Strategies to minimize fallback pigs in the nursery

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Summary

Preweaning strategies to minimize fallback pigs in the nursery include cross fostering, creep feeding, and weaning an older pig. Postweaning strategies to minimize fallback pigs in the nursery include optimum barn temperature and ventilation set points, easy access to feed and water, and proactive placement strategies. Phase-feeding programs to match the nutrient requirements and digestive abilities of weaned pigs are also crucial. Managing fallback pigs can be accomplished by minimizing drafts in removal pens, providing supplemental heat sources, having multiple feed access points by providing gruel and mat feed, and ensuring more intensive observations of pigs in removal pens.

Keywords: swine, weaning, fallback, nursery pig, livability

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Resumen - Estrategias para minimizar el retraso de los cerdos en la transición

Las estrategias previas al destete para minimizar el retraso de los cerdos en la transición incluyen las adopciones cruzadas, la alimentación de los lechones en la maternidad, y destetar lechones de mayor edad. Las estrategias post destete para minimizar el retraso de los cerdos en la transición incluyen mantener temperaturas optimas en el edificio y puntos de ajuste de la ventilación, fácil acceso al alimento y agua, así como estrategias proactivas de reacomodo. También son cruciales, los programas de alimentación por fases para satisfacer los requisitos de nutrientes, y la capacidad digestiva de los cerdos destetados. El manejo de los cerdos rezagados se puede lograr minimizando las corrientes de aire en los corrales de retrasados, proporcionarles fuentes de calor suplementarias, ofrecer múltiples puntos de acceso al alimento mediante la administración de papilla, alimentación en tapetes, y asegurando una observación constante de los cerdos en estos corrales.

Résumé - Stratégies pour minimiser les porcs retardataires en pouponnière

Les stratégies de présevrage pour minimiser les porcs retardataires dans la pouponnière comprennent le placement croisé, l'alimentation complémentaire, et le sevrage d'un porc plus âgé. Les stratégies post-sevrage pour minimiser le nombre de porcs retardataires dans la pouponnière comprennent des points de consigne de température et de ventilation optimaux, un accès facile aux aliments et à l'eau, et des stratégies de placement proactives. Les programmes d'alimentation par phases pour correspondre aux besoins en nutriments et aux capacités digestives des porcs sevrés sont également cruciaux. La gestion des porcs retardataires peut être accomplie en minimisant les courants d'air dans les enclos de retrait, en fournissant des sources de chaleur supplémentaires, en ayant plusieurs points d'accès aux aliments en fournissant du gruau et des tapis d'alimentation, et en assurant des observations plus intensives des porcs dans les enclos de retrait.

Nursery pigs may be removed from the general pig population due to acute, subacute, or chronic illness. However, this population of pigs may have a wide range of clinical presentations including lameness, gaunt flanks, rough hair coat, difficult breathing, droopy eyes, or listless ears that may be the result of several different conditions such as physical injury, sickness, or failure to consume feed. Pigs with low feed intake that fail to achieve similar performance to the general population are referred to as fallback pigs. This response is likely based on the pigs physiological and behavioral reaction to weaning stress, particularly during a vulnerable time when their gastrointestinal system is undergoing extensive maturation. While it is not fully understood why some pigs have a more challenging time adapting to weaning than others, it is important to have procedures in place to help fallback pigs when they are identified. Therefore, the strategies covered in this practice tip will focus on practical ways to reduce stress, improve piglet growth and development, encourage pen exploration, and promote earlier feed intake after weaning. A summary of strategies to minimize the number of fallback pigs in the nursery is summarized in Table 1.

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Table 1: Strategies to minimize the number of fallback pigs in the nursery

Area	Action
Minimizing fallback pigs preweaning	Floor mats and heat lamps in place and on prior to farrowing.
	Room temperature (22°C) and ventilation set points appropriate.
	Understand sow herd health status.
	Litters with > 9 pigs should be split suckled.
	Pigs from large or small litters should be cross fostered to achieve litters with similar counts.
	If creep feeding, proper management of creep feeders should allow for continued access to clean feed.
	Understand weaning ages and spread in weaning ages within weaning group.
Minimizing fallback pigs post weaning	Floor mats and heat lamps in place and on prior to pig arrival.
	Feed in feeders and adjusted to ensure easy feed flow prior to pig arrival.
	Water turned on and waterers adjusted to the correct height and checked to ensure adequate flow rates.
	Room temperature (23°C to 29°C) and ventilation set points appropriate.
	Sort the lightest 10% of the population into uniform body weight groups and the rest of the population into mixed groups.
	Mat feed all pens of pigs up to 4 times per day for the first 3-10 d post placement, depending on pig health status.
	Gruel feed pens of small pigs up to 4 times per day for the first 3-10 d post placement, depending on pig health status.
	Pens of pigs should be observed and encouraged to get up at least 2 times per day.
Intensive care pen management	Located at the center of the room away from external walls.
	Floor mats and heat lamps in place.
	Mat and gruel feeding should be done until full bellies are observed and pigs can be transitioned to recovery pens.
	Fence line panels or plastic covers/tarps should be used to minimize drafts if necessary.
	Pigs should be observed and encouraged to move 4 times per day.

