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Consumer sensory outcomes of 3 brisket muscles cooked using the "low n' slow" barbeque method served chopped, pulled and sliced (#550)

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Introduction

In the USA, barbecuing meats using low heat and smoke is an established method for cooking beef brisket (*M. pectoralis profundus* and *M. pectoralis superficialis*) and is an emerging market for Australian consumers. To date, work conducted on the eating quality of brisket has focussed on objective measures such as shear force, and conventional cooking methods (grilling, roasting). Untrained consumer sensory testing has previously been conducted on brisket for slow cook, stir fry and thin sliced cook methods with varying success, however limited work has been conducted on briskets cooked using the barbeque method. It was hypothesised that the low n' slow barbeque cook method would be accepted by Australian consumers as an alternative cook method for briskets.

Methods

Twenty-nine beef briskets were sourced from two commercial abattoirs from grain and grass fed carcasses of varying age. Carcasses were graded for eating quality using the Meat Standards Australia grading system (Watson, R, Polkinghorne, R & Thompson, JM 2008b, *Aust J of Exp Agric*, 48, 1368-1379). Briskets were separated into a Brisket point end (*M. pectoralis profundus* (BRI056) and *M. pectoralis superficialis*; BRI057) and a Brisket navel end (*M. serratus* ventralis; BRI079). Sensory testing was conducted over 4 sessions of 60 consumers utilising an adapted cooking procedure and serving as per MSA sensory roast protocols (Watson, R, Gee, A, Polkinghorne, R & Porter, M 2008a, *Aust J of Exp Agric*, 48, 1360-1367).

The briskets were lightly seasoned with a salt and pepper mix (1:1 by volume) and cooked on pellet smokers (Green Mountain Grills, Jim Bowie), using hardwood pellets (Gold blend) at 120°C. At an internal temperature of 66.7°C, briskets were wrapped in aluminium foil and returned to the smoker. At an internal temperature of 93.3°C the briskets were transferred to an insulated box to rest until service. Samples were consumer tested as chopped (BQC; 10 x 10 x 10 mm); pulled (BQP; 70 x 10 mm); or sliced (BQS; 70 x 40 x 6 mm) portions. Consumer sensory scores were collated and an eating quality score (CMQ4) generated for each sample.

Consumer sensory scores were analysed using linear regression with continuous variables for ossification score, MSA marble score, rib fat depth, carcass weight, *Bos indicus* content, plus fixed effects for hormone growth promotant status, sex, muscle, position within muscle, and serve type. Interactions between muscle and serve type and all continuous terms were explored, along with all relevant curvilinear relationships. Estimated marginal means were calculated and Tukey pairwise comparisons were conducted to determine differences using the emmeans package in R.

Results

Ossification, MSA marble score, cut and serve type all had a significant effect on CMQ4 score of briskets. The BRI057 and BRI079 CMQ4 score were 13.7 and 13.6 points higher than that of the BRI056 regardless of serve type (Table 1). Pulled samples were scored 2.95 points lower compared to chopped (n.s.) and 5.11 points lower than sliced regardless of muscle (Table 1; Figure 1). As marbling increased by 10 points, CMQ4 score increased linearly by 0.16 ± 0.55 CMQ4 points (P=0.003) independently of ossification. As ossification increased 10 points, CMQ4 decreased by 0.40 ± -0.53 points (P<0.001). There were no significant interactions or curvilinear relationships within the dataset.

Conclusion

Australian consumers rated most barbeque brisket 3 star to 4 star quality as determined by Watson et al (2008b). *M. pectoralis profundus* had the lowest eating quality of the 3 muscles tested and, to produce a uniform consumer product, would ideally be separated from M. *pectoralis superficialis* which would impact commercial application of point end briskets. *M. serratus* ventralis was shown to have a similar eating quality to M. *pectoralis superficialis.* Furthermore, an effect of serve type was evident in the sensory outcomes which was the same across all muscles. These findings suggest that the low n' slow barbeque style of cooking for beef brisket is an acceptable cook method for Australian consumers. However, further investigation into the commercialisation of this cook method is warranted.

Notes