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STUDIES IN EWE PRODUCTIVITY  
UNDER SEMI ARID CONDITIONS

By

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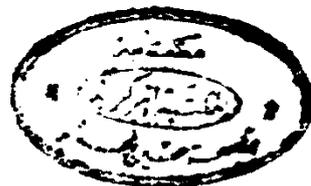
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## I. INTRODUCTION

Reproductive efficiency and productive ability are the most important traits to be considered in any breed of sheep raised for mutton or wool production. Crossbreeding is widely used as an accepted system to improve traits such as these particularly in local breeds of sheep living under semi arid areas. One fact remains to be considered in this respect which is, the conditions of those poor areas do not permit the imported purebreeds and some of their crosses to maintain their productive capabilities as high as in their original countries.

Data available for the present study were collected over a period of 11 years from two experimental stations belonging to the Desert Research Institute, where a crossbreeding programme was initiated at Ras El-Hekma station in 1958 in order to improve wool, lamb and milk production of the local Barki sheep by selection and/or by crossing with the imported Hungarian Merino and Syrian Awassi sheep.

The present work was conducted to evaluate some important reproductive and productive traits of sheep raised

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under semi arid conditions and to investigate the effect of crossbreeding on these traits.

The traits dealt with were: oestrous cycle length, number of services per conception, conception rate, lambing rate, number of lambs weaned per ewe bred and number of kilogrammes weaned per ewe bred.

## II. ABBREVIATION

B	=	Barki
M	=	Merino
A	=	Awassi
AB	=	$\frac{1}{2}$ Awassi $\frac{1}{2}$ Barki
$\frac{1}{4}$ M	=	$\frac{3}{4}$ Merino $\frac{1}{4}$ Barki
$\frac{1}{2}$ M	=	$\frac{1}{2}$ Merino $\frac{1}{2}$ Barki
$\frac{3}{4}$ M	=	$\frac{1}{4}$ Merino $\frac{3}{4}$ Barki
$\frac{3}{8}$ M	=	$\frac{3}{8}$ Merino $\frac{5}{8}$ Barki
$\frac{5}{8}$ M	=	$\frac{5}{8}$ Merino $\frac{3}{8}$ Barki

### III. REVIEW OF LITERATURE

#### A. Oestrous Cycle Length

The average length of the oestrous cycle in the ewe as reviewed by several workers; Timariu (1963), Mabrouk (1970), Badawy El-Bashary and Mohsen (1973) and Tiwari, Karmode, Singh, Singh and Sahni (1974); is round 16.5 days with a normal range from 14 to 19 days.

##### 1. Effect of season and year

Oestrous cycle length in the ewe was affected by season as reported by Timariu (1963) in Pals Merino, Amir and Volcani (1965) in Awassi fat-tailed, Smith, Bell and De Chancel (1966) in Merino and Anderson (1972) in Merino, Masai and Somali sheep.

In 697 cycles in Barki, Merino, Awassi and six different crosses, Mabrouk (1970), showed that year effect on interval between consecutive services proved to be highly significant.

On the other hand, Narayanaswamy and Balaine (1976) analysis 337 records from Bannun sheep, stated that the effect of season was not significant.

## 2. Effect of breed of ewe

The average length of oestrous cycle as reported by different authors is presented in Table 1.

Table 1. Oestrous cycle length in different breeds of sheep.

Reference	No.	Breed	Estimate of oestrous cycle length (days)
Kennedy and Bettenary (1950)	173	Merino	15.5 ± 3.3
Mounib, Ahmed and Hamada (1956)		Egyptian adult Rahmany sheep	17.4 ± 0.1
Ghanem, Fahmy, Seoudi and Farid (1963)		Barki	15.5
		Merino	18.0
		Awassi	15.0
Tinariu (1963)		Palas Merino	17.7
Hutchinson, Oconnor and Robertson (1964)	44 cycles	Welsh Mountain ewes	16.3
Anir and Volconi (1965)		Awasi	18.0
Mabrouk (1970)	290 records	Barki	16.6
	172	" Merino	17.0
	66	" Awassi	21.0

Table 1 (Contd.)

