PREDICTION OF MEAT QUALITY IN THE PIG CARCASS

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A rapid fall in pH combined with high muscle temperature in pig carcasses immediately post-slaughter can result in meat which is pale, soft and exudative (PSE). *Alternatively,* if the post-slaughter pH drop is reduced, due to insufficient muscle glycogen, the ultimate pH (pHu) of the meat will be high and dark, firm, dry (DFD) meat will result. PSE meat is generally defined by a pale colour, excessive exudate and a low initial pH although pHu<5.4 is also used. DFD can be defined by a dark colour, no exudate (dry) and pHu>6.0. Both aberrant quality conditions affect the manufacturing potential of pigmeat, the sensory traits and shelf-life of the product. Because there is increasing awareness of the economic losses associated with poor meat quality, abattoirs and pork processing plants in Australia are more concerned to identify meat quality problems, particularly since product quality can over-ride price in some markets. Thus, the development of techniques for detection of PSE and DFD in intact carcasses prior to processing or dispatch to retail stores has recently become a priority.

A trial was conducted to evaluate the Colomet optical reflectance probe (Instrumar, Ontario, Canada) to predict the colour (lightness), ultimate pH and drip loss of pork carcasses. One hundred and ten boneless pork loins, were randomly selected during visits to two boning rooms. The Colormet probe was inserted into the cut surface of the anterior end of the *M. longissimus dorsi* (LD) at 48-72 h post-slaughter and percent reflectance (%R) within the LD recorded over wavelengths 400-700 nm at 10 nm intervals. The lightness (L* value) of the cut surface of the LD at the anterior end was measured after the surface had been allowed to 'bloom' for 30 min, using a chromameter (Minolta CR-200, Minolta Camera Co. Pty. Ltd., Japan) and the ultimate pH of the meat recorded. Samples of the LD (200-300 g) were removed from the anterior end of each boneless loin, transported to the laboratory and were trimmed, weighed and suspended in a plastic bag at 4°C for 72 h. Drip loss (DL) was expressed as weight loss over 72 h divided by initial weight of meat.

The mean ultimate pH was 5.80 and ranged from 4.99-6.72, mean L* was 48.2 and ranged from 34.9-64.2 (ie. very dark to very pale), mean DL was 0.147 and ranged from 0.017-0.585 (dry to exudative). Only results for the %R at 480 nm and at 570 nm are reported here as they had the highest correlation with the other variables measured. The mean for each %R was 0.090 and 0.055 and the range was 0.053-0.181 and 0.031-0.126 respectively. The ultimate pH was negatively correlated with L* ($r = -0.72$), DL ($r = -0.38$), %R at 480 nm and 570 nm ($r = -0.66$, -0.63 respectively). L* was positively correlated with %R at 480 nm and %R at 570 nm ($r = 0.83$ for both) and also with DL ($r = 0.44$). Drip loss had lower correlations with %R at 480 and %R at 570 nm ($r =$ *0.29, 0.31* respectively). All correlation coefficients were significant at $P<0.001$ except for the relationship between DL and %R at 480 nm ($P<0.01$).

These results indicate that the technology for prediction of surface meat lightness and meat pH on the intact pork carcass using internal reflectance could be developed to be commercially viable but that prediction of drip loss is not reliable. These results agree with those of Murray *et al.* (1989), under Canadian conditions, who used pork loins with a similar range in quality. However, in that study a higher correlation ($r = 0.53$) between drip loss and internal reflectance was obtained.

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