UNIVERSITY OF MINNESOTA
Driven to Discover℠

Method to produce pea protein with improved functionality

A novel method to produce soluble pulse proteins with longer shelf-life that features a clean label and does not compromise nutritional value.

IP Status: PCT Application Filed

Applications

- Production of pulse protein isolates
- Production of starches from pulse proteins

Key Benefits & Differentiators

- **Improved solubility and thermal stability:** by using Maillard Reaction for partial glycation of pulse proteins
- **Clean label:** by utilizing reducing sugars already present in pulse protein starches as a carbohydrate source, instead of adding extra ingredients such as gum arabic, maltodextrin, or dextran
- **High nutritional value:** does not use typical stabilizing agents such as hydrocolloids that often compromise the nutritional value of plant-based proteins

Technology Overview

By 2025, the global demand for protein ingredients is expected to reach 7 million tons and generate revenues of nearly $70 billion USD. In particular, there is a growing demand for plant-based protein ingredients due to the increasing number of vegans, health conscious consumers, as well as a growing interest in sustainable and environment friendly sources. Therefore, interest in pulse protein (pea, bean, chickpea, lentil, mung bean, and fava beans) and especially pea protein has exploded in recent years. However, pulse proteins lack some of the functional attributes, especially solubility and thermal stability of other proteins, such as whey and soy proteins. This severely limits the food applications of pulse proteins, and as such protein beverages in the market are mostly formulated using whey protein.

To address this problem, researchers at the University of Minnesota have developed a method to produce functional pulse proteins with increased thermal stability and solubility, while also meeting clean label requirements. This novel process first converts sugar inherently present in pulse protein starches into a mixture of mostly maltodextrin. This mixture is then combined with pulse protein isolates to produce partially glycated pulse proteins through an incomplete Maillard reaction. This novel process is scalable, does not compromise nutritional quality, and is especially suitable for acidic conditions, which is often the case for protein beverages.

Phase of Development

TRL: 3-5
Proof of concept available.

Desired Partnerships

Technology ID
2021-054

Category
Engineering & Physical Sciences/Processes
Agriculture & Veterinary/Ag Biotechnology
Agriculture & Veterinary/Food Science & Nutrition

View online page

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

Researchers

- **Pam Ismail, PhD** Professor, Department of Food Science and Nutrition

References

1. Wang, Qian, and Baraem Ismail(2012) , https://doi.org/10.1016/j.idairyj.2012.02.009, International Dairy Journal
2. Wang, Q., He, L., Labuza, T.P. and Ismail, B.(2013) , https://doi.org/10.1016/j.foodchem.2012.12.050, Food chemistry
3. Walter, J., Greenberg, Y., Sriramarao, P. and Ismail, B.P.(2016) , https://doi.org/10.1016/j.foodchem.2016.07.012, Food Chemistry