

Allis Milling Method

The Allis-Chalmers mill was acquired in 1909 by the Ohio Agricultural Experiment Station. Chester Evans, a practical miller, was put in charge of the milling operation and baking plant. Mr. Evans came to the station from Williams Brothers Milling, Kent, Ohio. Apparently the Allis-Chalmers mill was donated to the Soft Wheat Quality Laboratory around 1937. The mill was extensively modified during the early 1970's: self-aligning, double-row roller bearings, and extensions manufactured for the roll spacing control arms. A one-inch movement of the control arm around a twenty-four inch radius is equal to one thousandth of an inch (25 microns) change in roll separation. The standard deviation for flour yield of duplicate millings is 0.15%.

Kernel weight is determined on each cleaned sample and grain volume weight measured. Following grain measurements, samples are tempered to 15% moisture. Tempered grain is milled on the SWQL Allis-Chalmers flour mill using the AACC method 26-32 as modified by Yamazaki and Andrews (1982)¹. The Allis-Chalmers mill is a long flow experimental milling system with adjustable roll gaps. Grain is initially milled with six break roll passes then reduced in seven reduction roll passes to produce straight grade flour. The roll settings, sifting screen sizes, and mill flow were as diagramed in Yamazaki and Andrews (1982).

For each grain sample, straight grade flour yield and break flour yield are recorded.

Data Analysis and Interpretation of Allis Milling

Since milling quality is a highly heritable genetic trait, excluding weather damaged examples, a single sample likely will produce representative milling yield, ESI and friability. Also, lactic acid solvent retention capacity values within a milling system are highly heritable in all published genetic studies of wheat. However, test weight, kernel weight, break flour yield, cookie baking, flour protein and ash can be influenced significantly by environmental variations. Usually, mean data from three millings will yield quality assessments that are more representative of those traits that are less stable. The number of samples included in the computation of the average is specified for each cultivar. A cultivar that has been composited from several locations/crop years may produce quality data that more nearly reflects its genetic nature. Cultivars listed in the tables that have a "c" beside the "number for the average" indicate that a composite sample has been milled to generate the quality data.

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1. Yamazaki, W.T. and L.C. Andrews. 1982. Experimental milling of soft wheat cultivars and breeding lines. *Cereal Chem.* 59:41-45.