

Wheat Quality and Competitiveness

An erosion of funds, staffing, and antiquated equipment jeopardizes research responsible for processing and product quality attributes of 2.5 billion bushels of US wheat produced each year.

USDA-ARS regional wheat quality laboratories in OH, KS, ND, and WA provide support for the entire wheat industry, including breeders, growers, millers, bakers, and exporters. Funding for these laboratories has not kept pace with demands for research needed to stabilize the increasingly volatile US and global wheat food supply.

'Wheat is not Corn' – Functional Quality Drives \$ Value

Wheat quality is a complex function of physical and biochemical attributes which impact processing efficiencies and product applications. The world wheat market is increasingly sophisticated, demanding of grain quality, processing and product quality, nutrition and food safety. At the same time, USDA-ARS Wheat Quality labs are understaffed and rely on inadequate and antiquated equipment, such as the 100 year old flour mill still in operation in Wooster, OH.

Quality is a Critical Component of Wheat Improvement

US breeders respond to production threats, such as Ug99 stem rust, by rapidly incorporating new genes for disease resistance and stress tolerance into US varieties. Quality assessment, as needed to meet US quality standards, remains among the most costly, time-consuming bottlenecks in variety development. Additional resources and new technologies are critical, as failure to maintain processing quality would jeopardize US markets and create economic hardships for US growers and US milling and baking industries.

New Technologies are Needed to Drive US Competitiveness

Market applicable functionality tests are needed to document processing value and end-product quality for marketing of US wheat. Availability of rapid, accurate, small-scale functionality tests would speed breeding, fundamentally change how US wheat is valued and marketed, and give American wheat producers a competitive advantage in the world market.

New rapid, objective methods to evaluate grain quality and functionality are a high priority of the Federal Grain Inspection Service of USDA-GIPSA, but efforts have been hampered by lack of resources available for research and development. A market applicable test for protein quality (gluten strength) has long been an industry-wide priority.

Molecular technologies hold great promise for developing novel quality traits, modifying grain composition, and adding-value to wheat. However, the promise of molecular markers and genetic modification cannot be realized without availability of technologies to measure processing quality and predict value in the milling and baking industries.



US Wheat must be Competitive in Domestic and World Markets

- The annual US wheat crop is valued at over \$12.5 billion. Half of US wheat, 1.25 billion bushels, is exported each year, competing in the international market with grain from Australia, Canada, South America, European Union, and the Black Sea region.
- US milling industry adds \$1.7 billion to the value of wheat
- The US baking industry adds over \$17 billion in value to wheat in wheat-based food products
- Consistent functional quality of wheat grain is critical for economic viability of these high-volume, low margin industries.

Quality is Fundamental to Competitiveness

- US wheat is competitive because of attention and commitment to milling and baking quality. The US simply cannot compete as the lowest cost producer.
- ARS wheat quality laboratories are a cost-effective means to provide quality testing for public and private programs in each major production region, and for each market class.

APPROPRIATIONS REQUEST FOR FY 2011

Wheat Quality and Competitiveness -
\$650,000 per Laboratory / Research Unit

Improving wheat is fundamental - for growers, food industries, and consumers

Wheat Quality and Competiveness

Appropriations Bill	Agriculture
Agency	US Department of Agriculture
Account	Agricultural Research Service
Program Name	Salaries and Expenses



Requested amount: \$650,000 per Laboratory / Research Unit

Authorization

- Department of Agriculture Organic Act of 1862



Description

- Four regional USDA-ARS Wheat Quality laboratories provide leadership, expertise and service to the US industry for improving quality and marketability of wheat. Each has responsibilities for a different market class and production area. The USDA-ARS Engineering and Wind Erosion Research Unit at Manhattan, KS, has the mandate to develop new technology for measuring, selection, and prediction of wheat quality. These programs have suffered from long-term decline in funding, staffing, and antiquated equipment. Immediate action must be taken to provide adequate funding and resources, or research critical to economic health of the US wheat industry will be curtailed.

Facilities and Programs (request of \$650,000 per Laboratory / Unit)

- Hard Red Winter Wheat Quality Laboratory, Manhattan, KS (supporting TX, OK, KS, CO, NE, WY, SD)
- Soft Red Winter Wheat Quality Laboratory, Wooster, OH (supporting LA, GA, NC, VA, KY, IL, OH, MO, AR, MI)
- Western Wheat Quality Laboratory, Pullman, WA (supporting CA, OR, WA, ID, MT, UT)
- Hard Red Spring and Durum Wheat Quality Laboratory, Fargo, ND (supporting MN, ND, SD, MT)
- Engineering and Wind Erosion Research Unit, Manhattan, KS (supporting programs nationwide)

Justification

- Funds, equipment, and infrastructure are needed for more rapid breeding and deployment of wheat varieties with market acceptable quality, while improving resistance to new and aggressive diseases and tolerance to environmental stress. A broad array of germplasm and exotic genetic stocks are needed to combat threats to production, such as Ug99 stem rust, which can significantly compromise quality and jeopardize US markets.
- Methods and equipment for rapid assessment of wheat quality, including means to more accurately predict protein, starch, processing, and end-product quality, would greatly increase value of US wheat in the international market. US growers would capture value from ability to produce, segregate, and assure quality of grain for diverse end-products, such as noodles, steam bread, tortillas, and flat breads.
 - Rapid, accurate, and non-destructive evaluations on a single kernel basis, including measurement of color, hardness, protein, and starch quality, would dramatically increase breeding efficiencies, reducing time and costs of variety development.
 - A rapid, accurate measure of protein functionality would fundamentally change how wheat is valued and marketed worldwide.
- Novel end-use qualities and trait combinations will be developed using both molecular and conventional biochemical approaches. Modified proteins and starches will create new value and value-capture opportunities for the food industries
- Solving the complexity and challenges of wheat quality requires scientific partnerships and innovative, multidisciplinary approaches. Cooperation between ARS and Land-Grant Universities will be established and strengthened to ensure that all necessary disciplines and components of the US research community contribute to solving these critical problems
- Partnerships with private technology providers will be established to ensure that tools and methods become commercialized and readily available. New technologies must be fully compliant and applicable to the official US grain inspection system.

Funding History

FY 2011 (President's Budget)	FY2010	FY 2009	FY 2008	FY2007	FY2006
Unknown	0	0	0	0	0

Additional Information: www.wheatworld.org/issues/research