ENDFOODWASTE
COOPERATIVE RESEARCH CENTRE

30/04/2025

Project Summary

The Leaf Protein Co: Leaf Protein Food Matrices & Model System

KEY **POINTS**

- Significant amounts of edible plant by-products, such as leaves and stems, are wasted each year, highlighting a major opportunity to reduce food waste
- Leaf proteins represent a promising sustainable plant-based alternative ingredient, that can contribute to food-waste reduction through valorisation into functional ingredients for food applications
- Leaf protein can be used as a functional ingredient in beverages processed using high pressure homogenisation, as well as an ingredient extrusion to produce puffed products
- Processing methodology for leaf protein production can affect the ingredients' physiochemical properties and therefore applications in food products.

THE **CHALLENGE**

Rising demand for plant-based proteins is driving the food industry to explore alternative sources that enhance food security and sustainability. Large volumes of plant by-products, such as leaves and stems, are currently wasted. Green leaf waste, often overlooked, offers a valuable protein source, helping to meet global protein demand while reducing the environmental impact of food waste.

Leaf protein is a novel alternative protein source that requires market education to support adoption by prospective customers. Without sufficient research demonstrating its physicochemical properties and potential applications, food companies are likely to continue relying on established plant protein ingredients already on the market, even when they are less sustainable.

Alfalfa leaves are a substantiable and emerging ingredient with the potential to contribute to food waste reduction. By transforming them into functional ingredients for food applications through valorisation, their nutritional value can be fully utilised, turning an underused by-product into a valuable resource.

THE **OPPORTUNITY**

Food waste and the growing demand for sustainable protein sources present a significant opportunity for the food industry. Leaf protein offers a novel, plant-based alternative that can be derived from underutilised biomass and food-system by-products. By valorising leafy materials into functional ingredients, this project addresses both protein sustainability and food-waste reduction, supporting the transition to more circular food systems. It also helps to accelerate the adoption of using leaf protein by developing base finished production formulations for Food Manufacturers.

OUR **RESEARCH**

This project investigated leaf protein as an emerging alternative protein ingredient, with a focus on understanding its physicochemical properties and functional performance in food applications. The research aimed to generate the technical evidence needed to support industry uptake, including characterisation of functionality and suitability across different food formats. This work helps bridge the knowledge gap, limiting adoption of leaf protein by food manufacturers.

OUTCOMES

The project provides foundational research to support the commercial potential of leaf protein as a sustainable food ingredient. The research helped to show leaf protein a more sustainable potential alternative plant protein and “greens” ingredient compared to existing common plant proteins in market today. It also demonstrated the ability to incorporate leaf protein into a beverage and snack food product. By demonstrating its functional properties and application potential, the outcomes help de-risk adoption for industry and enable informed decision-making. Ultimately, this research supports reduced reliance on less sustainable protein sources and contributes to food-waste valorisation within the Australian food system.

THE **IMPACT**

This project confirms the ability to use leaf protein as an ingredient in finished food products and therefore the ability to transform waste leafy material into higher value food ingredients.

NEXT **STEPS**

Next steps to improve the incorporation of leaf protein ingredients in finished products would include further refinement of product formulations using leaf protein, as well as the impact of post processing of leaf protein to improve its use as a functional ingredient.

PROJECT **TEAM**

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PROJECT **WEBPAGE**

"GREENLEAVES" PROJECT - STAGE 1 AND 2 - End Food Waste Australia » End Food Waste Australia

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Fact Sheet Version 1 – Date

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