

COMPARATIVE STUDY BETWEEN SINAI AND RAHMANI SHEEP 1- SOME REPRODUCTIVE PARAMETERS OF EWES AND SEASONAL VARIATIONS IN SEMEN CHARACTERISTICS

R.M. Khalifa and M.A. Yaseen

Department of Animal Production, Faculty of Agriculture, Suez Canal University, Ismailia, Egypt

SUMMARY

Eighteen Sinai and nine Rahmani ewes throughout two consecutive years were included to study oestrous cycle length (ECL), standing estrus period (SEP), gestation period (GP) and conception rate (CR). The obtained results revealed that the Sinai ewes were similar to Rahmani ewes in ECL, GP and CR. While SEP was significantly ($P < 0.01$) longer in Sinai (46.3 ± 1.6 hours) than Rahmani ewes (33.3 ± 1.9 hours).

Three rams of each breed were used to study some physical and chemical semen characteristics through the four seasons of the year. The semen characteristics of Sinai were totally averaged 1.05 ml/ejaculate, 6.68 pH, 73.7% initial advanced motility, 2.66×10^6 spermatozoa/ml, 12.59% total abnormality, 11.78% dead spermatozoa, 2.08×10^9 total motile sperm/ejaculate and 449.5mg initial fructose/100 ml semen. While the corresponding averages of Rahmani were 1.21, 6.73, 73.57, 2.69×10^6 , 13.52, 12.68, 2.44×10^9 and 686.78, respectively. All the studied semen characteristics were significantly ($P < 0.01$) affected by breed except initial motility and sperm cells concentration. Semen ejaculate volume was the only character which was not affected by season of the year. Average total motile sperm cell/ejaculate of summer season was the lowest in both Sinai (1.86×10^9) and Rahmani (2.05×10^9). The effect of sequence of semen ejaculation (First vs. Second) on the studied semen characteristics were significant ($P < 0.01$) except the pH and initial fructose content. This study indicated that both Sinai and Rahmani rams

gave good quality semen through the four seasons of the year in each of the first and second consecutive ejaculates.

Keywords: Sheep, Rahmani, Sinai, season, reproductive parameters, semen characteristics

INTRODUCTION

The government of Egypt resolved to develop the agriculture in Sinai. The new canal digging to provide Sinai with Nile water as a source of irrigation is great step for such development. The most abundant farm animals raised in Sinai are sheep, goats and camel. Sheep should contribute a great deal to the agriculture development due to its wide adaptability in a wide range of climatic and feeding conditions. The knowledge about reproductivity of Sinai sheep are necessary to improve sheep production in Sinai. Data concerning the reproductivity in Sinai sheep are lacking.

The present study was conducted to investigate a) the oestrous cycle length, estrus phase duration, conception rate and gestation period in Sinai ewes compared to Rahmani ewes and b) seasonal variations of some physical and chemical characteristics of semen of Sinai rams compared to Rahmani rams.

MATERIALS AND METHODS

This study was carried out at the Animal Production Farm of the Department of Animal Production, Faculty of Agriculture, Suze Canal University, during the period from July till July 1993.

Housing and feeding of the animals

Females of each strain were housed as one group in separate sheltered yard. Rams of both strains were housed together. The animals were fed according to their body weight following the daily allowances given by Ghoneim (1967) for local sheep in terms of starch value units and digestible protein/head. In winter and spring, the animals were fed on concentrate diet and Egyptian clover (*Trifolium alexandrinum*) however in summer and autumn, clover was replaced by clover hay. The concentrate diet consisted of wheat bran, corn,

cottonseed meal, rice bran, molasses, lime stone, sodium chloride and mineral mixture. Average chemical composition was 10.6% moisture, 12.1% crude protein, 13.3% crude fibers, 9.2% crude fat and 9.4% ash. Animals had free access to liberal amounts of rice straw was always available in the yards.

During the last eight weeks of gestation daily feed allowances were increased by 40% and over the lactation period they were increased by 200% over the maintenance level of energy and protein.

