The relationship between aged beef intramuscular fat content and Australian consumer rankings for juiciness

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The intramuscular fat content (IMF) of beef is important to its retail-potential and consumer appeal. To support this perceived value, the impact of IMF on the organoleptic traits of aged beef should be considered – specifically its prediction of and relationship to juiciness. This study compared aged beef IMF and sensory panel juiciness data to explore this relationship.

A total of 40 beef striploins (*longissimus lumborum* muscle) were selected from an Australian abattoir. These were divided into eight equal portions (total: 320) and aged under unique temperature-time combinations, to achieve a range of sensory characteristics (Kilgannon *et al.* 2019). Samples were analysed using the FOSS Soxtec method of IMF determination. Samples were also evaluated using an untrained consumer panel (n = 373) to capture juiciness rankings on a 100-point scale, with higher values indicative of more positive attitudes and *vice versa*. Sensory samples were prepared using a clam-grill set to 220°C and cooked to a medium doneness. Data were analysed in R so that the model included juiciness and taste order as fixed effects; as well as the random effects of animal (striploin/portion/slice + slice), sensory (repeat/sensory_evaluation_session/panellist + repeat/sensory_evaluation_session/panellist × taste order), and striploin/portion × panellist. The level of significance was set at P<0.05.

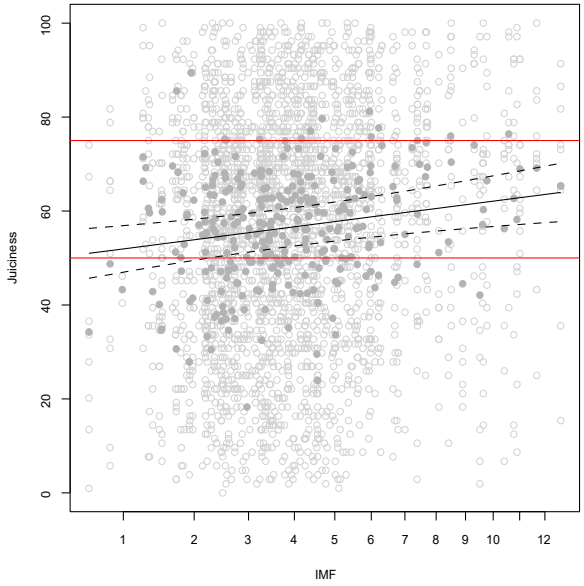

Figure 1. The fitted relationship of sensory evaluation juiciness scores with intramuscular fat content (IMF) percentages for aged beef striploin (*longissimus lumborum* muscle) samples. This is shown as a solid black line (with 95% confidence intervals included as dotted lines) overlaid on the raw data (light grey unfilled dots) and mean tenderness scores per sample (solid grey dots).

From this data, we were unable to define an IMF limit for consumer satisfaction with beef juiciness (mean juiciness ranking ≥ 50). We could identify a significant, positive relationship between IMF and juiciness (p = 0.002), which had a coefficient ± standard error of 4.70 ± 1.47 (Figure 1). It should be noted that this relationship was only apparent for the mean juiciness rankings as there was a substantial degree of variation evident between panellists assessing the same sample. These results suggest caution when inferring juiciness characteristics from IMF for aged beef.

References

Kilgannon AK, Holman BWB, Mawson AJ, Campbell M, Collins D and Hopkins DL (2019) *Meat Science*. **150** 23-42.

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