World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:13, No:08, 2019

Microalgae Applied to the Reduction of Biowaste Produced by Fruit Fly Drosophila melanogaster

Authors : Shuang Qiu, Zhipeng Chen, Lingfeng Wang, Shijian Ge

Abstract : Biowastes are a concern due to the large amounts of commercial food required for model animals during the biomedical research. Searching for sustainable food alternatives with negligible physiological effects on animals is critical to solving or reducing this challenge. Microalgae have been demonstrated as suitable for both human consumption and animal feed in addition to biofuel and bioenergy applications. In this study, the possibility of using Chlorella vulgaris and Senedesmus obliquus as a feed replacement to Drosophila melanogaster, one of the fly models commonly used in biomedical studies, was investigated to assess the fly locomotor activity, motor pattern, lifespan, and body weight. Compared to control, flies fed on 60% or 80% (w/w) microalgae exhibited varied walking performance including travel distance and apparent step size, and flies treated with 40% microalgae had shorter lifespans and decreased body weight. However, the 20% microalgae treatment showed no statistical differences in all parameters tested with respect to the control. When partially including 20% microalgae in the standard food, it can annually reduce the food waste (~ 202 kg) by 22.7 % and save $ 7,200 of the food cost, offering an environmentally superior and cost-effective food alternative without compromising physiological performance.

Keywords : animal feed, Chlorella vulgaris, Drosophila melanogaster, food waste, microalgae
Conference Title : ICEB 2019 : International Conference on Environment and Biotechnology
Conference Location : Vancouver, Canada
Conference Dates : August 07-08, 2019