RAPID AUTHENTICATION OF ENHANCED QUALITY PORK BY VISIBLE AND NEAR INFRARED SPECTROSCOPY

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To meet customer demands, pork processors are currently using processes such as moisture enhancement or blast chilling to consistently produce a pork product with enhanced quality. In order to assure quality control and guarantee consumers that they are getting exactly what they paid for and not inferior quality pork, rapid methods to distinguish pork products with enhanced quality are required. This study tested the ability of visible and near infrared spectroscopy (Vis-NIRS) to authenticate enhanced quality pork. One hundred and forty eight pigs from several genetic backgrounds, genders and diets were slaughtered at either 120 or 140 kg. Following splitting of the carcass, the right half carcass was blast chilled (BC) at -20 °C with a 2.5 m/sec wind speed for 1 h and moved into a cooler at 2 °C for 23 h, whereas the left half carcass was conventionally chilled at 2 °C for 24 h (Non-BC). The half loin from each left carcass side was moisture enhanced (ME; 0.50% salt and 0.49% disodium phosphate; pump rate 10%), whereas the other half was not subjected to ME treatment (Non-ME). Both ME and Non-ME half loins and another one from the right half carcass (BC) were cut in half, and the quarter loins were packed and aged for 2 or 14 days in a 1 °C cooler (2 and 14 d aged). The half and quarter loins were randomized by location to reduce location effects. After aging, Vis-NIR spectra were collected on the intact chops at the end of the loin using a portable LabSpec®4 spectrometer (350-2500 nm) at the laboratory. Partial least squares discriminant analysis based on Vis-NIR spectra correctly classified 90 and 95% of the 2 and 14 d aged pork samples. Vis-NIRS also correctly classified 99 and 96% of the Non-ME and ME pork samples aged for 2 d, and 95 and 94% of the Non-ME and ME samples aged for 14 d, respectively. Conversely, Vis-NIRS technology only correctly classified 57 and 54% of the Non-BC and BC samples aged for 2 d, and 53 and 54% of those aged for 14 d, respectively. Vis-NIRS technology can accurately discriminate the 14 d from 2 d aged and the ME from Non-ME pork samples but not the BC from Non-BC ones. This technology could hold value for on-line application in processing plants and at retail to authenticate pork of enhanced quality.
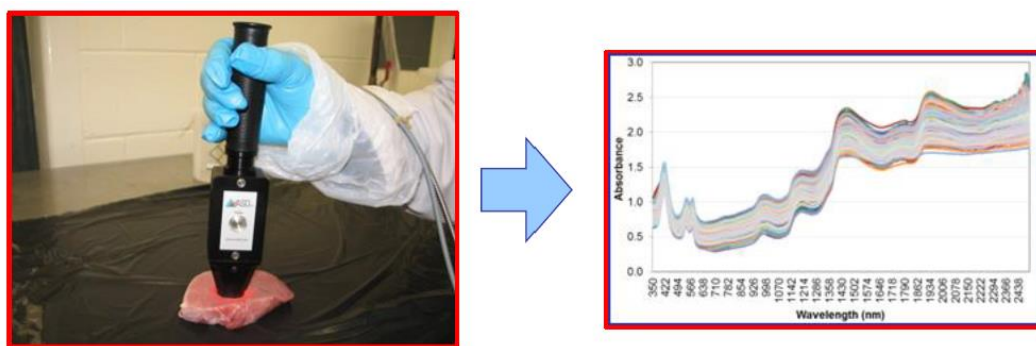
Figure 1. Visible and near infrared spectra collection on intact pork samples using a portable LabSpec®4 spectrometer equipped with a fibre-optic high intensity contact probe.