

Effect of zinc and selenium on the growth of black soldier fly

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Zinc (Zn) and selenium (Se) are two essential micronutrients involved in several biological functions in humans and animals. To guarantee an adequate intake, the use of various sources has been proposed. Among these, the possibility of biofortifying feed and food edible insects (e.g. *Hermetia illucens*, black soldier fly-BSF) may be an option. In this study, funded by Agritech National Research Center, we explored, as first step, the effects of the supplementation of inorganic feed grade Zn and Se into the substrates for rearing BSF larvae.

A mixture of two agro-industrial by-products okara and potato waste (50:50) was selected as rearing substrate, as well as a control diet (Gainsville). The substrates (okara+potato waste) were fortified as follow: I) 150 mg/kg of Zn; II) 0.3 mg/kg of Se; III) 150 mg/kg of Zn + 0.3 mg/kg of Se. Doses for both trace-elements have been selected on the base of other farm feed formulations. For each thesis, five replicates were set up containing 500 young larvae. Growth parameters, bioconversion ability and final biomass yield were measured. Experiments were conducted under dark conditions at 26°C and 60% relative humidity.

BSF larvae grew efficiently on the diets enriched with Zn and Se, without showing significant differences ($P > 0.05$) with the control and the unfortified diets in terms of survival (always above 94%), developmental time and mean larval weight (overall mean 0,14 g). Only the total biomass collected at the end of the experiment was higher in the control diet ($P > 0.05$). Substrate reduction and conversion efficiency were similar ($P > 0.05$) within the experimental thesis.

These first trails indicate the feasible of adding Zn and Se in the rearing diet, but further studies need to evaluate the influence of the microelements on adult reproduction and the effective enrichment of the larval biomass produced.