INTRODUCTION

The breadth of the topic of nursery pig management and nutrition is enormous and beyond the scope of a single paper, indeed there are entire books devoted to this area (e.g. The Weaner Pig Nutrition and management; Varley and Wiseman, 2001). Consequently, rather than try to be an exhaustive review, even on a few select topics of interest, we prefer only to make passing comments on some key areas. Our principle has been to include what we have found useful in guiding our thinking for farm advisory work. For more detailed information on nursery management, including some of the topics briefly covered here, see the paper of Wilcock (2009) previously presented at this conference.

In this paper we will begin by discussing the phenomena of compensatory, or ‘catch up’ growth as understanding the merits of compensatory growth may impact on how we choose to feed and manage piglets in the nursery. If we believe pigs will catch up any lost early growth later on in life, nutrition in the nursery may not be that important. It may also not be important to manage them correctly – why worry about getting the best out of piglets if any lost growth in the nursery can be caught up later? If however, we believe the way we feed and look after piglets in the nursery has lifetime performance and economic consequences, then we might pay attention to both nursery nutrition and management and the critical importance of feed intake to give them the best possible start.

Following some tips on how to increase nursery feed intake, we will briefly discuss a recent nutrition concept, superdosing phytase, one of our major research focuses over the past 3 years, before some final thoughts on how in our view a suitable nursery diet regime should be selected: if indeed we’ve managed to convince you it’s plays an important role in efficient, profitable and sustainable pork production!

COMPENSATORY GROWTH OR A LOST OPPORTUNITY?

Pig producers appear to have an unlimited optimism in their belief that pigs will compensate or catch up for any loss in their early growth caused by feeding a suboptimal starter diet or poor nursery management. This is perhaps not surprising as compensatory growth offers several advantages; mainly decreased overall feed costs as the lower performance caused by feeding a ‘cheaper’, lower quality, starter diet need no longer worry us because it will be cancelled out by compensatory growth on the lower cost per tonne grower/finisher diets. So with all this producer optimism and these apparent benefits why isn’t every commercial pig producer using a ‘compensatory growth’ feeding programme? Let’s look at the evidence; does compensatory growth occur, if so under what circumstances and then most important of all how can we take commercial advantage of it.
First we must have a clear definition of compensatory growth, which in itself is often not clear. The common definition is that for compensatory growth to have occurred, pigs which have been exposed to a period of restricted growth, through either insufficient feed intake (e.g., causes such as health and management factors including stocking density and feeder space) or an imbalance in the diet (e.g., protein to energy ratio, amino acid imbalance), must after a period of catch up growth regain a position that were similar, or at least not significantly different, to pigs that were unrestricted in their growth. With this definition in mind let’s look at the evidence. There are numerous scientific papers on compensatory growth that are relevant to what we do in commercial production. A brief literature search on the effect of dietary amino acid restriction in the starter period on subsequent performance highlights published papers with clear evidence for compensatory growth (Hogberg and Zimmerman, 1978; Critser et al., 1995; Chiba, 1995; Chiba et al., 1999; Fabian et al., 2004; Reynolds and O’Doherty, 2006; O’Connell et al., 2006; Heyer and Lebre, 2007; Martínez-Ramirez et al., 2008, 2009; Ferández and Nørgaard, 2009; Yang et al., 2009), whereby a significant difference in body weight at the end of the restriction period disappears by the end of the trial. That is to say there is no significant difference in end weight between restricted and non-restricted pigs and so the pigs have apparently caught up.

Should we be happy with this evidence that compensatory growth can and does commonly occur and may therefore be commercially exploited? Before we answer this question, it’s important to look how these trials were conducted, in particular how well replicated they were, and also the normal variation in body weight we expect to see in a population of pigs. While much of the data clearly shows the significant difference in body weight (BW) at the end of the restriction (nursery) period is no longer significant at slaughter, we argue the reason for this may be not that the pigs have caught up, but rather that the experiment was not sensitive enough (i.e. was not well enough replicated) to pick up the observed difference in end weight as statistically significant. For example, a 1 kg difference in BW at the end of the starter period is equivalent to 6.6% of a mean BW of 15 kg. This 1 kg difference in BW which may remain through the pigs’ life represents less than 0.9% of a typical slaughter weight of 115 kg. It is perhaps not surprising therefore we can’t pick this difference up with experiments designed to look only for differences in the starter period. A difference in BW of 7.67 kg at 115 kg would need to be achieved to observe the same 6.6% difference in BW as seen at the end of the starter period.

