



Post-Exsanguination Vascular Rinsing of Market Hogs and Cull Dairy Cows on Meat Quality

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Objectives

The objectives from two separate studies were to determine the meat quality effects of Rinse & Chill® (RC) on market hogs slaughtered under less than ideal harvest conditions (heat stress, warm harvest area, limited cooler air movement) and the impact of RC on commercially harvested cull dairy cows having different body condition scores (BCS).

Materials and Methods

Immediately after bleeding, market hogs were conventionally chilled (C, $n = 12$) or RC processed (RC, $n = 13$; MPSC Inc.) at the University of Wisconsin harvest facility. RC carcasses were vascularly rinsed (10% of live weight) with an isotonic chilled solution (3°C; 98.5% water; balance: glucose, polyphosphates, maltose). Carcasses were scalded rather than skinned. Carcass temperature (0–24h), carcass cooler shrink, and pH (0.5, 1, 2, 4, 6, 24h) were recorded. At 24 h postmortem (PM), muscles (picnic shoulder, PS; M. *Longissimus et lumborum*, LL) were further processed (PS: chops, ground pork; LL: chops, ground pork), packaged (polyvinyl chloride, PVC; vacuum, VAC) and displayed continuously (3°C, 1615 lux; 1, 4, 7d PM). Color measurements (CIE $L^*a^*b^*$, chemical states of myoglobin) along with pH, moisture fat free (MFF), water holding capacity (WHC), oxygen consumption, total pigment, TBARS and hexanal content were determined. Warner-Bratzler shear force on chops aged 4d PM (2°C) were cooked (71°C, endpoint temperature) according to AMSA guidelines.

Carcasses from cull dairy cows with two different BCS (Lean, LE; Light, LI) were conventionally chilled ($n = 10$ each BCS) or RC processed ($n = 12$ each BCS). Muscles (M. *Longissimus et lumborum*, LL; M. *Triceps brachii*, TB) were ground (19mm, 3mm plates), packaged (PVC, VAC) and displayed or stored in the dark. Color,

chemical states of myoglobin, pH, temperature, fat content and total pigments were determined. Data were analyzed using PROC MIXED procedures (SAS Institute).

Results

RC resulted in a lower ($P < 0.05$) pH during the first 4h compared to C. RC ground picnic shoulder was redder (CIE a^*), lighter (CIE L^*), had greater deoxymyoglobin and less metmyoglobin compared to C ($P < 0.05$). However, the RC ground loin had less ($P < 0.05$) oxymyoglobin than C. RC chops (LL) were lighter (CIE L^*) and had less deoxymyoglobin compared to C ($P < 0.05$). RC ground pork had greater ($P < 0.05$) oxygen consumption. RC pork had lower ($P < 0.05$) TBARS and hexanal values compared to C. RC did not ($P > 0.05$) affect cooler shrink, moisture content when assessed on an MFF basis, WHC, purge, cook loss, total pigment and WBS force.

RC resulted in a lower ($P < 0.05$) pH at each time PM than C. C (LE) had a lower pH than C (LI), however pH was not affected by BCS for RC. Generally, RC resulted in lower temperatures during chilling (24h). In LE and LICows, RC produced greater redness (CIE a^* , $P < 0.05$) associated with blooming and display times. RC LE beef resulted in greater ($P < 0.05$) oxymyoglobin during all display times, however, RC LI had higher ($P < 0.05$) deoxymyoglobin on 7d. No differences were found in total pigments.

Conclusion

For pork packing facilities that harvest during heat stress times and have less than ideal carcass cooler conditions, RC has the potential to improve color in certain cuts and reduce lipid oxidation. RC on lower quality BCS cull dairy cows has the opportunity to improve color and potentially decrease the incidence of dark cutting beef.