Probiotics in practice: supporting gut health and optimising production

The understanding of the animal gut has grown over the years, not only in regards to its basic mechanisms and how these function, but also how gut health plays a major role in effective animal production. The link with technical results is undeniable, with a healthy gut and balanced microbiota seen as the motor of performance. As such, impacting these has become increasingly more important, as animal production continues to aim for more efficiency and productivity.

by Wouter Van der Veken, Global Product Manager Probiotics Huvepharma, Belgium. www.huvepharma.com

Apart from understanding the gut, methods of influencing it have evolved over the years as well. With the rise of consumer demands, especially regarding the use of antibiotics, the interest in alternative tools to support the gut has increased, with probiotics being a strong contender.

Probiotics themselves are not a new concept in theory, and even less so in practice: for example ingesting certain fermented foods containing live bacteria has been associated with health benefits since ancient times. However, over time, our perception of probiotics has evolved, as have our definitions. Probiotics are viable micro-organisms which, when administered in adequate amounts, confer health benefits to the host, usually by impacting the gut.

Their mode of action can be multi-factorial and, as such, there remains plenty of research to be done, both commercially as well as scientifically. Nevertheless, the impact probiotics can have on gut health and technical performance has been proven beyond any doubt. A good example is Bacillus licheniformis, a spore-forming probiotic with a long history in supporting animal production. After intensive R&D a unique strain was isolated and tested (strain DSM 28710, B-Act), both in controlled laboratory conditions as well as in the field.

Bacillus licheniformis DSM 28710

From this research it became quickly clear that the DSM 28710 strain offers an impressive gut health management tool, for example to mitigate Clostridium perfringens challenges.

This pathogen mainly causes issues in piglets such as scours, but C. perfringens can also impact technical performance negatively in later stages. As such, having a management tool which can be incorporated from start until finish is a massive benefit.

When looking at B. licheniformis DSM 28710's characteristics, there are some interesting features that should be pointed out. First of all the probiotic is a spore-former, protecting the bacteria from environmental influences and allowing it to withstand a wide range of feed processes.

This includes feed treatments with sanitary products, as well as pelleting under different conditions.

Secondly the probiotic is capable of producing potent antimicrobial metabolites, with a specific affinity for C. perfringens. As such, the pathogen is effectively managed by B. licheniformis DSM 28710, preventing both clinical outbreaks as well as subclinical proliferation.

Finally the probiotic is part of the Bacillus genus, a class of bacteria well-versed in the principle of competitive exclusion.

As such, B. licheniformis DSM 28710 is a strong contender to outcompete undesirable bacteria in terms of nutrients and space, positively impacting the composition of the gut microbiota.

In practice

The above was highlighted recently in two commercial trials. The first was conducted with 208 fattening pigs, arriving at the farm weighing 29.5kg on average. After being randomly divided into two groups they were supplemented with either BMD (bacitracin methylene disalicylate, 300g/ton of feed) or B-Act (500g/ton of feed, equal to 1.6 x 10^{12} CFU B. licheniformis DSM 28710/ton of feed) for 70 days.

The trial was timed to coincide with a period of historically high C. perfringens incidences, to evaluate if B-Act was able to mitigate the expected challenge. To do so, average daily weight gain, feed intake, feed conversion ratio and mortality were recorded. At no point during the trial period did the results of either group differ statistically significantly from each other, indicating that B-Act achieved similar results as the BMD treatment.

The second commercial trial used 768 weaning piglets, randomly allocated to two different houses for the duration of the weaning period.

The first group (control) consisted of 379 piglets, with an average body weight of 6.79kg and an average weaning period of 45 days.

The second group (B-Act) counted 389 pigs, with an average body weight of 6.07kg and an average weaning period of 51 days.

From a management and veterinary perspective, this second group was separated as it contained all piglets that had encountered enteric problems in the nursery, resulting in a missed potential in terms of technical performance (so-called 'delayed piglets').

As a treatment, the second group was supplemented via the drinking water with B-Act WSP (water soluble formulation) for three days, in a concentration corresponding to 8.2 x 10^9 CFU B. licheniformis DSM 28710 per piglet per day (corresponding with in-feed recommendations).

Average daily weight gain, feed intake and feed conversion ratio were evaluated, as well as daily mortality.

At the end of weaning the B-Act WSP group had recovered and even surpassed the control group, both in terms of final end weight (26.26kg vs. 25kg) and feed conversion ratio (1.26 vs. 1.27). Mortality due to enteric issues followed the same trend, with 0.26% for the B-Act WSP group and 0.52% for the control.

Apart from a positive improvement from the control, a historical comparison showed that previous groups of delayed piglets did not have the tendency to recover to the same performance level as the control.

Keeping the above in mind, B-Act definitely offers an efficient tool to positively impact technical performance and mitigate bacterial challenges, supporting productivity on-farm. ■