Minimizing fallback pigs

Preweaning strategies

Because most challenges observed from wean to finish are linked back to the sow farm, strategies to minimize fallback pigs in the nursery should begin prior to weaning. The health status and productivity of the sow farm has been shown to be inversely associated with incidence of mortality.[1] Therefore, managing sow herd health and gilt introduction protocols should be top priority to ensure piglets are born and weaned as healthy as possible.

Adequate colostrum intake during the first 24 hours after birth is essential for short-term survival and long-term growth and immune health.[2] Creating a microenvironment within each crate through proper management of room temperature (22°C) and ventilation set points, as well as floor coverings and heat lamps, is necessary to prevent piglet chilling and encourage colostrum intake after birth. The location of heat lamps has not been shown to affect colostrum consumption or piglet survival; however, placing newborn piglets at the udder reduces the time from birth to first suckle (Kara Stewart, PhD, email, October 15, 2022). Another way to ensure colostrum intake is through split suckling which can be accomplished by temporarily removing the heaviest pigs in the litter or the first half of pigs born in the litter for approximately 2 hours. This allows pigs in large litters increased opportunity to receive colostrum. Cross fostering is another strategy that can be used to manage teat space. Most research suggests that cross fostering should occur 12 to 24 hours after birth, after piglets have had a chance to consume colostrum but before teat order has been established.[3] When cross fostering, the age and body weight of both the pig being fostered and the receiving litter should be considered, as well as litter size. Ideally, light-weight pigs (< 1.0 kg) should be fostered into small litters (< 9 pigs) of other light-weight pigs, whereas heavy-weight pigs can be fostered into mixed litters.[3-6] Likewise, piglets should be fostered into litters of a similar age to prevent decreased suckling activity.[7]

Flavor exposure through the maternal diet, followed by re-exposure of the same flavor in nursery starter diets may offer an opportunity to minimize fallback pigs. Some data suggests that flavor learning has the potential to reduce feed neophobia post weaning, therefore improving feed intake.[8,9] However, the impact on pig removal rates has not been determined.

Creep feeding is another strategy that has been shown to improve feed intake and minimize fallback pigs in the nursery. Providing creep feed to litters during the suckling period allows pigs to become acclimated with solid feed in a safe, familiar environment while still receiving nutrients from the sow and reducing feed neophobia post weaning.[10] However, on-farm application can be challenging because creep feeders are often difficult to clean and maintain. Some have attempted to supply creep feed directly onto farrowing stall mats rather than using creep feeders. Improved growth performance on a closeout basis has been observed when providing a pelleted phase 1 diet onto farrowing stall mats as creep feed, whereas providing sow lactation feed as the creep feed was not beneficial.[11] Regardless of application method, providing a complex diet or one that is similar to the diet pigs will be weaned onto can maximize the effects of creep feeding on piglet feed intake and growth after weaning.[11-13] Feeding a large, pelleted creep diet (12 mm) is another opportunity to increase creep feed consumption and intake after weaning.[14] Positive effects on nursery removal rates have also been observed when feeding large pellets (12.7 mm).[11] Furthermore, creep feed intake is dependent on weaning age, with greater intake observed as weaning age increases. Considering modern weaning ages (approximately 21 days), litter feed intake remains relatively low (< 150 g) up until the last 3 days prior to weaning.[15] However, providing creep feed for > 3 days may increase the percentage of pigs that consume creep feed.[16] Thus, duration of creep feeding should occur for a minimum of 3 days. Use of an extended feeding window must be assessed based on the cost of creep feed and labor capacity. The number of pigs consuming creep feed can also be increased by providing creep feed in rotary feeders with hoppers or play feeders.[17,18] Water supplementation through a piglet nipple in addition to creep feed may provide further benefits particularly when weaning an older pig.

Mixing litters in the farrowing facility prior to weaning has been shown to reduce manipulative behaviors and improve postweaning feed intake and body weight gain.[19,20] Some anecdotal evidence also suggests improved health and survivability post weaning due to decreased stress and increased pathogen exposure prior to weaning.

Increased weaning age can better prepare pigs for weaning and provides the greatest opportunity to improve wean-to-finish performance and decrease nursery removal rates.[21,22] Weaning pigs prior to 24 days of age has been linked to greater intestinal permeability, which may exacerbate health challenges such as *Escherichia coli* leading to chronic, recurring diarrhea that persists into later life.[23-25]

Postweaning strategies

Environmental factors have a large impact on how pigs begin to consume feed after weaning. Therefore, barn preparation is key to ensure a more successful transition. This includes making sure nipple waterers are turned on and cup waterers are full, feed is available in feeders, barn temperature (23°C to 29°C) and ventilation are at the appropriate set points with adequate airflow while avoiding animal chilling, mats are in place, and supplemental heat is available. As genetics companies have selected for increased finishing pig performance, starting newly weaned pigs on feed has become more challenging. Therefore, pigs with low feed intake may require higher temperature set points and more intensive care during the first 7 to 14 days after weaning. Likewise, knowing the expected feed intake and growth of the genetic lines used will help caretakers better track how pigs are performing.

