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التوثيق الالكتروني والميكرو فيلم

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*Tanta University
Faculty of Veterinary Medicine
Department of Theriogenology*

**STUDIES ON SEMEN CHARACTERISTICS AND
TESTOSTERONE PROFILE IN RELATION TO SOME
ULTRASONOGRAPHIC FEATURES OF THE TESTIS
AND EPIDIDYMIS OF BALADI GOAT**

A THESIS PRESENTED BY

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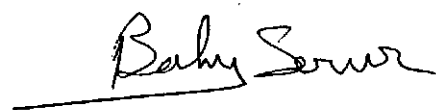
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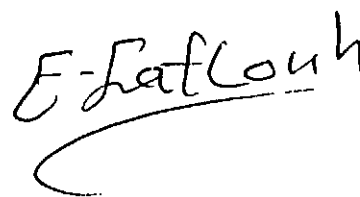
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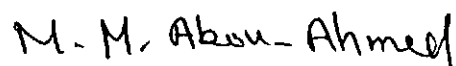
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ACKNOWLEDGMENT

The prayerful thanks should be submitted to the most merciful God, who made me able to accomplish this work.

I would like to express my sincere appreciation to **Prof. Dr. El-Sayed M. Fattouh**, Prof. of Theriogenology, Faculty of Veterinary Medicine, Tanta University, for his continuous helpful advice and valuable assistance throughout the course of this study.

My special appreciation is expressed to **Prof. Dr. M.M.M. Abou-Ahmed**, Prof. of Theriogenology, Faculty of Veterinary Medicine, Cairo University, for his helpful advice, constructive criticism, actual encouragement and guidance in preparing and proposing the subjects of this work.

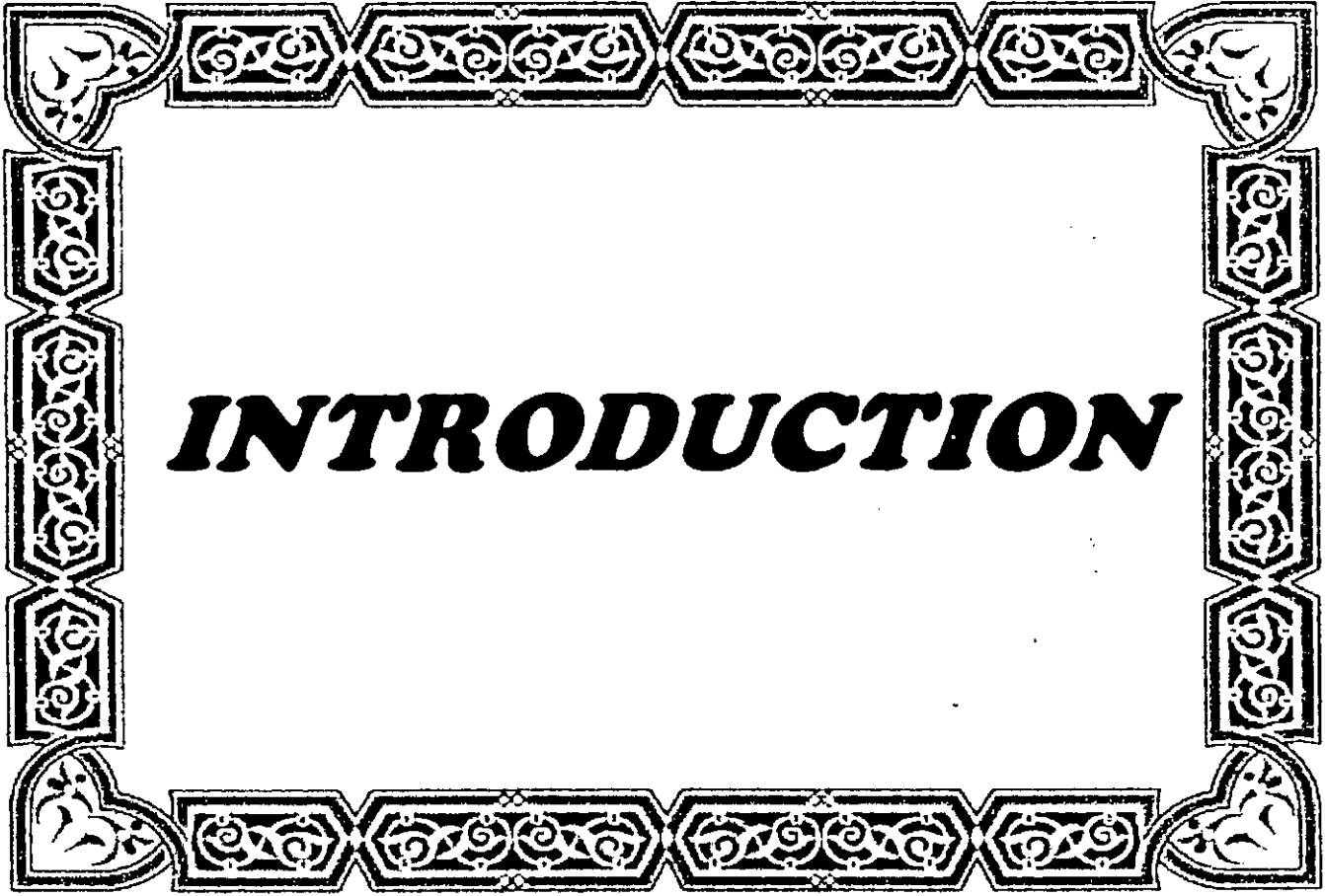
My deep gratitude to **Prof. Dr. Bahy H.M. Serur**, Prof. and Head of Theriogenology Department, Faculty of Veterinary Medicine, Tanta University, for his kind supervision and valuable advice during the course of the study.

