



SME Solutions Centre Case Study

Production and characterisation of potato protein isolate powder using mild, low cost and healthy extraction methods

The challenge

Australia produces in excess of 1.3 million tonnes of potatoes annually, the highest volume of any vegetable production in Australia. Currently, up to 20% of pre-farmgate potato is either lost or sold below the production cost, which is causing financial stress for producers and causing unnecessary food waste.

Undersized or oversized potatoes constitute the bulk of the potatoes that go to waste or sold below production cost. The proximate composition and nutritional value of potatoes are independent of their size. Thus, solutions are sought to reduce this waste by creating new, innovative products.

Pacific Ag is a family-owned business growing potatoes in an area around 800 acres based in southern Riverina, New South Wales. It exports 12,000 to 14,000 tonnes of potatoes to overseas customers. Due to the strict specifications and customer standards, not all produce

is able to be used. As a result, a large volume goes to low value uses each year. In the last two seasons, this total average waste has been between 1,200-1,400 tonnes.

Freshly harvested potatoes contain 78-80% water, 17-18% carbohydrate (mostly starch) and 2% protein. Given this low level of protein content and considering the processing loss, production of potato protein can only be economic when low cost, simple (unsophisticated) technologies/processes are chosen.

This project aimed to develop technological pathways for extraction of protein and convert the extracted protein slurry into powder. Optimisation of the process parameters was a key component of the project to establish highly functional and stable potato protein concentrate, and isolate powders.



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Project impacts

Pacific Ag will be able to manufacture potato protein powders (concentrate and isolate) that have sound techno-functionality and stability. The irregular size (undersize, oversize) potatoes, that would otherwise go to waste, can be used to produce these high value potato protein powders. In addition to waste minimisation, the project will add to environmental sustainability by avoiding potato waste going to landfill or water source. The extraction and drying technologies developed and/or optimised in this project can be readily implemented to manufacture the above-mentioned powders.

Conclusions & recommendations

This project delivered technologies for extraction of protein from (starch removed) potato fruit juice and technologies to convert the extracted protein into protein powders. The laboratory scale extraction pathways (technologies) can be readily scaled up to undertake industrial manufacturing. Similarly, the laboratory and pilot scale drying pathways (technologies) can also be readily scaled up to undertake industrial manufacturing.

Authors and acknowledgements

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Participants

www.fightfoodwastecrc.com.au