Not only do we have to deal with the mathematics of relative differences in BW outlined above, but we also have to understand the pigs themselves and the expected level of variation in a given population of pigs. Unpublished data collected by Harper Adam University College, UK, and supplied by JSR Genetics demonstrates this beautifully (Figure 1). This is data from 480 pigs of the same genotype on the same unit under the same management and feeding regime. What is clear to see is that variation in BW increases as pigs increase in weight/age. The standard deviation (Stdev) in BW increases from 1.82 kg (mean BW = 8.17 kg) at 26 days of age (weaning) to 3.09 kg (mean BW = 15.55 kg) at 48 days of age to 10.39 kg (mean BW = 85.53 kg) at 130 days of age. Day 130 is the last time point all pigs were weighed as the fastest growing pigs achieved slaughter weight. Of course we manage pigs to minimise slaughter weight variation by selecting pigs from differing batches/drafts so it would be rare a commercial enterprise saw this level of variation in their grading slips, unless they were a strict all-in-all-out system with all pigs going to slaughter on the same day.
Figure 1. Individual body weight over time of a group of 480 pigs of the same genotype on the same unit (Harper Adams University College, UK) under the same management and feeding regime. Data kindly supplied by JSR Genetics.

Looking at the normal level of variation that exists between pigs it’s perhaps not surprising that pigs appear to catch up 1 kg of lost growth in nursery by the time they reach slaughter. Power calculations with the above data demonstrate we would need 26 replicates (individually housed pigs in this case) to detect 1 kg at nursery exit compared to 279 replicates at day 130 of age. With only 26 replicates we would only be able to detect a difference of 3.3 kg at day 130; less than 33% of the observed standard deviation. Most experiments are of course conducted on pen replicates. Mean pen BW (± Stdev) of these same pigs (46 pens of 9-12 pigs) at day 48 and 130 of age were 15.48 (±3.17) kg and 86.63 (± 6.32) kg respectively. We would therefore require 10 pens per treatment to detect a 1 kg difference in BW at day 48 and 108 pens per treatment to detect a 1 kg difference at 130 of age. With 10 pens per treatment the minimum difference we could be confident in detecting is 3.4 kg at day 130. How many trials have the luxury of the required replication and were set up to detect this level of difference?

So what we need is (i) better replicated experiments, and (ii) perhaps a better definition of compensatory growth for this large number of under replicated trials. Rather than define compensatory growth as a lack of difference in BW at the defined catch up point, let’s rather define compensatory growth as restricted pigs exhibiting a significantly faster rate of gain than their non-restricted counterparts in the period of catch up growth in addition to no significant difference in body weight at the end of the catch up period. Going back to the same 12 scientific papers on compensatory growth with our new definition, only 5 of these now exhibit true compensatory gain (Critser et al., 1995; O’Connell et al., 2006; Heyer and Lebre, 2007; Martinez-Ramirez et al., 2008, 2009). Perhaps a little less convincing, although clear evidence compensatory gain can and does occur.

Where we do observe significantly faster rates of gain in the catch up period, does this provide enough information to understand and commercially exploit compensatory growth? Firstly, we need also to be sure that it is indeed the restricted pigs that did indeed grow faster and catch up,
rather than we slowed down the unrestricted pigs or at least didn’t allow them to fulfil their genetic potential, through either suboptimal nutrition or management (bigger pigs would be heavier stocked for example). We need also to be sure pigs don’t require a better diet to allow them to compensate as demonstrated by Whang et al., (2003) and that the additional cost of these higher specification diets don’t cancel out any earlier saving made. Lastly, there is the issue of reproducible and consistent results. Both Wahlstrom and Libal (1983) and Taylor et al., (submitted) reported the presence and absence of compensatory live weight gain when summarising their own series of four experiments conducted under the same conditions. These conflicting results are yet to be fully understood.

We are willing to concede there is some foundation in the pig producer’s optimism around compensatory growth but more work is necessary before science unravels enough of the complex factors to allow compensatory growth feed programmes to be commercially exploited. When we dig deeper into the science we see many variables that may influence the likelihood of observing compensatory growth; sex, genotype, length and severity of restriction and timing. That’s before we even start to look at the conflicting evidence of which body fractions are able to demonstrate compensatory gain (e.g., Bikker et al., 1996).

