PRO1534: Characterization of phytochemicals and dietary fibres in pulse processing by-products as functional food ingredients for health promotion and disease risk reduction

Increasing evidence suggests that consumption of pulses lead to improved health and reduced risks of chronic diseases, especially those caused by oxidative stress. The rich dietary fibre content of pulses also points to the benefits of pulse consumption to gut health. However, recent studies showed that some compounds in the hulls of pulses may be released in human digestive tract, especially during colonic fermentation, and they may play a significant role in enhancing the immune responses thus contributes gut health. This project aimed at utilizing the by-product of pulse processing for value-added health foods. The project specifically focused on developing solid-state fermentation technologies using food grade microbes, and targets on enhanced release and potential health benefits of the bioactives in hulls of lentils and peas. Results of the study showed that food grade yeast, fungi, and probiotic bacteria all enhanced the release of polyphenols which led to increased antioxidant activities. A gluten-free bread formulation based on lentil and pea hulls was developed and the bread quality was considered acceptable. These results suggest that the processing by-products of lentils and peas are great candidate of health promoting foods, and solid state-fermentation can lead to even greater potential. Fermented hulls can be value-added functional food ingredients, especially when further studies are conducted to confirm the bioavailability and in vivo health benefits, and the feasibility and palatability of different functional foods.