

INTESTINAL DEVELOPMENT WITH GLYCERIDES OF BUTYRIC ACID

Short-chain fatty acids improve intestinal health and FCR

BUTYRIC ACID FOCUSES ON INTESTINAL DEVELOPMENT AND GUT HEALTH. THE SHORT-CHAIN FATTY ACID IS AN ENERGY SOURCE, BUT MORE IMPORTANTLY IT HAS ANTIBACTERIAL PROPERTIES AND IS THEREFORE APPLIED TO YOUNG ANIMALS.

In order to achieve efficacy in the entire intestinal tract of the animal, binding butyric acid to glycerol proves to be a good solution. Feeding trials with sow and weaned piglets have shown that butyric acid-based feed additives lead to increased piglet weight and improved feed conversion ratio (fcr).

Increased
profitability

Increased
body weight

Decreased
FCR



Research has demonstrated that butyric acid stimulates intestinal epithelium development in the entire intestinal tract. Moreover, this short-chain fatty acid has antibacterial properties, mainly against Gram-negative bacteria such as Salmonella and E. coli.

Butyric acid is volatile and quickly absorbed by the body. To achieve a target release in the intestinal tract, specifically mono and - triglycerides of butyric acid are suitable. When bacterial challenge with e.g. E. coli or Salmonella occurs, alpha-monoglycerides of butyric acid are of interest as this molecule has antibacterial properties. In order to deliver high levels of butyric acid in the intestines, triglycerides of butyric acid, also known as tributyrin, should be added to the diet. As tributyrin is a fat, butyric acid will be released in the small intestine by the action of the pancreatic enzyme lipase. Hence, butyric acid is released in the desired part of the gastrointestinal tract, namely in the small intestine

FRA[®]MELCO



» FEEDING TRIAL IN SOWS

In a trial, performed by FRAmelco at Livestock Feed Tests in Germany, FRA® Butyrin Ultra Dry, a product based on tributyrin, was applied to the sows' diet. This trial involved a control group and a treatment group. All sows were fed twice a day with the same basal diet. The only difference in the treatment group was the addition of 2kg FRA® Butyrin Ultra Dry per ton of feed. The trial started 7 days before farrowing and lasted until weaning at 25-28 days lactation. Litter size was standardized to 13 piglets per sow after parturition.

From the results it became clear that adding FRA® Butyrin Ultra Dry to the diet of the sow increased body weight of the piglets at weaning with 10.5%. This was the result of an increased average daily weight gain of the suckling piglets of almost 26 gram per day. Litter size was almost identical at weaning (12.28 and 12.25 piglets per sow in the control and treatment group respectively), hence litter weight was over 7 kilos higher in the treatment group compared to the control group.

T1 The effect of FRA® Butyrin Ultra Dry on sow and piglet performance

Table 1

| Sow Performance | Control | FRA® Butyrin Ultra Dry |
|---|---------|------------------------|
| Number of sows | 18 | 20 |
| Stillborn piglets (n/sow) | 1.33 | 1.95 |
| Live born piglets (n/sow) | 15.56 | 16.15 |
| Average litter weight at birth (kg/sow) | 20.26 | 21.37 |
| Average birth weight (kg/piglet) | 1.31 | 1.34 |
| Weaned piglets (n/sow/litter) | 12.28 | 12.25 |
| Average weight at weaning (kg/piglet) | 5.93 | 6.55 |
| Litter weight at weaning (kg) | 72.82 | 80.24 |
| Average daily growth (kg) | 184.5 | 210.2 |
| Piglet mortality (%) | 8.57 | 8.98 |

» WEANING PIGLET PERFORMANCE

Another trial was performed in Denmark to confirm the positive effect of glycerides of butyric acid on weaned piglet performance. FRA® Butyrin Hybrid Dry, a mixture of mono- and triglycerides of butyric acid was applied to the piglets' diet to examine their performance after weaning. A total of 180 weaned piglets, aged 26 to 28 days, were divided over 18 pens, based on sex and weight. Every pen consisted of five gilts and five barrows which all had nearly identical starting weight. The control group consisted of 90 piglets with an average starting weight of 6.53kg and received a normal basal piglet diet. The treatment group consisted of the same amount of piglets with an average body weight at the start of 6.65kg. These piglets received the same basal diet, but during the first 3 weeks after weaning 2kg FRA® Butyrin Hybrid Dry per ton feed was added and during the following 3 weeks 1.5kg of the product per ton of feed was applied.

Results showed that piglets receiving FRA® Butyrin Hybrid Dry were on average almost 800 gram heavier 6 weeks after weaning (25.31kg compared to 24.53kg in the control group. Average daily growth per pig in the treatment group was 444 grams, which was almost 16 grams higher compared to the control group. This equals an improvement of 3.7

» IMPROVED FCR

Another major advantage of adding FRA® Butyrin Hybrid Dry to piglet diets is the improvement on feed conversion ratio. With a FCR of 1.366 in the treatment group and 1.461 in the control group during the entire period of 6 weeks after weaning, FCR was significantly improved. Such a result is very beneficial for pig farmers because it can reduce the cost price per kilogram of piglet produced and maximize gross profits. An economical calculation showed that for this trial a return on investment of 16.7 was obtained.

IN CONCLUSION

Adding tributyrin to the sows' diets just before farrowing and until the end of lactation showed to increase average daily growth of the suckling piglets, resulting in higher weaned piglet weight. It is assumed that improved gut function and increased nutrient absorption resulted in an increased milk production. Furthermore, glycerides of butyric acid have shown to improve also average daily weight gain of weaned piglets. Moreover, FCR of weaned piglets was strongly improved.