In terms of compensatory growth we are struggling to see the ‘wood for the trees’ at the scientific level so believe producers have little chance at exploiting it at commercial farm level without taking what would appear to be an inappropriate risk. Let’s rather try and minimise the lost opportunity of growth rather than try and exploit this poorly, currently at least, understood phenomena of compensatory growth. Better to get the pigs off to a better start through appropriate nutrition and management to ensure a quicker and more economical journey to slaughter allowing more profitable and sustainable pig production. A number of authors have shown that improving early nursery performance leads to a better lifetime performance with an average benefit of 1 kg out of the nursery equating to approximately 4 days saving to slaughter or put another way 3 to 4 kg extra gain (e.g., Tokach et al., 1992; Pluske et al., 1995, 1999; Dunshea et al., 1997; Slade et al., 2000; Kim et al., 2001; Lawlor et al., 2002; Broom et al., 2003).

HOW TO IMPROVE POST-WEANING FEED INTAKE

Our understanding of commercial practice is that the factor dominating both performance and health remains the level of feed intake pre- and post-weaning, with diet composition playing a vitally important yet less significant supporting role. The importance of feed intake and how this can be impacted by both nutrition and management is covered in the following section.

The importance of feed intake post-weaning

In the majority of modern pig production systems, piglets are weaned into a nursery facility where they must be 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 to 3 day period of anorexia resulting in growth stasis that can be detrimental to their health and productivity: the post-weaning growth check. While the precise mechanisms associated with this period of anorexia are not fully understood, it’s routinely attributed to several factors; maternal separation, stress associated with their new environmental, social surroundings and exposure to new pathogens.
Understanding and subsequently reducing the post-weaning growth check becomes even more challenging given the individual piglet variation that exists in 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’ post-weaning feed intake?**

Before tackling the issue of how we might increase post-weaning feed intake it’s useful to have a feel for what is a ‘normal’. Understanding what is ‘normal’ or ‘average’ is much harder than it might appear because not only is post-weaning feed intake highly variable between individual units due to differences in disease pressure, genetics and housing, it is also highly variable between individuals of similar weights in the same pen. Not only that but very few farms adequately record intake in the nursery.

Given the right conditions piglets are able to consume impressive amounts of feed in the immediate post-weaning period. This is shown by the black line in Figure 2 which represents the average daily feed intake collected from 4 week weaned piglets housed individually under experimental conditions (i.e., minimal environmental constraints) and will be close to the piglet’s maximum potential (unpublished data from Wellock et al., 2006). Clearly the piglet isn’t the limiting factor given suitable conditions and minimal disease pressure. 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 Figure 2. This represents the average daily feed intake recorded at Primary Diets principal trial site, Leeds University, in over 25 recent experimental trials and represents intake of over 5000 individually tagged pigs housed in 600 pens. Leeds University is a conventional health indoor slatted unit and typical of average UK conditions. This ‘Conventional Health’ intake curve (yellow line) has been compared against data from over 150 commercial trials (brown line) and can be considered a good representation of the average UK farm. 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 Figure 2 to capture the majority of commercial units. Our challenge as nutritionists and pig producers must be to increase intake post-weaning.

**Seven ways to improve post-weaning intake**

There are a number of nutritional and management factors that have been shown to have a dramatic effect on post-weaning feed intake. The following list (summarized in Table 1) highlights some of these factors which are relatively easy to employ on farm.

1. **Creep feeding**

The importance of creep feeding is often overlooked perhaps due to the small amount eaten pre-weaning, typically around 200-250 g/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 in pigs weaned at both 21 days (Sulabo et al., 2010) and 28 days (Bruininx et al., 2002a). Creep feed should be offered from around 4 to 10 days of age as studies have shown that the earlier creep feed is offered the greater proportion (80%) of the litter will be eating creep by weaning (Sulabo et al., 2010); even then not all pigs eat, often those on front teat with plentiful milk supply, and it often these that are the problem weaners. Piglets which
consume creep pre-weaning make the transition to solid feed post-weaning much easier, due to both an improvement in gastrointestinal tract morphology and health and learnt feeding behaviour. This results in improved post-weaning feed intakes of around 40 g/day (Sulabo et al., 2010) and improves lifetime performance (Klindt, 2003).

