

Pulse Crop Health Initiative Funded Projects – Fiscal Year 2024

Functionality Projects

Improving Extraction Yield, Purity and Functionality of Proteins from Pulse Grains using Enzyme-Assisted Green Extraction

FY24 Funding: \$85,433

Bingcan Chen (PI) North Dakota State University

Accessible cultivar and processing strategies for improve pulse flour quality

FY24 Funding: 180,461

Karen Cichy (PI), USDA-ARS, East Lansing, MI

Controlling Pulse Fermentation to Improve Gut Microbiome Health

FY24 Funding: \$0 (continuation of project funded in prior FY)

Darrell Cockburn (PI), Pennsylvania State University

Processing effects on the composition of pulses (beans, peas, chickpea and lentils) and the resulting benefits in the prevention of type-2 diabetes

FY24 Funding: \$125,759

Elvira de Mejia (PI), University of Illinois

Effects of extraction methods on lentils and dry beans extract composition and structural modifications: from extraction efficiency, functional and biological properties to fouling of industrial UHT equipment

FY24 Funding: \$99,856

Juliana Maria Leite Nobrega de Moura Bell (PI), University of California

Isolating and characterizing protein fractions from black beans and lentils for use as novel oil structuring agents: Development, optimization and nutritional implications

FY24 Funding: \$93,000

Andrew Gravelle (PI), University of California – Davis

Harnessing Fermentation Technology to Overcome Functionality, Nutritional and Sensory Challenges in Pulse Protein Ingredients for Food Applications

FY24 Funding: \$72,254

Lutz Grossmann (PI), University of Massachusetts – Amherst

Impact of Storage on Functionality and Shelf Life of Chickpea Flour

FY24 Funding: \$71,956

Clifford Hall (PI), South Dakota State University

Improving texture and nutritive value of pulse-based protein-rich ingredients with fiber adducts formed with high pressure homogenization and heat

FY24 Funding: \$90,044

Audrey Girard (PI), University of Wisconsin – Madison

Enhancing Pea Protein Functionality through Glycation Following a Novel and Efficient Upcycling Approach

FY24 Funding: \$113,637

B. Pam Ismail (PI), University of Minnesota

Developing and utilizing functionally enhanced pulse proteins as novel food ingredients

FY24 Funding: \$0 (continuation of project funded in prior FY)

Yonghui Li (PI), Kansas State University

Dough rheology, baking performance and bread sensory quality of pulse-fortified whole wheat flours

FY24 Funding: \$0 (continuation of project funded in prior FY)

Yonghui Li (PI), Kansas State University

Supercritical fluid extrusion for improvement of flavor and functionality of pulse flours and proteins concentrates

FY24 Funding: \$0 (continuation of project funded in prior FY)

Syed S.H. Rizvi (PI), Cornell University

Improving functional & nutritional properties of pulse flour by heat-moisture treatment & developing pasta and noodle with improved health benefits

FY24 Funding: \$104,611

Yong-Cheng Shi (PI), Kansas State University

An innovative supercritical carbon dioxide-based drying approach to enhancing functionality and sensory properties of pea and lentil proteins

FY24 Funding: \$86,130

Ali Ubeyitogullari (PI), University of Arkansas

Re-structuring pulse proteins into valuable fibrils via biocatalysis

FY24 Funding: \$0 (continuation of project funded in prior FY)

Yi Zhang (PI), Pennsylvania State University

Pulse-fruit aggregate ingredients with enhanced taste, functionality and health attributes for diversified food applications

FY24 Funding: \$43,940

Mary Ann Lila (PI), North Carolina State University

Enzymatic modification of pulse proteins to improve technical and health functionalities for diversified food applications

FY24 Funding: \$0 (continuation of project funded in prior FY)

Hoatian Zheng (PI), North Carolina State University

Human Health Projects

Human pulse consumption, the microbiome and meal satiety

FY24 Funding: \$118,190

Katherine Anguah (PI), University of Missouri

Identifying the Role of Pulses in the Healthful Diet: metabolomic signatures of dietary pulses and their benefits of cardiometabolic risk factors

FY24 Funding: \$259,579

Brian Bennett (PI), USDA-ARS, Western Human Nutrition Research Center

Maternal supplementation of pea fiber to protect against obesity and hypertension in offspring

FY24 Funding: \$158,238

Prasanth Chelikani (PI), Texas Tech University

Impacts of pulse consumption on human health, diet cost and environmental sustainability

FY24 Funding: \$135,498

Zach Conrad (PI), College of William & Mary

Impact of structural modification techniques on pea (*Pisum sativum* L.) protein's ability to modulate human gut microbiota

FY24 Funding: \$63,787

Leqi Cui (PI), Florida State University

Effects of a pulse-based USDA-diet on gut microbial metabolites and biomarkers of healthspan: An 18-week randomized controlled crossover feeding study in older adults

FY24 Funding: \$78,616

Moul Dey (PI), South Dakota State University

To determine whether adding polyphenol-rich pulses to daily diet improves skin health by reshaping the skin microbiome and lipids, and reducing oxidative stress and inflammation in women

FY24 Funding: \$96,697

Liwei Gu (PI), University of Florida

Targeted Messaging Highlighting Human Health and Sustainability Benefits to Promote Pulse Consumption

