**Formation of Heat-Induced Pressed Gels from Canola Press Cakes: Influence of Starting Materials, Stirring Conditions, and Carbohydrase Pretreatment**

Amir Vahedifara, Jianping Wua

*a Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada T6G 2P5*

Alternative plant protein sources provide promising solutions to address food insecurity and sustainability challenges. Inspired by soy tofu production method, pressed gels could be introduced as a robust and versatile approach to developing protein-rich plant-based products. This study explored the production of heat-induced pressed gels from canola cold-pressed cakes (CPC) and hot-pressed cakes (HPC) under different stirring conditions. Gels made from CPC exhibited higher yield and protein recovery compared to those from HPC. While carbohydrase pretreatment did not enhance yield or protein recovery, stirring during heating significantly improved protein recovery, reaching up to 38.3%. Additionally, stirring influenced textural properties by regulating aggregate size and compactness. The stabilization of pressed gels was attributed to a combination of hydrogen bonding, hydrophobic interactions, and disulfide bonds. Compared to canola press cake, the pressed gels contained lower levels of glucosinolates and phenolic compounds but higher amounts of phytic acid. A formation mechanism was proposed based on a nucleation-growth model, suggesting a shift from diffusion-limited processes in non-stirred gels to reaction-limited processes in stirred gels. Overall, this study highlights the potential of canola heat-induced pressed gels both as a functional food product and as a microstructured protein ingredient.