Recent studies have shown the importance that specialist creep can have on both pre and post-weaning performance. It has now been realised that not only the raw material composition (Fraser et al., 1994) but the manufacture process (Primary diets unpublished) of the creep feed can play an important part in how pigs respond in terms of pre and post-weaning performance. These specialist creep feeds have been shown not only to improve pre and post-weaning weight but also reduce piglet mortality making them highly cost effective when compared to a standard starter feed used as a creep feed. Figure 3 (unpublished data collected by Primary Diets at Harper Adams University college, UK) shows the lifetime effect of creep feeding a high lactose (>40%) specialised creep feed manufactured by a unique cold press technique (I4) versus a normal manufactured creep feed (Control; ≈15% lactose) on lifetime performance. All pigs were exposed to the same management and feeding regime post-weaning. Pigs fed I4 pre-weaning exited the nursery at 49 days of age an average of +1.1 kg heavier (P = 0.006) than control fed piglets and were +4.3 kg (heavier P = 0.251) at day 133 of age. It is acknowledged that the significant difference in BW between the two treatment groups on day 49 (1.1 kg), although it had increased to over 4 kg, was not statistically significant on day 133 and so may be viewed by some as compensatory gain with the control fed pigs having caught up. We prefer to view this as a problem of under replication (n = 10) and a good example of a better start better finish.

![Figure 2: Typical UK post-weaning intake. Experimental conditions data (unpublished daily intake from Wellock et al., 2006); Conventional Health data (Primary Diets, unpublished). UK commercial data compiled from over 150 commercial farm trials.](image-url)
Table 1. Seven ways to improve post-weaning feed intake.

<table>
<thead>
<tr>
<th>Factor</th>
<th>How to improve?</th>
</tr>
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<tbody>
<tr>
<td>Creep feeding</td>
<td>Creep feed early (ideally start between 4 and 10 days of age)</td>
</tr>
<tr>
<td></td>
<td>Feed little and often</td>
</tr>
<tr>
<td></td>
<td>Avoid changing diet at weaning</td>
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<tr>
<td>Nutrition</td>
<td>Feed highly palatable, nutrient dense diets</td>
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<tr>
<td></td>
<td>Blend diets between change over to avoid sudden changes</td>
</tr>
<tr>
<td>Feeder space</td>
<td>Ensure extra feeder space at weaning</td>
</tr>
<tr>
<td></td>
<td>Ideal feeder space allowance is 100 mm/pig</td>
</tr>
<tr>
<td>Water supply</td>
<td>Ensure adequate supply of fresh clean water</td>
</tr>
<tr>
<td></td>
<td>1 nipple drinker per 10 pigs or 1 bowl per 20 pigs</td>
</tr>
<tr>
<td></td>
<td>Minimum flow rate of 0.7 litre/min</td>
</tr>
<tr>
<td>Temperature</td>
<td>Pigs will reduce feed intake when hot</td>
</tr>
<tr>
<td></td>
<td>Air temperature should be 28 °C at weaning; Reduced to 22 °C by 20 kg</td>
</tr>
<tr>
<td>Lighting</td>
<td>Pigs won’t consume their first meal in the dark</td>
</tr>
<tr>
<td></td>
<td>Increase the period of lighting for first 48 hours post-weaning</td>
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<tr>
<td>Weaning stress</td>
<td>Avoid additional stress at weaning where possible (e.g. vaccination etc.)</td>
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</table>

Figure 3. Effect of pre-weaning creep feeding regime (I4 vs control) on lifetime performance (Primary Diets unpublished data conducted at Harper Adams University College, 2012).
2. **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 (Mahan et al., 2004). Blend diets to minimise the reduction in feed intake commonly observed at diets changeover.

3. **Ensure sufficient feeder space**

A minimum of 100 mm 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.

4. **Adequate water supply**

Adequate supply of fresh clean water is critical post-weaning. A piglet that doesn’t drink doesn’t eat! Water intake is typically around 2-3 times feed intake and will be concentrated around the time of feeding. In addition, newly weaned pigs have a tendency to drink excessively for the first few days as a response to hunger. Don’t forget they were obtaining the majority of their nutrients from sow’s milk prior to weaning. Consequently, adequate water supply is essential post-weaning 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 1 nipple drinker per 10 pigs or 1 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. As with feeder space, providing extra drinkers for the first week post-weaning, such as turkey drinkers allowing pigs to see water, is highly recommended.

