

Using the check-all-that-apply (CATA) method for sensory evaluation of fresh pork (#163)

Evan P. Bittner¹, Robert van Barneveld², Darryl D'Souza², Scott Hutchings¹, Hollis Ashman¹, Frank R. Dunshea¹

¹ University of Melbourne, Department of Agriculture and Food Science, Parkville, Australia; ² The SunPork Group, Murarrie, Australia

Introduction

Check-all-that-apply (CATA) methodology utilises a versatile multiple-choice question in which respondents are presented with a list of words or phrases and asked to select any and all that they consider appropriate (Ares and Jaeger, 2015). CATA has been widely used in other food categories to assess quality, but little information exists in its application to fresh meat. The application of CATA is reported to be a more rapid alternative of sampling consumer perception of sensory characteristics of food products, providing similar information to that obtained using descriptive analysis with trained consumer panels (Ares et al. 2010, Ares & Jaeger 2015, Bruzzone et al 2012, Dooley et al. 2010). Despite being easy and quick for participants, CATA responses have been shown to be reliable with a high test-retest reliability of sensory product characterisation across multiple studies (Ares & Jaeger 2015). Considering the difficulty in asking consumers to rate the ideal intensity of a large set of attributes using unstructured scales, it has been suggested that answering CATA questions to describe sensory characteristics of their ideal product may be more ideal (Ares & Jaeger 2015). This study paired hedonic sensory assessment of samples with CATA to evaluate the viability of CATA to assess quality in meat, as well as give deeper descriptive data on overall liking and quality.

Methods

Cantonese consumers (n=256) were recruited in Hong Kong and offered pork samples of different cuts (Loin, Scotch and Leg) as well as different sources (locally sourced, Standard Australian, Premium Australian). Samples were grilled in full steaks as required until medium well (internal temp 65°C) then cut into small cubes (~1cm x 1cm) for presentation to the participants. All samples were served blind without descriptive information. Participants first evaluated the sample for appearance, aroma, tenderness, juiciness, flavour and overall liking on a hedonic scale, making note of any off flavours, their purchase intent and rated the quality from unsatisfactory to premium. Finally, consumers were asked to evaluate the sample using CATA. All questionnaires were entered into Microsoft Excel and statistics analysed using IBM's SPSS. Hedonic results were analysed using REML with means adjusted for significant effects of gender, age, day tested and group. For CATA significance of each term was conducted using Cochran's Q test for non-parametric paired data. Pair-wise significance was tested using McNemar's test for non-parametric data for paired or matched samples.

Results

CATA analysis showed Australian pork samples scored significantly higher than local samples for all positive attributes ($P \leq 0.05$) and significantly lower for five of the nine negative attributes ($P \leq 0.05$) tested. Examples of CATA analysis for a positive and negative attribute can be seen in figures 1 and 2. The premium Australian product trended higher for positive and lower for negative attributes than the standard but these differences were not always significant. This analysis mirrors the overall hedonic testing results, with all Australian pork samples scoring consistently higher than equivalent locally sourced samples across all attributes measured (Figure 3, $P \leq 0.001$). Between Australian samples, a standard product (scotch) had the highest sensory score, but overall the premium product was far more consistent across the entire carcass.

Conclusion

The consistency of results between hedonic assessment and CATA clearly show evidence of CATA being a viable tool for quality assessment of fresh meat with untrained consumers. Furthermore, the CATA analysis when coupled with hedonic testing shows great insight into liking patterns of foreign consumers within a new test-market, allowing for a more detailed understanding of how they responded to the new product, as well as several key descriptive adjectives for marketing purposes.

