



**USDA-ARS National Pulse Crop Quality Center and Network
Fargo, ND
FY 2027 - \$6,000,000**

Background:

Pulse crops are the Future of Food.

Pulse crops (i.e. dry peas, lentils, chickpeas, and dry beans; grain legumes) are the nutritionally and sustainably optimal food choice. Food innovators recognize pulse crops as an outstanding source of protein, fiber, vitamins, and minerals. Over the past five years, the level of interest in pulse crops as both a food and a food ingredient has grown exponentially. From 2016-2020, pulse ingredients were listed 1666 times in food products in the US (Sadohara et al. 2022). On average, 1,200 new products, including pulse ingredients, have been launched in the US over the past five years. Products include beverages, plant-based meat analogs, flours, pasta, and extruded snacks, to name a few. However, product development teams from major companies and emerging entrepreneurs are demanding more comprehensive analyses of pulse crops and pulse ingredients. Quality analysis is critical to the efficient marketing of pulse crops and the development of pulse-based products. Although the visual standards provided by the USDA FGIS grading standard have served the industry well for the whole seed market for processors, further research and testing for functionality is now needed to continue the expansion of pulse crop usage and be a part of the plant-forward movement. To conduct robust research on the fundamental nature of end-use functionality and nutritional quality, as well as the biochemical and genetic basis of pulse quality, the establishment of a National Pulse Crop Quality Center and Network should be a priority. Establishing and continuing to support this Center and Network will enhance the marketability of pulse crops and meet the needs of the USA and the global population.

Pulse Markets demand quality and quality analysis.

For over 80 years, the USDA-ARS has provided wheat farmers and grain merchants with a vast array of wheat quality characteristics and measurements. Grain markets and new wheat and grain products have flourished with the support of four quality labs evaluating wheat and grain nationwide. Pulse product manufacturers, pulse crop marketers, and pulse producers are looking for quality parameters similar to the technical information provided to the grains industry. Still, it is not available because there is no comprehensive ARS service facility/network dedicated to pulse crop quality. It is important to focus research efforts on understanding pulse physical, chemical, and processing characteristics to help develop value-added foods with pulse crops and therefore increase the availability of healthful and sustainable foods. Pulses work well as main ingredients and can also be included in blended products thus improving the quality traits of traditional products like breads, crackers, and even meat. However, consistent pulse quality for food manufacturers is difficult to ensure due to the lack of technical information and research focused on pulse quality and functionality each year. ARS has the knowledge, technical know-how, and experience in their wheat quality labs to provide critical scientific support at this turning point in our industry's history. Without the needed technical information, the growth of the pulse industry and the opportunity to provide nutrient-dense foods to Americans will suffer due to lack of knowledge. The USDA-ARS is well positioned to provide the leadership to support pulse quality research, ensuring that pulse crop usage can grow with market demand and increasing acreage.

Proposal: USDA/ARS National Pulse Crop Quality Center, Fargo ND--\$3,200,000.

USA Pulses is eager to see the hiring process for the USDA-ARS Pulse Crop Quality Research Leader position, which will oversee other crops such as potato and small grains, resumed as soon as possible. In addition, USA Pulses proposes hiring a Research Technician, in addition to the existing Category 3 Support Scientist. The research technician ensure research program needs are met and expand the research and testing capacity. This facility is in the heart of a major pulse production region, and the facilities are well equipped and staffed to serve the evolving grain and pulse markets.

USDA/ARS National Pulse Crop Quality Network--\$2,800,000 (2 laboratories at \$1,400,000 each)

The USA Pulses proposes establishing two additional Pulse Crop Quality Laboratories that will form the National Pulse Crop Quality Network, with the Fargo, ND Center as the lead program and laboratory. We also request to fill the currently vacant director position at the Western Wheat Quality Lab in Pullman, WA.

Pulse Quality Laboratory Locations: Fargo ND | Pullman WA | East Lansing MI

The National Pulse Crop Quality Research Center and Network Objectives:Standards of Analysis

- Research and develop quality analysis standards that can rapidly predict end-use functionality.

Market Information

- Provide marketing information for potential customers about the quality of pulse products and production characteristics of particular pulse varieties, classes, and crops.
- Provide evaluation of quality characteristics of all pulse crops each year in the USA.
- Provide standards for marketing classes of pulse crops to provide better marketing tools, improve variety development and improve pulse quality in the USA.

Research

- Develop accurate and efficient laboratory methods for testing end-use qualities.
- Identify biochemical, physical, and genetic factors associated with end-use qualities.
- Identify, evaluate, and screen the intrinsic end-use quality to enhance cultivar development.
- Work with public pulse breeders to enhance germplasm and cultivar development for food production in milling, baking, pasta processing, beverages, and meat analogs.
- Define key physical-chemical parameters that communicate value to producers and processors; establish parameter targets to guide breeding efforts.
- Expand the genetic limits of pulse seed composition: protein content and composition, starch functionality, dietary fiber, vitamins, minerals, and other nutrients.
- Capture unique functionality and value from pulse sub-fractions that expand pulse processing, food innovation, and consumer product offerings.
- Identify, evaluate, and screen the intrinsic end-use quality to enhance cultivar development.
- Research nutritional and industrial properties as well as end-use characteristics of pulse crops.
- Identify potential food uses for pulses and evaluate varieties, both current and experimental, for product functionality, market suitability, and nutritional benefits to consumers.

This project has a national scope. The appointed pulse quality scientists at the Fargo, ND National Pulse Quality Center would work in close coordination with the North Dakota State University in addition to other public scientists investigating pulse crops. Additionally, the Pulse Quality Center and Network would provide critical information and collaborate with the Northern Crops Institute (Fargo, ND) to demonstrate the vast capabilities of pulses to the industry in the areas of ingredients and new products, such as beverages and meat analogues. The two satellite labs in Pullman and East Lansing provide technical expertise in flour quality and cooking/canning quality characteristics of pulses. By combining this significant federal investment with similar state and industry investments and linking it directly to breeding programs, USDA-ARS would be able to leverage the funding to significantly improve the quality of pulse crops across the USA. Considering the health, nutrition, and soil health benefits of pulse crops, research from the USDA-ARS Pulse Crop Quality Research Center and Network will benefit consumers and producers in the long term.

USA Pulses is requesting an appropriation of \$6,000,000 in FY 2027 to fund the needed Pulse Crop Quality Research Center and Network.