Appreciation is also extended to **Prof. Dr. Saber M. Shoker**, Prof. of Anatomy and Embryology, Faculty of Veterinary Medicine, Suiz Canal University, for his kind supervision, sincere advice and actual cooperation in the ultrasonographic examination.

I must not forget the cooperation and assistance of all members of staff in the Department of Theriogenology, Faculty of Veterinary Medicine, (Kafr El-Sheikh), Tanta University, to whom I express my deep gratitude.

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A decorative border with a repeating geometric and floral pattern, featuring stylized leaves and scrolls, framing the central text.

INTRODUCTION

INTRODUCTION

Genetic improvement of farm animals relies on the intensive use of a few superior males either from natural mating or in artificial insemination programmes. Goats are exploited for diverse purposes including meat, milk and cheese production, commercial antibody production and skins for leather making (Smith and Sherman, 1994). These products may be increased through selective breeding of does with bucks exhibiting good genetic characteristics. Goats are highly adaptable to a broad range of climatic and geographic conditions and are more widely distributed than any other ruminant livestock. Out of 609,488,000 heads in the world, 180.30 and 463.33 million in Africa and Asia, respectively, and 3,210,100 in Egypt (FAO, 1997). Approximately 94% of the world's goats are found in developing countries and 6% in developed countries. Goats in Africa and Asia produce 74.46% of goat milk and 65.10% of goat meat from the overall world production (FAO, 1997). The evaluation of male for breeding soundness is an important aspect of a reproductive management program. Evaluation of male fertility was based on scrotal circumference, motility and morphology of the sperm cells (Bongso, Jainudeen and Sitizahrah, 1982).

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Ultrasonography has rapidly become established as one of the principle imaging techniques used in veterinary practice. It allows the clinician to obtain instant information about a wide range of body systems and in some cases the dynamic function of the organs can be assessed. In addition, ultrasonography has led to new insights into basic anatomy and physiological processes (Goddard, 1995).

Ultrasonography in veterinary medicine was introduced in 1970. The earliest use of ultrasound in veterinary reproduction was that of pregnancy diagnosis in swine, sheep, goats and cattle, but the accuracy rate has not proven acceptable (Momont, 1980; Tierny, 1983). To date, despite the widespread use of ultrasonography in human medicine, veterinary literature contains few reports on the use of ultrasonography for the diagnosis of testicular and intra-scrotal lesions in domestic animals (Ahmad and Noakes, 1995).

