

饲料中谷胱甘肽对草鱼仔鱼生长性能及营养生理的影响

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摘要: 通过饲养实验研究了谷胱甘肽(GSH)对草鱼仔鱼生长性能和营养生理的影响。4种GSH水平不同(0、0.1、0.5、2.5%)的等氮等能的饲料投喂5日龄、初始体长约7.31mm、初始体重1.28mg的草鱼仔鱼, 饲养期42天。结果表明, 2.5%组仔鱼存活率显著低于0%组($P < 0.05$), 特定生长率在0.1%组和2.5%组显著高于0%组, 0.1%组和2.5%组仔鱼终末体重和体长亦显著高于对照组。在第10、14、33、40日龄, 0.1%组鱼体GSH含量显著高于其他组, 但鱼体丙二醛含量显著地低。在第33日龄, 体丙二醛含量(Y)与GSH含量(X)呈直线相关($Y = -0.08X + 7.77, R^2 = 0.9891$)。第47日龄, 0%、0.1%组鱼体谷胱甘肽还原酶活性显著高于2.5%组。鱼体的蛋白酶和淀粉酶活均随着仔鱼的生长而显著增强, 在第10、33日龄0.1%组蛋白酶、淀粉酶活性显著高于对照组。结果说明, 饲料中添加一定量的GSH可提高鱼体的抗氧化能力和消化酶活性, 从而促进草鱼仔鱼生长。

关键词: 草鱼; 仔鱼; 谷胱甘肽; 饲料; 生长

Effects of Dietary Glutathione on Growth Performance and Nutritional Physiology in Grass Carp Larvae

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Abstracts: A feeding trial was conducted to investigate the effect of glutathione (GSH) on growth performance and nutritional physiology in grass carp (*Ctenopharyngodon idellus* C.et V.) larvae. Four isoenergetic and iaonitrogenous test diets with different levels of GSH (0, 0.1, 0.5, 2.5%) were fed to grass carp larvae from 5 days post-hatching to 47 days. The results showed that the survival rate was significantly lower ($P < 0.05$) in larvae fed the diet with 2.5% GSH than that in larvae fed the diet without GSH. And significant higher specific growth rate were observed in larvae fed the diets with 0.1% and 2.5% GSH than that in control group. Final body length and weight of larvae fed the diets with 0.1% and 2.5% GSH were significantly higher than that in larvae fed the diet without GSH. On 10, 14, 33, 40 days post-hatching, the body GSH contents in larvae fed the diet with 0.1% GSH were significantly higher than those of larvae fed other diets. However, the body malondialdehyde (MDA) content was significantly lower. The linear relation between the content of body MDA (Y) and GSH (X) were obtained on 33 days post-hatching ($Y = -0.08X + 7.77, R^2 = 0.9891$). The activities of glutathione reductase in larvae fed the diets without GSH and with 0.1% GSH were significantly higher than that in 2.5% group on 47 days. The activities of protease and amylase increased markedly with the growth of larvae. On 10 and 33 days post-hatching, the activities of these two enzymes in larvae fed the diet with 0.1% GSH were significantly higher than that in control group on 33 days post-hatching. The results suggest that dietary GSH can enhance the growth in grass carp larvae through the improvement of antioxidant ability and activities of digestive enzyme.

Keywords: Grass carp; larvae; GSH; Diet; Growth