



Australasian Pork Research Institute Ltd APRIL

PROJECT SUMMARY

Project Number and Title: 5A-102 INSECT MEAL FROM PORK PROCESSING DERIVED MATERIAL

Project Leader: Dr Kristy DiGiacomo

Project Participants: Dr Darryl D'Souza, Claire Leach, Prof Brian Leury.

Aims and Objectives:

This project aimed to identify barriers to using black soldier fly larvae (BSFL) to bioconvert pork abattoir waste into protein and fat-rich feedstuffs suitable for the pig (and other) industry. As no local and few international studies have assessed this opportunity, little is known about potential risks relating to any aggregation of microbiological and chemical contaminants of BSFL bioconversion of pig abattoir material into pig feed.

Experimental design:

Samples of waste from pork processing abattoirs (across multiple replicates) were sourced and fed as a rearing substrate to BSFL. Pork waste included trim and bone, offal (floor waste and other soft offal), testes and skin, throat and uncleaned large intestine. The BSFL were reared for ~12 days and then harvested for further analysis.

Key Findings:

- Pork waste cannot be used as a stand-alone substrate for rearing BSFL. While the waste was somewhat consumed by the larvae, growth was inefficient and larvae survival was low.
- The BSFL reared on pork waste that survived grew to a good size (0.12 g) with a modest nutritional profile (~24 MJ/kg ME, 26% CP, 66% fat).
- BSFL did not totally consume and bioconvert the pork processing waste which resulted in no residual friable frass (fertilizer) being produced.
- High levels of bone in the pork waste were not an efficient rearing substrate and not efficiently bioconverted by the larvae.
- High levels of fat in the pork processing waste became liquid at the BSF rearing temperature (28°C) and resulted in an environment that was not favoured by the BSFL, leading to inefficient growth and high mortality.
- A lack of carbohydrate in the pork processing waste likely contributed to the stunted growth of the BSFL. The addition of a small amount of fibre (carbohydrate) to pork processing waste marginally improved the bioconversion and larvae growth, although this growth remained inefficient compared to solely plant-based rearing substrates in published studies.

Bioconversion of pork processing waste into BSFL is predicted to be improved with the addition of carbohydrate sources to the rearing feed. Additional waste streams that can be used as co-waste sources for rearing BSFL on low-value pork processing waste warrant exploration to improve larvae growth and bioconversion efficiency.

Applications to Industry:

With additional development and optimisation of rearing substrates, pork processing waste can be utilized as a contributing nutrient source for rearing BSFL. There is an opportunity to combine pork processing waste with other agricultural waste streams and develop an efficient closed loop system whereby waste produced is bioconverted into a high value insect protein, rather than ending up in landfill.