



## Detection of Differences in Cook Loss and Tenderness of Aged Pork Chops Cooked to Differing Degrees of Doneness Using Sous-Vide

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### Objectives

The objective was to determine the ability to detect differences in cook loss and Warner-Bratzler shear force (WBSF) value between chops aged for differing time periods and cooked to varying degrees of doneness in a sous-vide style cooker.

### Materials and Methods

Loins ( $n = 68$ ) from pigs humanely slaughtered at the University of Illinois Meat Science Laboratory were separated between the 10th and 11th rib into anterior and posterior sections. The posterior section was cut into 6 separate 2.54 cm thick chops. The middle 4 chops were randomly designated for aging of 3 d and cooked to 63°C, aged 7 d and cooked to 63°C, aged 14 d and cooked to 63°C, or aged 14 d and cooked to 71°C. Chops ( $n = 272$ ) were cooked by placing them in a water bath with an immersion circulator set to the desired end-point temperature for 90 min. Cook loss was calculated for each chop by measuring initial and final weight, and accounting for packaging weight. Four cores measuring 1.25 cm in diameter were cut parallel to the muscle fibers from each chop and analyzed for WBSF. Data were analyzed using a 1-way ANOVA. Least squares means were separated using the probability of difference (PDIFF) option in the MIXED procedure of SAS.

### Results

Cook loss increased as aging period or degree of doneness increased. Among chops cooked to 63°C, chops aged 3 d had 1.14% units less ( $P < 0.01$ ) cook loss than those aged 7 d, and chops aged 7 d had 1.13% units less ( $P < 0.01$ ) cook loss than those aged 14 d. Among chops aged for 14 d, chops cooked to 71°C had 10.06% units greater ( $P < 0.001$ ) cook loss than chops cooked to 63°C. Differences in tenderness were also detected between aging periods. Among chops cooked to 63°C, chops aged 3 d required 0.27 kg more ( $P = 0.02$ ) force to shear than those aged 7 d, but chops aged 7 d did not differ ( $P = 0.15$ ) from those aged 14 d. End-point cooking temperature had a greater effect on tenderness, with chops aged 14 d and cooked to 71°C requiring 0.83 ( $P < 0.001$ ) kg more force than those aged 14 d and cooked to 63°C. Previous studies have reported a decrease in Warner-Bratzler shear force between 7.10–21.29% when comparing early (1–3 d) and mid (7 or 9 d) aging and decreased between 3.53–15.38% when comparing mid and late (14–21 d) aging. In the present study, Warner-Bratzler shear force decreased 9.00% from early-to-mid aging and 5.86% from mid-to-late aging.

### Conclusion

Overall, these data indicate sous-vide is an acceptable cooking method for use in experiments as expected differences in cook loss and WBSF were detected in chops aged to differing time points or cooked to differing degrees of doneness.