STUDIES ON THE COMPOSITION AND PROPERTIES OF GOAT AND SHEEP MILK

By

MOHAMED MANSOUR ABD EL- REHIM EBRAHIM EL-LOLY

B. Sc. Agric. (Dairying) 1980

AL Azhar University

THESIS

Submitted in Partial Fulfilment of the Requirements for the Degree of

MASTER OF SCIENCE

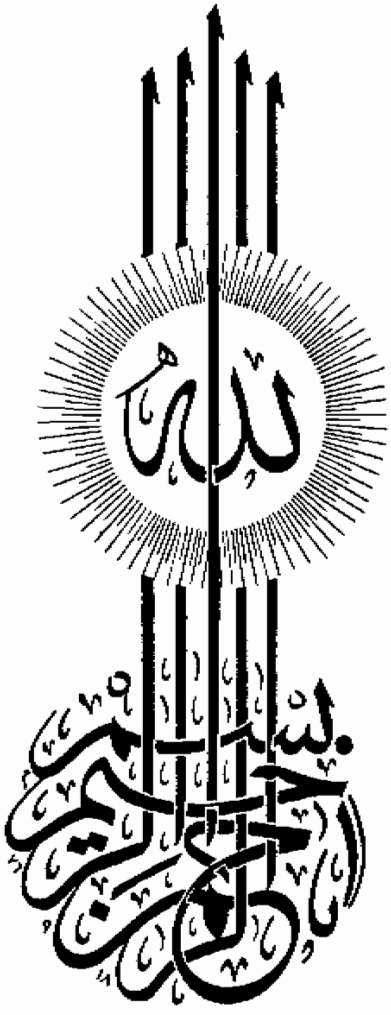
(Dairying)

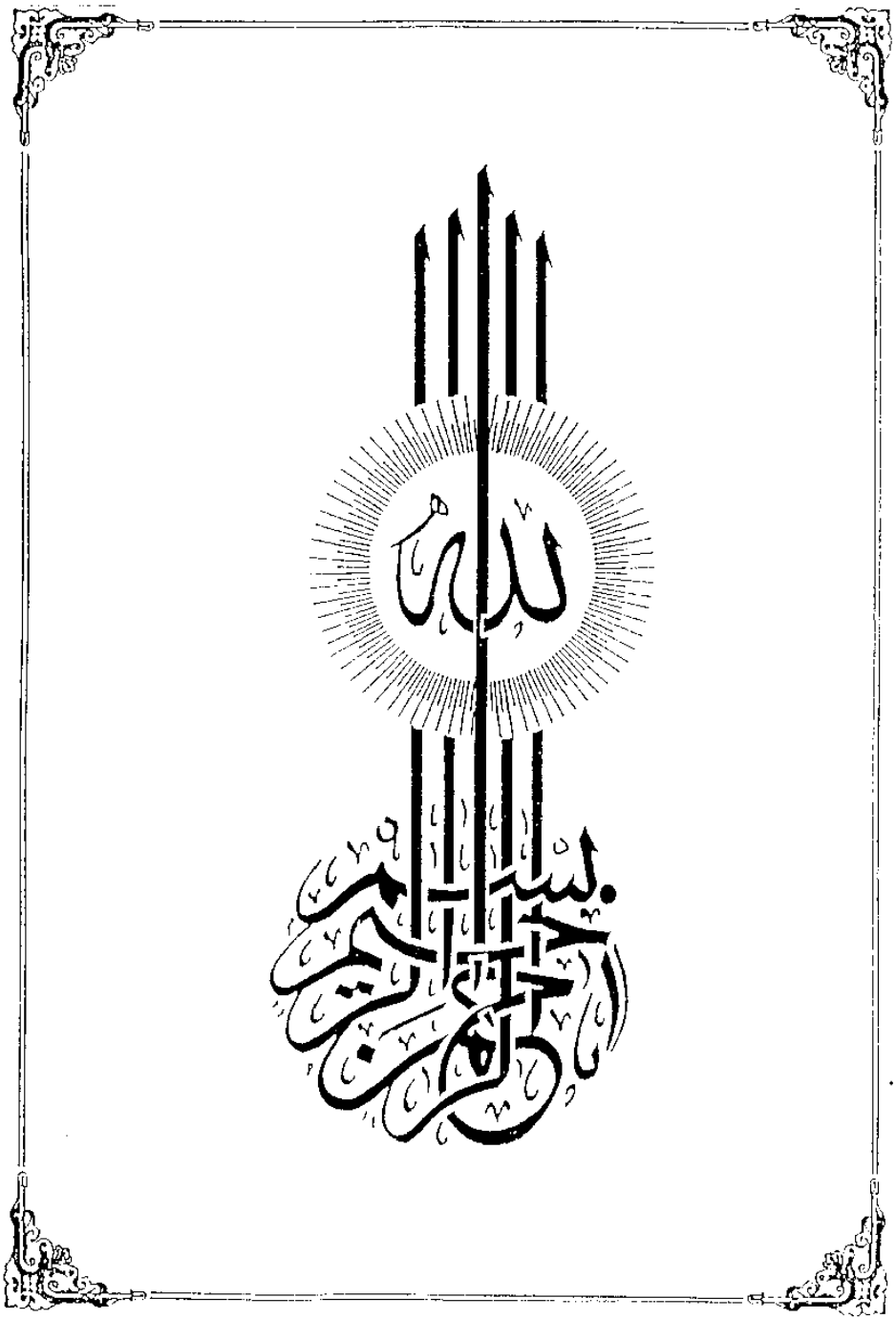
To

Food Science Department

Faculty of Agriculture, Ain Shams University

1987





APPROVAL SHEET

STUDIES ON THE COMPOSITION AND PROPERTIES OF GOAT AND SHEEP MILK

By

MOHAMED MANSOUR ABD EL- REHIM EBRAHIM EL- LOLY

This Thesis for the degree of M. Sc.

