THERMAL RESPONSE OF SHEEP IN DIFFERENT DESIGNS OF ROOF HOUSING

By

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B.Sc. Agric. Sci. (Agricultural Engineering), Fac. Agric., Al Fateh Univ., 2005

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE

In

Agricultural Sciences

(Agricultural Engineering)

Department of Agricultural Engineering
Faculty of Agriculture
Cairo University
EGYPT

2014

SUPERVISION SHEET

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ABSTRACT

The number of sheep in Egypt was estimated in 2013 to be 5.45 million head**.** But it's decreased productivity in recent years due to the extremely high air temperature. This is considered one of the reasons leading to this. Therefore, to the protection of sheep and its increase productivity should be providing housing which achieving of the sheep engineering and environmental requirements.

This research was conducted to study the effect of roofing material type and height on thermal response and productive of sheep. Carried out An experiment at Agricultural Experimental Station, Fac. of Agric. Cairo univ., Giza, Egypt, on 30 Barki sheep (20 Ram and Ewe lambs, 10 yearling ewes). The two types of housing were tested .housing of concrete roofing, housing of iron sheet roofing. The measured indicators of houses: dimensions, orientation of houses, roofs, walls and floors temperature, climatic conditions (air temperature, relative humidity and air velocity) inside and outside housing. Then calculating of THI, conduction, convection and radiation heat transfer by using mathematical equations. Physiological parameters were measured: skin temperature, rectal temperature, wool temperature, respiration rate, body weight for sheep in summer and winter. Found that air temperature and relative humidity under iron sheet roofing (HB) were higher than under concrete roofing (HA) in summer while air temperature was higher in concrete roofing house (HA) than in iron sheet roofing house (HB) and relative humidity was lower in (HA) than (HB) in winter. Where the THI values were higher in HB compared with HA. This is due to the high thermal conductivity of iron sheet compared with reinforced concrete. Confirmed these results that mean of increasing in physiological parameters were higher in HB compared HA, and also mean body weights were generally higher in (HA) concrete roofing house than (HB) Iron sheet roofing house. As a conclusion The concrete roofed housing was protection provided from high temperature and relative humidity better than iron sheet roofed housing. Despite the iron sheet more height than reinforced concrete, but it did not provide a comfortable environment conditions for sheep. Where found that the environmental conditions under the roof of the concrete are better than under the roof of iron sheet.

Key words: Sheep, Housing, Roofing materials, Comfort Zone, Environmental control, Thermal conductivity, Thermal responses and productive.

DEDICATION

I dedicate this work to my parents and brothers for all the support they lovely offered during my post –graduate studies.

ACKNOWLEDGEMENT

I wish to express my sincere thanks, deepest gratitude and appreciation to ***Dr.Mohammad Hashem Hatem,*** *Professor of Agricultural Engineering, faculty of Agriculture, Cairo university , Sincere appreciation to* ***Dr. Ehab Abd-Elmoneim Magdy*** *lectures of Agricultural Engineering, faculty of Agriculture, Cairo university, for supervision and special thanks and deepest gratitude to* ***Dr. Gamal Ashour Hassan,*** *Professor of Animal Production, Faculty of Agriculture, Cairo university, for suggesting the problem, Supervision, continued assistance, and guidance through the course of my study and for their revision of the manuscript of this thesis .*

Special deep appreciation is given to my father, my mother, my brothers and sisters. Also I feel deeply grateful to my dear country Libya.

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