

PRO1621 Growing the Market for Pulse Flours: Creating innovative bakery products and a pulse database for the food industry

The overall goal of this research is to provide information that can be used by the food industry to develop pulse based foods using pulse flours. Specific objectives include: development of a database which expands current knowledge about pulse flours and how they can be used in bakery products; determination of the effects of genotype and environment on the flavour and baking properties of pulse flours; examination of the effects of pulse flour particle size and pulse flour storage on the flavour and functionality of pulse flours; evaluation of pre-milling treatments (pre-germination, germination, micronization, heat and steam heating, and dry and steam roasting) on the flavour and functionality of pulse flours; determination of post-milling heat treatments on flavour and functionality of pulse flours; and investigation of pre-ferment technology to reduce the impact of pulse flavour and improve pulse flour functionality in bread. The research involves collaboration among Cigi, Warburtons, University of Saskatchewan, University of Manitoba, Crop Development Centre, Agriculture and Agri-Food Canada (Morden), Campden BRI, Best Cooking Pulses, and InfraReady Products.

Initial findings are as follows:

GxE: Small flavour differences were found among the breads made from different pulse types and among some varieties and locations within a market class. No differences in farinograph or pasting properties of the flour blends (80% wheat flour/20% pulse flour) were found.

Pre-Milling: Differences in pasting properties, water absorption capacity (WAC), and starch damage were observed among the various pre-milling treatments.

Post-milling: Differences in pasting properties, starch damage, WAC, and colour were found among the untreated and heated treated pulse flours. Bread made with split yellow pea flour heated at 140 C with 10% steam had significantly reduced pea flavour while maintaining good dough and bread quality. Analysis of untreated and heat treated pulse flours have identified approximately 2,000 chemical compounds. Many of the volatile organic compounds detected were found to be aldehydes and ketones which are known to contribute to the aroma and flavor of foods.

☐Particle size: Only small differences in pasting properties, starch damage, and WAC were found between the regular and fine commercial pulse flours. Greater differences in pasting properties, starch damage, and WAC were observed among the split yellow pea flours that were milled using the Ferkar mill equipped with four different screen sizes.

Storage: Lipoxigenase levels in stored pulse flours were found to decrease between Time 0 and Time 1.

Pre-Ferment: Studies conducted on wheat ferment have shown that acceptable bread can be made using various levels of ferment. Differences in total titratable acidity and viscosity of the ferment suggests that there may be a minimum amount of ferment aging required to achieve optimum results of fermentation.