

文章摘要

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饲料中脂肪水平对方格星虫稚虫生长性能、体组成及消化酶活性的影响

Effects of dietary lipid levels on growth performance, body composition and digestive enzyme activities of juvenile peanut worm, *Sipunculus nudus* Linnaeus

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中文摘要:

以初始体重为 15.50 ± 0.04 mg的方格星虫稚虫为实验对象, 分别饲喂脂肪水平为0.36%、3.32%、6.49%、9.31%、12.16%、15.14%和18.36%的7种等氮、等能饲料56 d, 研究饲料脂肪水平对方格星虫稚虫生长、体组成及消化酶活性的影响。实验结果表明, (1)饲料脂肪水平对方格星虫稚虫的生长性能有显著影响 ($P < 0.05$)。随着饲料中脂肪水平的提高, 方格星虫稚虫的增重率和特定生长率都呈先增后降的趋势, 当饲料中脂肪水平为9.31%时, 方格星虫稚虫增重率和特定生长率达到最大值。二次曲线回归分析确定当增重率达到极值时, 饲料脂肪水平为8.70%; (2)饲料脂肪水平对方格星虫稚虫体组成中脂肪和蛋白质的含量影响显著 ($P < 0.05$), 方格星虫稚虫体脂肪含量随着饲料脂肪水平的上升有显著升高的趋势, 18.36%组星虫体脂肪含量最高, 显著高于0.36%、3.32%、6.49%、9.31%和12.16%组 ($P < 0.05$)。体蛋白含量随着饲料脂肪水平的上升有降低的趋势, 18.36%组星虫的体蛋白含量最低, 显著低于0.36%、3.32%、6.49%、9.31%和12.16%组 ($P < 0.05$)。饲料脂肪水平对方格星虫稚虫体组成中水分和粗灰分含量没有显著影响 ($P > 0.05$); (3)随着饲料脂肪水平的增加, 方格星虫稚虫蛋白酶活性和脂肪酶活性均呈先增后降的趋势, 两种酶活性的最大值均出现在脂肪水平为9.31%时, 但是饲料脂肪水平对方格星虫稚虫的淀粉酶活性没有显著的影响 ($P > 0.05$)。以增重率为评价指标时, 方格星虫稚虫对饲料中脂肪的适宜需求量为8.70%。

英文摘要:

Sipunculus nudus juveniles at average body weight of (15.50 ± 0.04) mg were fed diets at seven lipid levels (0.36%, 3.32%, 6.48%, 9.31%, 12.16%, 15.14%, and 18.36%) respectively for 8 weeks to investigate the effects of dietary lipid levels on their growth performance, body composition and digestive enzyme activities. It was found that lipid levels significantly affected growth performance of juvenile *S. nudus* ($P < 0.05$). With the increased of dietary lipid levels, the weight growth ratio (WGR) and specific growth ratio (SGR) of peanut worm were firstly increased and then decreased, and when the dietary lipid level was 9.31%, both WGR and SGR produced the maximum value. The regression model analysis showed the best dietary lipid level which could acquire the best WGR was 8.70%. The results of body composition analysis showed that dietary lipid levels had significant effects on body lipid and

protein content. Body lipid content increased with increase of dietary lipid. *S. nudus* fed with 18.36% lipid produced the highest body lipid content, which was significantly higher than those fed on lower lipid levels (0.36%, 3.32%, 6.49%, 9.31% and 12.16%) ($P<0.05$). There was a downward trend in body protein content with the increase of dietary lipid, and when it reached 18.36%, the body protein content was significantly lower than that those seen in treatments with lower lipid levels ($P<0.05$). The dietary lipid levels had no significant effects on moisture and ash content of the worm ($P>0.05$). With the increasing doses of dietary lipid levels, the protease activity and the lipase activity were firstly increased and then decreased. Both protease activity and the lipase activity produced the maximum value when the worms were fed with diet containing 9.31% lipid. But the dietary lipid levels had no significant effects on amylase activity of *S. nudus* ($P>0.05$). Based on comprehensive analysis of WGR, it is suggested that the suitable dietary lipid level for juvenile *S. nudus* is 8.70%.

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