Mona maghraby

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني

Mona maghraby

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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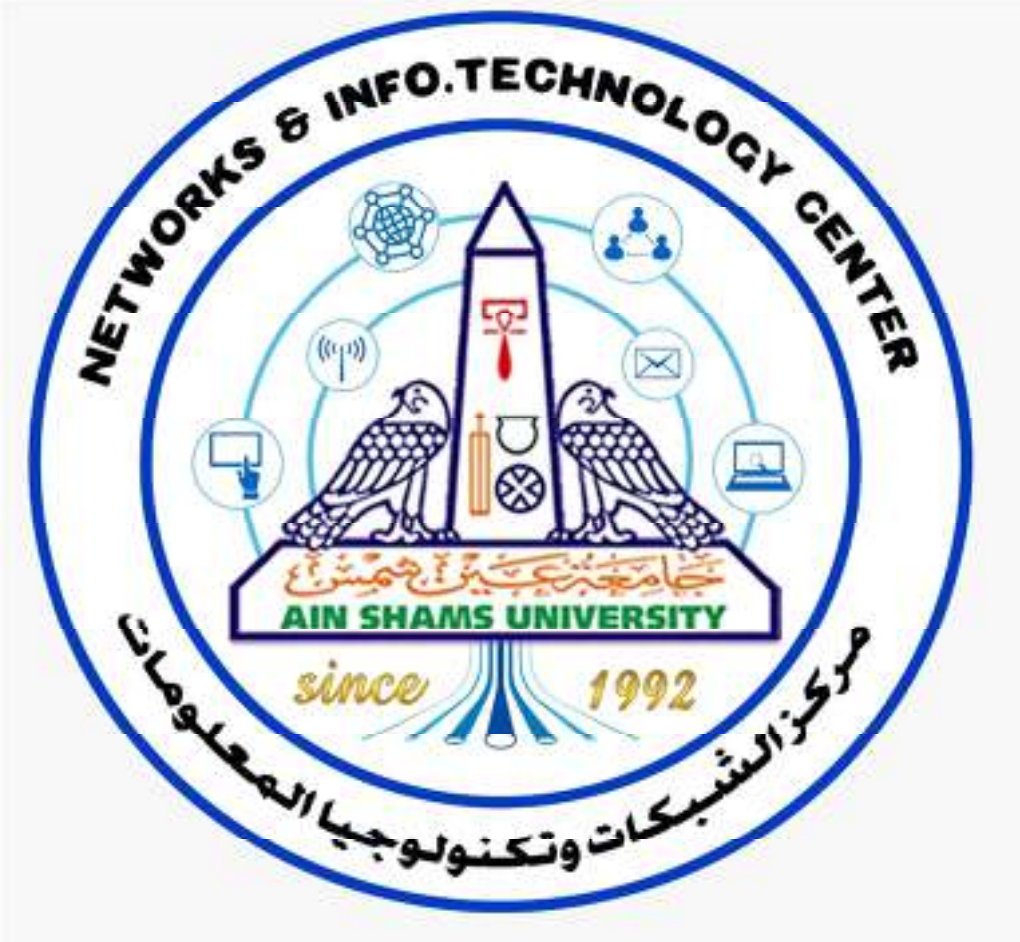

بعض الوثائق الأصلية تالفة
وبالرسالة صفحات لم ترد بالأصل

Cairo University
Department of Theriogenology
Faculty of Veterinary Medicine

SOME STUDIES ON SEMEN QUALITY IN GOATS

A thesis presented by

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CONTENTS

INTRODUCTION

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The goat is a hollow- horned ruminant belonging to the order Artiodactyla, sub-order Ruminantia, family Bovidae and either of the genera Capra or Hemitragus. The domestic goat belongs to the genus Capra.

