

PORK QUALITY

Title: The impact of Halothane genotype, pre-slaughter handling, and season on body temperature and its relationship with subsequent meat quality. **NPB- #97-1875**

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Abstract

The study was carried out to compare the impact of Halothane genotype [negative (NN) vs. carrier (Nn) vs. reactor (nn)], pre-slaughter handling procedures (high vs. low stress) and season (summer vs. winter) on body and muscle temperatures and pork quality. Sixty-five purebred Duroc pigs (approximately 110kg live weight) were surgically implanted with VHF transmitters one week prior to slaughter to monitor body temperature. The study was replicated in both the summer and winter to investigate the effect of season. Body temperatures were monitored from the time that the animals left the farm, through the slaughter process. The pH and temperature of the *Longissimus* and *Semimembranosus* were measured from slaughter through 24 hours post mortem. Meat quality attributes were evaluated at 24 hours post mortem.

Halothane genotype effects on body temperature were relatively small. Animals exposed to high compared to low pre-slaughter stress had higher body temperatures (between +0.5 to 1.7°C) from arrival at the slaughter facility through to evisceration when the measurements were terminated.

Halothane Reactors had the lowest pH values in the *Longissimus* and *Semimembranosus* muscles from 45 minutes to 24 hours post mortem. Post mortem muscle pH values for Carrier and Negative animals were generally similar. The effect of pre-slaughter stress on muscle pH decline differed between the *Longissimus* and *Semimembranosus*. There was no consistent effect of season on muscle pH decline.

Halothane Negative pigs had the highest *Longissimus* temperature from one hour post mortem onwards and the highest *Semimembranosus* temperature from 4 to 12 hours post mortem. High pre-slaughter stress increased the temperature in the *Longissimus* and *Semimembranosus* from 45 minutes to 6 and 4 hours post mortem, respectively. There was little effect of season on post mortem muscle temperature change.

Halothane reactors produced poorer meat quality, in terms of color and drip loss, than Negative pigs, with Carriers tending to be intermediate for pork quality attributes. High stress prior to slaughter increased the ultimate pH in the *Longissimus* and *Semimembranosus* but had limited effect on muscle color and drip loss. Pigs slaughtered in the winter generally produced poorer pork quality than those slaughtered in the summer with a lower ultimate pH and increased *Semimembranosus* drip loss.

Overall, Halothane Reactors produced the poorest meat quality largely as a result of a rapid decline in muscle pH in the early post mortem period rather than from any increase in body or muscle temperature. Exposing pigs to high pre-slaughter stress increased body temperatures at slaughter and muscle temperatures in the early post mortem period. However, the high stress treatment had an inconsistent effect on muscle pH decline and pork quality. Pigs slaughtered in the winter produced poorer quality meat than those slaughtered in the summer, an effect which appears independent of any association between season and either body and muscle temperatures or post mortem muscle pH changes. In this study, the link between changes in body temperature and post mortem muscle temperature changes and pork quality has not been clearly established and additional research is required to further understand these relationships.

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