How to improve post-weaning feed intake

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In most modern pig production systems, piglets are weaned into a nursery facility where they must adapt to a solid diet rapidly in order to survive and thrive in their new environment.

During this transition, many newly weaned pigs experience a 1-3 day period of anorexia resulting in growth stasis that can be detrimental to their health and productivity: a phenomena called the post-weaning growth check. While precise mechanisms associated with this transition period are not fully understood, it is routinely attributed to several factors including maternal separation, stress associated with their new environment and social surroundings and exposure to new pathogens.

Understanding and subsequently reducing the post-weaning growth check becomes even more challenging given the variation that exists in individual piglet behaviour and response to weaning, which is ultimately linked to lifetime feed intake and growth. Even a successful transition at weaning is rarely without an associated biological and economic cost.

Therefore, one of the biggest challenges, and potentially lucrative opportunities, in pig production is the ability to prevent or decrease the amount of time that young pigs spend in this weaning induced period of anorexia by being able to stimulate feed intake (and growth).

What is average intake?

Before tackling the issue of how to increase post-weaning feed intake, it is useful to have a feel for what is a 'normal' – a task that is much harder than it might appear. Post-weaning feed intake is highly variable between individual units due to differences in disease pressure, genetics and housing, it is also highly variable between piglets of similar weights in the same pen. In addition, very few farms adequately record intake in the nursery.

Given the right conditions, piglets can consume impressive amounts of feed in the immediate post-weaning period as shown by the black line in Fig. 1.

This represents average daily feed intake collected from piglets housed individually under experimental conditions (minimal environmental constraints) and will be close to the piglet's maximum potential. Under commercial conditions where a number of constraints exist, of which disease pressure is often the most important, intake is typically much lower as shown by the yellow line in Fig. 1.

This represents the average daily feed intake recorded at Primary Diets' principal trial site, the University of Leeds, in over 25 recent experimental trials and corresponds to intake of over 5,000 individually tagged pigs housed in 600 pens.

The University of Leeds is a conventional health, indoor, slatted unit and typical of average UK conditions.

This 'Conventional Health' intake curve has been compared against data from over 100 commercial trials and can be considered a good representation of the average UK farm. The average daily intake recorded from these commercial trials indicates 396g/d over an average trial length of 23 days which compares well to a predicted value of 384g/d calculated from our figure.

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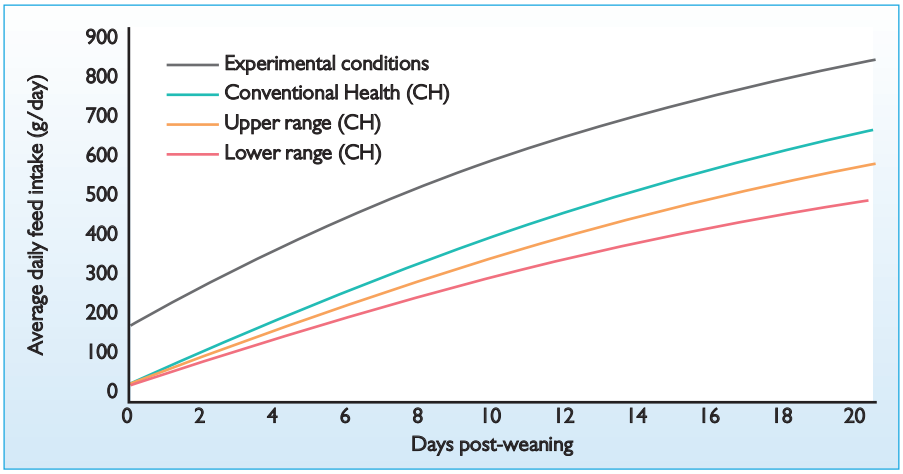
Fig. 1. Typical UK post-weaning intake. Experimental conditions data (Wellock, 2005; unpublished); Conventional Health data (Primary Diets).



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To account for the variation that exists between commercial units due to factors mentioned earlier, a lower (red line) and upper range (green line) have been added to Fig.1 to capture the majority of commercial units. Average post-weaning intake may be expected to differ between some countries and data is being collected to verify this.

Improving intake

There are a number of nutritional and management factors that have been shown to have a dramatic effect on post-weaning feed intake.

Table 1 highlights some of these factors which are relatively easy to employ on farm.

Creep feeding

The importance of creep feeding is often overlooked perhaps due to the small amount eaten pre-weaning, typically around 250g/pig. However, creep feeding from an early age has been demonstrated to improve the transition to solid food at weaning and thus improve post-weaning intake and performance. Studies have shown that the earlier creep feed is offered the greater proportion of the litter will be eating creep by weaning and that piglets that do eat it have improved post-weaning feed intakes of around 40g/day.

We recommend offering specialist creep feed from around 4-10 days of age – ones which contain a high percentage of highly palatable milk products have been shown to reduce piglet mortality and improve weaning weight, making them highly cost effective. Avoid changing diet at weaning by feeding the first stage starter diet 2-3 days pre-weaning.

