

Effects of Alfalfa Meal or Fermented Alfalfa Meal Diet on Growth Performance & Intestinal Microorganisms of Weaned Piglets

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Weaning stress can increase diarrhea rate and growth performance impairment in piglets. Although weaning stress can be alleviated by adding substances to the feed, such as trace elements and organic acids, etc., the long-term use of these additives in large quantities will increase productivity costs. In this study, a certain proportion of alfalfa meal, fermented or unfermented, was added to the diet of 21-day-old weaned piglets to investigate its effects on the growth performance, antioxidant capacity, intestinal development and gut microbiota of early weaned piglets. The experiment was randomly divided into four groups: control group (CG), alfalfa meal group (AG), 2.5% fermented alfalfa meal group (2.5% FG) and 7.5% fermented alfalfa meal group (7.5% FG). The results showed that: (1) The average daily weight gain and feed-to-gain ratio of piglets in each treatment group were not significantly affected ($P>0.05$), but 2.5% FG had the lowest feed-to-weight ratio. (2) Compared with the CG, AG and 2.5% FG significantly increased the activity of CAT and GSH-PX and decreased the amount of MDA in serum and liver tissue ($P<0.05$), while the difference was not significant in the 7.5% FG. (3) The microbiota in cecum and colon were determined by 16s rRNA sequencing, and it was found that the addition of alfalfa meal or fermented alfalfa meal to the diet significantly increased the abundance and diversity of microorganisms in cecum and colon. The 2.5% FG significantly increased the abundance and diversity of microorganisms in *unclassified_f_Lachnospiraceae*, *Ruminococcaceae_UC*, *Ruminococcaceae_UCG-005*, *Faecalibacterium*, *Mitsuokella* and *Bacteroidales_S24-7_group*, and decreased the relative abundance of *Helicobacter* and *Streptococcus*. In conclusion, the addition of a certain amount of alfalfa meal or fermented alfalfa meal to the diet of early weaned piglets could promote piglet development, improve gut microbial diversity, increase the relative abundance of beneficial bacteria and inhibit the colonization of harmful bacteria. In addition, it was more effective with the addition of 2.5% fermented alfalfa meal to the feed. This study provided a direction for exploring new feed resource and confirmed that the addition of 2.5% fermented alfalfa meal to the feed was more effective in reducing weaning stress in piglets, providing a theoretical basis for the application of alfalfa in production practice.

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