Female reproductive traits

Eighteen Sinai and nine Rahamani ewes were included to study oestrous cycle length, heat duration, gestation period and conception rate.

a- Oestrous cycle length (ESL) was determined during summer season. Heat detection was checked twice daily at about 12 hour intervals (using aproned fertile ram) with close observation. The ewe was considered in heat when it stood and accepted the ram to mount her, the oestrous cycle length was calculated as the period of time between two consecutive heats.

b- Duration of estrus phase (SEP) was checked at six hours intervals during day and night. The time from the mid of first or last interval at which the ewe allowed or refused the aproned ram to mount her was considered the start or end of the estrus phase and hence its duration was recorded.

c- Conception rate (CR) was determined in two seasons 1992, 1993 (Mating period was 45 days started from the first of September of both years). The ewe showed estrus signs was naturally mated twice by fertile ram of the same breed. The first mating was performed immediately after estrus detection and the second was at 10-12 hours later. The mated ewe which did not show the estrus signs during the expected follow estrus phase was considered pregnant.

d- Gestation period (GP) was calculated as the period from the date of fertile mating to the date of lambing.

Male reproductive traits

Six 18-24 month-old rams of Sinai and Rahmani (3 of each) were used for study seasonal variations of semen characteristics. Average body weight of Rahmani rams was 54.9 kg and 29.4 kg for Sinia rams.

a- Semen samples were collected at the middle of each of the four seasons of the year by artificial vagina, two ejaculates/day two times weekly. Semen was collected also one week just before each of the scheduled period of seasonal evaluation and the obtained results were not taken into consideration. The following characteristics were tested in each semen sample: - Semen ejaculate volume (SEV) was measured in a graduated collecting tube to the nearest 0.1 ml. - Initial pH of semen (pH) was measured by comparative pH paper ranging from 6.0 to 8.0 with 0.2 grades. - Initial advanced motility (IM) was estimated microscopically at 10 x 40 magnification power on warm stage adjusted to 37°C, after being diluted with sodium citrate (2.9%) solution. - Sperm cells concentration (SCC) per ml were determined using Haemocytometer. - Initial fructose content (IFC) was immediately determined in the fresh semen according to the method of Mann (1984). - Percentage of dead (DS) and abnormal spermatozoa (AS) were determined in film stained with buffer eosin according to Mayer *et al.* (1951) method.

Statistical analysis

The data of each character was statically analysed using General Linear Models (GLM) procedure of SAS statistical package (SAS institute, 1987). While conception rate data was statistically analysed using chi square test (χ^2).

RESULTS AND DISCUSSION

Female reproductive traits

Oestrous cycle and standing estrus period: Mean±SE of oestrous cycle length (ECL) and standing estrus period (SEP) are presented in Table 1. Average ECL for Rahmani (17.52 days) was insignificantly longer than Sinai by 0.35 day. These averages are similar to other reports concerned ECL in ewes. The ECL of Rahmani averaged 17.4 day (El-Fouly *et al.* 1977a), 16.88 (Abd El-Bary, 1978) and 17.8 (Aboul-Naga *et al.* 1985b). Studies on Ossimi and Rahmani (El-Fouly *et al.* 1977a), Barki, Ossimi and Rahmani (Abd El-Bary, 1978) and Finn, Ossimi and Rahmani ewes (Aboul-Naga *et al.* 1985b) revealed insignificant breed effect on ECL.

Table 1. Mean \pm SE of oestrous cycle length (days) and oestrus duration (hrs) as affected by breed

Breed	Estrous cycle ¹ length	Estrus duration ²
Rahmani	17.52 \pm 0.15	33.27 \pm 1.87
Sinai	17.17 \pm 0.12	46.32 \pm 1.64**
Overall	17.28 \pm 0.13	42.33 \pm 1.62

1. 105 oestrous cycles were recorded for both breeds.

2. 36 estrus periods were recorded for both breeds.

** Significant at $P < 0.01$

The Rahmani ewes had significantly ($p < 0.01$) shorter SEP (33.27 \pm 1.87 hours) than that of Sinai ewes (46.32 \pm 1.64 hours) as shown in Table 1. The present results of SEP are within the results of other authors especially in Rahmani ewes. El-Fouly *et al.* (1977a) reported an average of 31.5 hours for SEP of Rahmani ewes. However, Abd El-Bary (1978) reported 38.4 hours, while Aboul-Naga *et al.* (1985b) reported 37.7 hours. No available literatures was reported on the reproductive performance of Sinai ewes.

