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RETRIEVAL OF MEAT SPECTRAL SIGNATURE BASED ON MAJOR CHEMICAL COMPOSITION

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This study was carried out to present a simulation method for predicting spectral signatures of meat samples using their major chemical composition (moisture, fat and protein contents). A wide range of different meat compositions was created by adding different concentration of fat to lean beef minced samples and their corresponding contents of moisture, fat and protein were estimated by ordinary analytical methods. Samples were scanned using a high resolution spectroscopy employed in the visible and near infrared regions (400-2500 nm) to provide samples' reference spectral signatures. The basic chemical compositions and their absorption and optical properties (i.e. refractive index, extinction coefficient and absorption coefficients) from authenticated references were simulated to extract samples' spectral signatures. The simulated spectra were compared with the reference spectra measured by spectroscopy and the accuracy of prediction was estimated. Results revealed that developed models were accurate enough to derive spectral signatures of minced meat samples with a reasonable level of robustness. Possible alternatives of improving the performance of the simulation model were also evaluated.

Keywords: Image processing, image analysis, hyperspectral imaging, multispectral imaging, machine vision, computer vision, food quality, multivariate analysis.

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