Piglet Health and Welfare in the Nursery

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Piglets experience acute stress at weaning, as they must suddenly adapt to abrupt changes to their physical environment, social group, and diet. Weaning under typical farm conditions results in weight loss, aggression, belly nosing and increased susceptibility to diarrhoea and disease. The problem appears to be largely psychological, as young pigs are not prepared to cope with so many changes at once. Many studies have now identified ways to adapt the farrowing and nursery environments to facilitate the weaning transition by increasing early consumption of solid food and reducing stress. Some of these practices require more inputs and labour, however, many can be accommodated at little cost to producers.

What is the problem?

To understand the problem it is helpful to consider how pigs behave in wild or semi-natural settings. In wild pigs, weaning is a gradual process that is completed at 3 or 4 months of age. During this time, the sow interacts with her pigs, they explore a spacious and complex environment, learn to consume a variety of solid foods and socialize with other herd members.

Successful strategies to reduce weaning stress consider these factors and try to introduce them into the production environment. Changes which promote the early intake of solid food and reduce the abrupt impact of weaning have been found to aid greatly with piglets' adaptation to the nursery environment.

Stimulating early food intake

Often pigs will fail to consume feed for up to 48 hours after weaning, and this results in weight loss, damage to the intestine and increased susceptibility to diarrhoea. Over the past decade, weaning age on commercial farms has increased from 2 weeks to 3 or 4 weeks, and creep feeding in the farrowing room is a common practice. These practices result in piglets becoming familiar with solid feed before weaning occurs. Many studies have shown that piglets that eat feed preweaning will also consume more feed and have better growth postweaning. Unfortunately, the consumption of creep feed is highly variable, with some piglets benefitting from this practice much more than others. Studies at the Prairie Swine Centre show that smaller pigs were more likely to consume and benefit from creep feed, while larger piglets were less interested in creep (Bandara et al, 2011).

Providing feed in a way that stimulates exploration and social interaction, either before or after weaning, can increase feed intake. The new Canadian Code of Practice (NFACC, 2014) recommends the use of feeding trays or floor feeding for weaned pigs until they are eating readily (3-4 days). The tray encourages feed consumption by allowing piglets to explore the feed together. Providing creep feed in an open tray feeder in farrowing also resulted in more feed consumption and social interaction at the feeder, and reduced weight loss at weaning (Brown and Seddon, 2014). Another option is to provide moistened feed as this is more attractive to pigs than dry feed (Reiners et al, 2008).

Drinkers can also improve piglet welfare. Torrey et al (2008) found that push lever bowl drinkers reduce water wastage and belly nosing compared to nipple drinkers. They hypothesized that bowl drinkers satisfy nursing impulses in newly weaned pigs, as the pigs must create negative pressure to drink from a bowl. This requires the same tongue motion as suckling, which does not occur when the pig drinks from a nipple drinker. As well, pigs will push their noses against the metal rim providing additional tactile stimulus. Excessive drinking and water wastage can occur during the first 48 hours post-weaning, and results in less time spent eating by the pigs, so bowl drinkers can reduce help reduce this behaviour.

Another strategy for stimulating early feed intake is intermittent suckling, where the sow is segregated from her pigs for 6 to 12 hours per day, usually in week 3 or 4. In semi-natural conditions, sows often leave the litter for several hours each day, and during this time piglets will explore their environment and learn to consume solid feed. This procedure also reduces weaning stress by preparing piglets for separation from the sow.

Other strategies for increasing feed intake include multi-suckling and get-away systems (Oostindjer et al, 2014). In multi-suckling, piglets from more than one litter are allowed to mix before weaning. This simulates the early socialisation observed in wild pigs, which join the dam's group

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The Bottom Line

The project aimed to estimate the net energy (NE) content of canola meal (CM) and full-fat canola seeds (FFCS) in swine and to validate these values, through growth studies using diets containing graded levels of CM or FFCS. No difference in average daily gain and feed conversion ratio was observed between the treatments. This confirms that the estimation of the NE content (CM 2.41 and FFCS 3.53 Mcal/kg DM) was correct and that it is possible to formulate balanced diets for growing pigs that contain up to 15% FFCS and 22.5% CM.

