of age, and that less than 25% of the piglets have a weight of ≤5.9 kg.”

Sow body condition

Sows should be fed to feed to body condition score (BCS), not a fixed amount of feed. Ideally, the sows have a BCS of 2.75 (the sow’s backbone is visible, and the tips of the short ribs can be felt but are smooth) or 3.0 (well-rounded appearance, hips, and spine can only be felt with firm pressure) at 12 weeks of pregnancy, so we can feed more in the last month to achieve a BCS of 3-3.25 at farrowing. This is essential to ensure that sows have sufficient energy reserves for lactation and overall health.

Target body condition score – 2.75 at three months of gestation

Feed intake must be increased gradually during the last month of gestation as most fetal growth and mammary gland development occur during this period. This may involve raising energy-dense feeds or adjusting protein levels as needed.

Dr. Seksom stressed that “nutrition is not just the feed; it’s about feeding as well. To feed sows to BCS, assessments of BCS should be done regularly throughout gestation, ideally every 2-4 weeks. This allows for timely adjustments in feeding based on individual sow’s needs. Ensure that staff are trained one-on-one to accurately assess the body condition of sows. This includes recognizing the visual and tactile indicators of different scores and understanding how BCS impacts reproductive performance, longevity, and overall farm profitability.”

After farrowing, the sows must be monitored closely for any signs of excessive weight loss and feeding strategies adjusted accordingly to support recovery and lactation needs.

Piglet diarrhea

Many factors cause diarrhea and must be thoroughly investigated. For bacteria-caused diarrhea, Dr. Seksom advised a good hygiene program, whereas for viral causes, a vaccination program is essential. However, he emphasized that “for a vaccination program, you can’t just copy from another farm; it needs to be created specifically using the titers for diseases on your farm.”

Swine influenza is an often-overlooked cause of diarrhea in piglets. While it is primarily recognized for causing respiratory issues, the virus can also lead to scours in the first two weeks of piglets’ life. So, sows should be checked for symptoms of swine influenza (such as nasal discharge, sneezing and coughing, and inappetence) before farrowing. If necessary, they must be treated with paracetamol to reduce fever and symptoms.

Main disease causes of pre-weaning diarrhea

	Nursery period				Mortality level
	Days 1-3	Days 3-7	Days 7-14	Days 14-21	
Agalactia	√	√	√	√	Moderate
Clostridia	√	√	√		High
Coccidiosis		√	√	√	Low
E. coli	√	√	√		Moderate
PED	√	√	√		Variable
PRRS	√	√	√	√	Variable
Rotavirus			√	√	Low
TGE	√	√	√	√	High
Influenza		√	√		Low

Ensuring colostrum intake

The intake of an adequate quantity of colostrum is crucial for piglets to be protected during the first days of life. Best practices to ensure that piglets get □250 mL of colostrum include:

- **Teat access –** if a sow has a large litter or is unable to nurse all her piglets effectively, consider split suckling by separating larger, more vigorous piglets from the litter for a couple of hours after birth. This allows smaller or weaker piglets better access to the udder without competition. Syringe-feeding colostrum to smaller piglets is also effective.
- **Early access –** six hours after farrowing, the quality of colostrum begins to decline significantly. Additionally, the piglet can only absorb intact large IgG molecules, the major source of passive immunity, during the first 24 h after birth, prior to gut closure. In any case, by this time, the sow will start producing milk and not colostrum.
- **Sow behavior –** if a sow experiences pain or discomfort from injuries caused by her piglets’ teeth, she may become less willing to allow them to nurse, leading to delays in colostrum intake. Genetic background influences maternal behavior significantly. For example, some breeds exhibit stronger maternal instincts and better nursing behaviors than others. Selecting sows with proven good maternal traits can lead to improved outcomes in piglet survival and growth.
- **Drafts –** newborn piglets are born with low fat reserves and are highly susceptible to hypothermia. Drafts significantly impact the effective temperature experienced by piglets.
- **Staff training –** Staff must be trained to recognize signs of distress in both sows and piglets;

training in techniques enables them to assist with nursing and feeding, which is crucial for timely interventions.

Weaning is a process, not just a one-time event

Research has shown that heavier piglets at weaning have better lifetime performance than lighter ones. Weaning weight is a more accurate indication of post-weaning growth than either birth weight or age. It is, therefore, important to establish the weaner immediately post-weaning to maintain growth rates, reduce pen variation, and lessen the amount of 'tail-enders' at the point of sale.

