Effects of Feeding Peroxidized Soybean Oil to Finishing Barrows on the Shelf-Life of Bacon and Loin Chops

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Materials and Methods

Fifty-five individually housed barrows were randomly allotted to 1 of 4 diets containing 10% SO: 1.) not heated (CON), or heated at 2.) 45°C for 288 h (45C/288h), 3.) 90°C for 72 h (90C/72h), or 4.) 180°C for 6 h (180C/6h), and fed for 81 d. Barrows were slaughtered on d 82 at the University of Illinois. At 24 h postmortem, bellies (NAMP 408) and Canadian back loins (NAMP 414) were removed from carcasses. Two 2.54 cm thick chops were cut from the Canadian back loin and used to determining color stability and thiobarbituric acid reactive substances (TBARS) during simulated retail display. Loin samples were analyzed for TBARS on d 1 and d 10 of display. Data were analyzed as a complete randomized design repeated in time with fixed effects of oil treatment and storage day. Storage location (shelf) served as a random effect for analysis of loin shelf-life. Bacon sensory data were analyzed as a partially balanced incomplete block design repeated in time, with fixed effects of oil treatment and storage time, and sensory session serving as a random effect.

Results

There was no effect of oil treatment on TBARS (P > 0.90), oxidized odor (P = 0.63), or oxidized flavor (P = 0.79) of bacon. As expected lipid oxidation, oxidized odor, and oxidized flavor increased (P < 0.0001) over the 90 d storage period. There was no effect (P > 0.51) of oil treatment on L*, hue angle, or TBARS of loin chops subjected to a 10 d simulated retail display. However, chops from pigs fed 45C/288h oil were more red (greater a*; P < 0.01) and more yellow (greater b*; P < 0.01) than the other 3 treatments. Chroma and reflectance were also greater (P < 0.03) greater for these same chops; however, the 45C/288h chops were the most (P < 0.01) discolored after 10 d of simulated retail display.

Conclusion

Feeding peroxidized soybean oil did not affect lipid oxidation in either food-service packaged bacon or fresh loin chops. However, feeding the 45C/288h oil (mild thermal abuse) resulted in chops that were more red had more intense color, but also were the most discolored at the conclusion of an 11 d simulated retail display.