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Characterization of soft wheat varieties using the Gluto Peak

Nowadays, the protein content as mono-causal parameter for the prediction of the baking quality in the processing of soft wheat is the most important price-setting value in wheat trading. The bakery product market demands high protein contents in wheat due to its close relationship with baking quality. However, several approved varieties produce good baking quality even with low protein contents and are thus underrated when priced by protein content only. Against this background, a reliable rapid test to estimate baking quality is required to pay farmers in a fair way and may help reduce negative environmental effects induced by late nitrogen fertilisation practice.

As a new approach to predict the baking quality of soft wheat flour samples, the Glutopeak®-test could overcome the limitations of currently available methods by analysing the ability of wheat flour to form a gluten network. The Glutopeak®-test evaluates the rheological properties of a wheat flour sample by preparing dough of flour and water by vigorous mixing. Here the torque that is necessary for maintaining the mixing speed within the water flour mixture over a max. of 600 s is measured. For evaluation, the maximum peak height (max. torque), the peak area (introduced energy) and the peak formation time (time the water/flour system takes to develop a gluten network) is taken into account.

During this study, the existing protocols for the Glutopeak®-test has been optimised for a precise and universally usable application in order to predict the baking quality. Here different parameters e.g. mixing speed, filling volume of the measurement chamber, water/flour ratio has been varied. In addition different solvents as alternative to pure water has been evaluated. As alternative solvents, lactic acid, saccharose in water and sodium carbonate in water were chosen as they are applied within the "solvent retention capacity profile" (AACC 10-56) and are suitable to highlight different functional aspects within the wheat flour. The newly developed protocols are tested with varieties with high (~13 %) and low (~10.5 %) protein content.

The developed protocol showed a good correlation between the Glutopeak®-test results and the baking volume of soft wheat varieties either with high or low protein content. Consequently, the developed Glutopeak®-test protocol can be considered as promising candidate to predict the baking quality as a replacement for the existing methods, subject to further investigations with statistical reliable number of qualities from different varieties, locations and harvest years.

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