Laparia (1972)	100 approx.	Sonadi	17.2
Anderson (1972)	2122 cycles	Merino	17.7
	1159 "	Masais	17.5
	1261 "	Somalis	17.6
Badawy et al. (1973)		Barki	17.3
Sadykov, Rabochev and Sadykov (1973)	458 ewes	Alai semi coarse wooled	18.0
	527 "	Kingiz fine wool ewes	18.4
Tiwari et al. (1974)		Rambouillet, Rambouillet cros- ses and native breeds	16.5-17.7
Narayanawamy and Balaine (1978)	337 records	Bannur	19.4±1.1

### 3. Effect of age of ewe

Shaner et al. (1963) reported that oestrous cycle length was 15.9, 16.0 and 15.0 days for Barki, Merino and Awassi wethers, respectively; and 15.3 and 15.8 days for Barki and Merino, maiden ewes. Steklenov (1967) showed that oestrous cycle length tended to decrease as age of ewe increased in Hampshire and Mountain Merino.

Mabrouk (1970) analysing 697 normal cycles in Barki, Merino, Awassi and six different crosses, showed that the mean interval between services for 2, 3, 4 and over 4 years old ewes was 16.7, 15.5, 16.5 and 15.9 days, respectively; the differences were nonsignificant. This finding was contrary to what have been previously reported by Mounib et al. (1956) on Egyptian Rahmany ewes. The average length of normal cycles in the latter study was  $17.4 \pm 0.1$  days in adult ewes, while it was  $16.8 \pm 0.1$  days in ewe lambs; and the difference being highly significant. Badawy et al. (1973) showed the same results in ewe lambs and nature ones.

### 2. Number of Services Per Conception

Number of services to obtain conception is considered an important parameter in the flock reproduction. The most relevant factors involved fall into the following headings.

#### 1. Effect of season and year

In general, most workers showed that the number of services required for conception varied from year to year and from season to season within the year.

Watson and Radford (1966) showed that all Merino ewes mated in summer and autumn, whereas some ewes failed to mate in winter and many in spring due to ovarian inactivity. Ampy and Rottensten (1968) observed that Awassi ewes mated in autumn responded more readily to the rams than in spring or summer. Actual rates for return to service in the autumn were 43.2% of Bungaree and 20.5% of Peppin Merino ewes compared to 20.9 and 18.6%, respectively, in the spring as reported by Giles and Drinan (1969). This may be due in part to changes occurring in the fertility of rams.

Fertility of Southdown rams was lowered under high environmental temperature as showed by Smith et al. (1964). Habrouk (1970) found that the effect of year on the number of services per ewe conceived was significant. Quinlivan and Martin (1971) stated that the proportion of New Zealand Romney ewes which returned to service decreased with the delay in the mating season.

## 2. Effect of breed of ewe

Shanem et al. (1963) reported that 93% of Baraki ewes were mated during the first 34 days of breeding season,

while 79% and 68% of Merino and Awassi ewes, respectively, were mated during the same period. Repeated services occurred more frequently in Merino and Awassi than in the local Barki ewes. Giles and Drinan (1969) found that Bungee ewes returned to service during autumn more than Peppin Merino ewes; the difference being significant.

Mabrouk (1970) working on Barki, Merino, Awassi and six different crosses, found that breed of ewe had no significant influence on number of services per conception. However, he observed that Barki ewes required less number of services followed by the Merino while the Awassi required more services per conception.

### 3. Effect of age of ewe

Edgar (1962) found that the proportion of young and mature New Zealand Romney Marsh ewes returning to service was 30% and 16%, respectively. He also observed that in young ewes the ova tended to pass more rapidly through the Fallopian tubes, thus missing fertilization. Likewise, repeated services occurred more frequently in maiden (1½ years old) than in mature ewes, as stated by Khanem et al. (1983). However, age of ewe was not a significant source of variation