Conception rate and gestation period

Conception rate (CR) for Rahmani sheep averaged 94.44%, insignificantly higher than 88.57% for Sinai sheep as presented in Table 2. The obtained results of CR are in agreement with other reports on naturally mated ewes. Aboul-Naga (1976), Aboul-Naga *et al.* (1980a) and Aboul-Naga and Aboul-Ela (1987) reported 82, 92.6 and 86% CR, respectively for Rahmani sheep. Also CR was 80.5% in Ibidi (Ahmed, 1972) and 85% in Barki sheep (Aboul-Naga, 1976). The CR of first breeding season averaged 88.89% which was insignificantly lower than the 92.31% for second breeding season (Table 2). The ewes of the present work were mated at the same period of the two successive mating seasons, so that the age of ewes (parity) was ineffective on CR.

The overall mean of gestation period (GP) averaged 151.62 \pm 0.29 days as shown in Table 2. The mean GP in the two breed and two parities was almost the same and insignificant. Whereas the difference between first and second parity (0.45 day) and between Rahmani and Sinai

(0.71 day) was few hours as deduced from Table 2. Studies by Mahajan *et al.* (1970), Abd El-Bary (1978) dealt to insignificant breed effect on GP. Mabrouk *et al.* (1976) reported that age of ewes was insignificantly effected GP.

Table 2. Mean \pm SE of conception rate and gestation period length as affected by breed and parity

Breed	Conception rate %*			Gestation period length (days)		
	1st season	2nd season	Overall	1st season	2nd season	Overall
Rahmani	100.00	88.89	94.44	151.78 \pm .6	150.50 \pm .7	151.18 \pm .5
Sinai	83.33	94.12	88.57	151.87 \pm .4	151.92 \pm .6	151.89 \pm .4
Overall	88.89	92.31	90.57	151.83 \pm .4	151.38 \pm .5	151.62 \pm .3

* The ewes conceived from first mating.

Semen characteristics

The climatological data through the season of semen evaluation are presented in Table 3.

Table 3. Range air temperature ($^{\circ}$ C) and average relative humidity(%) and day length (hrs) in Ismailia during seasons of semen investigation

Season of the year	Air temp. Min Max.	Relative humidity	Day length	
Winter	January	8.9-17.5	70.0	10.4
	February	8.7-18.3	63.0	11.3
Spring	April	13.7-26.1	52.3	12.8
	May	17.2-30.3	49.3	13.7
Summer	July	22.3-34.5	55.0	13.9
	August	22.9-35.5	60.0	13.2
Autumn	October	17.6-30.7	67.0	11.5
	November	14.5-21.9	60.7	10.7

Breed effect

Data presented in Table (4) shows that the Rahmani rams gave higher averages of all semen characteristics than Sinai rams except IM which was almost the same in both breeds. ANOVA (Table 6) showed that breed of rams significantly ($p < 0.01$) affected all semen characteristics except IM and SCC. The total average was 1.05 and 1.21 ml SEV, 6.68 and 6.73 pH, 73.7 and 73.6% IM 2.66 and 2.69 $\times 10^9$ SCC/ml, 12.59 and 13.52% AS, 11.78 and 12.68% DS, 2.08 and 2.44 $\times 10^9$ TMS/ ejaculate and 449.5 and 686.8 mg IFC/100 ml semen of Sinai and Rahmani rams, respectively. The available literature did not contain data about Sinai ram semen. While some reports (El-Fouly *et al.* 1977b and Aboul-Naga *et al.* 1980b) been written about Rahmani semen. Rams of different breeds reared under the same environmental conditions gave different characteristics of semen. The studies by El-Alamy *et al.* (1980) showed that breed of rams (Ossimi and Saidi) affects SEV. Ram semen pH was affected by breed (Mehta *et al.* and Sharma *et al.*, 1973; El-Fouly *et al.*, 1977b; Hilal, 1979 and Trejo *et al.*, 1990). Sharma *et al.* (1973) reported that breed of ram effected AS and TMS. Semen IFC affected by breed of ram also (Rao and Singh, 1975). The difference between breeds in semen characteristics are mainly due to the rate of spermatogenesis and size and activity of sex organs (Mann and Maann, 1981). The statistical analysis revealed that the effect of interaction between breed and ejaculates was insignificant for all the studied semen characteristics except SEV. This may be due to that the Sinai rams did not show the same trend of SEV through the experimental period. Generally both Sinai and Rahmani rams gave good quality semen ejaculates during the four seasons of the year.