Feed high quality starter diets

Ensuring optimal nutrition by investing in good quality starter diets is essential to maximise palatability and nutrient intake. Feeding complex starter diets containing highly digestible ingredients such as milk products, fish and processed cereals have been shown to better facilitate the weaning process and increase post-weaning intake more than simple starter diets. Blend diets to minimise the reduction in feed intake commonly observed at diets changeover.

Ensure sufficient feeder space

A minimum of 100mm feeder space per pig should be provided where possible to allow newly weaned pigs to feed together as a group, as this is how they would have fed from their mother pre-weaning. Adding extra feeders, ideally long flat troughs, for the first week post-weaning is recommended.

Adequate water supply

A piglet which does not drink does not eat! Newly weaned pigs have a tendency to drink excessively for the first few days as a response to hunger (clearly they were obtaining the majority of their nutrients from sows' milk prior to weaning) so an adequate supply of fresh clean water is critical post-weaning.

With intakes typically around 2-3 times feed intake, concentrated around the time of feeding, it is essential to allow for this increase in water consumption and to accommodate for the preference of pigs to feed in groups during this time. Classic indicators of inadequate water supply include left feed, dirty drinkers, drinking all night and crowding and fighting around drinkers.

A minimum of one nipple drinker per 10 pigs or one bowl per 20 pigs, with a flow rate of at least 0.7 litre/min in the first week post-weaning will ensure adequate water supply and we recommend a minimum of two drinkers per pen in case one drinker fails completely.

As with feeder space, providing extra drinkers for the first week post-weaning, such as turkey drinkers which allow pigs to see the water, is also highly recommended.

Optimum temperature

If the pigs are too hot they will reduce feed intake to minimise the heat produced from growth and feeding. Conversely, if piglets are too cold they will huddle to keep warm and avoid feeding. In slatted accommodation, ambient air should be 28°C at weaning; reducing to 22°C by the time the piglets

reach 20kg. When bedded on straw the temperature should be a few degrees cooler.

- **Increased period of lighting**

Piglets which have not eaten creep pre-weaning will not take their first meal in the dark. Increasing the period of light exposure therefore improves post-weaning feed intake.

Research suggests increased lighting length needs to be for at least one week post-weaning but no longer than two. For example, piglets exposed to 23 hours of light and one hour of darkness (23:1) for two weeks post weaning showed an increased feed intake, resulting in a higher growth rate than those exposed to normal lighting regime (8:16). Some farm assurance schemes may prohibit increased day length so it is important to check first.

- **Minimise weaning stress**

Try to avoid any additional stress at weaning such as vaccinations or over-handling which may further reduce feed intake.

Conclusion

This article has briefly discussed a number of ways to help increase feed intake in the critical post-weaning period and has focused on management changes rather than the specific detail of starter diet specification and formulations.

This is deliberate as increasing feed intake in the first few days post-weaning, which can have a dramatic effect on lifetime performance and productivity, is likely to have a much greater impact than a relatively minor change in diet specification.

For example, whilst important, increasing the lysine level of a diet by 0.1% from 1.5 to 1.6%, will increase lysine intake by only +0.1g/d assuming a typical intake of 100g/d. However, increasing intake from 100 to 150g/d (imminently possible in the first few days post weaning) increases lysine intake by +0.75g/d assuming a 1.5% lysine diet is fed.

Whilst increasing the intake of nutrients such as lysine is important through all means available and the importance of diet specification and quality should not be underestimated, increasing feed intake is likely to have a much greater impact in the first few days post-weaning as is demonstrated by the 50% increase in lysine achieved through increasing intake compared to only a 6.6% increase by increasing lysine content of the diet.

Finally, understanding both target and actual intake is an important management tool.

Knowing how much a group of pigs on a given unit should have eaten over a given time period allows any deviation from 'normality' to be easily identified, for example a pen of 150 pigs might be expected to eat their allocation of 300kg of starter diet one by day 10 post-weaning.

Once this is established effort can then be spent understanding and rectifying any causes for this deviation. ■

References are available from the author on request.

Table 1. Seven ways to improve post-weaning feed intake.

Factor	How to improve
Creep feeding	● Creep feed early (ideally start between 4 and 10 days of age). ● Feed little and often. ● Avoid changing diet at weaning.
Nutrition	● Feed highly palatable, nutrient dense diets. ● Blend diets between changeover to avoid sudden changes.
Feeder space	● Ensure extra feeder space at weaning. ● Ideal feeder space allowance is 100mm/pig.
Water supply	● Ensure adequate supply of fresh clean water. ● One nipple drinker per 10 pigs or one bowl per 20 pigs. ● Minimum flow rate of 0.7litre/min.
Temperature	● Pigs will reduce feed intake when hot. ● Air temperature should be 28°C at weaning; Reduced to 22°C by 20kg.
Lighting	● Pigs will not consume their first meal in the dark. ● Increase the period of lighting for first 48 hours post-weaning.
Weaning stress	● Avoid additional stress at weaning where possible (for example vaccination).