The goat is probably the first animal to be domesticated around 9000 - 7000 B.C. Goats are small, hardy animals and easier to maintain than cattle **(Devendra and McLeroy, 1990)**. They are important in tropical and sub-tropical livestock production systems and can be exploited for the benefit of the peoples. In their subsistence sector, pastoralists and agriculturalists often depend on goats for much of their livelihood. The economic importance of goats depends on the value of their produce or services which include meat, milk, fibres and skin among others **(Devendra, 1981).**

Although goats are widely distributed in the tropics and sub-tropics,they remain neglected resources. In the tropics and sub-tropics, goats represent 28.9% of the total population of ruminant livestock and 78.5% (350.2 millions) of the total world goat population (446 millions). The largest concentration of goats are in Africa, 144.7 millions, and in the Indian sub-continent, 109.8 millions, (**FAO, 1979**).

The wide distribution of goats in the tropics and sub-tropics reflects their ability to adapt to a variety of environments. The inherent characteristics of goats such as resistance to dehydration, preference for browse and wide-ranging feeding habits, enable them to thrive in regions with very little rainfall.

In less developed countries, human populations are growing very rapidly creating a significant and increasing demand for additional animal protein feeds. This demand can be met most easily by rapidly increasing the ruminant livestock population. It is easier to increase the population and productivity potential of small ruminants such as goats and sheep than large ruminants such as cattle and buffaloes.

Productivity potential in goats can be augmented through use of sire testing and artificial insemination (AI). If AI is to be used nationally in goat industry and progress is to be made concerning overall improvement of the species, more research is required. AI is used to spread the high quality male genes evidenced by progeny testing. This become possible only after the application of AI and related methods, treatments and techniques had reached high levels of efficiency (**Chenoweth, 1983**).

The AI technology in goats is relatively less developed as compared to cattle and buffaloes although fairly good knowledge of its practical aspects have accumulated over a period of the last 25 years in Egypt.

Good semen quality is essential for the success of an AI program. It is well known that quality of semen in goats depending on the breed, geographical location and season of the year (**Eaton and Simmons, 1952; Corteel, 1981; Chemineau, 1986**). Systemic studies on goat semen are needed in order to understand the problems of seasonality in production , morphological and biochemical make up.

Semen characteristics are assessed not only for the prediction of male fertility, but also to evaluate the way of processing the ejaculate in the laboratory. The characteristics used are believed to be relevant to the chance of oocyte penetration, fertilization and subsequent embryonic development.

Examples of these criteria are sperm motility, membrane integrity, occurrence of sperm abnormalities, activity of specific enzymes and sperm-oocyte interaction. The majority of semen quality characteristics are related to viability (**Woelders, 1988**). It has been recognized that fertile bulls have more viable spermatozoa and a consistently lower incidence of morphologically abnormal sperm than non fertile or subfertile bulls (**Saacke, 1982**). A high proportion of abnormal spermatozoa has been shown to influence fertility adversely in domestic animals, including goats (**Skalet, Rodrigues, Goyal, Maloney, Vig and Noble, 1988 ; Barth and Oko, 1989**). In order to obtain more detailed information on the fertilizing capacity of spermatozoa, attention should be paid to the acrosome integrity (morphology) and/or aspartate amino transferase (AS-T) activity in the seminal plasma (**Hillmann and Treu, 1973**).

Cellular injury resulting from rapid cooling to a temperature in the range of 0 to 10°c or 15°c is surprisingly wide spread (**Morris and Watson, 1984**). The peculiar sensitivity of goat spermatozoa (**Sahni and Roy, 1972a**) presents an intriguing scientific problem as well as practical difficulty to be overcome in the preservation of semen by freezing. Indeed, survival after cold shock is positively correlated with fertility after freezing and thawing , and has been used as a test for freezability in boar (**Moroz, Korban, Shapiev and Rustenova, 1980**).

