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DETERMINATION OF PROTEINS IN MILK USING NIR SPECTROSCOPY AND ALGORITHMS FOR THE SELECTION OF VARIABLES

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Abstract

The Kjeldahl method is employed for decades to determine the level of protein in different samples, including milk matrices such as milk powder. This procedure is time consuming and tedious due to various analysis steps: digestion, distillation and titration. However, near-infrared diffuse reflectance spectroscopy is used in direct and non-destructive determination of a large number of samples, saving time and reagents. It is a technique that can provide quick results and for analysis of grain samples in powder. However, largely responsible for advancing the NIR technique is the use of appropriate tools for multivariate calibration, such as partial least squares (PLS), principal component regression (PCR), artificial neural network (ANN), and methods of selection of samples and variables, such as successive projections algorithm (SPA) and Kernnard-Stone (KS). In this work, chemometric models were built using PCR, PLS and PLS-SPA in the determination of protein content in milk a few metropolitan regions of Brazil (Natal, Salvador and Rio de Janeiro) resulting low RMSEP values and good correlations between the reference values (Kjeldahl) and the values predicted by NIR models.