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Abstract

A prototype on-line hyperspectral imaging system (λ = 400 to 1000 *nm*) was developed and used to acquire images of exposed ribeye muscle on hanging beef carcasses (n = 274) at 2-day postmortem in a commercial beef packing plant. After image acquisition, a strip steak was cut from each carcass and vacuum packaged. After aging for 14 days, the steaks were cooked and Warner-Bratzler shear force values were collected as a measure of tenderness. Four different principal component analysis-based dimensionality reduction methods were implemented to reduce information redundancy in beef hyperspectral images. Textural features extracted from the 2-day hyperspectral images were modeled using Fisher's linear discriminant (FLD), support vector machines (SVM), and decision tree (DT) models to predict 14-day aged, cooked beef tenderness.