The release of AS-T from spermatozoa after cold shock has been considered to be an index of measurement of cellular injury (**Graham and Pace, 1967; Roychaudhury, Pareek and Gowda, 1974**). The most obvious signs of cold-shock injury to spermatozoa is an irreversible loss of motility. The organelles most frequently damaged by cold shock are the plasma

membrane, the acrosome, the mitochondria and leakage of enzymes. Loss of lipids from spermatozoa into the extracellular medium have been found following cold shock (**Watson, 1981**).

The present study was, therefore, undertaken to:

(1) Determine the quality of the semen of Zaraibi goats throughout a period of one year. This information is a prelude to semen extension and AI in this breed.

(2) study the relationship between scrotal circumference measurements , semen characteristics and body weight changes throughout the year.

(3) Test the cold-shock resistance as an indicator of spermatozoa freezability in Zaraibi male goats

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The goat buck is frequently described as half of the breeding herd and many owners find him the more difficult half to control(**Smith and Sherman, 1994**).

Body weight:

Prasad, Roy and Pandy (1972) in their study on live weight growth of Barbari kids up to one year of age observed that live weight gain was not affected by type of birth. In cross Angora male goats slaughtered at 24 months the mean live weight was 21.51 kg (**Ghanekar, Bhatawadekar and Soman, 1973**). **EL-Wishy and EL-Sawaf (1974)** recorded that the increase in live body weight of male Damascus goats aged 2.0 - 8.5 years was clear till the age of five years after which it remained nearly constant. The mean body weight recorded by the latter authors for bucks aged 2.0 - 2.5 years was 43.6±8.3 kg. **Robstad (1976)** found that the body weight of bucks at one year of age was 18.00 kg. For small east African goats mated with a male of the same breed and a male of the Boer breed, average weight of the goats at 375 days of age was 22.00 kg for pure breeds and 34.30 kg for cross-breeds (**Haas, 1978**). In Baladi bucks, **Ghallab (1981)** recorded that live body weight of the bucks increased from 23.31 kg at 12 months and to reach 38.78 kg at 23 months. For Angora goats at postweaning age, **Koratkar and Patil (1982)** recorded average values of 40.31 kg for body weight. **Nanu, Soman and Prabhakaran (1987)** recorded that live body weight of male adult goats (12-15 months age) was 23.00 ± 1.06 kg (ranged between 16.00 to 33.58 kg). For Marwari male goats,

Mittal (1988) found that body weights(kg) were 20.51 and 39.91 kg at 12 months and adult goats respectively. In Baladi bucks ejaculated at high frequency (once daily over a year), **Ghallab (1991)** reported that average body weight of the bucks increased significantly ($p<0.05$) from 33.8 kg at 53 to 56 weeks and to reach 57.2 kg at 101 to 104 weeks age. **EL-Saidy(1993)** reported that the average live body weight was 52.62 kg for Damascus goats and 34.25 kg for Baladi goats at 18 months old.

Ghallab (1981) revealed that body weight of Baladi bucks was highest (24.62 kg) during Summer and increased consistently during the consecutive seasons to reach the heaviest weight (36.91 kg) during Spring. Age and seasonal variations in body weight were statistically highly significant ($P<0.01$). In Malabari and their Saanen half-breds, **Mukundan, Bhat and Khan (1984)** reported that month and year of birth significantly affected body weight gain. In Alpine and Saanen buck goats, **Delgadillo, Leboeuf and Chemineau (1991)** noted that live body weights were decreased(about 7 kg) between September and January.

Body Size and Scrotal Circumference:

Differences in body dimensions (withers height and heart girth) of male goats due to breed effect were significant **(Chawla and Iqbal Nath, 1979; Mukhrejee, Singh and Mishra, 1979** and **Kumar, Ameresh and Harpal,1980)**. For Angora goats at postweaning age, **Koratkar and Patil(1982)** reported that heart girth and height at withers were 90.00 and 66.89 cm respectively. For Marwari goats, **Mittal (1988)** found that withers