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断奶仔猪小肠黏膜脂肪酸结合蛋白和二肽转运载体1 mRNA表达发育性变化及谷氨酰胺对其的影响

周琳, 曹广添, 张帅, 杨彩梅, 陈安国, 洪奇华

浙江大学动物科学学院, 杭州 310058

Intestinal Fatty Acid Binding Protein and Dipeptide Transporter 1 mRNA in the Small Intestinal Mucosa of Weaner Piglets: Developmental Expression and Influence of Glutamine

ZHOU Lin, CAO Guangtian, ZHANG Shuai, YANG Caimei, CHEN Anguo, HONG Qihua

College of Animal Science, Zhejiang University, Hangzhou 310058, China

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摘要 本试验旨在研究断奶仔猪小肠黏膜脂肪酸结合蛋白(I-FABP)和二肽转运载体1(PEPT1)mRNA表达的发育性变化及谷氨酰胺对其的影响。以69头(21±3)日龄断奶杜×长×大仔猪为试验动物,断奶当天选取3头猪进行屠宰,剩余66头随机分为2组,每组3个重复,每个重复11头。对照组饲喂基础饲粮,试验组饲喂基础饲粮+1%谷氨酰胺。断奶后第3、5、7、14天试验组和对照组分别选取3头猪进行屠宰(共计27头),取十二指肠、空肠和回肠黏膜组织样品,通过实时定量PCR法测定I-FABP和PEPT1 mRNA的表达量。结果表明:1)I-FABP和PEPT1 mRNA的表达量各肠段间无显著差异($P>0.05$);2)I-FABP和PEPT1 mRNA在十二指肠、空肠和回肠的表达量均在断奶后急剧下降,断奶第3天的表达量最低,显著低于断奶当天($P<0.05$),而后逐渐升高,第14天达到峰值;3)试验组I-FABP和PEPT1 mRNA表达量与对照组无显著差异($P>0.05$),但试验组表现出促使十二指肠、空肠、回肠黏膜的I-FABP和十二指肠PEPT1 mRNA表达提前恢复至断奶前水平的趋势。结果提示,断奶仔猪I-FABP和PEPT1 mRNA表达量随时间而变化,谷氨酰胺对断奶后I-FABP和PEPT1 mRNA表达量的恢复有一定的促进作用。

关键词: 断奶仔猪 小肠黏膜 吸收 小肠脂肪酸结合蛋白 二肽转运蛋白1 谷氨酰胺

Abstract: This study was conducted to investigate the developmental expression of intestinal fatty acid binding protein (I-FABP) and dipeptide transporter 1 (PEPT1) mRNA in the small intestinal mucosa of weaner piglets and the influence of glutamine (Gln). Sixty nine crossed piglets (Duroc譮andrace譮arge white) aged (21?3) d were used as the exprimental animals, 3 piglets were slaughted at the day of weaning, and the rest 66 piglets were divided into two gruops with 3 replicates in each group and 11 piglets per relicate. Piglets in the control group and the experimental group were fed a basal diet and the basal diet+1% Gln, respectively. Three piglets were slaughtered at 3, 5, 7 and 14 d after weaning, respectively. Mucosal tissues were collected from the duodenum, jejunum and ileum. Real-time PCR was applied to determine the mRNA expressions of I-FABP and PEPT1. The results showed as follows: 1) no significant difference was observed in the mRNA expression levels of I-FABP and PEPT1 in the duodenum, jejunum and ileum ($P<0.05$); 2) the mRNA expression levels of I-FABP and PEPT1 in the duodenum, jejunum and ileum were decreased obviously due to the weaning, and the expression levels of piglets at the 3rd day postweaning reached the lowest and were significantly lower than those at the wearning day ($P<0.05$), then the expression levels were increased and reached a peak at the 14th day postweaning; 3) there was no significant difference in mRNA expression levels of I-FABP and PEPT1 between the control group and the experimental group ($P>0.05$), however, the experimental group showed a trend that I-FABP mRNA expression level in the duodemum, jejunum and ileum as well as PEPT1 mRNA expression level in the duodemum recovered to normal levels early. The results indicate that the mRNA expression levels of I-FABP and PEPT1 in the duodenum, jejunum and ileum of weaner piglets change over time, and Gln plays a role in promoting the recovery of I-FABP and PEPT1 mRNA expression levels of weaner piglets.

Keywords: weaner piglet, small intestinal mucosa, absorption, I-FABP, PEPT1, glutamine

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通讯作者 杨彩梅,副教授,硕士生导师,E-mail: yangcm@zju.edu.cn

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