NUTRITION NOTES
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BUTYRIC ACID IN PIG FEEDS & WATER SUPPLEMENTS: NOT JUST ROTTEN SILAGE ANYMORE

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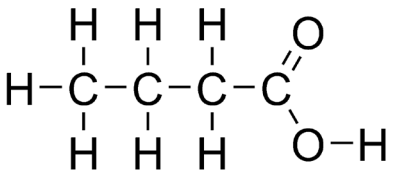
Butyric Acid is well known in the livestock industry as an indicator of poor fermentation in silages. It is produced by Clostridium in an aerobic environment when the pH of the silage does not drop fast enough to encourage the growth of lactic-acid-producing bacteria. High Butyric Acid in silages results in decreased feed intake by cattle and an increased risk of Ketosis, particularly in pre- and post-fresh cattle. However, in pigs, Butyric Acid is gaining acceptance as a nutrient to improve gut health and as an aid to reduce the effects of intestinal diseases.

Butyric Acid is a Short Chain Fatty Acid similar to Propionic and Acetic Acids and is typically added to pig feeds as Sodium Butyrate or Calcium Butyrate. It is used as an energy source by the cells of the intestine of the pig and may also be consumed by lactic-acid-producing bacteria found in the gut. Supplementation of starter feeds with Butyrate results in pigs with better growth performance, especially when Butyrate is fed to pigs immediately after weaning.

Researchers claim that the improvements in growth performance in pigs fed feeds supplemented with Butyrate are due to improvements in cell growth and regeneration, along with improvements in the cell's ability to deal with the stresses of disease challenges. Kotunia and coworkers (2004) showed that feeding baby pigs Butyrate resulted in a better developed intestinal brush border. The brush border is the area of the intestine that absorbs nutrients and serves as a barrier between the gut and the body. One of the theories for the improvements in the brush border cells of the intestine is that these cells easily absorb Butyrate and utilize it for energy; more energy should lead to larger, healthier cells.

Structure of Butyric Acid



Another benefit of using Butyrate in piglet feeds is an increase in lactic acid and lactobacillus bacteria in the gut (Galfi et al., 1991). These increases were accompanied by reductions in harmful bacteria such as E. Coli. The increase in lactic-acid-producing bacteria in the gut may lead to improved gut health due to reduced gut pH, which limits disease-causing bacteria since they typically prefer an environment with a more neutral pH.

continued

Improving the health of the intestinal cells is one of the keys to helping young pigs both use feed efficiently and to combat intestinal challenges such as E. coli and PEDv after weaning. The following photos from Malheiros and Ferket (2010) show the difference in intestinal cell health of broilers fed Butyrate. It is obvious that the cells from the Butyrate-fed broilers are more robust and healthier than the cells of the birds not fed the Butyrate. This also occurs in the intestine of the piglet; the more robust cells also make a tighter, less-pervious barrier between the gut and the body. A tighter barrier leads to fewer bacteria absorbed into the body, which further improves the health of the pig.

Adapted from Malheiros and Ferket (2010)

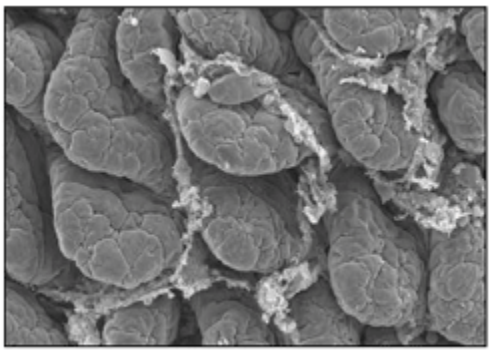


Fig. 2A Broiler chicks, 7 days, negative control

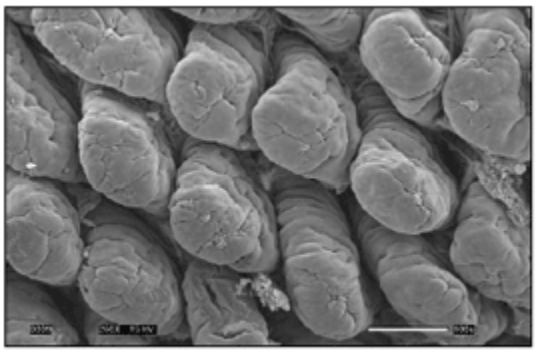


Fig. 2B Broiler chicks, 7 days, 0.06% butyrate

Because of the advantages of adding Butyric Acid to starter feeds, the Kent NexGen family of starter feeds contains appropriate levels of Butyric Acid to help improve piglet growth performance and provide protection strategies to help the piglet deal with disease stresses. In addition, Butyrate is a key ingredient in HydraVantage™ due to the dramatic influence it can have on the health and function of stressed intestinal cells. The research at the Kent Product Development Center shows that our preferred source of Sodium Butyrate is highly effective and improves the health and wellness of stressed piglets.

REFERENCES

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