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Effect of active immunization against luteinizing hormone on carcass and meat quality of Romanov lambs

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Abstract

Romanov male (n=37) and female (n=6) lambs 50 d old were used to investigate the possibility of improving carcass and meat quality at slaughter with a non-surgical method of castration. Seven groups were compared: intact untreated control (C1); surgically castrated (SC); immunized with 0.25 (T 0.25), 0.50 (T 0.50) or 1.00 (T 1.00) mg porcine LH (injected at 50±7 d of age and three more times 10 d apart); control, injected only with adjuvant (C2) and females (F). Blood samples were collected at d 50 and thereafter at 3 wk intervals until slaughter to determine testosterone and LH concentrations, and presence of antibodies. Scrotal circumference and body weight were determined every 3 wk. The lambs were slaughtered at 43±2 kg live weight and detailed carcass evaluations were performed. Testicular weight, width and length were recorded and diameter of the seminiferous tubules was measured. Immunization with the higher levels of LH (T 0.5 and T 1.0) reduced growth rate and feed efficiency to levels similar to those of F and SC. Dressing percentages of C1 and T 0.25, T 0.50 and T 1.0 were similar and 3.6–4.0% lower than in SC lambs mainly as a result of lower carcass fat. Both SC and immunization reduced carcass shoulder proportion. Whereas, SC increased the loin-proportion, immunization treatments increased the leg proportion. The 12th rib measurements of all immunized lambs showed an increase in lean (45.7–53.3% vs 40.9%) and bone (19.8–23.1% vs 16.4%) content and a decrease in fat content (24.4–33.6% vs 41.5%) compared with SC lambs (P>0.05). Dissection of half of each carcass showed similar results. Marked decrease (P<0.01) in backfat was observed in all immunized lambs compared with SC, F, C1 and C2 lambs. Testes weights decreased 15–29% in immunized lambs as compared with C2 and 5–20% as compared with C1 lambs (P>0.05). Testes circumferences and widths showed dose-dependent decreases. No significant differences among treatments in seminiferous tubule circumference was observed. Free LH was not detectable in serum of immunized lambs but elevated levels of LH antibodies were present at the termination of the study. Significant correlation coefficients were calculated between testosterone concentration and various carcass traits. It is concluded that immunizing against LH could improve the proportions of the most valuable cuts without increased deposition of adipose tissues associated with castration.

Keywords: Immunization; Luteinizing hormone; Romanov sheep; Carcass

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