SOW CLASSIFICATION BASED ON WEIGHT AND PARITY AFFECTS PORK QUALITY

J. J. Nehls[1*], K. E. Hwang[1], and J. R. Claus[1],

[1]*Animal Sciences, University of Wisconsin, Madison, WI, USA*,

*jrclaus@wisc.edu

I. OBJECTIVES

The objective of this study was to determine the effects of sow classification used by the industry based on a combination of slaughter weight and parity on various meat quality attributes.

II. MATERIALS AND METHODS

Six sows representing 2 commercial classification groups (low weight [LW] = 155–165 kg; high weight [HW] = 278–308 kg) were harvested. The weight classes were further controlled by age and parity (LW average age = 1 y, average parity = 1; HW average age = 3.8 y, average parity = 8). Sows were electrically stunned, bled, skinned, eviscerated, cut into anatomical lateral sides, and fabricated (~45 min postmortem). One side was sampled for water-holding capacity (WHC) and pH. The other side was hot-boned, and the meat was ground through a 3/4" plate. The ground meat was mixed with salt (1.5% meat weight basis) and dry ice (28% meat weight basis) and stored (3 d) before being re-ground (5/32" plate). Ground samples were homogenized and then analyzed for moisture, fat, and protein. Additional samples (~150 g) were placed on Styrofoam trays, overwrapped with polyvinyl chloride, and continuously displayed (1,615 lux, 3°C). Color measurements were taken on 1, 4, and 7 d (CIE *L*a*b**; reflectance: chemical states of myoglobin). Oxygen consumption (OC) and metmyoglobin reductase activity (MRA) were calculated using a reflectance method. Ability of the meat to hold water was measured using a centrifugal method (expressible moisture [EM]%) on ground meat and Carver Press (WHC %) on *Longissimus lumborum (LL)* and *Semimembranosus (SM)* muscle samples. Ground meat samples premixed with 40% water added (meat weight basis) prior to being centrifuged (15,000 G, 5 min, 4°C) were used to determine EM%. Patties (~125 g each) were prepared and cooked in an oven until 160°F, cooled (30 min), and weighed for cook loss. Animal served as the experimental unit. Data were analyzed using PROC MIXED procedures (SAS Institute Inc., Cary, NC), and significance was set at $P < 0.05$.

III. RESULTS

Ground meat from LW compared to HW had more moisture (68.59% vs. 66.42%, $P < 0.05$), less fat (8.14% vs. 10.57%, $P < 0.05$), and slightly lower protein (20.83% vs. 21.19%, $P < 0.05$). During lighted display, the HW ground meat had lower L^* values, higher a^* values, and greater oxymyoglobin ($P < 0.05$) than LW. Also, the L^* and a^* values decreased while the metmyoglobin estimate increased with increasing display time ($P < 0.05$). The calculated OC was higher ($P < 0.05$) in the HW ground meat compared to LW, but no differences were found in MRA. WHC % was greater ($P < 0.05$) in HW than LW for both the *SM* and *LL*. In contrast EM% was not affected ($P > 0.05$) by weight class. The pH of HW (5.74) was higher than LW (5.55). In addition, the pH of the *SM* (5.77) was higher ($P < 0.05$) than in the *LL* (5.52). The cook loss percentage was almost identical for the HW and LW patties, and the HW cooked patties were noticeably darker in color.

IV. CONCLUSION

Sow classification, based on weight relative to age and parity, had a significant effect on moisture content, fat content, OC, WHC percentage and meat color during lighted display. However, sow classification did not have an influence on the protein content, MRA, EM%, pH, and cook loss. Time in lighted display had a significant effect on meat color. The results serve as valuable information for pork harvest facilities making decisions on which sow classification provides the most positive impact on meeting consumer quality expectations.

Keywords: meat quality, parity, pre-rigor, slaughter weight, sows