

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

**Innovative protein sources in animal diets: bioconversion of vegetable waste with black soldier fly (*Hermetia illucens*)**

**This is a pre print version of the following article:**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1723443> since 2020-01-16T15:01:53Z

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

# **Innovative protein sources in animal diets: bioconversion of vegetable waste with black soldier fly (*Hermetia illucens*)**

Andrea Dama<sup>1</sup>, Marco Meneguz<sup>1</sup>, Manuela Renna<sup>1</sup>, Carola Lussiana<sup>1</sup>, Achille Schiavone<sup>2</sup>,  
Francesco Gai<sup>3</sup>, Enrico Bressan<sup>1</sup>, Laura Gasco<sup>1</sup>

<sup>1</sup> *Dipartimento di Scienze Agrarie, Forestali e Alimentari, University of Turin, Grugliasco (TO), Italy*

<sup>2</sup> *Dipartimento di Scienze Veterinarie, University of Turin, Grugliasco (TO), Italy*

<sup>3</sup> *Istituto di Scienze delle Produzioni Alimentari, National Research Council, Grugliasco (TO), Italy*  
Corresponding mail: [andrea.dama@icloud.com](mailto:andrea.dama@icloud.com)

The aim of this study was to evaluate the effects of different vegetable substrates on growth and chemical composition of Black Soldier Fly larvae (BSFL). Two trials were performed using: 1) fruit (FRU) and vegetable waste (VEG) obtained from the large scale retail and 2) brewery (TRE) and grapes (VIN) by-products. The two trials were carried out in a climatic chamber with controlled temperature (T: 27±0.5 °C) and relative humidity (RH: 70±0.5%). Six replicates for each substrate were prepared containing one hundred 6-days old BSFL and 100 g of substrate. Every four days, 30 larvae were randomly sampled for three consecutive times from each container to observe the morphometric parameters. Larvae development (length and weight) was recorded. Data collection ended when the 30% of the larvae reached the prepupae stage. In order to obtain a sufficient quantity of larvae to perform chemical analyses at the end of the trial, 6 other replicates per substrate were prepared. The following parameters were analyzed: final larvae weight and length and chemical composition of the substrate and of the BSFL. Substrates had an influence of the growth performance and chemical composition. BSFL grown on TRE showed a faster growth and highest content in crude protein (CP: 52.6%) and those grown on VIN took longer time to reach 30% of pupae. BSFL grown on FRU reached the highest body weight (BW: 153±39 mg) and showed the highest content of ether extract (EE: 40.70%). Considering results of this study TRE should be the most promising substrate in order to obtain BSFL to use in animal nutrition as feed rich in crude protein. The bioconversion with BSF larvae could be a new way to add value to wastes obtaining innovative raw material for feed and other purposes.

## ***Acknowledgments***

The research was supported by the University of Turin (ex 60%) grant (Es. 2015-2016)