Consumer studies on the eating quality of Welsh lamb

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Introduction: Welsh lamb has a strong reputation for quality and Hybu Cig Cymru - Meat Promotion Wales (HCC) wished to investigate factors affecting the eating quality of Welsh lamb and provide insight into the needs of the modern lamb consumer. This paper describes the results of consumer sensory panels investigate the effect of muscle, breed and gender on the eating quality of lamb including an investigation of demographic factors and attitudes.

Materials and methods: Lambs (96) were sourced through Welsh abattoirs on eight different sampling dates. Three breed types (hill, cross-bred and terminal), two genders (castrates and ram) and three muscles (loin, chump and topside) were sampled. Samples were stored at 4oC until Day 9 after slaughter. The muscles were then cut into 15mm thick slices and held frozen at -20oC until required. Sensory consumer panels were conducted with 160 consumers at each of three locations (Cardiff, Newport (Shropshire) and Belfast), with meat from all 96 lambs being assessed at each location.

Prior to sensory assessments, assessors completed a questionnaire on socioeconomic background, attitude and behaviour. They then scored the lamb for aroma liking, tenderness, juiciness, flavour liking and overall liking on a line scale (0-100) and satisfaction on a four point category scale. Each consumer assessed a "starter sample" followed by six experimental samples with the presentation order balanced by treatment and location. The samples were cooked on a Silesia grill with both top and bottom grill plates set at 180oC. The samples were rested for two minutes and served with an internal temperature at a minimum 65oC.

Statistical analysis techniques included restricted maximum likelihood (REML), regression analysis, cluster analysis and permutation tests.

Results: The effect of muscle, breed type, gender and panel location on consumer scores for grilled lamb was evaluated. All mean scores were close to 60, indicating that, while there was variation between individual lambs, on average, all the lamb had good eating quality. Eating quality was most affected by muscle and location and interactions between these. There were no significant first order effects of breed type or gender. Chump and loin consistently scored higher than topside for all attributes. Interestingly, this included aroma liking, which was assessed before the sample was placed in the mouth. The difference in scores between the British and Northern Ireland locations may be related to demographic differences.

Age and gender were found to have most influence on consumer behaviour and attitudes. Not surprisingly, people over 45 years of age and women found lamb significantly easier to prepare. More unexpected was the fact that nutrition, environmental impact, animal welfare and provenance were all regarded as more important by people older than 45/55, and by women than men. Likewise, sensory properties, such as tenderness and cooked aroma were also regarded as more important by people older than 45 and women.

Hierarchical cluster analysis based on similarity of sensory scores showed that consumer cluster groups were not differentiated on demographics or behaviour but only on experience of sensory attributes.

Conclusions: Consumers rated the average eating quality of the lamb highly. The main effects on eating quality were differences between muscles and locations. There were no significant first order effects of breed type or gender on consumer scores. The main differences in attitudes and perceptions were due to age group and gender. Consumer liking scores could not be predicted from the sociodemographic data and are driven primarily by their individual perceptions of sensory quality.

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