ENDFOODWASTE
COOPERATIVE RESEARCH CENTRE

31 December 2024

PROJECT SUMMARY

‘Food Waste to Pig Feed – Safe & Bio-secure’ Project

KEY POINTS

- Livestock animals can efficiently transform unavoidable food waste back into valuable protein for human consumption.
- Utilisation of safely transformed food waste for the livestock industry could reduce costs of production.
- Greater utilisation of human food waste for animal feed would significantly reduce greenhouse gas emissions from both the food wasted, and from grain production and transport associated with traditional feed production.

Figure 1. Mixed supermarket food waste

THE CHALLENGE

Australia limits the food wastes permissible for livestock feed. Pigs are considered high risk for the introduction of exotic viral diseases through the illegal feeding of prohibited pig feed (PPF) or ‘swill’. PPF includes any material of placental mammal origin (other than milk and milk by-products, properly rendered meat meal, or tallow) and anything that has come into contact with meat or meat products. PPF is not permitted to be fed to pigs in Australia unless: rendered in accordance to Australian Standard (AS5008:2007, 2007); under jurisdictional permit, cooking processes subject to compliance verification that ensure a core temperature of at least 100°C for a minimum of 30 min, or equivalent; treatment of cooking oil, which has been used for cooking in Australia, in accordance with the national standard; and under jurisdictional permit, any other nationally agreed process approved by Animal Health Committee.

THE OPPORTUNITY

There is a growing body of knowledge showing that if the correct processing and safety measures are implemented, mixed food waste (containing meat) from retail and food service could be effectively and safety utilised in commercial pig production systems. In Japan, a successful food waste to pig feed industry has been developed based on both liquid and dry feeding systems, which is regulated and encouraged under national policy. Furthermore, the Japanese pork industry has not been negatively affected by emergency animal diseases through these feeding practice.

The Australasian Pork Research Institute Ltd (APRIL) and Australian Pork Limited (APL) considers the greater utilisation of food wastes to substitute current feed ingredients to be of potential high importance for the pork industry.

OUR RESEARCH

The objectives of the project were to:

- Identify the food safety/biosecurity risks and strategies to mitigate these perceived risks in utilising mixed food waste streams into feed.
- Determine the techno-economic feasibility of utilising food waste for pig feed in key Australian regional areas.
- Undertake a pilot pig feeding study using treated mixed human food waste.

Figure 2. Food waste feeding study.

OUTCOMES

A scientific peer reviewed publication on the opportunities and challenges of utilising mixed human food waste for the livestock industries (Torok et al., 2021).

Regional techno-economic analysis (TEA) on the feasibility of utilising mixed human food waste for the pig industry was done in five key pig production areas in Australia. The TEA considered both wet and dry feeding systems in the production of a feed ingredient as compared with a reference grain-based diet (70% wheat, 30% canola). Approximately, 373,000 tonne/pa of untapped mixed food waste were identified from commercial and industrial sources in identified regional areas. This volume of mixed food waste could support up to six food waste to feed manufacturing facility. Wet feed production was found to be feasible in all areas investigated, with dry feed ingredient production being feasible only on the eastern seaboard.

A four week pilot weaner feeding study was undertaken where mixed human supermarket food waste (Fig 1) was processed, heat treated and dried into a dry feed ingredient and incorporated into the diet at a 20% inclusion rate (Fig 2). No significant differences in the performance or faecal amino acid digestibility of pigs were observed as compared to a commercial weaner diet, demonstrating that the food waste diet had no negative impact on pig production. Furthermore, no impact of diet was observed on meat quality measures or the intestinal microbiota.

IMPACT

Implementing the opportunity of safely transforming identified volumes of mixed food waste for use in pig feeds could lead to significant environmental benefits by reducing food waste going to landfill by 5% and lowering demand for conventional grain feed ingredients by 6%, based on assumptions at the time.

Such an initiative would have the potential to benefit the Australian pig industry by delivering alternative, cheaper feed ingredients, and providing additional surety against the price volatility of some ingredients.

NEXT STEPS

Australia currently lacks the legislative framework to support uptake by both the food and livestock industries. Safe implementation would require development of policy and legislative frameworks and further investment into research, new infrastructure for waste handling and feed manufacturing facilities.

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PROJECT TEAM

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PROJECT REPORTS/PUBLICATIONS

Torok, V.A., Luyckx, K., Lapidge, S., 2021. Human food waste to animal feed: opportunities and challenges. Animal Production Science 62, 1129-1139

PROJECT WEBPAGE

FOOD WASTE TO PIG FEED – SAFE AND BIOSECURE - End Food Waste Australia » End Food Waste Australia

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Fact Sheet Version 1 – Date

DISCLAIMER

End Food Waste Cooperative Research Centre is funded through the Australian Government's CRC Program administered by the Department of Science, Industry and Resources.