SELECTION OF VISIBLE/NIR WAVELENGTHS FOR CHARACTERIZING FECAL AND INGESTA CONTAMINATION OF POULTRY CARCASSES

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Ingesta and fecal contamination on a poultry carcass is a food safety hazard due to potential microbiological contamination. A visible/near-infrared (NIR) spectrometer was used to discriminate among pure ingesta and fecal material, breast skin contaminated with ingesta or fecal material and uncontaminated breast skin. Birds were fed isocaloric diets formulated with either maize, milo, or wheat and soybean meal for protein requirements. Following completion of the feeding period (14 days), the birds were humanely processed and eviscerated to obtain ingesta from the crop or proventriculus and feces from the duodenum, ceca, and colon portion of the digestive tract. Pure feces and ingesta, breast skin, and contaminated breast skin were scanned from 400 to 2500 nm and analyzed from 400 to 900 nm. Principal component analysis (PCA) of reflectance spectra was used to discriminate between contaminates and uncontaminated breast skin. Results indicate that visible (400 to 760 nm) and NIR 760-900 nm) spectra can detect contaminates. From PCA analysis, key wavelengths were identified for discrimination of uncontaminated skin from contaminates based the evaluation of loadings weights.