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SERUM LEVELS OF INSULIN-LIKE GROWTH FACTOR-I, THYROID HORMONES, AND SKELETAL MUSCLE FIBER SIZE IN CASTRATED LAMBS WITH AND WITHOUT ANDROGEN TREATMENT

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ABSTRACT

To test the influence of castration on sexually dimorphic muscle growth and the interaction between testosterone and IGF-1, T3 and T4 in muscle growth in Awassi lambs, 12 male lambs were divided into 3 groups; Group W (4 lambs) were castrated at age less than 1 month, group WT (4 lambs) were castrated at the same age and treated with testosterone, and group R (4 lambs) intact males served as control. Animals were weighed before any treatment and monthly thereafter and whole blood samples were collected monthly until slaughtering. Insulin-like growth factor-1, T3, and T4 concentrations were measured in the harvested serum using ELISA commercially available kits. Lambs were slaughtered at 8 months of age and semitendinosus and splenius muscles fiber areas were measured using digital image technique. In WT and R groups, IGF-I concentrations were significantly higher ($P<0.05$) at 4 and 8 months compared to IGF-I levels in group W. There was an effect of age on IGF-1 concentration in groups WT and R. Serum T3 concentrations were significantly the lowest in group R compared to groups W and WT at most sampling times. Group WT had intermediate serum levels of T3 in most sampling times. There was a negative correlation between the concentration of T3 and age in group R. Testosterone treatment resulted in marginally reduced T3 concentration in group WT. Serum levels of T4 were not significantly affected by age in all groups until months 6 and 8 of age where in group R its concentrations were significantly higher than groups W and WT. The highest daily weight gain was reported in group R (19.90 gm/day) followed by group W and group WT. There was a significant difference in weight gain ($P<0.05$) between group R and groups W and WT and no significant difference between groups W and group WT. In group R, splenius muscle fiber area (1458 ± 193 um^2) was significantly higher ($P < 0.05$) than that of groups W and WT while the muscle fiber area of the semitendonosus was not significantly different among all groups.