Dr. Seksom emphasized that "viewing weaning merely as a single event, rather than a process, overlooks the complexities involved in ensuring a smooth transition for the animals. He advocated for a comprehensive approach to weaning that includes the shown well-planned steps to support piglets during this critical phase. If the weaning process is managed effectively, you can significantly reduce the need for antibiotics."

Conclusion

"By integrating these holistic management strategies, pig producers can effectively raise pigs without antibiotics while promoting animal health, improving productivity, and addressing consumer concerns about antibiotic use in livestock production," summarized Dr. Seksom.

EW Nutrition's Swine Academy took place in Ho Chi Minh City and Bangkok in October 2024. Dr. Seksom Attamangkune, a leading expert in the nutrition and management of pigs in tropical conditions and former Head of the Animal Science Department and Dean of the Faculty of Agriculture at Kamphaeng Saen, Kasetsart University, was a reputable guest speaker at this event.

Building and boosting the immunity shield of pigs

Conference report

A well-functioning immune system is vital for the survival and performance of animals. It helps piglets cope with challenging periods, such as their first days of life or weaning. Measures can be taken around farrowing to support the piglets during their first days by enhancing the quality and quantity of colostrum and helping them develop their own immune system as fast as possible.

Adequate feeding of the sow before and around farrowing

Feeding of both the sow and the piglet has an important influence on farrowing, the health of the sow, colostrum and milk production, piglets' development of immunity, and their later performance. A well-functioning immune system is crucial for the piglets to withstand upcoming challenges such as weaning.

Colostrum quality can be influenced by feeding

Newborn piglets have no functioning immunity system. They rely entirely on immunoglobulin G (IgG) absorption from colostrum within the first few hours after birth to establish their immunity shield. Dr. Megan Edwards, Animal Nutrition Consultant from Integral Nutrition (S) Pte Ltd, highlighted the payback of adequate colostrum quality and intake: Adequate colostrum intake can positively affect whole-of-life immunity and, ultimately, growth performance. The contained IgG is essential for providing passive immunity to piglets, protecting them from infections during their early days of life when their immune systems are still developing. There is a positive correlation between the amount of IgG they absorb from colostrum and their performance. This benefit of colostrum intake is independent of birth weight.

We have a 3-week window to influence colostrogenesis. However, the fat content of colostrum is determined in the last 48 hours before farrowing. According to Dr. Edwards, influencing colostrum quality is generally easier than affecting quantity. She identified several compounds that can serve as immunomodulators, such as MCFAs, yeast extracts, and butyrate. However, by moving IgG to colostrum and milk in late gestation and lactation, the sow compromises her immunity status by depleting her own reserves for about two weeks.

Feeding at farrowing

Sow body condition has been shown to have more impact on colostrum yield than feeding level. The highest colostrum yield was achieved when sows entered the farrowing unit with a moderate body condition (3-3.25 – the ribs, spine, and hip bones can only be felt with firm pressure but are not visibly prominent). Overfeeding should be avoided to prevent sows from becoming excessively fat pre-farrowing.

Sows experience increased energy demands during farrowing due to the physical demands of parturition and the physiological changes occurring in their bodies. Dr. Edwards does not encourage withholding feed on the day of farrowing and suggests offering up to 3kg if the sow has the appetite. Feeding just below the energy requirement helps the sow to mobilize her own body fat.

Many producers mistakenly withhold feed on the day of the farrow to reduce the incidence of constipation. Feeding, however, stimulates gut motility. Withholding feed can slow down gut transit time and actually increase the likelihood of constipation.

Piglet feeding for developing intestinal tract and immune system

In piglet feeding, two strategies are decisive: the early intake of immunoglobulins via colostrum to protect the piglets against pathogens during their first days of life and the offering of creep feed to stimulate their intestinal development.

High-quality colostrum as much and as soon as possible

When the piglets are born, it is of the highest importance that they ingest colostrum as much and as soon as possible. The piglet can only absorb intact large IgG molecules, the primary source of passive immunity, before gut closure, which begins about 6–12 hours after birth and progresses rapidly to completion in about 24 hours. In any case, the sow will start producing milk by this time and no more colostrum. The concentration of colostrum IgG decreases by 50% within 6 hours after the birth of the first piglet. The target is for piglets to consume 250 g of colostrum within the first 24 hours, ideally within the first 6 hours. However, about 30% of sows produce insufficient colostrum.

