

ABSTRACT

**Fibre-optic method for estimation of bovine fat quality**

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Spectroscopy using remote surface, contact, insertion and transmission fibre-optic probes and a sensor at wavelengths of 400 to 1100 nm was used for rapid estimation of the physio-chemical characteristics of bovine fat. Surface reflectance of the adipose tissue was negatively correlated with the bovine fat colour score at many wavelengths and positively correlated with the contents of the polyunsaturated fatty acids at 400 to 650 nm ( $P < 0.05$ ). Internal reflectance using an insertion probe at 445 to 1100 nm was positively correlated with melting point and negatively correlated with refractive index ( $P < 0.05$ ). Internal reflectance using a contact probe tended to be related to saturated and monounsaturated fatty acid contents. Transmittance at almost all wavelengths was positively correlated with refractive index ( $P < 0.05$ ). Internal reflectance of the intermuscular fat from 34 animals measured at a meat market was correlated ( $P < 0.01$ ) with saturated fatty acid content ( $r = 0.72$  at 650 nm) and with monounsaturated fatty acid content ( $r = -0.69$  at 650 nm). These results indicated the possibility of using fibre-optic measurements, requiring 1 s in bovine adipose tissue, to evaluate the quality of depot fat and that the various types of probe can be used to evaluate different physiochemical characteristics of fat. Copyright © 2003 Society of Chemical Industry.

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