

INTEGRATED APPROACH WILL HELP LESSEN IMPACT OF ANTIBIOTIC REDUCTIONS

By Tim J Carter, Feed Additives manager, Trouw Nutrition GB

Producers will have no option other than to review their management in the light of Government decisions to reduce antibiotic usage in farmed livestock. So the focus has to be on how to limit the consequences on physical and financial performance. Given the nature of the challenges that have been addressed and managed by the use of antibiotics, the most effective strategy will be based around holistic management approaches to help offset the effects on productivity of a reduction in prophylactic antibiotic use on pig and poultry units.

There can be no argument that increasing levels of antibiotic resistance represents one of the most pressing public health issues currently being faced. The threat is correlated with both geographical regions of high antibiotic usage and also with the fall in the number of new antibiotics being developed.

Consequently the spotlight has fallen on those industries with high antibiotic usage including pig and poultry production with the aim of reducing usage, with pressure from both Government and consumers. Many major food industry names, including McDonalds, are leading a move away from animals raised using antibiotics.

Despite significant focus on reducing antibiotic usage, it is currently estimated that globally over 60,000 tonnes of antibiotics are used annually in animal production and if left unchecked this will probably increase.

The EU has said it wants to prohibit the purely preventative use of antibiotics, insisting that antibiotics should not be used to improve performance or compensate for poor husbandry. Furthermore, prophylactic antimicrobials which are used as a preventative measure in the absence of clinical signs of infection should be limited to single animals and justified by a vet. This will be a major challenge for poultry units where whole flocks are often routinely treated as a strategic management measure.

In the UK, the Government has said it will uphold the recommendations of the O'Neill review into antibiotic usage, which they say will build on the success of the poultry sector in reducing antibiotic usage by 44% between 2012 and 2015. Defra has committed to reducing antibiotic use across animal agriculture to 50mg/kg, down from the 2014 average of 62mg/kg – a further 19% decrease.

The industry will therefore have to consider how to react to these new targets and maintain healthy, cost-effective pig and poultry production in the face of reduced access to antibiotics.

Consider current antibiotic usage

Antibiotics have been used in monogastric systems for three principal purposes. By far the largest use was as a growth promoter until the practice was banned in 2006. Since then antibiotics have been used

curatively and prophylactically.

The curative use of antibiotics in farmed animals is not currently being challenged, although the EU want to prohibit the veterinary use of those antibiotics that are critically important for human medicine.

It is the prophylactic use, where antibiotics are used to maintain health and prevent the spread of disease, that is being targeted.

The key reason for prophylactic use in monogastric units is to maintain gut health to support optimal feed conversion and daily liveweight gain. It is estimated that around 70% of the antibiotic use on pig and poultry units is prophylactic to improve gut health.

There is plenty of evidence to demonstrate that prophylactic antibiotic strategies work, with up to 4% higher daily gains and a similar improvement in feed conversion. Interestingly, however, there is a strong correlation between the improvement achieved and the overall health status of the farm.

The best managed farms have less potential for improvement, whereas those units with wider challenges including housing, and biosecurity as well as disease can benefit the most. This can indicate where a new strategy can be developed to allow maintenance of better performance in a post-prophylactic antibiotic usage era.

Optimised feed conversion is a consequence of developing and maintaining optimal gut health with stable gut microbiota favouring beneficial organisms, and the maintenance of gut wall integrity. In situations where pathogenic micro-organisms can thrive the integrity of the gut wall can be compromised, reducing its ability to absorb nutrients and leading to reduced feed utilisation and growth while also allowing toxins to enter the bloodstream. At the same time, the impaired gut function can also lead to increased incidence of diarrhoea.

The role of prophylactic antibiotics in reducing enteric problems revolves around stabilising the gut microbiota, the elimination of pathogenic bacteria and the maintenance of the integrity of the gut wall. Prophylactic antibiotics can often mask the root cause of performance problems instead of addressing them.

Implementing management practices which tackle the root causes can firstly reduce the risk of pathogenic bacteria entering the system, and then limit their ability to thrive in the gut.