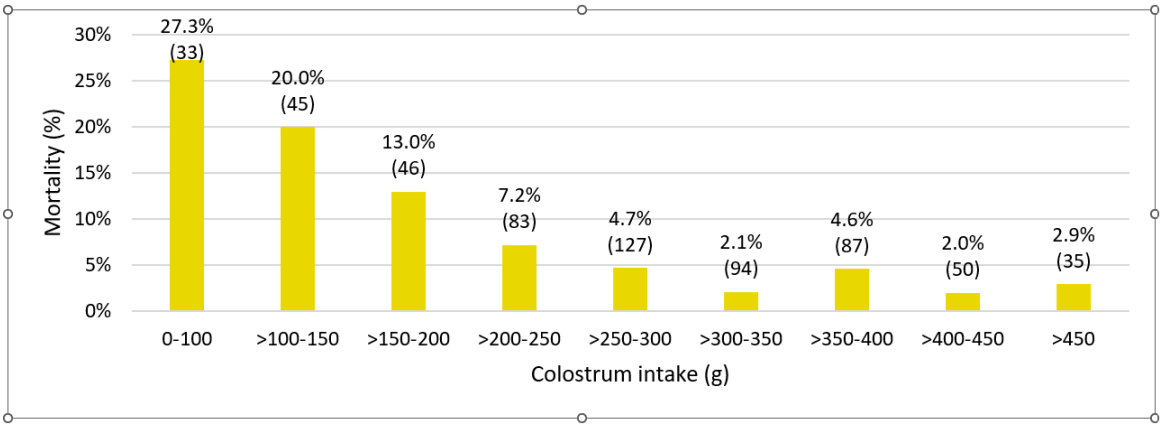

Figure 1: Mortality of piglets until 42 days of age according to intervals of birthweight and colostrum intake
(Hasan *et al*. 2019; the numbers of piglets are shown in parenthesis)

Split suckling jump-starts weak piglets

Split suckling is an effective management strategy to improve piglets' access to colostrum and milk, particularly in increasingly common situations where sows give birth to large litters. This involves temporarily separating the more vigorous piglets from the sow to allow smaller or weaker piglets better access to the teats. This method helps ensure that all piglets receive adequate nutrition during the critical early hours after birth.

Large litters provoke energy deficiency in piglets

Piglets are born with limited energy reserves (glycogen and brown fat tissue). Ingestion of colostrum is associated with a considerable increase in the metabolic rate, contributing to maintaining body temperature. About 70% of the piglets' energy requirement in the first 72 hours is provided by colostrum. "Most piglets that die within this period do so primarily due to energy deficiencies rather than immune-related issues. The trend towards larger litter sizes has exacerbated the issue of energy deficiency," stated Dr. Edwards.

Creep feeding

The primary role of creep feed is to accelerate the development of the piglets, their digestive and immune systems, and their gut microbiome, not for weight gain. Creep feeding helps evolve digestive enzymes and acid secretion necessary for breaking down complex carbohydrates and proteins. This early feeding supports piglets in adapting to solid diets, mitigating stress during weaning.
Creep feeding also helps piglets develop an oral tolerance to avoid transient hypersensitivity due to various dietary ingredients. This process is essential for preventing allergic reactions and hypersensitivity, which can occur when the immune system mistakenly identifies harmless substances as threats. It takes about two weeks for the piglet to recognize an ingredient as a nutrient, not a pathogen. To facilitate this process, she recommends that creep diets contain a broad range of ingredients at low doses. This approach gradually exposes piglets to various nutrients, allowing their immune systems to adapt without overwhelming them with high concentrations of any single ingredient.

Mycotoxins must be managed – even in piglets

The significance of mycotoxins in piglets is often underestimated due to their relatively small feed intake. However, there is substantial evidence that mycotoxins can be transferred from sows to piglets through colostrum and milk, which can have profound health implications.

Dr. Edwards is convinced that managing mycotoxins is managing immunity. Mycotoxins are transferrable

via the placenta, colostrum, and milk. There is a positive correlation between the mycotoxin levels in feed and colostrum. For example, adverse effects seen in piglets consuming colostrum with low doses of deoxynivalenol (DON) include:
• Decreased villus height
• Reduced mucosal integrity
• Increased inflammation
• Alternated immune response
The bottom line is that mycotoxins are a real and everyday risk to the immune quality of your piglets.

Nutrition influences piglets' immune development

Dr. Edwards summarized that adequate nutrition is fundamental for developing a strong immune system in pigs, which is the basis for high performance. By focusing on the appropriate nutrition of the sow, ensuring an adequate intake of high-quality colostrum intake in piglets, and implementing creep feeding strategies, producers can significantly enhance the lifetime health and productivity of their piglets from an early age.

EW Nutrition's Swine Academy took place in Ho Chi Minh City and Bangkok in October 2024. Dr. Megan Edwards, an Australian animal nutrition consultant with global research and praxis experience and a keen interest in immuno-nutrition and functional nutrients, was an esteemed guest speaker at this event.