

Black soldier fly as a tool for an advantageous system of a local circular economy

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Every year, around one-third of the food produced for human consumption in the world is lost. It consists of biomass rich in nutrients that the traditional ways of disposal not fully valorise. Black soldier fly (BSF) can convert organic wastes into nutrient-rich raw materials with a new approach of sustainable circular economy (CE). This study evaluated BSF as tools of biomass valorisation, creating a system of local CE. A census of the most representative agro-food companies in the area was selected and contacted. A database was created concerning by-product (BP) categories, quantities, seasonality, their current management. BP were evaluated in terms of suitability for BSF, analysing their bibliographic evidence towards the breeding of BSF considering the nutritional quality and the quantity surveyed. The 115 companies were divided into 6 categories: brewery (BRE), milling (MIL), fruit-vegetable (FRU-VEG), rice (RIC), winery (WIN), distillation (DIS). A total biomass of 87,325 tons was recorded. The major contributors were represented by MIL (81,225 tons), DIS (3,710 tons) and FRU-VEG (1,190 tons) BP. Only a few of the BP identified were recognised as suitable for BSF rearing: BRE, MIL, FRU-VEG, WIN, DIS. Only 0.37% of the BP was inserted in the process of CE, 0.30% was managed through the combination of agricultural and CE principles, while 97% was used for agricultural-zootechnical purposes. Furthermore, 1.37% of the BP (1,201.8 tons) was disposed as waste. There was a relevant quantity of BP present in the area under-valued. The management through BSF rearing would be more efficient and convenient than traditional way, as emerged from economical evaluation and comparison of the two scenarios. This bio-transformation technology can be scalable and customised, in relation to the geographic area under study and it contributes to the creation of a new source of protein addressed to the feed sector, reducing the under valorisation of BP and their management costs.

West African context call for rapid implementation of insect meal for fishmeal substitution

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In West Africa, numerous economies are dependent on fisheries resources; this sector can reach almost 10% of the national gross domestic product and represents a central sector for food security as the most important animal protein for human consumption and aquafeeds. Due to overexploitation, West African fish stocks are under serious threats and massive implantation of fishmeal factories has raised serious concerns about the sustainability of small pelagic fish resources. Although this situation is well understood by many political decision-makers, this trend is not about to be reversed. Concurrently, the government of Senegal seeks to increase the production of the Senegalese fish farming industry. To address these challenges, we are investigating the possibility of harnessing the ability of black soldier fly (BSF) larvae to replace fishmeal. Given the lack of formal institutional initiatives in Northwest Africa, we initiated in 2020 a collaborative program to establish a technical platform ‘Art Sunu Gueej’ to develop an inter-institutional insect production unit in a controlled environment. We have identified endemic BSF populations in local piggeries as well as agricultural surpluses including millet bran, rice bran, and mango waste that could serve as BSF feedstocks, to ultimately partially replace fishmeal for aquafeed formulations. We have established an Action Plan for awareness of political decision-makers, including a research plan to: (1) optimise and adapt BSF strains for West Africa production and, (2) test insect meals for aquaculture and poultry sectors. Based on these results, we will use our new platform for fundraising and foster collaborations to promote insect meals as fishmeal replacements for aquafeeds in West Africa.



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