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Analysis of Gelatin on Soft Candy using a Combination of Fourier Transform Infrared Spectroscopy (FTIR) with Chemometrics for Halal Authentication

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Abstract

The main ingredients of soft candies are gelatin made from the skin/bones of cows and pigs, i.e. bovine and porcine gelatin. This research aims to analyze the present bovine and porcine gelatin in soft candy using a fast and low-cost method. The method used is a combination of FTIR and chemometrics. The reference candy samples were made with formulation porcine gelatin concentrations of 15, 30, 45, 60, 75, 90 and 100%. As a control, we used a bovine gelatin reference candy. All the candy samples were measured with FTIR in the reflection mode in the wavenumber range from 4000 to 500 cm⁻¹. Data analysis was carried out using the chemometric method with the Minitab 18 application. PLS calibration results in $y = 0,99999x + 0,000396$ indicate a good correlation. The value of $R^2 = 0,99999$ and the RMSEC of 0.03%. Internal validation with $R^2 = 0,9999$ and RMSECV = 3.69% and external validation with $R^2 = 0,9994$ with RMSEP = 1.28%. The PCA results show different quadrant classifications of bovine and porcine gelatin. Also, there are similarities between the market candy quadrant, bovine gelatin, and porcine gelatin. The fast method and low cost involved simple sample preparation, which were developed to detect and classify the presence of bovine and porcine gelatin in soft candy using FTIR and chemometrics. © 2023 by the authors.

Author Keywords

chemometric; FTIR; gelatin; soft candy

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