The effect of sequence of ejaculation

The averages of semen characteristics in first and second ejaculates of both the two breeds are presented in Table (4). The averages of the first and second ejaculates respectively were 1.19 and 1.06 ml SEV, 6.73 and 6.71 pH, 72.6 and 74.66 and 2.28 $\times 10^9$ SCC/ml, 13.99 and 12.67% AS, 12.48 and 11.97 % DS, 2.44 and 2.09 $\times 10^9$ TMS/ ejaculate and 551.73 and 586.56 mg IFC/100ml semen. ANOVA (Table 6) shows significant ($p < 0.01$) differences between ejaculates in all the studied semen

Table (4): Mean \pm SE of ram semen characteristics as affected by breed and ejaculate.

Semen Characteristics*	Sinaï			Rahmani			Overall	
	Ejaculates			Ejaculates			1st ejaculates	2nd ejaculates
	1st	2nd	Total	1st	2nd	Total		
SEV (ml)	1.08 \pm 0.03	1.02 \pm 0.02	1.05 \pm 0.02	1.30 \pm 0.03	1.11 \pm 0.02	1.21 \pm 0.02	1.19 \pm 0.02	1.06 \pm 0.02
pH	6.67 \pm 0.01	6.70 \pm 0.01	6.68 \pm 0.01	6.72 \pm 0.01	6.73 \pm 0.01	6.73 \pm 0.01	6.69 \pm 0.01	6.71 \pm 0.01
IM %	72.81 \pm 0.92	74.58 \pm 0.79	73.7 \pm 0.61	72.40 \pm 0.78	74.74 \pm 0.88	73.57 \pm 0.52	72.60 \pm 0.60	74.66 \pm 0.52
SCC $\times 10^7$ /ml	2.76 \pm 0.07	2.56 \pm 0.07	2.66 \pm 0.05	2.77 \pm 0.07	2.61 \pm 0.07	2.69 \pm 0.05	2.76 \pm 0.05	2.58 \pm 0.05
AS %	12.70 \pm 0.34	12.48 \pm 0.29	12.59 \pm 0.22	14.19 \pm 0.31	12.85 \pm 0.25	13.52 \pm 0.20	13.99 \pm 0.24	12.67 \pm 0.19
DS %	12.20 \pm 0.26	11.36 \pm 0.20	11.78 \pm 0.17	12.77 \pm 0.30	12.59 \pm 0.18	12.68 \pm 0.14	12.48 \pm 0.16	11.97 \pm 0.14
TMS $\times 10^7$ /ej	2.18 \pm 0.15	1.99 \pm 0.15	2.08 \pm 0.06	2.68 \pm 0.30	2.19 \pm 0.15	2.44 \pm 0.07	2.44 \pm 0.07	2.09 \pm 0.06
IFC mg/100ml	438.25 \pm 31.41	460.96 \pm 32.40	449.54 \pm 22.51	644.03 \pm 31.43	709.54 \pm 28.79	686.78 \pm 21.32	551.73 \pm 23.62	586.56 \pm 23.41

* In this table and table 6, SEV = Semen ejaculate volume; pH = Fresh semen reaction; IM = Initial advanced motility. SCC = Sperm cells concentration; AS = Abnormal spermatozoa; DS = Dead spermatozoa; TMS = Total motile sperm and IFC = Total free motile sperm.

Table (5): Mean \pm SE of ram semen characteristics as affected by seasons of year.

