

Abstract

# Nutritional Value of Black Soldier Fly Grown on Abattoir Waste †

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**Abstract:** Meat processing plants generate a range of solid and liquid wastes, including manure, paunch solids, and biological solids from wastewater treatment. There is growing interest in alternative technologies for treating abattoir waste, including using insects to transform waste into high-value products. Black Soldier Fly (BSF) larvae may be a competitive source of digestible amino acids and, depending on the protein digestibility, can be used as a replacement for fish meal, soybean meal or cottonseed meal in livestock and aquaculture rations. The objective of this study was to evaluate the effect of using different substrates and substrate mixes from abattoir waste streams on the nutritional quality of BSF harvested at two growth stages (larvae and prepupae). Protein digestibility was evaluated using an adapted pepsin digestion. Averaged across all substrates, there was no difference between growth stages in total protein content (43.7%). However, protein digestibility was higher for larvae (86.5%) than for prepupae (65.1%). The substrate used greatly influenced the nutritional composition of BSF. Prepupae protein content varied from 42 to 48% and protein digestibility varied from 42 to 80%, according to the substrate. Variation in larvae across substrates was greater than prepupae for protein content (34% to 53%) but much lower for digestibility (80% to 91%). Both substrate and growth stage altered the mineral composition of BSF prepupae and larvae. Iron levels varied from 79 (paunch) to 453 mg/kg DM (substrate containing blood), illustrating the plasticity of BSF. In conclusion, BSF can be used to transform abattoir waste into high-value products.



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