

Antioxidant activities and total polyphenolic content of mealworm growth on herb containing substrates

A. Moradei ¹, T. Spranghers ², D. Deruytter ³, P. Premarajan ¹, L. Pinotti ¹⁻⁵, M. Ottoboni ¹

¹University of Milan, Department of Veterinary Medicine and Animal Sciences (DIVAS), Via dell'Università 6, 26900 Lodi, Italy;

²Research Group Food Processing, VIVES University of Applied Sciences, Oostnieuwkerksesteenweg 113, 8800 Roeselare, Belgium;

³Insect Research Centre, Inagro, Ieperseweg 87, 8800 Rumeke-Beitem, Belgium; ⁵ Coordinating Research Centre: Innovation for Well-Being and Environment (CRC I-WE), University of Milan, 20133 Milan, Italy

Mealworms (MW, *Tenebrio molitor*) can be reared on a diet of grain by-products and grain-based former foodstuffs, with the process resulting in the production of high-quality biomass. These products may comprise multiple herbs, which have the capacity to exert deleterious effects on insects, given the elevated presence of polyphenolic compounds therein. The objective of this project is to assess the impact of herb inclusion on the larval total polyphenolic content (TPC) and antioxidant activity. The MWs were raised on a control diet consisting solely of wheat bran, as well as on wheat bran supplemented with four different herbs: namely, basil, oregano, rosemary, and thyme. The herbs were incorporated at two concentrations, 0.125% and 2% on a dry matter (DM) basis. All experiments were carried out in darkness at 27°C with 60% relative humidity for a period of five weeks. There were no significant differences in growth performance among the groups. However, the inclusion of herbs did have a minor detrimental effect on larval composition. The elevated TPC observed in the herbs did not correspond with the TPC levels exhibited by the larvae. Instead, a negative correlation was identified between these two sets of data. It can be deduced from the evidence presented that the inclusion of herbs at elevated levels had an impact on the larvae. Conversely, the antioxidant activity of the larvae (as measured by FRAP and ABTS) was augmented by both varieties of herb and their respective inclusion levels. Further research is required to investigate these effects more extensively.