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Determination of protein and gluten quality-related parameters of wheat flour using near-infrared reflectance spectroscopy (NIRS)

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Abstract: Wet chemistry analyses done for quality control purposes in wheat and flour processing are time-consuming. Near-infrared spectroscopy (NIRS) as an alternative technology to conventional methods allows us to obtain results in a few seconds. In this study, NIRS was used in the development of calibration models for protein, wet and dry gluten contents and Zeleny sedimentation of flours from the grinding of 120 varieties of bread wheat collected from different regions of Turkey. Therefore, spectra in the range of 1100 to 2500 nm of the flours were acquired by scanning with the NIRSystems 6500 monochromator. Multiple linear regression (MLR) and partial least squares (PLS) regression were applied to the spectral data in log 1/R, and first derivative and second derivative of log 1/R formats. Reasonable results were obtained for protein, wet and dry gluten contents, and Zeleny sedimentation with r = 0.985, 0.976, 0.953, and 0.924, respectively.

Key words: Gluten, NIRS, protein, Zeleny sedimentation

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