



饲料中添加乳酸杆菌对幼建鲤生长性能和消化吸收功能的影响

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Effect of Lactobacillus fermentum Supplementation on Growth Performance, Digestive and Absorptive Function of Juvenile Jian Carp (Cyprinus carpio var. Jian)

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摘要 本试验旨在研究饲料中添加乳酸杆菌对幼建鲤生长性能和消化吸收功能的影响。选择平均体重为(22.35±0.06) g的健康幼建鲤720尾,随机分成6组,每组设3个重复,每个重复40尾,分别饲喂乳酸杆菌含量为0(对照组)、0.45×10⁷、0.91×10⁷、1.31×10⁷、2.14×10⁷和2.40×10⁷ cfu/kg的试验饲料80 d。结果表明,各乳酸杆菌组的末重、增重率和摄食量均显著或极显著高于对照组(P<0.05或P<0.01)。当乳酸杆菌含量>0.45×10⁷ cfu/kg时,幼建鲤蛋白质沉积率和脂肪沉积率均极显著提高(P<0.01);当乳酸杆菌含量>0.91×10⁷ cfu/kg时,幼建鲤灰分沉积率极显著高于对照组(P<0.01)。饲料中添加乳酸杆菌可以显著或极显著提高幼建鲤肝胰脏和肠重、肝胰脏和肠蛋白质含量以及前、中、后肠皱襞高度(P<0.05或P<0.01)。当乳酸杆菌含量>0.45×10⁷ cfu/kg时,肠道糜蛋白酶、脂肪酶和淀粉酶活性极显著升高(P<0.01);当乳酸杆菌含量>0.91×10⁷ cfu/kg时,肠道胰蛋白酶活性显著升高(P<0.05)。对照组前、中、后肠碱性磷酸酶、Na⁺,K⁺-ATP酶、γ-谷氨酰转肽酶以及全肠肌酸激酶活性显著或极显著低于各乳酸杆菌组(P<0.05或P<0.01)。由此得出,饲料中添加乳酸杆菌可以促进幼建鲤的生长,同时促进其消化器官的生长发育,提高幼建鲤的消化和吸收能力。以幼建鲤增重率为标识,根据折线法确定的乳酸杆菌最适添加量为0.99×10⁷ cfu/kg。

关键词: 幼建鲤 乳酸杆菌 生长性能 消化吸收

Abstract: The experiment was aimed to investigate the effects of Lactobacillus fermentum supplementation on growth performance, digestive and absorptive function of juvenile Jian carp (Cyprinus carpio var. Jian). In 80 days of feeding trial, a total of 720 juvenile Jian carp with average body weight of (22.35±0.06) g were randomly allocated to 6 groups with 3 replicates per group and 40 fish per replicate. The fish in the 6 groups were fed 6 experimental diets containing graded levels of L. fermentum: 0 (control group), 0.45×10⁷, 0.91×10⁷, 1.31×10⁷, 2.14×10⁷ and 2.40×10⁷ cfu/g diet, respectively. The results showed as follows: the final body weight, weight gain ratio and feed intake in L. fermentum supplementation groups were significantly higher than those in control group (P<0.05 or P<0.01). When L. fermentum supplementation>0.45×10⁷ cfu/g, the productive protein value and productive lipid value of juvenile Jian carp were significantly increased (P<0.01); when L. fermentum supplementation>0.91×10⁷ cfu/g, the productive ash value of juvenile Jian carp was significantly increased, too (P<0.01). L. fermentum supplementation could significantly enhance the weight and protein content of hepatopancreas and gut, and fold height in foregut, midgut and hindgut of juvenile Jian carp (P<0.05 or P<0.01). When L. fermentum supplementation>0.45×10⁷ cfu/g, the activities of chymotrypsin, lipase and amylase in gut were significantly increased (P<0.01); when L. fermentum content>0.91×10⁷ cfu/g, the trypsin activity in gut was significantly increased, too (P<0.05). Compared with those in control group, the activities of alkaline phosphatase, Na⁺,K⁺-ATPase and γ-glutamyl transpeptidase in foregut, midgut and hindgut, and creatine kinase in gut of juvenile Jian carp in L. fermentum supplementation groups were significantly increased (P<0.05 or P<0.01). These results indicate that L. fermentum supplementation can promote the growth, improve the growth and development of digestive organs and enhance the digestive and absorptive function of juvenile Jian carp. The optimal L. fermentum supplementation for maximum weight gain ratio of juvenile Jian carp is 0.99×10⁷ cfu/g diet based on broken-line regression. [Chinese Journal of Animal Nutrition, 2011, 23 (8) : 1386 -1393]

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Keywords: [juvenile Jian carp \(Cyprinus carpio var. Jian\)](#), [Lactobacillus fermentum](#), [growth performance](#), [digestion and absorption](#)

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