Weaning in pigs, when the facts change

Competence Center
Phytogenics
It has always been true that weaning is one of the most stressful moments in pigs’ life due to the sudden shift from high protein, high fat and high lactose milk to low protein, low fat, low lactose and high carbohydrate solid feed. Shortly after weaning, the gastrointestinal tract appears to be susceptible to this feed shift. Diet shift is just another factor which can be added to other sources for stress like immunological and environmental stresses. Weaning induces many unwanted changes that can be summarised as follows:

• A decrease in the immune response of the small intestine due to the damage that occurs in the epithelial lining which contains the mucin-secreting cells.
• A substantial increase in \textit{E.coli} and \textit{Clostridium perfringens} populations concomitant with a sharp decrease in Lactobacillus species.
• Villous atrophy due to the shifting to the solid diet (just after weaning, the digestive tract of the pigs is almost empty for 3-6 hours which is considered as a golden opportunity for microbes to attack the epithelial lining of the small intestine and cause the previously mentioned morphological damage). Also it is very common to observe a significant decrease in villous height followed by an increase in the cryptal depth.

These changes count for the vast majority of health and performance problems that occur at this critical time. As consequences to these changes, digestive disorders appear to cause improper growth performance through poor nutrients digestibility which is followed by an increase in the feed conversion ratio.

The improper nutrients digestibility and the enteritis caused by pathogens are the most important factors leading to diarrhea incidence and mortality in newly weaned pigs. Just after weaning there are some facts that most producers believe in like the growth performance of pigs is normally decreased, health also is adversely affected by weaning and mortality is a common incidence during that time.

On the other hand, there is another fact in the mind of all producers: the performance of pigs during the nursery phase is the key limiting factor in the pigs’ future productivity until the marketing step.

In the light of all mentioned above, it seems that we can achieve a successful post-weaning performance mainly through supporting and stabilising the gastrointestinal tract. Regardless of the different weaning programs, pigs still need powerful, safe and sometimes uncommon solutions to overcome the weaning-related problems and hence change these old facts regarding animals’ health and growth performances after weaning.

Different natural feed additives and growth promoters were studied for their possible effects on improving pig performance. Phytogenics are a potent group within the family of natural growth promoters which have been shown to exert many positive effects within the gastrointestinal tract.

A 28-day experiment on 23 days old pigs was conducted to investigate the potential of a phytogenic product (Biomin® P.E.P) in comparison to an antibiotic growth promoter on the productive performance of newly weaned pigs under the conditions in Korea. A total of 360 weaned pigs equally distributed into three groups with four replicates as follows:

Group 1: Negative control (commercial diet)
Group 2: Positive control (commercial diet + 100 ppm apramycin/ton)
Group 3: Treatment (commercial diet + 125 ppm Biomin® P.E.P/ton).

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In order to achieve a successful transition from milk to solid feed, BIOMIN recommends the enrichment of diets with phytogenics feed additives to support growth performance in newly weaned pigs.
Phytogenics vs antibiotics and their effects on live body weight

For a very long time, antibiotics have been used in animal feed as medical treatments and as growth promoters, but since 2006 Europe has banned the use of antibiotics as growth promoters in animal rations. This decision created major problems for producers since they observed a pronounced decrease in live body weight, high mortality rate and a significant increase in the incidences of diarrhea in their herds. This response was expected because of the weak nature of young pigs during the early stages of their lives. Furthermore, in our current case (Korea) the producers will not be free to use antibiotics as feed additives. The Korea food and drug administration will ban the use of the antibiotics in animal rations by July 2011. In the present study the phytogenic product was shown to exert a positive effect on the live body weight at 50 days of age (Figure 1a) where pigs fed with Biomin® P.E.P. had significantly higher body weights than those fed on the antibiotic growth promoter (1530g difference) and numerically higher weights than the negative control group (230g difference).

Phytogenics and FCR

Feed conversion ratio (FCR) is affected by different parameters including mainly gastrointestinal health and feed quality. For producers, feed conversion ratio represents an important parameter in the production process. Figure 1b shows that the phytogenic improved feed conversion ratio by about 6% than the negative control group (1530g difference) and numerically higher weights than the negative control group (230g difference).

No mortality with phytogenics

Piglets are born weak and for a considerable amount of time they are observed to be susceptible to different diseases and stressors. It is known that mortality appears especially at the early life stage. This is why mortality always peaked at birth and at weaning. Furthermore, considering the complexity of reasons that lead to death at the end, it seems that mortality control at the weaning phase is a distant dream. Data regarding live body weight and feed conversion ratio revealed that the negative control group has a performance quite similar to the phytogenic group but and as shown in Figure 2 the difference became clear where the negative control group had a mortality rate of 2.5% and the phytogenic group showed 0%. Also, the phytogenic group performed better than the antibiotic group which had a 1.7% mortality rate.

At the end money talks: profits behind phytogenics

The cost-benefit analysis (Table 1) shows the differences between different treatments regarding to total feed cost in a quite short period (23 to 50 days of age). Diet supplementation with Biomin® P.E.P. resulted in reducing total feed cost by 4% and 15% in comparison to negative and positive control groups, respectively.

Conclusion

It is a fact that there is no escape from having improper performance shortly after weaning and it is accompanied with an increasing mortality rate. After reviewing the presented data, we can in fact control this very sensitive period through having better live body weight, lower feed conversion ratio, reduced mortality and reduction in the feed cost.

Other data not shown indicate that Biomin® P.E.P.
is modulating the gastrointestinal tract by controlling total microbial count, increasing nutrient digestibility and influencing immune response. In order to achieve a successful transition from milk to solid feed, it is a must to increase feed quality and one of the possible ways is the enrichment through using phytogenics as feed additives to support growth performance in newly weaned pigs.

It is also worth mentioning that phytogenics could be a powerful solution for producers on an early weaning program.

Finally, all facts that we know about post-weaning difficulties, can be controlled if we support our herds by increasing the quality of their rations by adding phytogenics.

### Table 1. Cost-benefit analysis per total pigs from 23 to 50 days of age.

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Antibiotic growth promoter</th>
<th>Biomin® P.E.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pigs</td>
<td>120</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>BW (kg)</td>
<td>20.79</td>
<td>19.49</td>
<td>21.02</td>
</tr>
<tr>
<td>BW gain (kg)</td>
<td>13.34</td>
<td>12.47</td>
<td>13.61</td>
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<tr>
<td>Total feed intake (kg)</td>
<td>2753</td>
<td>2738</td>
<td>2646</td>
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<tr>
<td>Feed cost ($/kg)</td>
<td>0.857</td>
<td>0.892</td>
<td>0.863</td>
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<tr>
<td>Total feed cost</td>
<td>2359.3</td>
<td>2442.3</td>
<td>2283.5</td>
</tr>
<tr>
<td>Feed cost/gain ($/kg)</td>
<td>113.48</td>
<td>125.31</td>
<td>108.63</td>
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<tr>
<td>Differences</td>
<td>104%</td>
<td>115%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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