Notes

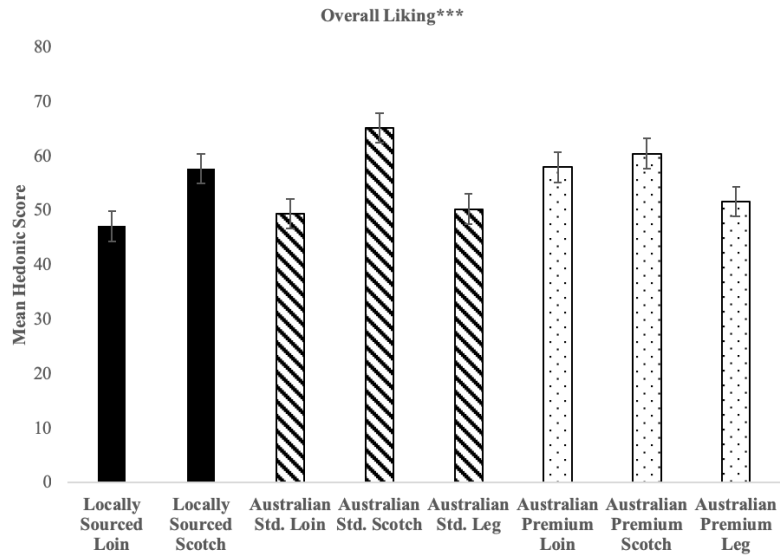


Figure 3 Mean hedonic scores for all samples. Bars indicate 95% confidence intervals (** $P < 0.001$)

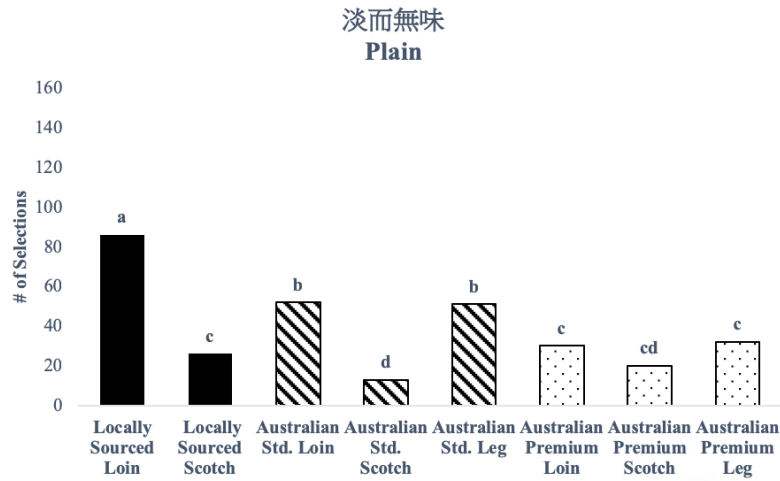


Figure 2 CATA results for negative attribute 淡而無味, (English trans. Plain) letters indicate significance ($P < 0.05$)

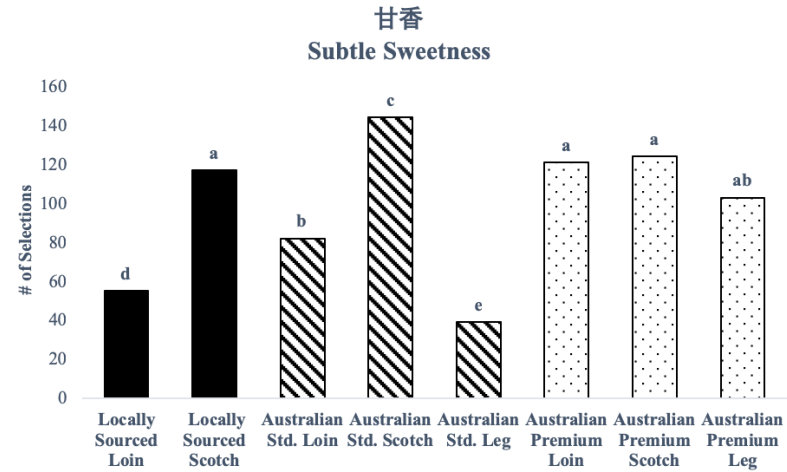


Figure 1 CATA results for positive attribute 甘香, (English trans. Subtle sweetness) letters indicate significance ($P < 0.05$).

Notes