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.

Optimising Weaner Performance

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To optimize weaner performance, it is helpful to understand the stressful situation the piglets are facing. In contrast to weaning in nature, which occurs gradually until completion at approximately 4-5 months, weaning in intensive pig operations is an acute process, typically occurring at 3-4 weeks of age. This critical phase subjects piglets to multiple stressors, which can have cumulative effects on their health and development.

Furthermore, the weaning process usually coincides with a decline in the levels of maternally derived antibodies. As these antibody levels decrease, piglets become increasingly susceptible to infections, particularly during the stressful transition to solid food and movement from the sow to the new nursery environment. Managing the weaning process carefully is crucial to minimize stress and support immune function.

Weaning factors that influence a successful weaning

Several aspects must be considered to provide the weaning piglets with the best conditions, and diverse measures must be taken. These measures range from the social environment to nutrition, hygiene, and the people dealing with the pigs.

Social dynamics

When forming nursery groups, aim to keep pigs in these groups as long as possible. Moving all pigs to their new environment at the same time can promote a more rapid establishment of social stability. If possible, once weaning groups are selected and placed in the nursery, keep these groups together to harvest. Any change in the pig group will again result in the need for a new hierarchy to be established, along with fighting and disrupting the group. “Allow newly selected nursery groups to establish their hierarchy by avoiding interventions during the first 48 hours, except to treat sick or injured pigs”, recommends Dr. Parke. “A well-enriched environment, such as chewable ropes and toys, can help reduce stress levels and may reduce the frequency of abnormal behaviors such as tail biting and aggression.”

Environmental management

The piglets should be kept at an optimal temperature between 27-30°C – depending on floor type, weight, and age of piglets. Adding a heat lamp/floor mat warm area for just-weaned piglets will further assist thermoregulation and minimize stress through the weaning transition.

Proper ventilation is crucial for maintaining air quality and preventing the buildup of harmful gases like ammonia. Good airflow helps regulate temperature and humidity, reducing stress on the pigs. However, care must be taken to avoid drafts that can chill young pigs. For example, a draft of 0.5 m/second can ‘feel’ like an 8°C drop for the piglet.

Targets for gas, dust, and bacteria levels

Risk factor	Gas			Total dust	Respirable dust	Bacteria
	Ammonia	Hydrogen sulphide	Carbon dioxide			
Target levels	<10ppm (20ppm max.)	<5ppm	<3,000ppm (aim for <1,500ppm)	2.4mg/m^3	0.23mg/m^3	100,000 CFU/m^3

Flooring and pen materials should be robust, in good condition, and easily cleaned to reduce the risk of skin abrasions and subsequent infections.

Provide sufficient space (recommended 0.19 m^2/8 kg pig on slat/solid floor) in pens to minimize competition for feed and water and to reduce social stress among piglets.

Weaner pigs benefit from using the same type of feeder in the nursery as in the farrowing room. This consistency can help to reduce stress and anxiety during the transition to the nursery and increase the feed intake during the first few days post-weaning.

Nutritional support

Weaning stress and poor feed intake post-weaning commonly result in dysbiosis and a decrease in villus height in the small intestine of piglets. Associated digestive impairment and altered gut morphology can lead to decreased nutrient absorption, as well as enteric and systemic health issues. A palatable transition diet, from 7 days pre- to 7 days post-weaning, is recommended to keep piglets eating. The composition or form of the transition diet should remain the same during this period. Consider using functional feed additives, such as phytomolecules or egg immunoglobulins, to support microbial modulation and gut integrity.

Ensure piglets have access to fresh, cool, and clean water (minimum water flow of 0.5-0.7L/minute), with enough drinking space (maximum of ten piglets per drinker). Consider providing additional water supply points (e.g., bowls) in the first week.

Hygiene and biosecurity

All-in, all-out management avoids the mixing of different age groups. It is particularly beneficial for weaner pigs, as it helps minimize disease transmission. After removing each batch of weaners, the nursery must be thoroughly cleaned, disinfected, and dried. This includes not just the floors but also feeders, waterers,

and any equipment used in the room.

There should be strict rules for everything that comes through the external perimeter fence. Internal biosecurity is also essential, e.g., changing into clean, disinfected boots and thoroughly washing hands when moving between rooms/buildings.

Routine monitoring

Regular and proactive monitoring of weaner pigs, including carefully observing their behavior, is essential for ensuring their health and optimizing growth performance. By implementing effective monitoring strategies, producers can identify potential challenges early and take timely interventions to minimize negative impacts.

Pig positive people

Dr. Parke emphasized that the attitude and skills of stockpersons play a significant role in reducing stress during this vulnerable weaning transition period. Positive handling can improve piglet welfare and their future response to human contact, which is crucial for their short and long-term production performance.

Piglets that receive positive handling are likelier to demonstrate affiliative behaviors towards humans, facilitating smoother transitions during weaning and enhancing their overall development. Stockpersons should be trained to recognize signs of stress or discomfort in pigs.

Collaborative approach

“Collaboration is critical for successful weaning; we can’t have silos in pig production unless it’s to store feed,” joked Dr. Parke. “By adopting a proactive approach that emphasizes collaboration and comprehensive management strategies across the production system, pig welfare and long-term productivity of the herd will be enhanced,” she concluded.

