Effects of marbling on physical and sensory characteristics of ribeye steaks from four different cattle breeds

ABSTRACT

Marbling or intramuscular fat (IMF) has been widely reported to directly impact the sensory acceptance of meat. This study was carried out to determine the physical and sensory characteristics of ribeye, Longissimus dorsi steaks obtained from four different cattle breeds namely Wagyu, Angus, Brahman, and Malaysian local beef, the Kedah-Kelantan (KK). The degree of marbling was determined by using an established combined camera-image analysis technique while instrumental texture determination was carried out by using Warner-Bratzler shear force analysis. Sensory evaluation of the beef steaks was performed following a quantitative descriptive analysis incorporating 10 trained consumer panelists. Wagyu was found to possess the highest ($p<0.05$) percentage of IMF at 33.90% and the lowest shear force (raw = 5.61 N/mm2; cooked = 14.72 N/mm2) followed by Angus (20.87%), Brahman (12.17%), and KK ($p<0.05$, 6.86%). The difference in sensory properties of the four steaks was evident, with Wagyu appearing to be highly correlated with most sensory attributes measured namely sustained buttery, tooth-packing, chewiness, juiciness, tenderness, mouthfeel, oiliness, and overall acceptability. The Malaysian local beef, KK was found to be less acceptable ($p<0.05$), although most of its sensory attributes were found similar ($p>0.05$) in appearance, aroma, texture, juiciness, and flavour to the cooked steak from Angus and Brahman. This present study demonstrated the role of IMF in determining the quality and sensory acceptance of beef from different cattle breeds. These data have provided new information and further understanding on the physical and sensory quality of Malaysian local beef.