## Effect of Different Sources and levels of Chromium Supplementation to Awassi Lambs Rations on Carcass Quantity and Quality Characteristics

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## Abstract

This study was conducted to investigate the effects of adding different sources and levels of chromium to awassi lambs diets on carcass quantity and quality characteristics. Thirty five local awassi lambs ages 3-4 months and averaged  $21.9\pm0.2$  kg live body weight were used and reared at the farm of Agriculture collage – University of Tikrit for the period from 1/4 to 2/7/2011. Lambs were divided randomly to seven treatments (five animals for each) and distribution to individual pens. Treatments animals have been providing a steady concentrate diet. Various sources and levels of chromium were added to the concentrate diet as follows: Control treatment with no added chromium. Added chromium yeast levels of 300, 600  $\mu$ /kg diet(Pic3, Pic6 respectively). Added chromium picolinate levels of 300, 600  $\mu$ /kg diet(Pic3, Pic6 respectively). Added chromium chloride levels of 300, 600  $\mu$ /kg diet (Ch3, Ch6 respectively). Concentrate diets was providing to animals by 3% of live body weight for whole period of rearing (90 days), wheat straw was provided *adlibitum* as a roughage diet. Twenty one animals were slaughtered at the end of period (three animals for each treatment) then carcasses were chilled at 2°c for 24 hours. Thereafter, several quantity and quality measured were taken in addition to sensory evaluation. The results as follows:

1-Treatment Yst3 recorded the highest average of each final weight, average daily and total weight gain superior (P $\leq$ 0.05) than control treatment, in addition, treatment Yst6 recorded lowest average feed intake , treatments Yst3,Yst6 recorded the best feed conversion ratio superior (P $\leq$ 0.01) than control treatment.

2-All additive treatments (except treatment Pic6) recorded superior (P $\leq$ 0.01) slaughtering weight and empty body weight than control treatment, while recorded superior (P $\leq$ 0.05) hot and cold carcass weight than control treatment.

**3-**Treatment Yst6 recorded lowest (P $\leq$ 0.05) carcass length among all treatments, whilst treatment Ch3 recorded highest (P $\leq$ 0.05) dressing percentage and highest (P $\leq$ 0.01) fat thickness among all treatments, while highest (P $\leq$ 0.01) rib eye area among all treatments was recorded by Pic6 treatment.

**4-**Treatments Yst3, Yst6 and Pic3, Pic6 generally recorded superiority than control treatment in primary cuts percentages except the loin. As for the secondary cuts, treatments Yst3, Yst6 was superior than control treatment except the fore shank; treatment Pic6 was superior than control treatment except the breast. Treatments Ch3, Ch6 varied in their effects on primary and secondary cuts, as it superior to control treatment in most of primary cuts while the reverse was true with secondary cuts.

**5-**Among all treatments, treatment Pic6 recorded an increase in lean percentage and a decrease in both fat and bone percentages for primary cuts, while Yst3, Ch3 treatments showed the opposite. No positive results noticed for secondary cuts physical structure ingredients. Among all treatments, treatment Pic6 recorded highest lean, lowest fat percentages and highest lean:fat percentage in half carcass (without tail fat, kidney and pelvic fat) and whole half carcass. Treatment Pic3 recorded highest bone percentage in half carcass (without tail fat, kidney and pelvic fat) and whole half carcass.

pelvic fat), while no significant differences were observed between treatments in whole half carcass bone percentage.

**6**-Generally Chromium additive treatments recorded increase in pelvic limb, dorsal region, and thoracic limb muscles when compared with control treatment.

**7-**Chromium additive treatments in general and in particular Pic3, Pic6 treatments showed increase in carcass fat deposition and decrease in offal fat as a percentage of total fat, in addition to decrease in total fat weight and percentage based on empty body weight, decrease in percent of subcutaneous to intramuscular fat and decrease in percent of tail fat to cold carcass weight comparing with control treatment which showed the opposite.

**8**-Chemical analysis of each Rack and leg ,and of each Longissimus Dorsi (LD), Semimembranosus (SM) and Infraspinotus (IS) muscles showed highest protein and moisture percentages and lowest fat percentages recorded by Treatments Pic3, Pic6 comparing with the control.

**9-**Chromium additive treatments in general and in particular Pic3, Pic6 treatments showed increase in water holding capacity and protein solubility for each LD, SM and IS muscles comparing with the control , while no significant differences were noticed among treatments in spite of arithmetic increase noticed by most of chromium additive treatments comparing with the control . also those treatments showed decrease in thawing loss and cocking loss for LD, SM muscles comparing with the control.

**10-**All chromium additive treatments recorded decrease ( $P \le 0.01$ ) in cholesterol content for LD, SM and IS muscles comparing with the control while no significant differences recorded in myoglobin concentration.

**11-**Treatment Ch3 recorded decrease ( $P \le 0.05$ ) in flavor and tenderness comparing with control treatment while treatment Yst6 recorded highest ( $P \le 0.01$ ) tenderness comparing with other treatments. Treatments Yst3, Pic6 recorded highest ( $P \le 0.01$ ) juiciness comparing with other treatments. treatments Yst3, Yst6 and Pic3, Pic6 recorded arithmetic increase comparing with control treatment in palatability while treatments Ch3 and Ch6 decrease of it.