COLLABORATIVELY GROWING THE LANDSCAPE OF PLANT-BASED PROTEINS

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The mission of the Plant Protein Innovation Center (PPIC), first of its kind in the nation, is to bring together interdisciplinary researchers and industry partners to deliver to the supply chain new nutritious and functional plant protein ingredients and products, working all the way from breeding and genetics to processing, formulation, and marketing.

PPIC addresses industry-identified plant-protein challenges and opportunities to develop a wealth of fundamental science leading to a low emission food industry.
Why PPIC? Why Now?

The PPIC strives to not only bring economic gain to the industry but to also address the consumer desire for nutritious and healthy food, have a positive impact on the environment by seeking and utilizing sustainable crops, provide additional sources of protein for the growing population, and provide revenue to farmers.
How? The PPIC Model

- Research is mainly **Pre-Competitive** and **Non-Proprietary**
- Research focuses on fundamental science that addresses industry needs and consumers demands

- **Total funds acquired:** over $6,000,000
The PPIC Model: Coming Together to Grow Research
Research Areas
- Nutrition
- Food Science & Technology
- Breeding & Genetics
- Agronomy
- Analytical Chemistry
- Biochemistry
- Business Management
- Statistics

Experts in Various Fields
- Protein Chemistry
- Metabolomics
- Human Nutrition
- Animal Nutrition
- Polymer Characterization
- Athlete Nutrition
- Toxicology
- Product Development
- Non-Thermal Processing
- Protein Functionalization
- Protein Bioactivity
- Dietetics

Broad Instrumentation & Research Capabilities
- Proteomics and Mass Spectrometry Center
- Rheology Characterization Lab
- Food Processing Center (Pilot Plant)
- Encapsulation Center
- Sensory Center
- Biotechnology Institute
- Equipped Research Labs
- Imaging Center
- Analytical Biochemistry Center
- NMR Center

INNOVATION
Areas to be Addressed

Understand how novel proteins can replace or be combined with traditional protein ingredients in various food products to deliver optimal nutrition, functionality, and flavor.

Determine viable (cost effective) extraction (wet and dry) and processing technologies for producing functional protein ingredient from novel sources.

Unveil unique characteristics and applications for each protein source.

Develop prediction models to link protein structure to function.

Investigate crop diversity and breed for protein quality traits.

Secure abundant and sustainable supply.
Identified Research Priorities

Production
Primary research focus areas related to breeding, sustainability of the supply, and crop diversity

Processing & Formulation
Primary research focus areas related to extraction methods, unique processing, co-products, food systems, high value end use

Application
Primary research focus areas related to flavor, functionality, and nutrition

https://ppic.cfans.umn.edu/research/research-priorities
Research Advances

PPIC Funded Research

- Three successful RFPs resulting in seven projects, submitted by PPIC researchers, funded for up to $50,000 per year

- Link to research summaries
Examples of PPIC Grant Proposals

(Over one million dollars)

 Proposal funded through Good Food Institute (GFI) (2020)
  • Title: *Characterizing and texturizing proteins from pulses to form fibers with textures that mimic chicken*
  • Three interdisciplinary PPIC researchers
  • Funds granted: $250,000

 Proposal funded through Foundation for Food & Agricultural Research (FFAR) (2020)
  • Plant Protein Enhancement Project
  • Title: *Legumes of the future: Developing methodologies and germplasm to enhance the functionality and nutritional quality of pea protein*
  • Five interdisciplinary researchers
  • Funds requested: $800,000
Who?

Industry Members

Associate Members
Who?

Industry Members

Affiliate Members

Catapult

DryGro

NuCicer
Who?

Supporters & Collaborators

Agricultural Utilization Research Institute
Bridge2Food
Canada Consulate General
CROWN
DIL
ExAlt R&D, LLC
Forever Green
GFI
Good Food Institute
Hartman Group
Improve
Naturally Minnesota
Plant Based Foods Association
Protein Highway
Schwan's Company
Schwan's Corporate Giving Foundation
University of Manitoba
VTT
Wageningen University & Research
Who?

Researchers

37 interdisciplinary researchers across the University of Minnesota and from external institutions!

https://ppic.cfans.umn.edu/expertise/researchers

Senior Scientists, Postdocs, and Students
Benefits to Members

https://ppic.cfans.umn.edu/members-supporters/membership-benefits
PPIC Capabilities
Check out our webpage for a full list of capabilities

Sample Preparation
Compositional Analysis
Protein Extraction

Structural & Functional Characterization
Nutritional Analysis
Flavor Extraction Techniques

Analytical Measurement of Flavor Compounds
Application Techniques
Access to University Facilities

https://ppic.cfans.umn.edu/capabilities-overview
PPIC Outreach

Annual PPIC events include:

- Research Spotlight Meeting
- Protein short courses and hands on experiences
- Workshops on
  - Commercialization
  - Scale up challenges
  - Abundance of supply challenges

Outreach will allow for the exchange of knowledge between the public and private sphere.
What PPIC Offers the Community

- Networking opportunities during events with companies across the value chain (Ingredient suppliers, processors, and CPG companies)
- Interaction with scientists from various disciplines
- Research advancement and innovation
- Development of new and successful protein ingredients and applications
- Post-farm processing technologies that add value along the entire value chain
- Scaling plant protein from regenerative Agriculture
- Development of environmentally sustainable protein crops
- Securing supply chain
- Training the next generation of plant protein scientists
Thank You to Our: Technical Committee
Thank You to Our: Executive Board

Laurice Pouvreau
Expertise Leader Protein Technology
Wageningen University & Research (The Netherlands)

Denis Chéreau
CEO, IMPROVE (France)

Greg Cuomo
Associate Dean for Research & Graduate Programs, Utah State University

Sergiy Smetana
Head of Food Data Group, German Institute of Food Technologies (DIL e.V.) (Germany)

Julie Simonson
VP R&D Product Innovation, Schwan’s Company

Jason Robinson
Director – Business Development, Food Agricultural Utilization Research Institute

Christina Connelly
Trade Commissioner, Consulate General of Canada
Partner with us today to change the landscape of plant-based protein tomorrow!