FY24 Funding: \$93,337

Christopher Gustafson (PI), University of Nebraska – Lincoln

Pulse Consumption Improves Gut and Bone Health and Metabolic Outcomes of Postmenopausal Women

FY24 Funding: \$0 (continuation of project funded in prior FY)

Edralin Lucas (PI), Oklahoma State University

Gut microbiota dependent and independent impact of dietary pulses on pre- and postprandial metabolism and inflammation in overweight/obese humans

FY24 Funding: \$0 (continuation of project funded in prior FY)

Mary P. Miles (PI), Montana State University

Using Pulse Resistant Starch to Ameliorate Aging-Associated Dysbiosis of the Gut-Microbiome-Brain Axis

FY24 Funding: \$0 (continuation of project funded in prior FY)

Ravinder Nagpal (PI), Florida State University

The effect of regular lentil and chickpea intake on gut microbiome and metabolic health in healthy young adults: A pilot randomized clinical trial

FY24 Funding: \$95,044

Ravinder Nagpal (PI), Florida State University

Comparative Analysis of the Impact of Type of Pulse Consumed in Human Subjects and Pre-Clinical Models

FY24 Funding: \$0 (continuation of project funded in prior FY)

Henry Thompson (PI), Colorado State University

Tempeh Fermentation of Dry Chickpeas and Dry Peas for Enhanced Protection against Western Diet – Induced Health Risks

FY24 Funding: \$91,464

Hang Xiao (PI), University of Massachusetts – Amherst

Effects of pulse consumption on maternal and child health

FY24 Funding: \$100,043

Xiaozhong Wen (PI), State University of New York – Buffalo

Identification of molecular traits of specific pulses that maximize human health

FY24 Funding: \$81,813

Danielle Lemay (PI), USDA – ARS – Davis

Impact of Pulse Consumption on Lowering Antimicrobial Resistance in Gut Microbiomes

FY24 Funding: \$90,413

Danielle Lemay (PI), USDA – ARS - Davis

Sustainability Projects

Developing chickpea cultivars with radically improved nitrogen

FY24 Funding: \$116,243

Douglas Cook (PI), University of California

Replacing Fallow and Cover Crops with Field Pea and Chickpea in Semi-Arid Northern High Plains: Impacts on Production and Sustainability

FY24 Funding: \$116,083

Cody Creech (PI), University of Nebraska – Lincoln

Improving Environmental and Economic Sustainability Outcomes through incorporation of pulses into irrigated and dryland crop rotations

FY24 Funding: \$131,096

Jessica Davis (PI), Colorado State University

Quantifying, predicting and parallelizing the examination of post-digestive properties of common beans

FY24 Funding: \$89,861

Christine Diepenbrock (PI), University of California – Davis

Leveraging Plant-(SNF) of Dry Bean

FY24 Funding: \$65,170

David Douches (PI), Michigan State University

Functional Properties and Nutritional Quality of Pea Starch and Protein as Affected by Genetic and Environmental Variables

FY24 Funding: \$155,500

Sean Finnie (PI), USDA – ARS – Pullman, WA

Screening of Field Pea Accessions for Combined and Superior Drought-Tolerance and Enhanced Nitrogen Fixation in Semi-Arid Climates

FY24 Funding: \$0 (continuation of project funded in prior FY)

Donna Harris (PI), University of Wyoming

Understanding Environmental Controls on Pea Protein

FY24 Funding: \$83,996

Perry Miller (PI), Montana State University

Chickpea genetic improvement for drought and heat stress resilient grain yield

FY24 Funding: \$83,821

Ramachandra Penmetsa (PI), University of California – Davis

Rapid and in situ screening for key quality traits in pulse crops

FY24 Funding: \$97,041

Luis E. Rodriguez-Saona (PI), Ohio State University

Minimizing water and nutrient footprint for sustainable pulses-wheat cropping systems and enhanced soil health

FY24 Funding: \$25,422

Kurtis L. Schroeder (PI), University of Idaho

Enhancing Winter Pea production in the annually cropped, rainfed region of the Inland Pacific Northwest

FY24 Funding: \$64,077

Kurtis L. Schroeder (PI), University of Idaho

Assessing the impacts of dryland wheat-pea rotations and compost application on soil health and soil carbon dynamics

FY24 Funding: \$80,583

Shikha Singh (PI), Washington State University

Increasing the quantity and quality of protein in chickpeas

FY24 Funding: \$66,431

George Vandemark (PI), USDA – ARS – Pullman, WA

Lentil 2.0: Targeted genomic assisted improvement of seed protein concentration

FY24 Funding: \$95,666

Marilyn Warburton (PI), USDA – ARS – Pullman, WA

ChickpeAI: Deployment of machine learning to develop chickpea with improved nutritional, functional and yield profiles

FY24 Funding: \$150,000

Marilyn Warburton (PI), USDA – ARS – Pullman, WA

Conservation Practices to Improve Soil Health and Reduce Greenhouse Gas Emissions in Small-grain, Dry Bean Cropping Systems

FY24 Funding: \$43,000

Christopher Rogers (PI), USDA – ARS – Kimberly, ID

Improving Production of Winter Pea Cropping Systems through Enhancement of Beneficial Microbiomes

FY24 Funding: \$98,000

Svetlana Yurgel (PI), USDA – ARS – Prosser, WA