INSECTUM: WASTE MANAGEMENT WITH INSECTS

AUTHOR

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HIGHLIGHTS

- *Due to high production costs, larvae protein cannot compete with other available proteins in farming and pet care, but it stands out because of its antibacterial properties.*
- *The reliance on waste as a resource creates competition with other waste management methods, such as biogas production, which may encourage companies to sell their waste instead of providing it for free.*
- *Insectum's production capacity is limited because of the larva-based protein's inability to compete with other protein sources on the market.*

ABOUT THE CIRCULAR PRACTICE

UAB Insectum is a biotechnology-focused startup spearheaded by organic waste experts dedicated to advancing innovation in alternative proteins. Their pioneering approach involves the cultivation of black soldier flies (Hermetia illucens) using food waste as a rearing medium. Hermetia illucens larvae offer a sustainable protein source for various industries such as farming, aquaculture, and pet care. Moreover, the byproduct of this insect rearing process, in the form of larvae meal and granulated larvae frass, serves as an environmentally friendly fertiliser for agricultural purposes. Insectum also places great importance on research and collaborates closely with several universities to explore novel applications for larvae. The company sees pharmaceutics as the main area where the initiative could grow in the future. The first step in this direction is larvae lipid balm that has been certified as suitable for use on human skin and mucous membrane.

BUSINESS MODEL

Insectum creates value by transforming food waste into valuable protein resources and fertilisers. The enterprise offers a diverse range of larvae-based products, including live/frozen larvae, dried larvae, larvae meal, and larvae lipids. These products are known for their high protein and mineral content, making them suitable for the production of animal food and supplements. Additionally, the company provides granulated larvae frass, which can be used as an effective fertiliser in agriculture. This organic byproduct enhances soil fertility and supports sustainable farming practices. In production, the company mainly uses such bioresources as waste from the beer industry, waste from fruit and vegetable production industry, waste from mills (i.e., the waste left in the pasta production process). When acquiring waste from these industries, the company can be certain that it contains no heavy metals.

Insectum employs a direct approach in its product advertising by emphasising the narrative of sustainability and circularity. This is primarily due to the fact that their main resource consists of waste products. However, an equally significant aspect that the company focuses on is the healing properties of black soldier fly larvae, specifically their antibacterial properties. Acknowledging the larvae's antibacterial properties positions

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ABOUT CIRCLE

The CIRCLE project aims to develop an interdisciplinary perspective on the circular economy in the Baltic-Nordic region by integrating insights from sociology, economics, philosophy, political science, and environmental science. The emphasis is placed on the use of by-products (bio-resources) generated as part of primary production in agriculture, forestry, and aquaculture and across the sectoral boundaries to explore the underlying models of socially- and commercially-driven collaborations, and the factors facilitating and hindering the development and wider use of circular practices and collaborative arrangements thereof.

More about CIRCLE: https://circle-eea.eu

More about Insectum: https://insectum.eu/

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Insectum as a potential contributor to pharmaceutical applications. Although the products cannot be marketed as medicinal without undergoing additional research and obtaining the necessarylicenses, the company recognises the valuable potential for further exploration in this field.

OPPORTUNITIES AND CHALLENGES

The opportunities are related to experimentation to explore the biofermentation method. Originally, Ekofrisa had plans to develop a composting solution for the waste generated from cleaning all kinds of grain, not just buckwheat. The intention was to build infrastructure that would allow them to convert the compost into biochar, a type of fertilizer beneficial for replenishing the soil's microflora. However, the required investments for this composting and biochar production infrastructure were estimated as prohibitively high for Ekofrisa. Given their financial constraints, they decided to sell the waste materials from the production process instead. This extension of circularity allows another company to reuse the waste generated during the grain cleaning process, contributing to a more sustainable utilization of resources.

However, the company faces several barriers. The production costs of larvae protein put the circular business initiative at a disadvantage compared to alternative proteins such as fish or soy protein. Consequently, farmers have little incentive, aside from the antibacterial properties, to feed their livestock with larvae protein from Insectum. Obtaining suitable waste to feed the larvae is another challenge the company faces. As a small startup, Insectum can only acquire small amounts of waste (up to 10 t), which discourages collaboration with larger food production companies. Consequently, Insectum purchases waste instead. If the company were to focus on pharmaceutical properties of the fly, further research would still be required to establish the pharmaceutical applications, making it impractical for the company to sell its products as medicine due to the high costs associated with licensing and research, particularly for a small startup.