

Impact of loin versus individual cut intramuscular fat on eating quality prediction of several cuts within the lamb carcass

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Intramuscular fat (IMF) is a positive driver of consumer sheepmeat sensory scores for tenderness, juiciness, liking of flavour and overall liking (Pannier *et al.* 2014), hence inclusion in future eating quality grading systems is crucial. Ideally, these grading systems would measure IMF in the loin as this is one of the most valuable cuts in the lamb carcass and has been shown to correlate with IMF of other muscles (Anderson *et al.* 2015). However, no research to-date has demonstrated the loss in precision caused by relying on a loin IMF measurement to predict eating quality as opposed to a direct IMF measurement from each muscle. We hypothesised that IMF of individual cuts will provide a more accurate description of the variability in eating quality between cuts than IMF of the loin.

Three hundred and sixty lambs (5-11 months old) from the Meat and Livestock Australia Genetic Resource Flock, located at the Katanning (WA) research site were produced from key industry sires (Maternal, Merino and Terminal) and slaughtered across four kill groups. Loin and topside cuts were collected from all lambs, and the rump, outside and knuckle cuts were collected from a subset of lambs (n=102). Sensory scores (on a scale from 0 to 100) for tenderness, juiciness, liking of flavour and overall liking were obtained for all cuts with each cut being consumed by 10 individual untrained consumers. IMF measurements were obtained for the loin of all carcasses, and in addition, the topside, outside and rump from the subset of animals. Individual consumer responses for all eating quality attributes were analysed using linear mixed effect models in SAS (SAS Version 9.1) with cut, kill group, sex, sire type and birth type included as fixed effects. Either IMF from the loin, or IMF from the individual cuts was included as a covariate within the models. All relevant first order interactions were included with non-significant (P>0.05) terms removed in a stepwise manner.

Loin IMF and individual cut IMF predicted the eating quality of all cuts for tenderness (Figure 1A, B) and flavour, and predicted loin, outside and topside eating quality for juiciness and overall liking. Loin IMF accounted for more variation in tenderness (39%; Figure 1A), flavour (43%) and juiciness (32%), compared to individual cut IMF which described 19% (Figure 1B), 35% and 24% of the total variance respectively. However, individual cut IMF was marginally better at predicting overall liking scores (35% versus 32%).

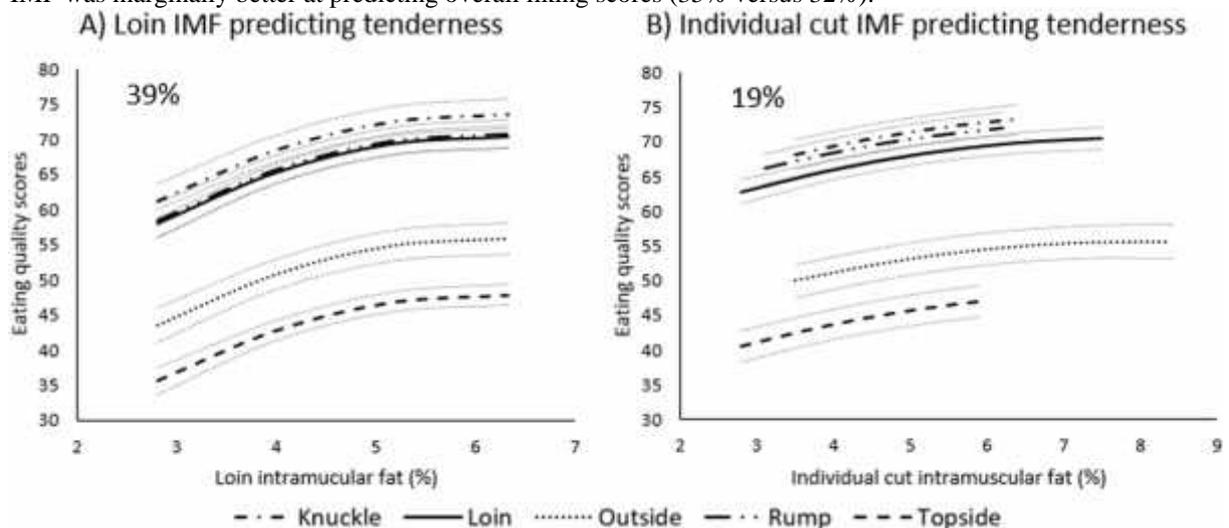


Figure 1 Relationship between A) loin IMF and B) individual cut IMF on tenderness sensory scores of the loin, outside, topside, knuckle and rump muscles of lamb. Lines represent least square means with S.E.

Contrary to our hypothesis, loin IMF accounted for a greater portion of variation for tenderness, juiciness and flavour scores than individual cut IMF. Only variation in overall liking scores was better explained by individual cut IMF, though the difference in variance between the models was just 3%. The reason for this is unclear but may be due to loin IMF correlating with other drivers of eating quality, such as lean meat yield, that impact more strongly in other muscle groups. The results suggest a single site measurement of IMF taken from the loin during processing can be used to predict eating quality of individual lamb cuts, a crucial finding when considering the future industrial measurement of this trait.

References

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