Antibiotic Resistance

Global antimicrobial usage in pig production has increased proportionally to meet the high demand for animal protein. However, the overuse of antibiotics has led to the development of certain bacteria that are able to resist the effect of antibiotic treatments. This could potentially have negative effects on pig health (gut microbiome), farm productivity, and human health if antibiotics no longer work to treat infections.

Antibiotic Alternative Additives

Antibiotic alternative additives improve growth performance and gut mucosal immunity, and inhibit enteric pathogenic bacterial proliferation. As these alternatives rarely equal antibiotics in their effectiveness, a combinational strategy of antibiotic alternatives with multiple mechanisms should be adopted.

Regulatory Changes on Antibiotic Usage in Swine Production

1941 - The first clinical trials of penicillin were conducted.
1953 - Antibiotics were introduced to animal feed in Europe.
1997 - European Union (EU) started to limit the use of antibiotics as growth promoters in livestock production.
2006 - EU banned the use of antibiotics as growth promoters in livestock production.
2006 - South Korea followed the step taken by the EU in 2006.
2011 - Canada introduced the same regulation as US.
2017 - US Food and Drug Administration (FDA) implemented regulations that eliminated over-the-counter (OTC) status for in-feed antibiotics that are medically important in human medicine and required additional veterinary oversight for on-farm applications.
2020 - In China, both the production and importation of growth-promoting antibiotics were halted since Jan 2020 and the uses of antibiotics as growth promoters are banned starting from Jul 2020.

Best Practices for Optimizing Gut Health in Swine

Optimal practices stimulating gut development and health in pigs can be categorized into two groups: 1) antibiotic alternative in feed additives and 2) managing feed quality strategies.

Antibiotic Alternative Strategies

- Probiotics
- Prebiotics
- Enzymes
- Antimicrobial peptides

Managing Feed Quality Strategies

- Limit anti-nutritional factors
- Use of feed processing
- Safe feed storage