EFFECT OF SALINE WATER INTAKE AND SALT TOLERANT PLANTS FEEDING ON SKIN PROPERTIES AND SOME PHYSIOLOGICAL PARAMETERS OF SHAMI GOATS IN SOUTH SINAI

Submitted By

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B. Sc. Agric. (Animal Production), Ain Shams University, 1999
Diploma of Environmental Science, Ain Shams University, 2002
Master in Environmental Sci., Ain Shams University, 2009

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Science

Department of Environmental Agricultural Sciences
Institute of Environmental Studies and Research
Ain Shams University

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APPROVAL SHEET

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ABSTRACT

This study was performed to evaluate the effect of salinity stress (i.e. salt tolerant plant feeding, STP and drinking saline water, SW) on skin characteristics (skin layers thickness, follicles area and follicles density) and some physical properties of leather (tensile strength, elongation and tear strength) as well as some physiological responses of male Shami goat. This study was carried out at South Sinai Research Station, Desert Research Center, Ministry of Agriculture, Egypt.

Twenty eight growing male Shami goats were assigned randomly into four equal groups (7 of each). The first group (G1; H&TW) was fed on berseem (*Trifolium alexandrnum*) hay (H) and drank tap water (TW, 274 ppm) and served as control. The second group (G2; H&SW) was fed on H and drank saline water (SW, 6000 ppm). The third group (G3; STP&TW) was fed on salt-tolerant plants (STP, alfalfa) and drank TW while the fourth group (G4; STP&SW) was fed on STP and drank SW. All groups were offered concentrate feed mixture (CFM) and roughages (60:40%) to cover their maintenance and productive requirements. Blood samples were taken from all experimental animals for hormonal assay. By the end of the study, animals were slaughtered and skins were preserved for physical analysis.

Results revealed that the histological structure (dermis, papillary and reticular thicknesses and follicle density) of skin didn't differ significantly among the experimental groups except those animals fed STP with SW were significantly ($P<0.05$) affected. There was a significant ($p<0.05$) effect of salinity on epidermis layer thickness. The thickness of papillary tended to decrease with either SW or STP intake. Reticular layer thickness was affected ($p<0.05$) by water salinity rather than STP feeding.

Results clarified that neither feeding STP nor drinking SW had a significant effect on leather physical properties (tensile strength,

elongation and tear strength).

Present results indicated that salinity through feed or water had a significant effect ($P<0.05$) on the mean values of plasma minerals (Na, K, Ca and P) concentrations. Thyroid hormones (T_3; triiodothyronine and T4; thyroxine) and aldosterone (Ald) concentrations tended to decrease ($P<0.05$) compared to the control group which might be related to the impact of salinity on feed intake. In contrast, cortisol (Cort.) concentration tended to increase ($P<0.05$) in SW vs. TW groups and STP vs. H groups to help animals to cope with such stress.

It could be concluded that salt-tolerant plants as animal feeds in salt affected lands could be utilized safely without any adverse effects on animal health and productivity as well as improving the histological parameters of the skin and physical properties of leather of male Shami goats. Therefore, developing small-scale of leather production, as a source of income generating activities, is needed to increase the Bedouins returns from goat skins and improve their livelihood in such areas.

Keywords: Salt-tolerant plants, saline water, T_3, T_4, aldosterone, cortisol, follicle density, skin layer thickness, leather, tensile strength, tear strength, elongation, Shami goats.

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