The ultrasonographic appearance of the normal testis and epididymis of the buck has been described previously (Ahmad, Noakes and Subandrio, 1991) and its use in the diagnosis of testicular degeneration has been reported, although no conclusion could be drawn (Ahmad, Noakes and Middleton, 1993).

Testicular volume, as estimated by measuring scrotal circumference or testicular size is often used to predict sperm production in bull (Lunstra, Gregory and Cundiff, 1985; Toelle and Robison, 1985; Gabor, Mezes, Tozser, Bozo, Szucs and Barany, 1995). Ultrasonography can also be used to predict testicular volume and sperm production in bulls. Moreover, ultrasonographic measurements of testicular volume in men were correlated with sperm count (Lenz, Thomsen, Giwereman, Herte, Hertz and Skakkebaek, 1994).

The present study was, therefore, undertaken to:

1. Imaging the normal echogenic features of the testis and epididymis of goats.
2. Compare the efficiency of ultrasonographic measurements of the testis (length, width and thickness) and scrotal circumference with caliper and tape measurements *in vivo*.
3. Determine the relationships amongst the studied ultrasonic measurements of the testis and scrotal circumference, caliper measurements, semen characteristics and testosterone profile in male goats.
4. Evaluate the validity of using scrotal circumference, caliper and/or ultrasonic measurements of testis size *in vivo* to predict sperm production in goats.

***REVIEW
OF
LITERATURE***

REVIEW OF LITERATURE

I. Ultrasonographic imaging of the male genital organs:

Despite the fact that ultrasound has been extensively used for examination of the female genital system, little information is available on the ultrasonographic appearance of the male genital organs.

I.1. Ultrasonographic imaging of buck and ram testes:

It is important for the sonographer to be familiar with the normal appearance of the tissues of the testes which allows identification of the testicular abnormalities. The great advantage of ultrasound in the evaluation of testis abnormalities is the ability to detect those lesions which do not produce gross changes of testicular size and can not be palpated (Moudy and Makhija, 1983).

Eilts, Pechman, Taylor and Usenik (1989) stated that testicular parenchyma of the male goat was uniform and homogenous in appearance. The authors added that the mediastinum testis appeared as a hyperechoic line in the center of the testis, the testicular tunics and testicular capsule were evident as distinct hyperechoic lines encircling the testicular parenchyma. In some goats, a small amount of fluid could be seen between the parietal and visceral tunics. After orchiectomy, the ultrasonographic observations of the excised testes did not differ from those seen when ultrasonography was performed on the testes in the

scrotum. Therefore, ultrasonography of the testes after castration had no particular advantage over scrotal ultrasonography (Eilts *et al.*, 1989).

The ultrasonographic appearance of the degenerating testicular parenchyma of goat was hypoechoic at the prephery, and retained its mottled texture in the central area. The mediastinum testis was clearly visible (Eilts *et al.*, 1989).

The ultrasonographic appearance of testicular parenchyma of ram testis was predominately homogenous and hypoechoic, with hyperechoic areas representing the mediastinum testis or other intrusions of the tunica albuginea (Cartee, Rumph, Abuzaid and Carson, 1990). The ultrasonographic appearance of the normal caprine testis was similar to that of bovine and ovine testes. The testicular parenchyma of ram and buck appeared as a homogenous and moderately echogenic structure with a centrally located mediastinum testis represented by an hyperechogenic line in longitudinal ultrasound scan and by an almost circular spot in transverse images (Ahmad, *et al.*, 1991). The later authors recorded that the testicular capsule and skin were evident as a distinct hyperechogenic line encircling the testicular parenchyma. A thin non-echogenic layer of fluid between the two layers of tunica vaginalis was observed.

In *British Alpine* buck with a history of progressively declining fertility, the testicular parenchyma was appeared heterogeneous with many dense echogenic areas scattered through them and many of them exhibited acoustic shadowing. Owing to their abundance, the mediastinum testis, which normally appears as an echogenic line on longitudinal images and as an almost circular area on transverse images, could not be identified (Ahmad *et al.*, 1993).