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脱酚棉籽粉替代部分鱼粉对西伯利亚鲟幼鱼生长、体成分及血清生化指标的影响

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Effect of Substitution of Solvent-extracted Cottonseed Meal for Part Fish Meal on Growth, Body Composition and Serum Biochemical Indices of Juvenile Siberian Sturgeon (*Acipenser baerii* Brandt)

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摘要 本文旨在研究用脱酚棉籽粉 (solvent-extracted cottonseed meal, SECM) 替代部分鱼粉对西伯利亚鲟幼鱼生长性能、体成分和血清生化指标的影响。试验日粮用脱酚棉籽粉等蛋白质替代基础日粮中0、25%和40%的鱼粉, 25%和40%替代水平分别设2个氨基酸平衡组: 血粉氨基酸平衡组 (B) 和晶体氨基酸平衡组 (C)。5种日粮分别命名为SECM 0、SECM 25B、SECM 25C、SECM 40B和SECM 40C。选用初重为 (57.36±0.17) g的西伯利亚鲟幼鱼400尾, 随机分为5组 (每组设4个重复, 每个重复20尾), 分别饲喂1种试验日粮, 试验期8周。结果显示, SECM 25C组的增重率、特定生长率和蛋白质效率显著高于SECM 25B组 (P<0.05)。SECM 25C组的饲料系数与对照组差异不显著 (P>0.05), 其他试验组显著高于对照组 (P<0.05)。随着SECM替代量的增加, 摄食率也不断上升, 其中SECM 25C组、SECM 40C组和SECM 40B组显著高于对照组 (P<0.05)。SECM 25B组和SECM 40B组的蛋白质效率显著低于其他各组 (P<0.05), 且蛋白质储积率显著低于对照组和SECM 25C组 (P<0.05)。与血粉相比, 晶体氨基酸可显著降低西伯利亚鲟内脏比和肝指数 (P<0.05)。SECM 25C组和SECM 40C组的丙氨酸氨基转移酶显著高于SECM 25B组 (P<0.05), 与其他组差异不显著 (P>0.05)。由此得出, 在理想蛋白质模式下, 在西伯利亚鲟幼鱼日粮中添加脱酚棉籽粉可等蛋白质替代40%的鱼粉; 此外, 与血粉相比, 西伯利亚鲟可以更有效的利用晶体氨基酸。

关键词: 西伯利亚鲟; 氨基酸平衡; 脱酚棉籽粉; 鱼粉; 晶体氨基酸

Abstract: Effects of replacement of part fish meal with solvent-extracted cottonseed meal (SECM) in diet on the growth performance, body composition and serum biochemical indices of juvenile Siberian sturgeon (*Acipenser baerii* Brandt) were investigated in this study. In this trial, the fish meal protein in diet was replaced with SECM by 0, 25% and 40% respectively. 25% and 40%, substitution levels had 2 amino acid balance treatments: blood meal balance treatment (B) and crystal amino acid balance treatment (C). Five experimental diets were named as SECM 0, SECM 25B, SECM 25C, SECM 40B and SECM 40C, respectively. Four hundred juvenile Siberian sturgeon with initial body weight of (57.36±0.17) g were randomly allotted to 5 groups (with 4 replicates of 20 fish) and each group fed 1 experimental diet. The trial lasted for 8 weeks. The results showed as follows: the weight gain rate (WGR), specific growth rate (SGR) and protein efficiency ratio (PER) in SECM 25C group were significantly higher than those in SECM 25B group (P<0.05). The feed conversion ratio (FCR) in all substitution groups was higher than that in control group except for SECM 25C group (P<0.05). The feed intake rate increased with the increase of SECM substitution levels, and that in SECM 25C group, SECM 40C group and SECM 40B group was significant higher than that in SECM 0 group (P<0.05). The protein efficiency rate (PER) in SECM 25C group and SECM 40C group was significantly lower than that in other groups (P<0.05), and the protein retention rate (PRR) in SECM 25C group and SECM 40C group was significantly lower than that in control group and SECM 25B group (P<0.05). Compared with blood meal, crystal amino acid significantly decreased the viscerosomatic index (VSI) and hepaticosomatic index (HSI) (P<0.05). The serum alanine aminotransferase (ALT) activities in SECM 25C group and SECM 40C group were higher than those in SECM 25B group (P<0.05). In conclusion, under the ideal protein profile, 40% fish meal protein in the diet of juvenile Siberian sturgeon could be replaced by SECM, and Siberian sturgeon could effectively utilize the crystal amino acid. [Chinese Journal of Animal Nutrition, 2010, 22 (1): 117-124]

Keywords: Siberian sturgeon; Amino acid balance; Solvent-extracted cottonseed meal; Fish meal; Crystal amino acid

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