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研究简报

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益生菌制剂对早期断奶仔猪肠道pH、黏膜形态结构和挥发性脂肪酸含量的影响

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Effects of Probiotic Preparation on Intestinal pH, Mucosal Morphology and Volatile Fatty Acid Content in Early Weaner Piglets

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摘要 本试验旨在研究益生菌制剂对早期断奶仔猪肠道pH、黏膜形态结构和挥发性脂肪酸含量的影响。选用48头平均体重为(6.39±0.42) kg的(21±2)日龄“杜×长×大”三元杂交断奶仔猪,按性别、体重和窝源基本一致原则随机分为2个组,每个组4个重复,每个重复6头猪。试验1组为对照组,采用基础饲料;试验2组为益生菌组,每千克基础饲料中添加 1×10^9 CFU活菌。试验期为21 d。结果表明:1)28日龄时,益生菌组回肠内容物pH显著低于对照组($P<0.05$)。2)和对照组相比,添加益生菌制剂,28日龄时,显著增加空肠、回肠绒毛高度和上皮内淋巴细胞数量($P<0.05$),显著提高回肠杯状细胞数量($P<0.05$),显著降低回肠隐窝深度($P<0.05$);35日龄时,显著增加空肠、回肠绒毛高度($P<0.05$),显著提高空肠上皮内淋巴细胞数量($P<0.05$),显著降低空肠、回肠隐窝深度($P<0.05$);42日龄时,显著增加空肠、回肠绒毛高度,显著提高空肠上皮内淋巴细胞和杯状细胞数量($P<0.05$),显著降低空肠隐窝深度($P<0.05$)。3)28日龄时,益生菌组盲肠内容物中丁酸和乳酸含量显著高于对照组($P<0.05$);35日龄和42日龄时,益生菌组盲肠内容物中乙酸、丙酸、丁酸和乳酸含量显著高于对照组($P<0.05$)。由结果可知,添加益生菌制剂能改善断奶应激对绒毛高度和隐窝深度的影响,提高肠道淋巴细胞数量和挥发性脂肪酸含量,降低肠道pH,从而缓解断奶应激对肠道环境的影响。

关键词: 益生菌制剂 断奶仔猪 pH 黏膜形态结构 挥发性脂肪酸

Abstract: This experiment was conducted to study the effects of probiotic preparation on intestinal pH, mucosal morphology and volatile fatty acid (VFA) content in early weaner piglets. Forty-eight crossed-bred (Duroc×Landrace×Yorkshire) piglets with an average body weight of (6.39±0.42) kg were randomly assigned to 2 groups (control group and probiotic group) with 4 replicates in each group and 6 piglets in each pen balanced for sex, weight and litter origin. The piglets in the control group were fed a basal diet, and the others in the probiotic group were fed the basal diet supplemented with the probiotic preparation at a concentration of 1×10^9 CFU per kg feed. The feeding trial lasted for 21 days. The results showed as follows: 1) the pH of ileum in the probiotic group was significantly lower than that in the control group at 28 days of age ($P<0.05$). 2) At 28 days of age, compared with the control group, villus height and the number of intestinal intraepithelial lymphocytes (IELs) of jejunum and ileum in the probiotic group were increased significantly ($P<0.05$), the number of ileal goblet cells in the probiotic group was increased significantly ($P<0.05$) and the ileal crypt depth in the probiotic group was decreased significantly ($P<0.05$); at 35 days of age, probiotic preparation significantly increased villus height of jejunum and ileum ($P<0.05$). Probiotic preparation significantly improved the number of IELs of jejunum and decreased crypt depth of jejunum and ileum ($P<0.05$); at 42 days of age, villus height of jejunum and ileum in the probiotic group was significantly increased ($P<0.05$). Probiotic preparation significantly increased the number of IELs and goblet cells of jejunum ($P<0.05$), and significantly decreased crypt depth of jejunum ($P<0.05$). 3) The contents of butyric acid and lactic acid of cecum in the probiotic group were significantly increased compared with the control group at 28 days of age ($P<0.05$). Probiotic preparation significantly increased the contents of acetic acid, propionic acid, butyric acid and lactic acid of cecum at 35 and 42 days of age ($P<0.05$). In conclusion, villus height, crypt depth, the number of IELs and goblet cells, and VFA content in weaner piglets are improved by dietary probiotic preparation

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supplementation. The probiotic preparation can effectively alleviate intestinal environment disorder caused by the stress of early weaning of piglets.

Keywords: probiotic preparation, weaner piglets, pH, mucosal morphology, VFA

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