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Internal temperature decline rate in beef primals is reduced in heavier carcasses

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Objective

The objective of this study was to determine the influence of increasing beef hot carcass weights on internal temperature decline during chilling.

Study Description

Beef carcasses (n = 309) were selected by hot carcass weight [light (LW) = 650-750 lb; middle (MW) = 850-950 lb; heavy (HW) = 1025-1150 lb] from a commercial beef packing facility approximately 45 minutes postmortem. Temperature data loggers were placed 8 inches deep in the chuck and round and 4 inches deep in the loin to record internal temperature every 5 minutes for 26 hours. Data were analyzed using the PROC MIXED procedure in SAS (SAS v 9.4, Cary, NC) using carcass weight as the main effect and a significance level of $\alpha = 0.05$.

Take home points

At 0 hours, no temperature differences were observed between carcasses ($P > 0.05$). After 45 minutes of chilling, LW carcasses had decreased temperatures compared to MW and HW carcasses in the loin and chuck ($P < 0.04$). After 2 hours of chilling, LW carcasses had lower temperatures in the round compared to MW and HW carcasses ($P < 0.03$). Heavier loins had an increased temperature throughout chilling, but by 22.5 hours, all loins had achieved similar temperatures ($P > 0.05$). At 26 hours, the internal temperature of chucks was higher in HW (52.32 ± 0.32°F) compared to MW (47.12 ± 0.28°F) and LW (45.37 ± 0.31°F; $P < 0.04$). Internal temperature of rounds was higher in HW (58.32 ± 0.16°F) compared to MW (54.01 ± 0.14°F) and LW (49.52 ± 0.15°F; $P < 0.0001$) at 26 hours. The chuck and round from heavier carcasses have increased temperatures during 26 hours of chilling compared to light weight carcasses.

Keywords: beef, hot carcass weight, temperature decline