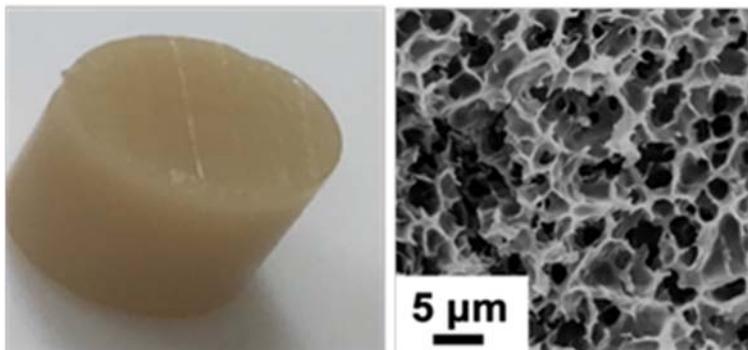


## Development of Innovative Plant Protein-Based Gelling Ingredients for Food Applications

As the global population keeps increasing, so does the demand for protein-rich foods. It is forecasted that animal-based proteins and products will be insufficient to meet the protein demands of the projected population of 9 billion in 2050. Pulses are a good source of protein (20-30%) with high nutritive value. However, their wide application as protein ingredients in food products has been hindered by their less desirable texture. Using peas and lentils grown in Alberta and western Canada, the project team is developing pulse protein-based gelling ingredients to replicate the texture and sensory properties of meat products for use in the manufacture of protein-rich foods. The global market for pulse-based proteins is expanding, resulting in increased production and higher profit competitiveness for Alberta's pulse sector.



**RECIPIENT:**

University of Alberta

PI: Dr. Lingyun Chen



**PARTNERS:**

N/A



**TOTAL BUDGET:**

\$236,999



**AI FUNDING:**

\$149,999



**PROJECT DATES:**

MAR 2019 -  
FEB 2022  
(Extended)



**PROJECT TRL:**

Start: 3  
End: 6

### APPLICATION

The project aims to develop new pulse-based protein gelling ingredients that can be used to improve the texture and sensory quality of protein-rich foods. It will also improve a pre-texturization technique that has been commercialized for dairy proteins and not yet applied in pulse proteins. As the technique does not use chemical reagents or enzymes, food processors will be able to incorporate it in their production line to generate high value ingredients and protein products labelled as "natural," vegetarian and vegan.

# ALBERTA INNOVATES CLEAN RESOURCES

## AGRI-FOOD INNOVATION

### FOOD INNOVATION

#### PROJECT GOALS

- Investigate the gelling properties of pea and lentil protein to develop new gelling ingredients that will allow manufacturing of protein-rich foods with desirable structure, and sensory quality.
- Develop plant protein gels of improved strength by pre-texturization and protein-polysaccharide complexing that can provide appropriate food texture.
- Scale up the technique at pilot level to develop two food prototypes incorporating the developed protein ingredients and evaluate the food quality.

#### BENEFITS TO ALBERTA

- The development of high-value gelling ingredients from Alberta crops will allow producers for a new market opportunity for specific value-added applications.
- Generation of new high value ingredients and protein products using vegetarian and vegan ingredients with high sensory and quality attributes.
- Increasing the consumption of pulse-based protein can reduce health issues associated with cholesterol and saturated fats, which will contribute towards improving overall nutrition and health of Albertans.



4 Publications



6 Students  
Trained



4 Project Jobs



1 Patent

#### CURRENT STATUS

##### Jun 2022

The project was successfully completed with pea protein gelling ingredient with gel strength comparable to that of soy protein and egg white developed using pH shifting, Atmospheric Cold Plasma (ACP) treatment, and protein-polysaccharide complexing techniques. The production of the pea protein gelling ingredient from pH shifting and ACP approaches was also successfully scaled to a pilot level of 2 kg and 0.5 kg, respectively while the pea protein gelling ingredient from pH shifting alone was incorporated into two food applications – veggie patties and tofu/jello-like products.