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Application of Visible/Near-Infrared Transmittance Spectroscopy for the Improvement of Amylose Determination Accuracy

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The performance of partial least squares (PLS) calibration models developed using NIR and visible transmittance were examined in order to improve the accuracy of the calibration model for amylose content. The regression coefficients in the PLS calibration model developed by a full-cross validation using the wavelength region from 570 to 1000 nm (Model B) were smoother and the fluctuations of the coefficients were smaller than the model developed by a full-cross validation using the wavelength region from 850 to 1048 nm (Model A). Significant peaks in the regression coefficients of Model A were characterized by two absorption bands at 928 and 990 nm, and those of Model B were characterized by four absorption bands at 607, 760, 928 and 990 nm. The samples were separated into calibration sets and validation sets, and PLS calibration and validation were also performed. The statistics performance (standard error of performance (SEP), a coefficient of determination (R^2)) of the model developed using the wavelength region from 570 to 1000 nm (Model D), was better than those of the model developed using the wavelength region from 850 to 1048 nm (Model C). The SEP of 0.64% on model D examined here was smaller than that of 0.99% on Model C. Therefore, the absorption bands at 607 and 760 nm play an important function in improving the performance of the

PLS calibration model.

Keywords: visible/near-infrared transmittance, near-infrared transmittance (NIT), partial least squares (PLS), regression coefficients, *japonica*, amylose

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