Snapshot Report

Fly Farm

Small commercial pilot scale evaluation and optimisation

Project code
2025-1011

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Project description

The FlyFarm Small Commercial Pilot Scale Evaluation and Optimisation project assessed the feasibility of using black soldier fly (BSF) bioconversion technology to transform JBS Australia's low-value red meat waste—primarily paunch and red offals—into high-value outputs such as protein meal, insect oil, and biofertiliser (frass). Driven by industry sustainability goals and increasing pressure to improve waste valorisation, the project explored whether insect-based circular economy solutions could deliver both environmental and economic benefits to the red meat processing sector. The pilot was executed in collaboration with FlyFarm and targeted commercial viability, technical performance, and market engagement.

Project content

The project operated a dedicated pilot plant for three months, exclusively processing JBS-supplied waste. More than 90 feedstock formulations were trialled to optimise feed conversion ratios (FCR), larval growth, and product yield. The system was scaled from lab to near-industrial levels using FlyFarm's FF2 automated technology. Key parameters such as temperature, humidity, feed density, and composting protocols were systematically refined. Products—BSF protein meal, oil, and frass—underwent laboratory testing and were distributed to potential market partners for validation. Wiley was commissioned to develop a high-level ROI and capital cost model (+/-30%) for a potential facility at JBS's Dinmore site.

Project outcomes

The pilot processed 18 tonnes of waste, achieving an average FCR of 7.5 (best: 5.3), and produced 484 kg of protein meal (>55% protein), 99.1% pure BSF oil, and composted, pathogen-free frass. Product testing with aquafeed (Biomar) and pet food (RPF) markets confirmed technical suitability and commercial interest, with protein meal priced up to AUD $6,500/tonne. Frass outperformed commercial fertilisers in early-stage trials. However, Wiley's modelling concluded that new-build facilities using natural BSF strains are currently not financially viable. Repurposing existing infrastructure or using enhanced BSF strains may improve ROI.

Benefit for industry

This project provides compelling evidence that BSF bioconversion is a technically sound method for converting red meat waste into marketable, sustainable products. The approach offers a potential solution to reduce disposal costs, increase resource efficiency, and access premium markets in pet food, aquafeed, and regenerative agriculture. It also supports industry objectives around circularity and environmental stewardship. While commercial scale-up will require further research, especially in strain development and infrastructure optimisation, the pilot lays a robust foundation for continued innovation and investment in sustainable waste-to-value technologies in the red meat industry.