

ORIGINAL RESEARCH

Black Soldier Fly as A Sustainable Source of Protein for Human Consumption

Zindzi Damianna Wekesa¹, Gilbert Keen Arigi²

¹Department of Food Science Nutrition City County Nairobi;

²Department of Independent Researcher City County Nairobi

¹Corresponding Author Email: zindzidamianna@gmail.com

Abstract

Background: Insects, particularly the black soldier fly (*Hermetia illucens*), have gained attention as a promising alternative protein source to address food security challenges. This study explores the potential of black soldier fly larvae as a sustainable and nutritious protein source for human consumption.

Objective: The objective of this study is to investigate the nutritional composition and safety aspects of black soldier fly larvae, evaluate its potential as a viable protein source, and discuss its implications for food security and policy.

Methods: Black soldier fly larvae were reared under controlled conditions and analyzed for their nutritional composition, including protein content, amino acid profile, fatty acid profile, and micronutrient content. Safety aspects, such as heavy metal and pesticide residue levels, were also assessed. The study further examined the feasibility and scalability of black soldier fly production for human consumption.

Results: The results reveal that black soldier fly larvae possess a high protein content, rich in essential amino acids, and a favorable fatty acid profile. Furthermore, the larvae contain significant amounts of essential micronutrients, including vitamins and minerals, contributing to a well-rounded nutritional profile. Safety analysis demonstrates low levels of heavy metals and pesticide residues, indicating its suitability for human consumption. The study also identifies the potential of large-scale black soldier fly production as an economically viable solution for food security.

Conclusion: This study highlights the potential of black soldier fly larvae as a sustainable and nutritious protein source for human consumption. With its high protein content, favorable nutrient profile, and safety parameters, black soldier fly larvae offer a promising solution to address food security challenges. Incorporating black soldier fly larvae into diets and food systems has the potential to enhance nutritional adequacy and reduce reliance on traditional protein sources. Furthermore, the findings emphasize the need for policy frameworks and regulatory support to promote the adoption of insect-based diets and ensure their safe integration into global food systems.

Keywords: Black soldier fly, *Hermetia illucens*, insect-based diet, food security, protein source, sustainability, nutritional composition, safety.