Acid based eubiotics: the holistic approach to gut health

Supporting sow performance is no longer only about providing optimum nutrition to support her genetic potential. Now we must look to protect her from both bacterial and viral pathogens which can be present in feed, on the farm, or in the environment.

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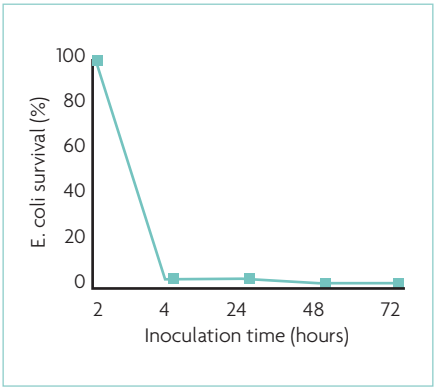
Promoting sow gut health has direct links to supporting her immune system. As 70% of the immune cells reside within the gut, any unnecessary inflammation can divert vital energy from an immune response.

Therefore, gut health and animal health are synonymous, and by rearing high health sows we can also help to ensure we wean high health piglets.

Importance of feed hygiene

Feed and raw materials must be free from pathogens; bacteria, moulds and viruses. An effective, formaldehyde-free, acid-based eubiotic (ABE) developed from a concentrated synergistic blend of formic and propionic acid, can help to protect feed hygiene.

Fig. 1. Survival of E. coli when ABE (pHorce) was applied to infected feed at 4kg/t (Abbot Analytical, 2019).



Propionic acid is beneficial to prevent mould development, whereas formic acid acts as a bacterial decontaminating agent, helping to control potentially pathogenic bacteria, such as Escherichia coli and salmonella.

Certain ABEs have a triple action effect which protects the feed and the animal against pathogens, moulds and viruses, as well as promoting a well-balanced and diverse gut microbiome.

A triple action ABE (pHorce, Anparo plc) included at just 4kg/tonne of feed can reduce E. coli counts by 98.3% after four hours of application. This also helps to maintain feed hygiene and protects feed over time (Fig. 1).

Viral transmission through feed

Many of those involved in feed and swine production are familiar with the risk posed by feed contaminated with moulds and bacteria. However, as well as the impact this can have on feed quality, animal health and performance, the significance of viral transmission should not be ignored.

Viral pathogens have been shown to survive for prolonged periods in feed and remain viable, with times ranging from seven to over 180 days, with environmental conditions and virus type being contributing factors.

Studies have indicated that certain feed ingredients are more likely to support survival and thus transmission of viruses, such as PEDv. High-risk feed ingredients include soybean meal, DDGS, lysine, methionine and vitamin D.

Numerous studies have highlighted the risk of in-feed survival for multiple viruses including ASFv, PRRS and PED.

In the United States alone, PRRS has created devastating results, with approximately 50% of all sow herds becoming infected, resulting in costs to farmers of over $560 million every year.

The results of a recent trial conducted at Pipestone Applied Research Facility in the United States found that pigs fed a control diet infected with Senecavirus A (Seneca Valley Virus, SVA), PEDv and PRRS exhibited clinical symptoms and also had a 100% infection rate with 6% mortality over the trial period.

However, pigs fed the same infected diet supplemented with a triple action, formaldehyde free ABE had no clinical symptoms of SVA, PED or PRRS and a much-reduced mortality rate (Fig. 2).

This work was undertaken to assess the anti-viral efficacy of ABEs on PRRS, PEDv and SVA in contaminated feed. In the trial, pigs were offered either a positive control (infected feed with no additive) or infected feed supplemented with the ABE (pHorce at 3kg/tonne of feed).

Feed quality and voluntary feed intakes

Supporting sow feed intake, particularly during lactation, is one fundamental aspect in maintaining optimum performance, and with increasing numbers of piglets born alive, the requirement for high quality milk and colostrum is amplified.

There are multiple factors involved in maximising feed intake during lactation, including provision of high-quality feed and feed hygiene, as well as ensuring feed palatability.

Supporting lactation intakes can help to maintain sow body condition and protect the future reproductive performance of the herd, especially in parities one and two.

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Bacterial, fungal and viral load at this time can have severe lifetime impacts on sow performance and her progeny.

Optimum gut health

In addition to supporting overall sow health and performance through feed hygiene and biosecurity, the benefit of ABEs on gut health should not be underestimated. Ensuring the gut microbiome is well balanced and rich in diversity can help to improve feed efficiency and animal robustness. Investing in sow gut health in gestation and lactation subsequently benefits lifetime piglet health and performance.

Initial microbial colonisation in the piglet occurs through maternal transfer at birth and during lactation. The suckling period is a critical time in the piglet's life to acquire a healthy gut bacterial population, which is essential for optimal digestive function, gut barrier protection and immune development.

Therefore, driving piglet performance through maternal nutrition is a cost-effective way to maximise lifetime performance and health of the growing piglet and maintain optimal sow productivity.

ABEs can help to lower the pH throughout the gastrointestinal tract of the sow and even a small change in pH can have a huge impact on the gut microbiome. Salmonella spp., for example, prefer a more alkaline (less acidic) environment, so a small shift in pH can help to reduce the risk of salmonella colonisation and proliferation in the upper intestine. In addition to reducing the numbers of potentially pathogenic bacteria, a more acidic pH in the gastrointestinal tract increases the number of beneficial bacteria, such as lactobacilli and bifidobacteria.

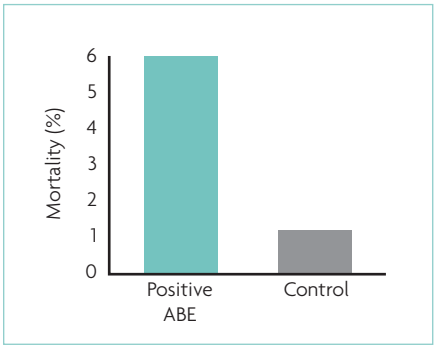

Fig. 2. Effect of dietary supplementation of an ABE (pHorce) at 3kg/t of feed on group mortality (%) 15 days following viral challenge (Dee et al., 2020).

These bacteria promote production of propionate and butyrate, which are metabolites produced in fibre digestion and are beneficial for gut development, repair and function. Supporting the natural function of the gut helps to reduce the risk of a bacterial imbalance, which supports normal immune function and minimises unnecessary stress on the animal.

Piglets are further benefitted through maternal transfer of immunity and a low stress environment.

Multiple benefits, maximum profits

Selecting the right feed additive is finding a product that provides multiple benefits and can help to deliver a great return on investment. Certain ABEs offer a broad range of actions which are effective throughout the production chains, from feed material hygiene to meat quality.

The advantage of such ABEs is simple application of a single product which helps to support the health and performance of the feed, sow and her progeny. A wide range of benefits, consequently delivering a greater return on investment, is how some producers are getting ahead.

Certain ABEs do offer a broad range of proven actions and benefits which are effective throughout the production chain and over all life stages. The advantages of such ABEs, where use of a single product supports the health and performance of the sow and her progeny, are favourable for the modern-day sow producer.

Improving lifetime performance should offer a long-term return on investment. ■