5. **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 20 kg. When bedded on straw the temperature should be a few degrees cooler.

6. **Increased period of lighting**

Piglets which have not eaten creep pre-weaning will not take their first meal in the dark (Bruininx et al., 2001). Increasing the period of light exposure therefore improves post-weaning feed intake. Research suggests increased daily 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 1 hour of darkness (23:1) for 2 weeks post weaning showed an increased feed intake, resulting in a higher growth rate than those exposed to normal lighting regime (8:16) (Bruininx et al., 2002b). Some farm assurance schemes may prohibit increased day length so it’s important to check first.

7. **Minimise weaning stress**

Try to avoid any additional stressors at weaning such as vaccinations, over-handling etc. which may further reduce feed intake.
It’s all about intake!

The above briefly discusses a number of ways to increase feed intake in the critical post-weaning period and has focused on management changes that are able to be made on pig units 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 +0.1 g/d assuming an intake of 100 g/d. However, increasing intake from 100 to 150 g/d (eminently possible in the first few days post weaning) increases lysine intake by +0.75 g/d assuming a 1.5% lysine diet is fed. Increasing the post-weaning intake of nutrients such as lysine is important and whilst this can be achieved through diet specification and diet quality the most important factor is increasing feed intake.

Finally, understanding both target and actual intake is an important management tool and is not commonly monitored on commercial farms. Knowing how much a group of pigs on a given unit should have eaten over a given time period allows for any deviation from normality to be easily identified. Once this is established the producer can focus on understanding and rectifying if necessary any causes for this deviation.

A NUTRITION CONCEPT: LOW PHYTATE NUTRITION

In conjunction with targeting improved feed intake it’s important to maximise the nutrient utilisation of the feed. Typically in starter feeds the improved nutrient utilisation is reflected by the use of high digestible raw materials such as milk proteins, plasma and fishmeal etc. In addition the level of anti-nutrients present in raw materials used in starter feed is reduced. A common example of this is soy protein concentrate were soybean has been processed and trypsin inhibitor (inhibits protease activity in the pig) is reduced. In addition feed ingredients can be utilised to improve nutrient utilisation and one area of key research conducted by Primary Diets and AB Vista focused on the use of high levels of phytase (> 1250 FTU/g of a modified E Coli Phytase) to breakdown phytate as an anti-nutrient.

Dietary phytate has been shown to be an anti-nutrient and has a negative impact on nursery performance and the authors direct the readers to the following paper for a more detailed review: Cowieson et al (2009). It is known that higher dietary phytate reduces mineral bioavailability, increases pancreatic and intestinal mucus secretions, increases amino acid endogenous losses, reduces protein solubility and increases luminal sodium levels impacting active transport. This anti-nutrient effect of phytate on pig performance was confirmed in research by Woyengo et al., (2011) at the University of Manitoba. In this trial the addition of phytate (2%) to a synthetic diet containing no phytate reduced 3 week post-weaning average daily gain (ADG) by 118 g/d and FCR by 43 points (Figure 4).

Based on phytate being negative in terms of pig performance it was a target of Primary Diets and AB Vista to reduce the dietary phytate level by using high levels of Quantum phytase. This phytase was selected due to its key characteristic of breaking down phytate quickly. The speed of phytate breakdown is critical in this application as if phytate is not broken down in the stomach (low pH), were phytate is soluble, quickly it will make proteins insoluble and bind minerals. The results of this are increased endogenous losses resulting in poorer nutrient utilisation and poorer mineral bioavailability.
Figure 4. Effect of high phytate (control + 2% phytic acid) on 3 week post-weaning performance (from Woyengo et al., 2011).

After a series of university trials and commercial evaluations Primary Diets launched the low phytate nutrition concept in 2010 and the results showed that this new program improved 3 week post-weaning performance; 11% ADG, 4% FCR and 7% ADFI. This performance benefit can be attributed to lower levels of dietary phytate achieved with the superdosing level of phytase. Also notice that this low phytate concept positively targeted one of the key factors of this paper; feed intake.

This low phytate concept has been expanded globally by AB Vista since 2010 and now with 40 nursery comparisons globally the average response in different diets and markets has shown a 6% improvement in ADG and 4% improvement in FCR. This concept has helped lower the costs of pork production and has also lead to new avenues of research in low phytate nutrition diets that have already started to enhance post-weaning piglet performance further.