EW Nutrition’s Swine Academy took place in Ho Chi Minh City and Bangkok in October 2024. Dr. Merideth Parke, Global Application Manager, Swine, was one of the highly experienced speakers of EW Nutrition. She is a veterinarian who strongly focuses on swine health and preventive medicine.

Successful weaning requires adequate pre-weaning preparation

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The abrupt transition from the sow's milk to solid feed, combined with environmental changes and social restructuring, creates a challenging situation for young piglets. Weaning is a critical phase that subjects piglets to multiple stressors, which can have cumulative effects on their health and development. Weaning stressors are inevitable in the piglets' development; however, effective pre-weaning management practices can significantly minimize their impact on health and performance.

Pre-weaning measures help improve weaner performance.

"Successful weaning of piglets is a multifaceted process that requires careful management and strategic planning well before the actual weaning event," says Dr. Merideth Parke, Global Application Manager, Swine, EW Nutrition. She emphasized the following key pre-weaning factors that can significantly influence success during this most critical time.

Genetics

Selecting the right genetics for your specific production system is crucial for ensuring successful weaning outcomes. The genetic traits of sows with a direct impact include sow resilience, litter size, piglet birth weights, and overall growth rates.

Furthermore, it is decisive for piglets' survival and performance that the sow shows strong maternal instincts, and, to ensure enhanced colostrum and milk uptake, an adequate number of functional teats and high milk production.

Gestation and farrowing influencers

Having an optimal body condition score at farrowing is essential for sows. Being overweight or underweight poses the risk of prolonged farrowing and reduced colostrum and milk production.

On the piglet side, prolonged farrowing negatively impacts their vitality at birth, which correlates with reduced colostrum uptake and increased pre-weaning mortality rates.

Environmental conditions

Newborn piglets are particularly vulnerable to hypothermia and have a minimal critical temperature of 33-35°C. Below this range, they struggle to maintain their body temperature, which can lead to increased mortality rates. Cold piglets are less likely to suckle, compromising their energy reserves and ability to maintain body temperature.

In contrast, lactating sows have an optimal temperature of 18-22°C to maximize feed intake and milk production. Therefore, to balance the temperature needs of sow and piglets, it is essential to create a controlled temperature, draft-free creep microenvironment for piglets.

Hygiene

The hygiene of farrowing crates plays an essential role in the successful weaning of piglets. Maintaining a clean environment significantly impacts the health and growth of piglets, ultimately influencing their survival and weight at weaning. “We must consider the time spent cleaning, disinfecting, and drying farrowing crates an investment, not a cost,” emphasized Dr. Parke. “Doing these routine tasks really well will inevitably reduce the time spent treating sick pigs.”

Lactation phase

The primary objective of pre-weaning measures is to ensure adequate colostrum and milk production throughout lactation while beginning the adjustment to solid feed. Efforts should be directed toward facilitating nursing access for all piglets, with particular attention to smaller or weaker ones probably facing difficulties accessing teats.

Split suckling can be the method of choice for improving their colostrum and milk intake, particularly in large litters. For that measure, larger, more robust piglets are separated, allowing smaller or weaker piglets to nurse first. Once the weaker piglets have had sufficient time, the groups are swapped.

However, according to Dr. Parke, fostering piglets is recommended to be undertaken cautiously. “While it can be beneficial, it can significantly disrupt pathogen stability and teat hierarchy, particularly when it occurs after the first 24-48 hours of birth when piglets have established their preference for specific teats. This can increase fighting among piglets as they establish a new hierarchy. This aggression can result in injuries, especially for weaker or smaller piglets. Fighting can also cause damage to the sow’s udder, leading to infections or mastitis, compromising milk production and overall sow health,” she stated.

Nurturing the gut

Providing creep feed for a minimum of 7 days before weaning significantly boosts litter weight at weaning and reduces the risk of post-weaning fallback. Early exposure to solid feed accelerates the development of digestive enzymes and acid production, both essential for breaking down carbohydrates and proteins.

Combining pre-weaning creep feeding with high-quality, palatable post-weaning diets has been shown to lead to piglets with increased post-weaning feed intake, health, and growth during the critical post-weaning transition.

As the swine sector evolves with larger litter sizes and, therefore, increased competition for sows' milk, using milk replacers is becoming common practice. Following a "little and often" approach by providing small amounts of fresh milk replacer multiple times a day is most effective. The hygienic preparation and feeding of milk replacers go without saying to prevent the growth of harmful bacteria and molds that can lead to diarrhea and other health issues in piglets.

Collaborative approach

The swine industry is grappling with mounting challenges associated with post-weaning stress and health, exacerbated by the prohibition of AGPs and the use of pharmacological levels of dietary zinc and copper in many regions. Addressing these issues requires a coordinated strategy to improve piglet welfare and optimize production outcomes. "By adopting a proactive approach emphasizing collaboration and comprehensive management strategies across the production system, piglet welfare and long-term productivity can be enhanced," concluded Dr. Parke.

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