

**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

Sameh Taha Kassem Mohamed

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

2018

APPROVAL SHEET
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Department of Agricultural Science

This Thesis Towards a Doctor of Philosophy Degree in Environmental
Science Has Been Approved by:

Name

Signature

1- Prof. Dr. Mona Abd-Eltawab El-Khashab

Professor of Animal Physiology, Dean of The
Faculty of Agriculture, Fayoum University

2- Prof. Dr. Gamal Ashour Hassan

Professor of Animal Physiology, Faculty of
Agriculture, Cairo University

3- Prof. Dr. Ali Hassan Ali Azzam

Professor of Wool Biology, Desert Research Center

4- Prof. Dr. Hamdy Hamed Swelim

Professor of Cell Biology, Faculty of Science, Ain
Shams University

5- Prof. Dr. Essmat Bakry Abdalla

Professor of Animal Physiology, Faculty of
Agriculture, Ain Shams University

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Under The Supervision of:

1- Prof. Dr. Essmat B. Abdalla

Professor of Animal Physiology, Faculty of Agriculture, Ain Shams University (Principal Supervisor)

2- Prof. Dr. Farouk A. Khalil

Professor Emeritus of Animal Physiology, Faculty of Agriculture, Ain Shams University

3- Prof. Dr. Hamdy H. Swelim

Professor of Cell Biology, Faculty of Science, Ain Shams University

4- Prof. Dr. Ali H. A. Azzam

Professor Emeritus of Wool biology, Desert Research Center

2018

ACKNOWLEDGEMENT

Thanks to ALLAH

First of all, thanks to ALLAH, the most gracious, beneficent and merciful for his induced approval to complete goals and make them possible.

The author wishes to express his deep personal gratitude and sincere appreciation to **Dr. Essmat Bakry Abdalla**, Professor of Animal Physiology, Animal Production Department, Faculty of Agriculture, Ain Shams University for his kind guidance, close supervision and valuable suggestions. His constant encouragement, competent assistance during all stages of this work and revising the manuscript are gratefully acknowledged.

My deep thanks also are due to **Dr. Farouk Abdalla Khalil**, Professor of Animal Physiology, Animal Production Department, Faculty of Agriculture, Ain Shams University for his kind supervision, constructive criticism and revision of the manuscript.

I am very grateful to **Dr. Hamdy Hamed Swelim**, Professor of Cell Biology, Department of Zoology, Faculty of Science, Ain Shams University, for his encouragement, revision of the manuscript and helps in progress of this work.

Deep gratitude is due to **Dr. Ali Hassan Azzam**, Researcher Professor of Skin and Wool Biology, Wool Production and Technology Department, Desert Research Center for his continuous interest, kind supervision, valuable advice during the whole period of the experimental work and constructive criticism and revision of

the manuscript.

Deep thanks are due to **Dr. Hamdi Abdel-Aziz Gawish**, Researcher Professor of Animal Physiology, Animal and Poultry Physiology Department, Desert Research Center for his valuable suggestions and helping in revision of the manuscript.

I am indebted also to **Dr. Samia Abd-Elmagied Hekal**, Researcher Professor of Skin Histology, Wool Production and Technology Department, Desert Research Center for her kind help and facilities that she made available for me during the histological study.

The author would like to express his sincere gratitude and thanks to **Dr. Ahmed Ibrahiem Nasser**, Researcher Associate professor of leather tanning, Wool Production and Technology Department, Desert Research Center for his great help and continuous encouragement.

I am much obliged to **all workers** of Wool Production and Technology Department, Desert Research Center especially **Mr. Eid Mohamed Abd-Elhady and Mr. Khaled Ali El-Shemi** for lending me a helping hand with continuous encouragement during this study.

Finally, I am heartily and greatly indebted to my lovely great wife **Dr. Doaa Galal**, my sons (**Ahmad, Eyad and Adham**) and my family members; father, mother, sisters and brother for their patience and generous continuous encouragement and moral support throughout all my life.

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 alexandrinum*) 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 T_4 ; 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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