

Protecting piglets against post-weaning diarrhoea with phytogenics

Post-weaning diarrhoea (PWD) is a problem swine producers face worldwide. *Escherichia coli* often causes this disease, characterised by diarrhoea, dehydration, mortality, and growth retardation in surviving pigs. The impact ranges from mild reductions in the growth performance to severe weight loss and mortality.

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Many factors, including husbandry, environment, nutrition, and genetic susceptibility, play a critical role in the severity of this disease.

Therefore, the control of PWD usually has to be approached at different levels: husbandry practices at the sow farms and nursery sites with proper sanitation and vaccination programmes; minimise the stress after weaning by providing a fresh and easily accessible feed and water and an adequate environment (temperature and humidity) and space for the newly weaned pigs.

Nutritional interventions to mitigate post-weaning diarrhoea

Management of nutritional programmes is also an essential aspect of controlling PWD. Conventional swine production systems rely on the in-feed application of antibiotics, pharmacological levels of zinc, fibre, high digestible protein, spray-dried plasma, dietary acidification, functional feed additives, and others to help the newly weaned pigs to overcome post-weaning challenges.

The usage of pharmacological zinc levels has been a successful strategy for controlling PWD. However, regulations limit this nutritional strategy's usage among pork producers. It is well known that zinc at pharmacological levels will be banned in the EU this year.

It will not take long for other regions of the world to follow a similar approach to regulate the usage of this mineral in pigs'

diets due to the concerns on microbial resistance and environmental contamination.

Phytogenics to mitigate post-weaning challenges

Among nutritional strategies, various feed additives are commonly used to mitigate the post-weaning challenges. Phytogenic feed additives (PFA) are recognised for their potential to improve growth performance, nutrient digestibility, and gut health of livestock species, including pigs. They are commonly defined as plant-based additives or a group of natural substances from different origins, like essential oils, bitter and pungent substances, mucilages, flavonoids, tannins, and saponins.

Delacon has been researching a combination of essential oils, flavonoids, and mucilages in post-weaning diets to maintain growth performance while decreasing the dependence on therapeutic zinc.

This selected formula of phytogenic compounds supports the animal on three different levels:

- On the first level, the gut mucosa is protected by a fine film of phytogenic mucilages, preventing the adhesion of pathogens like *Escherichia coli*.
- On the second level, a specific synergistic effect of the ingredients reduces the pathogenicity of intestinal bacteria via Quorum Sensing Interference (QSI). QSI disrupts bacterial communication pathways, leading to reduced expression of virulence factors, for example, reduced expression of fimbriae and suppression of bacterial toxin production.
- On the third level, the ingredients provide substantial antioxidative effects, mediated via upregulation of antioxidative enzymes and direct scavenging of reactive oxygen species.

Proving a phytogenic formula during post-weaning challenges

This combination of phytogenic compounds has been tested in several studies under field conditions. Field trials have been

conducted at commercial farms with a historical incidence of PWD associated with *Escherichia coli*.

In Germany, 540 weaned pigs were allotted into 30 pens (18 pigs/pen) during a 42-day trial. Animals received two treatments:

- Control diet (without therapeutic levels of zinc oxide).
- Control diet supplemented with PFA (1kg/MT Fresta Protect).

Supplementation of the PFA improved livability (97.4% vs. 96%) and decreased the number of pigs requiring medicine to control post-weaning diarrhoea (1.8% vs. 2.9%) compared to the control treatment.

This study suggests that this phytogenic formula is beneficial during post-weaning diarrhoea outbreaks by improving livability and reducing the cost associated with medical treatments in weaned pigs.

In another field study conducted in Spain, a total of 682 weaned pigs were allotted into 62 pens (11 pigs/pen) during a 42-day trial. Dietary treatments were:

- Control (3,000ppm of zinc oxide during the first 14 days).
- PFA (1kg/MT Fresta Protect during the 42 days).

No statistical differences were observed during the experiment in growth performance, faecal score, medical treatments, and mortality.

However, the ADFI during the first 14 days tended to increase when pigs were supplemented with PFA compared to the control treatment (230 vs. 220g; P=0.07).

The lack of statistical differences in the recorded parameters shows a similar effect on the growth performance of pigs supplemented with 3,000ppm of zinc oxide or PFA.

This study indicates that this type of PFA could be used as an alternative to zinc oxide in supporting piglets during the post-weaning period.

In summary, specific and proven phytogenic compounds can be used as a nutritional strategy in post-weaning diets to counteract post-weaning challenges, while decreasing the dependence on therapeutic zinc oxide. ■

References are available
from the author on request