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## **EARTHWORMS FOR FEED PRODUCTION FROM VEGETABLE WASTE: ENVIRONMENTAL IMPACT ASSESSMENT**

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### **Abstract**

In the European Union, 88 million tons of food is wasted annually, 30% of which comes from the production and processing sectors. Among the different food waste, vegetable ones represent a remarkable share and their management is complicated by the usually high-water content and the difficult storage. In this context, the earthworms are an interesting solution because transform vegetable waste into valuable products: the vermicompost, that can be sold as organic fertilizer, and the earthworms that, thanks to their high protein content can be used for feed and food production. This study aims to evaluate the environmental impact related to the production of vermicompost and dry earthworm meal. LCA approach was applied, 1 kg of dry meal for feed production was selected as functional unit. Inventory data were collected during experimental tests carried out in 2017 in a composting plant located in Northern Italy where earthworms were fed with vegetable waste. Secondary data were used about emissions during earthworms rearing. A quantity of 1 kg of fresh earthworms (16% of dry matter with 67% of protein content) and 13 kg of vermicompost were produced from 45 kg of vegetable wastes. Between earthworm rearing and processing, the first one is the main responsible for the environmental impact for all the evaluated impact categories except for freshwater eutrophication and ecotoxicity. GHG emissions during composting are the main hotspots for Climate Change.

*Key words:* feed, protein source, vermicompost, waste valorization

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