International Pig Topics

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ESPHM 12th EUROPEAN SYMPOSIUM OF PORCINE HEALTH MANAGEMENT

Number: 170

Vaccinology VI

The metabolic cost of infection

In Vaccinology V, the concept of the metabolic cost of infection was briefly touched upon. It appears that this concept is not widely known or understood. Therefore, here in this Pig Bytes, attention will be given to the subject.

The metabolic cost of infection has two sides. Firstly, because the animals undergo an infection they often eat less and therefore their growth (average daily gain) is impaired. Secondly, parts of the feed will be directed to produce proteins that are used to build up antibodies to neutralise the invaders or are used to upgrade the activity of the cellular immunity component. In short, the metabolic cost of infection is composed of both a reduced feed intake and a higher fraction of the feed intake that is used to eliminate invading pathogens through a higher activity of the immune apparatus.

These two factors lead to fewer materials being available to build up muscles or perform body functions. In general, individuals are exposed to all kind of bacteria, viruses, parasites etc. The immune apparatus is constantly working to clear these invading bugs. Sometimes this process is just a mechanical activity requiring almost no energy.

When pathogens are involved it becomes a different matter. Under practical conditions, and certainly when large groups of pigs are housed together, a constant exposure to a large number of pathogens occurs. This exposure to these pathogens is/was traditionally controlled by using large quantities of in-feed antibiotics. Antibiotics only work against bacteria but the modern viruses are economically devastating because of the complicating effects of the accompanying secondary bacterial infections.

As the antibiotics did the job of clearing the bacteria, no metabolic cost of infection was noted in pigs. Pigs continued to grow as if the bugs were not present and, as a consequence, the in-feed antibiotics were commonly referred to as growth promoters. Efficacious viral vaccines prevent damage caused by pathogenic viruses and therefore also make it difficult for the secondary bacterial invaders. In other words, there is less need for in-feed antibiotics.

Conclusion

The great success of reducing the use of antimicrobial products lies in the management system used to prevent and control pathogens. Vaccination, biosecurity and all-in/all-out procedures are all methods of reducing the viral and bacterial load so that the impact of the metabolic cost of infection is greatly reduced, and also the use of antimicrobial compounds. It takes guts to stop using in-feed antibiotics as the broad-spectrum activity was, and is, highly appreciated in the industry. However, when society demands prudent use of antimicrobials, the correct use of vaccines, biosecurity and hygiene matters, play a major role in reducing the use of antimicrobials to control the metabolic cost of infection.