

APPLICATION OF IR SPECTROSCOPY TO CLASSIFY EGG WHITE POWDERS BASED ON TECHNOLOGICAL PROPERTIES

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The use of egg white powder (EWP) is widespread in food industries due to its gelling and whipping properties. Many factors affect EWP performance, so that “high gel” or “high foam” products do not always meet end-user expectations. Thus, the aim of this work was to evaluate the suitability of FT-NIR and FT-IR spectroscopy as rapid, easy, and cost-effective tools for the classification of EWP based on technological properties.

FT-NIR and FT-IR spectra of 100 EWP samples with known technological performances, kindly provided by Sanovo Egg Group, were collected and elaborated by suitable chemometric strategies. A DUPLEX algorithm was used for data splitting in calibration and test sets, and different pre-treating methods were applied before Partial Least Squares–Discriminant Analysis (PLS-DA), performed according to gel strength (600 g/cm² threshold), foam height (160 mm threshold) and foam instability (35 mL threshold).

The best model was obtained for foam instability prediction by FT-IR data after linear baseline pre-treatment, with 19 out of 25 samples of the test set being correctly classified.

In conclusion, IR spectroscopy can be considered as a potential tool for a rapid and non-destructive classification of EWP on the basis of gelling and whipping properties.

Keywords: Egg white powder, classification, gelling properties, whipping properties, IR spectroscopy.