



ENHANCEMENT OF CHICKPEA AND AQUAFABA QUALITY BY HIGH PRESSURE PROCESSING

Oral Defence by PhD Candidate Fatemah B. Alsalman

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Abstract

The first part of the research is focused on the effect of high pressure treatment on reduction of chickpea soaking and cooking time through effective hydration along with improving its quality. HPP allowed to reach 90-93% hydration where similar results could be reached with overnight soaking without HPP. HP-soaking resulted softer texture, 48N, compared to 368N of untreated samples. High-pressure-treated samples improved chickpeas quality by reducing tannin content to around 26.7% and phytic acid content to around 16.7% from initial levels. Using pressure cooker gave desired textural properties in 20min that could not be reached within 60min in conventional cooking. In the second part, the focus was on chickpeas by-product "aquafaba", its characterization and optimization of its functional and antinutritional properties. By comparing aquafaba optimized condition with aquafaba from cans, results showed that aquafaba from cans had higher phytates content, protein content, and some of the functional properties. Principle reason being the long thermal processing times at much higher temperatures. HPP improved aquafaba emulsion properties and could reduce protein aggregates by 33.3%, while α -helices decreased by 50%. It increased viscosity as well as strengthened gel structure by increasing elasticity (G'). By comparing HP-treated samples to control, we found that starch digestibility was significantly enhanced from 0.8 to 4.1% (SDS), 25.1 to 31.5% (TDS), and 3.8 to 4.4% (RS). HP increased crystallinity with both FTIR and XRD techniques which might have contributed in increasing RS and G' that are considered as good attributes in nutritional and food processing aspects.



About the Candidate

Fatemah completed her BSc from Kuwait University, Nutrition department in 2011. Then, she joined Kuwait Institute for Scientific Research as a research assistant before starting her MSc program in Food Science department at McGill University. In 2016, she obtained her MSc degree and started her PhD under the supervision of Prof. Hosahalli Ramaswamy. During her PhD, she completed a project on aquafaba funded by NSERC. She published 2 first-author manuscripts in peer-reviewed food science related journals.