Three pronged approach

Trouw Nutrition has developed programmes to help pig and poultry producers move towards systems with reduced dependence on prophylactic antibiotics, while maintaining similar performance levels. These programmes are based on three key areas which will each impact on reducing the threat and effect of pathogenic microorganisms, allowing the establishment and maintenance of optimal gut health

status. They combine best management practices in water, feed and health management with specific product treatments.

The starting point has to be a focus on animal health *per se* and reducing the risk of pathogenic challenges. Factors such as stocking density, temperature and relative humidity and ventilation will all have a direct influence on the levels of pathogenic bacteria. In addition, they can all contribute to physiological stress and inflammation, which can disrupt the mucosal barrier in the gut, leading to impaired gut function and a detrimental shift in microbial balance.

Biosecurity is another key area where strict protocols and management can help reduce the risk of enteric problems. Operating all in: all out systems with through cleaning and disinfection can help ensure new intakes of animals enter the best possible environment. Additionally, control of vermin and visitors can help maintain a desirable environment.

Water and feed hygiene and safety are the other central pillars to our programme.

Water is an often overlooked nutrient, but its quality can have a significant impact on performance. It is essential to understand the quality of water in terms of mineral content, hardness, pH and pathogenic load. Reducing the pH of the water can help digestion and also improve microbial balance in the gut. Quantifying and improving the quality of water should be a priority on all units.

Treatment of water with Selko® pH, a synergistic, partially buffered blend of organic acids has two benefits. Not only can it support digestion by lowering the pH of the drinking water and consequentially the crop and stomach, but the buffered acids also help to improve microbial balance in the intestine

Feed is the final key area. Producers should challenge their feed supplier about the processes taken to ensure all feed delivered meets high hygiene standards. Once delivered, feed management needs to focus on maintaining quality, and preventing spoilage. Ensure feed bins and delivery systems are regularly disinfected and protected from vermin. Treatment of feeds with Fysal® a sophisticated blend of free and buffered organic acids with specific and targeted antimicrobial effects can reduce pathogenic bacteria.

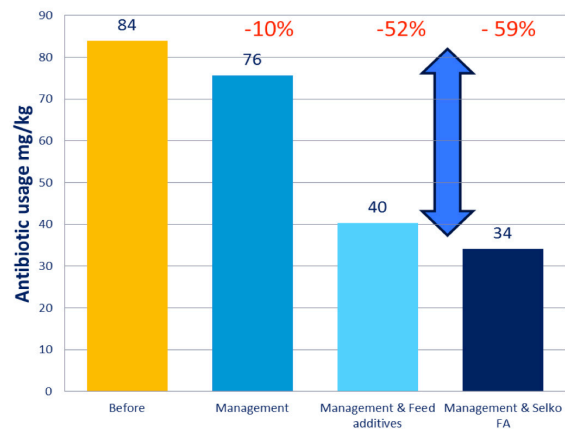
Feed composition can also play a role in improving gut health. For example, undigested protein can act as a substrate of bacterial growth. Therefore, providing only the required level of protein, using more digestible protein sources and amino acids can reduce the incidence of diarrhoea in piglets and wet litter in broilers. The inclusion of specific fibres or larger particles can promote improved peristalsis, contributing to the prevention of gastrointestinal infections.

The effectiveness of a strategic approach to the removal of prophylactic antibiotics is being demonstrated in numerous trials. A study of data from Germany, involving over 40 million broilers from 11 commercial broiler units over five years showed it was possible to reduce antibiotic usage by 59%, cut mortality by 28% and improve FCR by 5.3% (see graphs).

The trial involved the farms assessing management and setting best practice targets for all areas of farm, feed and health management including biosecurity, health care, climate control and nutrition. Part of this strategy was to include several feed and water additives.

Faced with the enormous challenge of reducing antibiotic usage on pig and poultry units, integrated management programmes could offer a cost-effective way to meet the usage targets set by Government while demonstrating a willingness to work with consumers.

Antibiotic usage effect



Broiler Mortality effect



FCR effect on the different treatments

