

**EFFECT OF SALINITY LEVEL IN DRINKING WATER ON FEED
INTAKE, NUTRIENT UTILIZATION, WATER INTAKE AND
TURNOVER AND RUMEN FUNCTION IN SHEEP AND GOATS**

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ABSTRACT

Twelve adult males of each Baladi goats and Barki sheep were divided, each, into four groups based on body weight. Animals were fed a ration consisted of berseem hay (ad lib) and concentrate feed mixture (at the rate of 1.5% of body weight). Treatments were drinking sea water diluted with fresh water to contain 4.04g, 8.15g, and 12.33g total dissolved salts/100 ml (TDS l-1), for 2nd, 3rd and 4th treatments, respectively along with fresh water (0.42 g TDS l-1) as a control.

Feed intake of both sheep and goats increased by increasing level of salinity, while species differences existed ($P<0.05$). Nutrient digestibility coefficients did not differ significantly due to salinity levels. Salinity levels effect appeared significant ($P<0.05$) on nitrogen utilization. Water intake increased in response to increasing salinity level till 8.15g TDS l-1, and then decreased at the higher level (12.33 g TDS l-1). Water intake response to load of elevated salt was higher in sheep than goats. Neither ammonia nitrogen nor total volatile fatty acid production were affected by salinity level while species effect was found to be significant ($P<0.05$ for $\text{NH}_3\text{-N}$ and $P<0.0001$ for TVFA's). Quadratic regression analysis revealed variations over time of both metabolites due to increasing salinity levels. The ruminal pH values were significantly affected by increasing salinity in drinking water. Both salinity levels (8.15 and 12.33g TDS l-1) showed lower ruminal pH than that of fresh water (0.42g TDS l-1). Drinking fresh water resulted in ruminal pH similar to that of the lowest salinity level (4.04g TDS l-1). Sheep had higher ($P<0.0001$) ruminal pH value (7.309) than goats (7.156). Turnover rate of fresh water was significantly ($P<0.05$) lower than water of higher salinity levels. The increments in turnover rate as a result of increasing salt concentrations were 42, 84 and 111% for 4.04, 8.15 and 12.33g TDS l-1, respectively. Sheep turned over more water (12%) than did goats. Relative stabilization of the rumen fermentation appeared to be restored at about the 21st day from the beginning of the treatments.

Key words: *sheep, goats, salinity, water intake, turnover, nutrient digestibility*