Reducing stress during the weaning period through proper feeding

In this interview, Dr Maygane Ronsmans, Product Manager, Animal Nutrition at BENEO, discusses nutrition as the key to piglet weaning performance.

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Q: What impact can piglet weaning have on their health and long-term performance?

According to a study by Main et al., variation in weaning age can be a major contributor in live weight at the end of finishing, with weaning ages of 12, 15, 18 and 21 days compared and results showing that earlier weaning ages are associated with lower weights. Hence post-weaning growth, morbidity and mortality can be significantly impacted by a piglet's weaning weight. In this respect, the farmers' practice of 'early' weaning to achieve a quicker return to oestrus and improve fertility for the sow can have a key influence and result in lower piglet weight. So, the challenge is how to achieve the best performance for both the sow and her piglets if early weaning does occur. This is where nutrition plays a significant role in promoting piglets' long-term health and performance.

Q: How sensitive are piglets to digestive disturbances?

Like any young animals, piglets are sensitive to digestive disturbances. This is because their digestive tract and immune system are not fully functional. Notably the piglet's intestinal microbiota is not yet well established, and their immune system is not complete until six weeks of age.

At this stage they have a more established microbiome, both in the gut and on the skin, and the immune system can tolerate a greater concentration of illness-provoking viruses and bacteria in the environment.

Moreover, weaning is often a stressful period for piglets since they are taken away from their dam and switched to a solid food, which can result in post-weaning diarrhoea, impaired growth performance and a high mortality rate.

Q: What ingredients can be used to address these issues?

Switching from sow's milk to solid pre-starter formula feed can trigger a range of digestive issues, impacting both piglet health and long-term performance (for example, time to slaughter). However, transitioning to a rice-based feed can help support a piglet's growth and digestive health.

Also, there has been a growing awareness of the role the microbiome in piglet development and the important part prebiotic fibres have to play in increasing bifidobacteria (beneficial bacteria) and reducing coliforms (pathogenic strains), resulting in more balanced gut microflora.

Q: How do they promote digestibility and growth in piglets?

Compared to wheat, corn, tapioca and potato, rice has a very small starch granule size (2-8μm) and presents a neutral taste that is palatable for piglets. The unique granular structure of its starch fraction allows rice flour to be a highly digestible ingredient, making it of particular interest for young or sensitive animals such as piglets.

In addition to its starch, rice flour has low ash and fibre levels (maximum 1% each), and still contains a certain percentage of protein, that is an easily digestible source of plant-based protein with a well-balanced amino acid profile.

As well as promoting growth performance, the inclusion of rice in feed has been linked to a significant reduction in piglet removal rate and it has also been shown to be supportive for piglets facing various diseases.

Besides the benefit of rice-based diets, the inclusion of chicory prebiotic fibres, namely chicory inulin and oligofructose, can support a healthy gut microflora and ensure proper piglet growth performance.

Inulin-type fructans are carbohydrates featuring β glycosidic bounds that are non-digested but rather fermented by beneficial bacteria.

These selective fermentations bring many benefits in piglets. Firstly, the specific stimulation of good bacteria will help competing against pathogenic strains for nutrients and other resources, and therefore support prevention of infections.

Secondly, the fermentation of chicory prebiotic fibres increases the production of short chain fatty acids (SFCA), i.e., acetic, propionic and butyric acids.

The SCFA have different roles. Aside from providing a small amount of energy to the animal as per their absorption by the intestinal epithelium, they will above all decrease the intestinal pH and therefore create a deterrent against pathogenic bacteria.

Finally, the butyric acid also plays a key role in stimulating the regeneration process in damaged epithelial tissue. In stressful conditions such as weaning, the chicory prebiotic fibres represent an outstanding support to piglet health and performance.

Q: What opportunities does this present for feed formulators?

While most cereal ingredients are further processed or cooked to gelatinise the starch and improve their digestibility, the rice flour can either be included raw or cooked, as in both states it is highly digestible. In addition to benefitting from a highly digestible solution, pig feed producers can finetune the speed of digestion via the choice of rice variety used in their piglets' feed.

According to research, using a rice variety with higher amylose content – such as indica – leads to slower digestion rates than if a waxy rice variety with no amylose is used. The slower digestion rate also achieves lower blood glucose levels, a factor that is associated with improved piglet growth performance.

The impact that rice flour can have on piglet development has been further analysed by BENEO in a trial where standard commercial piglet feed was compared with one containing 6% BENEO rice flour. The results showed that piglets fed a diet containing rice flour had an average daily weight gain that was 7% higher than those on the standard feed.

This was further demonstrated in a follow up trial where rice flour was used as a 100% replacement of whey powder. It was shown that the average daily gain over the whole feeding period (day 21-67) was similar for the two diets, and that complete exchange of expensive dairy ingredients with rice flour is therefore feasible without impairing piglet performance.

Additionally, the inclusion of prebiotic chicory root fibre (which is the richest source of inulin in nature) specifically stimulates beneficial bacteria like lactobacilli and bifidobacteria so that they can outgrow the most common pathogens (coliforms and salmonellae) and greatly diminish the likelihood of these opportunistic pathogenic bacteria becoming a real problem.

As well as encouraging a balanced gut microflora and good intestinal health, the chicory inulin and oligofructose have shown other beneficial effects like stimulation of the immune system, increase of calcium absorption, and regulation of bowel movements.

In an era where antibiotics are banned from in-feed use, choosing the right selection of high quality, functional ingredients is even more paramount to ensure a smooth weaning process and better animal performance. In this respect, rice and chicory prebiotic fibres inulin and oligofructose, are valuable ingredients for piglets' feed formulation.

Thanks to greater insights into the benefits of including such ingredients in piglet feed, formulators across the world are now increasingly seeing the value of incorporating them into diets to improve growth performance and also to support the health of young piglets. ■

References are available from BENEO on request