had been approved by :

Prof. Dr. G. A. Mahran

Prof. Dr. M. A. El-Ghandour

Prof. Dr. M. A. Khalil

Committee in charge

Date 21 / 9 /1987

ACKNOWLEDGMENT

The writer is gratefully indebted to Professor Dr. ***G.A. MAHRAN***, Food Science Department , Faculty of Agriculture , Ain - Shams University and Dr. ***H.A. EL-ALAMY***, Associate Professor , Food Technology and Dairying Laboratory , National Research Centre , Cairo , for their supervision and unlimitting help right through this course of investigation.

Thanks are also due to Dr. ***L.F. HAMZAWY***, Associate Professor of the above Department and Dr. ***M.B. MAHFOUZ*** Researcher of the above Laboratory for their well appreciated assistance.

Grateful acknowledgment should be also extended to the staff of the Dairy Research Laboratory, National Research Centre, and Food Science Department, Faculty of Agriculture Ain-Shams University, for the facilities they offered to make this work possible.

CONTENTS

INTRODUCTION

INTRODUCTION

In animal production systems, a particular species is often preferable due to its economic importance, and its ability to make use of available feed stuffs. Goats and sheep are the most neglected of farm animals with value for humans in the Less Developed Countries (LDC).

Increasing goat and sheep production in the LDC, therefore, offers tremendous opportunities for improving the living conditions of the people in these countries.

The production of goat milk is more important than production of sheep milk in the LDC. According to the 1976 FAO production Yearbook, LDC goats produced about 69% of the world supply of goat milk, while sheep in the LDC produced 47% of the world's sheep milk. Also, the production of ewes' and goats' milk is important in several countries whose climatic conditions are not well-suited to cattle raising . The FAO Production Yearbook for 1980 gives the figures of 1120 and 459 million heads of sheep and goats, respectively, world-wide, with an annual milk production of 7.6 and 7.2 million metric tonnes (*FAO, 1981*).

In Egypt, according to the 1982 Yearbook of statistics, the goat population occupies the fourth position in order of frequency after buffaloe's, cow's and sheep. The goat population in 1979 was 1349000 capita and raised in 1981 to 1475000 capita.

The overall milk production animals in Egypt during 1981 buffaloes, cows, sheeps and goats were 7195000 capita. So the goat's percentage is 20.05% from the total number of animals producing in 1981 and its production contributed about 0.42% of the total milk production from all sources.

The ewes population in Egypt in 1982 were 3541367 capita (1529452 in upper Egypt, 949790 in lower Egypt and 1062125 in Matrooh reigons).

In general, data regarding the detailed composition of either goat or sheep milks in Egypt are relatively limited. Therefore, the object of the present work was to study the detailed gross compositions of both goats' and ewes' milk including fatty acids, amino acids, minerals and also the electrophoretic pattern of milk protein fractions to find some correlation between them that would be of importance to goats' and ewes' milk processing.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

GOATS' MILK

The chemical composition of goats' milk in Egypt was studied by ***Sirry*** and ***Hassan*** , (***1954***). They found the averages of 1.0318 for specific gravity (S.G.); 4.08% for fat; 8.56% for solids -not- fat (S.N.F.); 0.533 % for total nitrogen (T.N.); 0.429% for casein nitrogen; 0.035% for non- protein-nitrogen (N.P.N.) and 80.52% for casein number. Also they showed that the specific gravity, casein number and solids-not-fat percent of cow and goat milks differed significantly.

Nirmalan and ***Nair*** , (***1962***), reported that the averages composition of Malabar goats' milk were 1.034 for S.G. (at 60^{O}F); 14.62% for T.S.; 0.76% for ash; 4.95% for fat; 4.044g/100ml for protein; 3.15 g. for casein; 0.613g. for whey proteins; 45.5 mg. for N.P.N.; 5.09g. for lactose; 167.7 mg. for Ca and 102.9 mg. for P.

Kuzdzal and ***Kuzdzal,*** (***1963***), estimated the fatty acids of milk of several species and noted that goats' milk had greater amounts of capric acid than the cow and human milks.

Leonhard , (***1963***), showed that the mean values for composition of the milk of improved white goat were : 11.26% for T.S.; 2.97% for fat ; 3.18% for T.P.; 2.62% for casein; 0.206% for Cl; 4,75% for lactose; 0.169% for Ca; 0.1047% for P. 1.0298 for density and 5.55 ^{O}SH for acidity. Also he observed that the mineral content and acidity were higher in winter than in summer and there was an increase in Ca and P contents, and in milk acidity towards the end of lactation.