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CONFERENCE PROCEEDINGS

Modelling Meat Eating Quality Traits During Ageing as Affected by Early Post-Mortem pH Decay

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Abstract

Previous work has demonstrated that beef carcasses can be accurately classified into optimal quality and cold-shortened in accordance to the concept of pH/temperature 'ideal window' by early post-mortem pH/temperature decay descriptors. The objective of this study was to assess the combined effects of such variables on the two main eating quality attributes of meat-tenderness (measured as shear force) and juiciness (measured as cooking loss)-during chill ageing. The pH and temperature of longissimus thoracis muscle of 51 beef carcasses were recorded during 24 h post-mortem, and decay descriptors were then obtained by fitting exponential models. Measures of Warner-Bratzler shear force and cooking loss were obtained from cooked meat after 3, 8 and 13 days of cold ageing. A fitted mixed-effect models revealed that both meat tenderisation and cooking loss increased with ageing ($p<0.01$) although their rates slowed down in time ($p<0.05$). Beef carcasses with a higher pH (obtained at different endpoints: 1.5, 3.0, 4.5 or 6.0 h post-mortem) produced aged meat with increased tenderness ($p=0.013$) and increased water retention during cooking ($p=0.016$) than those of lower pH. Nonetheless, the slower the pH decay rate, as happens in a cold-shortened carcass, the lower the potential for tenderisation ($p=0.038$) and water retention ($p=0.050$) during ageing. Whereas sex affected shear force, with females producing meat of higher tenderness, aged meat of increased water retention was produced by heavier beef carcasses ($p<0.001$). The good fitting quality of the shear force ($R^2=0.847$) and cooking loss ($R^2=0.882$) models indicated that both eating quality attributes can be approached by recording the pH decline of a beef carcass during the first 3.0 hours after slaughter.

Keywords: Beef, carcass, tenderness, cook loss, maturation

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