

Wheat Research to Address Gluten Sensitivity and Increase Demand

By AURI and Back When Foods

The Minnesota Wheat Research and Promotion Council, in partnership with the Agricultural Utilization Research Institute and the University of Minnesota, are currently pursuing a new study that could make a meaningful impact on the wheat industry. Together, these partners are investigating options to reduce wheat digestibility concerns by identifying naturally occurring anti-nutrient elements in specific breeds of wheat.

For thousands of years wheat has been a staple in human diets due to its unmatched nutrition profile. Although this fact remains undisputed, within recent years wheat has increasingly come under attack due to digestive difficulties for some consumers. These digestibility issues have contributed to an 11% decline in per capita consumption of wheat flour (product) between 1997 and 2017 [1]. On the other hand, experts expect gluten-free product sales to reach about \$1 billion in 2020.

For this reason, research into potentially reactive components negatively impacting consumers of wheat is underway. Fermentable sugars known by the acronym “FODMAP” (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols) and certain proteins “ATI” (amylase-trypsin inhibitors) are the focus of this research. Researchers believe these reactive components are triggers of non-celiac gluten sensitivity and irritable bowel syndrome (IBS).

Not all consumers deal with digestive distress when eating cereal grains. Through insights gained in recent research into microbiology, it is also becoming apparent the human microbiome (the vast army of bacteria, fungi and other microbes in the digestive tract) plays a critical role in maintaining or disrupting our health. Research in 2019 showed ATIs kill or suppress good bacteria and enhance the bad bacteria, leading to imbalances in the gut [2]. Current research illustrates



Photo: Rolf Hagberg

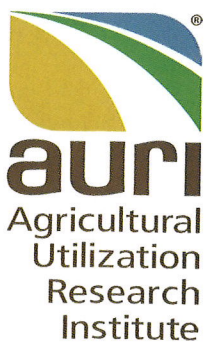
that many individuals who suffer from digestive distress when consuming cereal grains may have an underlying dysbiosis (microbial imbalance or impaired microbiota). For such individuals FODMAPS may become reactive, causing diarrhea, abdominal pain, distention and bloating. Recent research indicates the majority of inflammatory diseases are related to microbiome dysbiosis [3].

The process of developing low reactive wheat food products is a combination of selecting the right wheat variety and alternative processing, such as sourdough fermentation, so that the ATI's and FODMAPs are substantially reduced. The current project funded by the Minnesota Department of Agriculture's (MDA) Agricultural Growth, Research and Innovation (AGRI) program investigates the

level of ATI's and FODMAPs present in current and past Minnesota wheat varieties, as well as their anti-nutrient levels, after processing the wheat into a sourdough wheat food product.

Australian researchers and businesses have been actively pursuing FODMAP opportunities. Monash University in Australia is a leader in low FODMAP diets and certified low FODMAP food products testing. In addition, the Manildra Group, a major Australian flour milling company that also has facilities in the United States, launched a low FODMAP flour in 2018, which makes low FODMAP flour available in the United States. The flour is produced by Lo-Fo Pantry (Manildra Group USA).

The benefits of this research are three-fold. First, bread processors will gain valu-

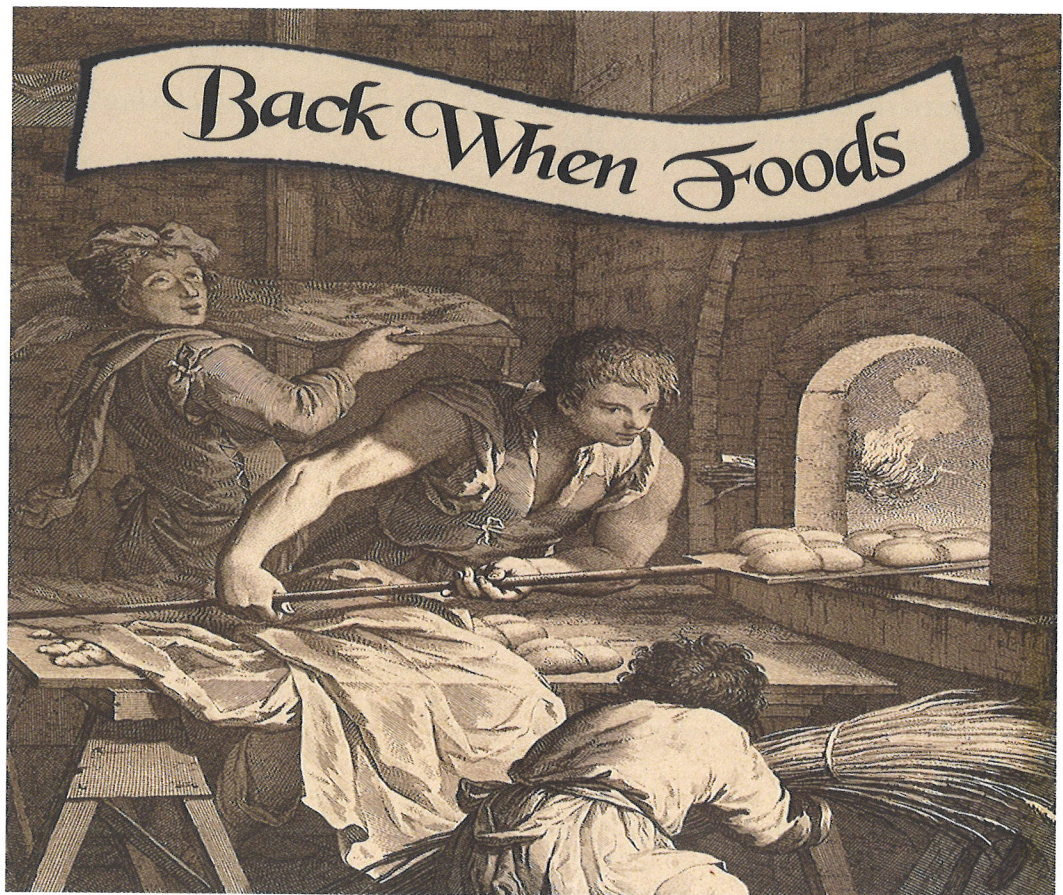


able information about processing techniques using fermentation that could reduce anti-nutrients in new wheat products that reduce human digestive issues in populations with FODMAP sensitivities. Second, consumers may start enjoying wheat products that have lower FODMAPs and anti-nutrients that cause digestive issues. For individuals with wheat sensitivity, less reactive wheat products can increase quality of life while enjoying the health benefits of wheat products. Third, Minnesota wheat farmers benefit. By spurring research for possible breeding efforts into new wheat varieties that help reduce wheat digestibility sensitivities, it is expected that consumer demand for wheat-based products will increase, thus resulting in expanded market opportunities to increase profitability for wheat growers.

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CITATIONS:

[1]Data obtained from United States Department of Agriculture Economic Research Service: <https://>



www.ers.usda.gov/data-products/wheat-data/
 [2]"Dietary Wheat Amylase Trypsin Inhibitors Modify the Gut Microbiome by Antimicrobial Activity and Aggravates Experimental Colitis" Pickert, Wirtz, Heck, Thies, et.al. (2019).

[3]Fructans with a higher Degree of Polymerization (HDPI) produced more diversity (of bacteria) towards the end of the experiment, and that this effect was statistically significant against controls when more weight was attached to the more

abundant (or "highly effective") OTUs. "Effect of the Degree of Polymerization of Fructans on Ex Vivo Fermented Human Gut Microbiome" Asto, Mendez, Prado, Cune, et.al. June 7, 2019.