

ABSTRACT

On-site evaluation of Wagyu beef carcasses based on the monounsaturated, oleic, and saturated fatty acid composition using a handheld fiber-optic near-infrared spectrometer

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The fat quality is an important aspect, especially for Wagyu beef. A handheld fiber-optic near-infrared spectrometer for on-site evaluation of beef fat quality was developed, and the interactance spectra of the intermuscular fat from 833 Wagyu carcasses at 12 markets were measured. The calibration model was transferred to five slave instruments using twenty-six block samples. The performance of one slave instrument was verified at five meat markets (n=360). The coefficients of determination of the slave instrument for monounsaturated, oleic, and saturated fatty acid compositions determined by gas chromatography and near-infrared measurements were 0.69, 0.64, and 0.67, respectively. The standard error of prediction for the slave instrument was approximately 2%. The fiber-optic near-infrared spectrometers were highly accurate in the fat quality evaluation of Wagyu carcasses based on monounsaturated, oleic, and saturated fatty acid composition with easy calibration model transfer.

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