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DIETARY PROTEIN AND ENERGY LEVELS IN YELLOW MEALWORM REARING: EFFECTS ON GROWTH, FEED EFFICIENCY AND BODY COMPOSITION

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• Introduction

Optimizing dietary protein and energy supply is important for improving Tenebrio molitor L. (yellow mealworm) production and the nutritional quality of the resulting biomass. This study evaluated the dietary effects of three protein levels combined with three energy levels on the chemical composition and growth performance of yellow mealworm larvae.

• Material and method

Nine wheat-bran-based diets were formulated using soybean meal, corn, and sugar beet pulp to adjust nutrient composition. The five week trial, with four replicates per treatment, was conducted twice. Growth was expressed as daily biomass gain per tray, providing a measure relevant to production at the rearing-unit level.

• Results and discussions

The three dietary protein levels significantly affected larval growth, with average weight gains of 0.58, 0.66 and 0.68 g/day per tray at low, medium and high protein levels, respectively. Feed conversion ratio (FCR) improved as dietary protein levels increased, with corresponding FCR values of 2.29, 2.02 and 1.94 g/g. The three dietary energy levels had no significant impact on weight gain or FCR. Increasing dietary protein also increased mean larval crude protein content from 45.6% to 50.6% of dry matter, while reducing fat content. Among the nine diets, larval fat content ranged from 25.2% to 40.4% of dry matter.

• Conclusions

These findings emphasize the importance of dietary protein supply in determining mealworm biomass composition and growth. Appropriate diet formulation can support efficient larval production while tailoring the nutritional profile of the harvested biomass.

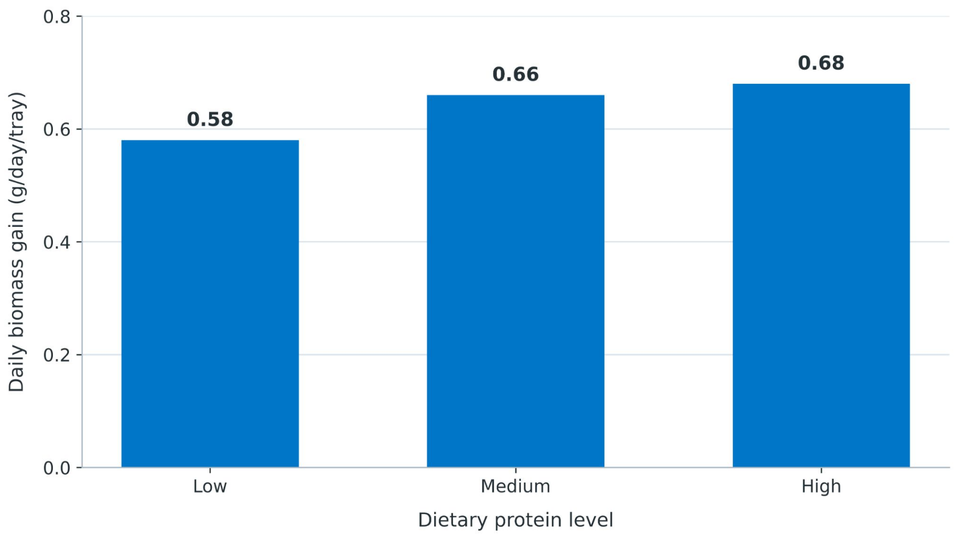


Figure 1. Effect of dietary protein level on larval weight gain

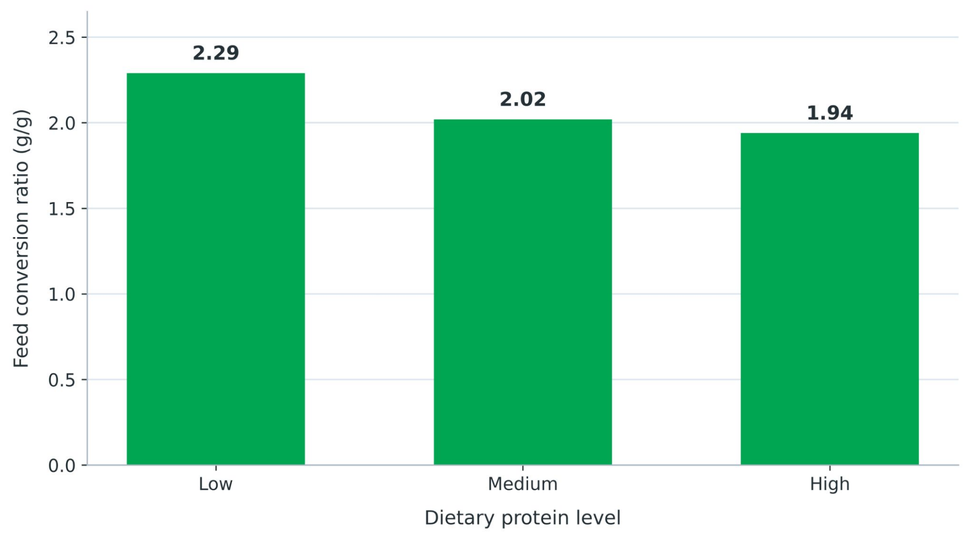


Figure 2. Effect of dietary protein level on feed conversion ratio

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