

HEAVIER BEEF HOT CARCASS WEIGHTS IMPACT SENSORY TRAITS

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I. OBJECTIVES

Tenderness and flavor are two of the most important beef sensory attributes driving consumer satisfaction. Heavier carcasses may influence product quality and consistency. The objective of this study was to determine the effect of increased hot carcass weight (HCW) on the sensory attributes of the Denver cut (DEN), strip loin (SL), and eye of round (EOR) from USDA Select (Se) and Low Choice (LC) carcasses.

II. MATERIALS AND METHODS

Carcasses ($n=116$) were selected at a commercial packing facility by weight [light [LW]= 295.5–341 kg; middle [MW]= 386.4–431.8 kg; and heavy (HW)= 465.9–522.7 kg]. After 26 h of chilling, carcass data were collected. Carcasses meeting weight and grade criteria were fabricated (20 per group; 16 for Se HW), and samples were transported to the South Dakota State University meat lab. Steaks (DEN, SL, and EOR) were collected on day 5, day 10, and day 14 and assessed by consumer sensory panels for tenderness, juiciness, off-flavors, flavor liking, texture liking, and overall liking. Data were analyzed using PROC MIXED in SAS (version 9.4, SAS Institute Inc., Cary, NC) for the main effects of HCW and aging day. Correlations were determined using PROC CORR. An $\alpha=0.05$ was used to determine significance.

III. RESULTS

In Se DEN steaks, LW had decreased tenderness and overall liking on day 5 compared to MW and HW day-5 steaks ($P<0.03$), but by day 10, no differences were observed. No differences were observed between weight groups for flavor in Se DEN steaks. For LC DEN steaks, a HCW \times aging day interaction was observed for tenderness ($P<0.0001$). On day 5, LW were the least tender, and on day 14, HW were the most tender. There were no differences between HCW for flavor or overall liking for the LC DEN ($P > 0.05$). In Se SL steaks, tenderness was increased in MW and HW compared to LW ($P<0.02$). Flavor was more intense on day 10 and day 14 compared to day 5 in LW Se SL steaks ($P<0.04$). Overall liking of Se SL was influenced by aging day, with higher ratings given to day-10 and day-14 steaks ($P<0.01$). A HCW \times aging day interaction was observed for tenderness and overall liking ($P<0.04$) for LC SL steaks. Tenderness was decreased in day-5 LW and day-10 HW. Overall liking was higher for day-5 MW and decreased for day-10 HW. By day 14, all LC SL steaks had similar ratings for tenderness and overall liking. Flavor in LC SL steaks was more intense for day-5 MW and day-14 MW compared to day-5 LW and day-14 LW, respectively ($P<0.05$). A HCW \times aging day interaction was observed for tenderness ($P = 0.01$) in Se EOR steaks. Tenderness was increased in day-10 MW compared to day-14 MW and decreased in day-5 HW compared to day-10 and day-14 HW. Aging day influenced flavor and overall liking in Se EOR. The day-5 and day-14 MW steaks were rated higher than day-10 for both sensory

attributes ($P < 0.04$). For LC EOR steaks, a HCW \times aging day interaction was observed for tenderness ($P < 0.05$). Tenderness was decreased in LW, but similar between MW and HW. Flavor was more intense in day-5 MW compared to day-5 LW ($P < 0.01$). Overall liking was higher in MW compared to LW and HW ($P < 0.01$). A moderate negative relationship was found between overall liking and tenderness ($r = -0.41$; $P < 0.0001$), but a stronger positive correlation was observed between flavor and overall liking ($r = 0.85$; $P < 0.0001$).

IV. CONCLUSION

In this study, consumers were more apt to rate MW steaks higher for sensory attributes, but a definitive pattern was not observed between HCW or aging day. The relationship between HCW and aging time is unclear and warrants further investigation to determine whether quality grade impacts these ratings.

Keywords: beef, hot carcass weight, sensory