CONCLUDING REMARKS

How to choose the correct starter feed regime

Pig production is a commercial business. Performance has a value and a cost so it is important to judge how they interact to achieve the best return per pig. We believe the best way to determine the most appropriate feed program for a given unit, is to run a trial and let the pigs decide which dietary regime work best.

Of course, there are different measures to judge a diet or feeding program. Margin over feed (MOF) is our preferred measure, calculated from the value of weight gain per pig in the nursery phase less the feed cost associated with this gain. We believe that in loss making times as well as profitable ones MOF is given greatest importance or chosen as the sole determining factor in assessing which starter diet regime to use.
A commercial trial conducted by Primary Diets is shown in Table 2. The producer wanted to compare their current starter feed regime (Regime 1) against an alternative supplied by Primary Diets (Regime 2). The trial was well conducted with 6 pens of pigs per dietary regime, in the same air space and balanced for number, sex and weaning weight as far as possible. Slightly differing amounts of starter feed (Diets 1 and 2) per pig were fed before moving onto a common (12-20 kg) diet (Diet 3) until exit from the nursery on day 22 post-weaning.

Table 2. The effect of starter feed regime on performance 22 days post-weaning.

<table>
<thead>
<tr>
<th></th>
<th>Regime 1</th>
<th>Regime 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Diet 1, kg/pig</td>
<td>1.01</td>
<td>1.47</td>
</tr>
<tr>
<td>*Diet 2, kg/pig</td>
<td>5.06</td>
<td>5.44</td>
</tr>
<tr>
<td>*Diet 3, kg/pig</td>
<td>1.30</td>
<td>1.30</td>
</tr>
<tr>
<td>Wean weight, kg</td>
<td>7.62</td>
<td>7.46</td>
</tr>
<tr>
<td>Day 22 weight, kg</td>
<td>13.27</td>
<td>14.18</td>
</tr>
<tr>
<td>Weight gain in nursery period, kg</td>
<td>5.65</td>
<td>6.72</td>
</tr>
<tr>
<td>ADG, g/day</td>
<td>257</td>
<td>305</td>
</tr>
<tr>
<td>ADFI, g/day</td>
<td>335</td>
<td>373</td>
</tr>
<tr>
<td>FCR</td>
<td>1.30</td>
<td>1.22</td>
</tr>
<tr>
<td>Cost per tonne diet 1/2/3, £</td>
<td>810/620/350</td>
<td>850/650/350</td>
</tr>
<tr>
<td>Feed cost, £/pig</td>
<td>4.41</td>
<td>5.24</td>
</tr>
<tr>
<td>Cost/kg gain, £</td>
<td>0.78</td>
<td>0.78</td>
</tr>
<tr>
<td>1Return, £/pig</td>
<td>6.78</td>
<td>8.06</td>
</tr>
<tr>
<td>2MOF, £/pig</td>
<td>2.37</td>
<td>2.82</td>
</tr>
</tbody>
</table>

*Diets 1 and 2 differed between regime and 2, whilst diet 3 was common between both treatments and fed until day 22 post-weaning.

1Return per pig calculated using a price of £1.20 per kg live weight gained
2MOF; Margin Over Feed = Return per pig – feed cost

Initially the producer was attracted to regime 1 due to its lower cost per tonne, -£40/t (-$60) and -£30/t (-$45/t) for Diets 1 and 2 respectively; - £0.94 (-$1.41)/pig according to companies suggested amounts). However, due to the improved performance of regime 2 (+0.91 kg/pig gain and -0.08 FCR), feeding the cheaper regime 1 would be a false economy. An increased MOF of +£0.45 (+$0.68) per pig or +£69.30 (+$103.80) per tonne of starter feed (154 pigs fed per tonne of starter feed; diets 1 and 2) was achieved on regime 2 meaning regime 2 could be +£69.30 (+$103.80) more expensive before it was not cost effective to use. Furthermore pigs on regime 2 would be expected to reach slaughter around 3 kg heavier or 3 days earlier on regime 2 giving further economic return.

There’s no doubt the right starter feed regime is critical. After all, the pig will only eat starter feed once in its life and if it is wrong, there is no opportunity to correct this with the next diet. A cost:benefit approach to diet choice remains the most appropriate way to choose the correct start feed regime.
ACKNOWLEDGEMENTS
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REFERENCES


