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


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