Once pigs arrive at the nursery or wean-to-finish facility, sorting strategies can help ensure a successful transition and prevent fallback pigs. Sorting light-weight pigs (approximately 10% of the population) into uniform body weight groups and the rest of the population into mixed groups reduces initial aggression in heavy-weight pigs and provides greater feeding opportunities for light-weight pigs.[26,27] Sorting by sex is another option that also has been shown to decrease mixing aggression.[28] Likewise, decreasing the number of pigs per feeder hole (approximately 3.75 pigs), particularly at high stocking densities (15 pigs/pen) or low floor space allowance (≤ 0.25 m^2), has been shown to result in more rapid onset of feeding and reduced removals.[29,30] The most important factor of feeder design is ease of feed access and management. Typically, wet/dry feeding systems are not recommended because newly weaned pigs have a difficult time dispensing feed and often overfill the feed pan with water. In addition to floor and feeder space, drinker space should also be considered.[31] The Swine Housing and Equipment Handbook[32] recommends 10 nursery pigs per nipple drinker space; however, most production barns are closer to 25:1.[33] While young pigs prefer nipple waterers, push-lever bowl drinkers are recommend to decrease wastage and have no impact on performance.[34]

In addition to sorting strategies, having an appropriate phase-feeding program to match the nutrient requirements and digestive abilities of weaned pigs is crucial.[35] Dietary phases are typically matched with the weight of pigs at weaning, such that heavy weaned pigs receive less of the starter diet compared to light weaned pigs. This is because starter diets are often more expensive due to diet form and complexity. Weaning age data suggest that matching starter diet feed budgets with pig age rather than weight would be more beneficial, as digestive abilities are more closely related to pig age than weight. However, this hypothesis has not been tested. When possible, starter diets should be provided in pelleted form to improve feed efficiency. Pigs prefer course ground corn and pellets with a larger diameter.[20,36,37] In pens where lightweight or removal pigs are housed, an intensive care diet with highly palatable ingredients may need to be provided before the starter diet to encourage earlier feed intake.

Increasing accessibility to feed beyond standard trough feeding through mat and gruel feeding strategies is another opportunity to prevent fallbacks.[38-40] When pigs are weaned around 24 days of age these strategies may be less critical. However, in young (≤ 21 days) or health challenged flows, providing mat or gruel feed 2 to 4 times per day up to 10 days post placement should increase pen exploration and eating activity by stimulating group feeding behavior similar to suckling. Mat feed is a practice that can be accomplished by taking 1 to 2 handfuls of feed from the feeder and placing it directly on mats specifically designated for mat feeding. Having a separate

mat available under supplemental heat is helpful to minimize drafts and provide a warm, dry resting place for pigs. Gruel feeding by adding water to feed in designated gruel feeders is another way to provide multiple feed access points. Gruel feeding should start with a more liquid mixture and gradually transition to a dry mixture over time (3-10 days post weaning). The act of caretakers getting into pens at each feeding time also creates an opportunity to get pigs up and observe pigs more than twice per day. This is particularly important during the first 3 to 10 days post weaning.

Managing fallback pigs

Fully preventing fallback pigs is challenging. Therefore, it is important to know how to properly care for fallbacks when identified and removed from the general population. Early identification is key. Intensive care pens should be equipped with a supplemental heat source to keep pigs warm and dry. Limiting drafts to these pens is also critical, hence, the location of intensive care pens in relation to wall fans and ceiling inlets needs to be considered. Typically, it is recommended to place these pens at the center of the room, away from outside walls. In some cases, this may still require a solid partition be added to the fence lines of pens to prevent excessive drafts. For this reason, mats are also important as they provide a solid place for pigs to sleep while reducing pit drafts. Plastic covers or tarps may also be used to create a microenvironment in the back of pens. Furthermore, mat and gruel feeding this population of pigs for an extended period is necessary until full bellies are observed and pigs can be transitioned to recovery pens. Each of these management strategies are only successful when available to the pig. Therefore, ensuring pigs do not have to travel far to find feed, water, or supplemental heat, especially in large pens, needs to be top priority. This may require multiple resources positioned at different locations throughout the pen or dividing larger pens into multiple small pens. Frequent observations of intensive care pens throughout the day should be a priority and the caretaker should be focused on getting pigs up and moving them towards feed and water, while also observing animal progress to ensure timely euthanasia is applied when necessary.

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Conflict of interest

None reported.

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