

Title Determination of degree of retrogradation of cooked rice by near infrared reflectance spectroscopy
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Citation J. Near Infrared Spectrosc. 6, A355-A359 (1998)
Keywords NIR; near infrared; degree of retrogradation; cooked rice; starch

Abstract

Near infrared (NIR) reflectance spectroscopy was used to determine the degree of retrogradation of cooked rice. Cooked rice samples were stored at 4°C for 120 hours, and the degree of retrogradation was measured every six hours during the storage time. Enzymatic method, using glucoamylase, was used as reference method for the determination of the degree of retrogradation. Spectral differences, due to retrogradation of cooked rice, were observed at 1434, 1700, 1928, 2100, 2284 and 2320 nm. 32 samples were used for calibration set and 16 samples were used for validation set. High correlations were achieved between degree of retrogradation determined by enzymatic method and by NIR with multiple correlation coefficient of 0.9753 and a standard error of calibration of 3.64%. Comparable results were obtained with 3.91% of standard error of prediction, when the calibration equation was applied to an independent group of samples. The moisture content of samples tested significantly affected the determination of degree of retrogradation by NIR. The critical moisture content for the determination of degree of retrogradation by NIR was found to be ca. 5% (W.R.). The results suggested that NIR spectroscopy might be used as a potential method for determining both the degree of retrogradation and gelatinization of cooked rice.