Table 2. Feed intake and growth in growing pigs fed with different levels of canola meal(CM) or full-fat canola seeds(FFCS) in the diets

	Inclusion level (%)				*RSD*[1]	*P*			
CM	0	7.5	15	22.5		Diet	Time	D x T	Gender
FFCS	0	5	10	15					
Average Daily Gain (kg)									
CM	2.03	2.02	2.01	2.09	0.55	0.664	0.001	0.122	0.023
FFCS	1.97[a]	1.99[a]	1.84[ab]	1.75[b]	0.45	0.001	0.001	0.651	0.002
Average Daily Gain (kg)									
CM	1.08	1.09	1.03	1.08	0.25	0.483	0.001	0.925	0.360
FFCS	0.98	1.00	0.94	0.95	0.24	0.070	0.001	0.437	0.018
Feed Conversion									
CM	1.94	1.95	2.06	2.00	0.63	0.190	0.001	0.694	0.814
FFCS	2.07	2.05	2.03	1.92	0.66	0.068	0.002	0.056	0.245

[1] *RSD: residual feed deviation*

[a, b] *Values with different letters in the same row differ significantly at P<0.05.*

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approximately 10 days after birth. In get-away systems, the sow is allowed to leave her litter, and may do so for up to 14 hours per day in the fourth week (Johnson and Marchant-Forde, 2009). The benefits of multi-suckling are due to reduced aggression and mixing stress at weaning, not just increased feed intake. Because multi-suckling allows piglets to mix and socialise at an earlier age, later mixing results in less stress. It can be easily implemented on-farm by creating a small door between 2 adjacent farrowing crates, and opening this when pigs are 2 weeks old to allow piglets from the two litters to mix.

Social learning and enrichment

Young pigs learn about their environment and what foods to eat from observing and imitating their litter mates and the sow. Without this experience, they are naturally neophobic and will avoid new foods or objects. Neophobia serves to protect young animals from ingesting toxic foods, but in weaned piglets this can make them more reluctant to consume feed. Seeing another pig eat increases the motivation to eat, and being able to participate may be even more important than just observing the behaviour. Learning from the sow is especially important. Unfortunately the sow's ability to interact with piglets is restricted in most farrowing pens, so there is little opportunity for them to learn from her behaviour. For this reason new farrowing systems have been developed which allow greater opportunities for interaction between the sow and her piglets, including a common feeding area (ProDromi, 2014). European studies have also shown that providing flavoured foods to the sow prenatally or postnatally results in positive effects on piglet performance after weaning (Oostindjer et al, 2014), as they recognise and are attracted to the familiar flavour.

Neophobia in piglets is also increased by the lack of exposure to different objects, foods and situations in both the farrowing and nursery environment. Typically these environments are barren and do not encourage activities such as exploration or foraging. The new Code of Practice (NFACC, 2014) recommends that pigs be provided with a variety of enrichments, including objects such as suspended toys, cloth strips or rubber, or rootable materials such as straw, hay, wood, or peat. Providing enrichment has been shown to reduce stress and fear responses in a variety of species. In piglets, providing enrichment in the farrowing pen resulted in reduced belly nosing and better growth and feed intake postweaning. Providing enrichment postweaning was even more effective, and resulted in improved growth and feed efficiency, and reduced incidence of diarrhoea in the two weeks following weaning (Oostindjer et al, 2014). Less aggression and more exploration and play behaviours were also found, further indicating that weaning stress was reduced, probably due to the distraction provided by enrichment. The ingestion of straw and other fibres may also increase saliva production and maturation of the intestine, resulting in improved gut health.

Enrichment studies clearly show that providing enrichment only in farrowing and not in nursery has a negative effect. So if enrichments are provided in farrowing they should definitely be included in the nursery, otherwise the negative impact of weaning will be increased.

Conclusions

Since weaning occurs more abruptly and at an earlier age than is natural, it is important to prepare piglets for this transition. This includes encouraging piglets to feed preweaning by using tray feeders, providing mash feed, and use of enrichment (hay, straw, rope, objects) to encourage exploration and rooting. Other measures that allow more social interaction should also be considered, including providing feed where both the sow and piglets can access it, and systems that allow early mixing of piglets such as the multi-suckling system described. Enrichment is most important in the nursery, where it can distract piglets from negative behaviours and encourage exploration activity and feeding. Further research is needed on the use of flavoured feeds, the design of farrowing pens and use of enrichment to reduce weaning stress and promote health in weaned piglets.