Semen Characteristics	Spring			Summer			Autumn			Winter		
	S	R	T	S	R	T	S	R	T	S	R	T
SEV (ml)	1.04 \pm 0.03	1.15 \pm 0.03	1.10 \pm 0.02	0.99 \pm 0.03	1.18 \pm 0.04	1.09 \pm 0.03	1.08 \pm 0.04	1.25 \pm 0.03	1.16 \pm 0.03	1.08 \pm 0.04	1.21 \pm 0.02	1.13 \pm 0.01
pH	6.57 \pm 0.02	6.67 \pm 0.02	6.62 \pm 0.01*	6.70 \pm 0.02	6.72 \pm 0.01	6.71 \pm 0.01*	6.74 \pm 0.02	6.77 \pm 0.01	6.75 \pm 0.01*	6.71 \pm 0.01	6.74 \pm 0.01	6.73 \pm 0.01*
LM %	76.9 \pm 0.57	77.08 \pm 0.51	76.98 \pm 0.38*	70.83 \pm 1.48	69.48 \pm 1.08	70.16 \pm 0.91*	69.58 \pm 1.48	71.35 \pm 1.33	70.45 \pm 0.99*	77.50 \pm 0.32	76.35 \pm 0.61	76.93 \pm 0.40*
SCC (10^6 /ml)	3.00 \pm 0.08	2.74 \pm 0.09	2.87 \pm 0.06*	2.64 \pm 0.09	2.39 \pm 0.10	2.52 \pm 0.07*	2.59 \pm 0.11	2.75 \pm 0.12	2.67 \pm 0.08*	2.41 \pm 0.10	2.88 \pm 0.07	2.64 \pm 0.06*
AS %	11.35 \pm 0.31	12.77 \pm 0.27	12.06 \pm 0.22*	12.13 \pm 0.37	14.25 \pm 0.45	13.19 \pm 0.31*	14.69 \pm 0.52	13.89 \pm 0.54	14.29 \pm 0.37*	12.19 \pm 0.42	13.17 \pm 0.30	12.68 \pm 0.28*
DS %	10.65 \pm 0.33	11.60 \pm 0.27	11.12 \pm 0.22*	12.26 \pm 0.32	12.80 \pm 0.30	12.53 \pm 0.21*	13.10 \pm 0.32	13.02 \pm 0.25	13.06 \pm 0.20*	11.10 \pm 0.28	13.28 \pm 0.18	12.19 \pm 0.20*
TMS $\times 10^6$ /g	2.42 \pm 0.10	2.44 \pm 0.11	2.43 \pm 0.07*	1.86 \pm 0.09	2.05 \pm 0.15	1.95 \pm 0.08*	2.01 \pm 0.12	2.46 \pm 0.14	2.24 \pm 0.10*	2.03 \pm 0.12	2.76 \pm 0.12	2.40 \pm 0.09*
IFC mg/100ml	368.35 \pm 28.68	526.76 \pm 30.31	497.55 ^a \pm 22.29	440.40 \pm 46.31	558.47 \pm 45.49	500.60 ^a \pm 32.85	534.64 \pm 60.21	894.34 \pm 37.98	716.38 ^a \pm 39.83	456.18 \pm 37.67	776.57 \pm 31.75	611.88 ^b \pm 29.28

a, b in a rows, means with different superscripts differ significantly (Duncan's test).

Table 6. Analysis of variance the studied ram semen characteristics as affected by breed, ejaculate and season of the year.

Source of variation	DF	Mean Square values									
		SEV	PH	MO	SCC	AS	DS	TMS	DF	MS	IF
Breed (B)	1	2.375**	0.189**	1.628	0.067	83.44**	77.85**	11.76**	1	5345710.87**	
Ejaculate (E)	1	1.475**	0.044	406.32**	3.16**	57.82**	25.06**	10.57**	1	115689.032	
Season (S)	3	0.148	0.316**	1412.74**	2.06**	85.72**	64.25**	3.94**	3	1351505.24**	
B x S	3	0.033	0.034	50.07	2.96**	37.33**	21.82**	2.17*	3	323926.75**	
B x E	1	0.427**	0.0006	7.88	0.05	30.26	10.24	2.04	1	101819.64	
S x E	3	0.033	0.0002	181.14*	0.46	24.31	3.103	0.803	3	26462.4	
Error	368	0.053	0.013	49.59	0.41	7.62	3.73	0.635	365	80349.22	

* Significant ($P < 0.05$)

** Significant ($P < 0.01$)

characteristics except pH and IFC. The trend of the present results are agreed with Mann and Mann(1981). They concluded that first ejaculation of ram semen gave higher values of SEV, AS, DS, SCC than second ejaculation. They explained this conclusion that about 2% of semen firstly ejaculated was preserved in vas deference and epididymes. During preservation, more seminal plasma are reabsorped (Higher concentration of spermatozoa yields) and the spermatozoa in the vas deherens are not preserveed indefinitely in available state (Higher DS and AS yield). However, in semen secondly ejaculed have more seminal plasma (or less SCC) and IM%. Generally from the biological point of view, semen from the two successive ejaculates of Sinai and Rahmani rams are considered to be of good quality. .

Season effect

It is worth to mention that at first season (Spring) of semen evaluation, age of the rams was about 26 month and their body weights averaged 54.9±3.5 kg for Rahmani and 29.4±1.1 kg for Sinai. While at the end of the last season (Winter) of semen evaluation, the body weighed 62.7±4.9 kg for Rahmani rams and 27.7±1.7 kg for Sinai rams, so that the advance in age of rams (sexual maturity) may partially affected the present results.

ANOVA (Table 6) showed that SEV the only character which did not affect by season of the year. Table 4 shows that the lowest pH was 6.62 during spring season. Duncan multiple range test revealed significant difference between semen pH of spring and each of the other three seasons. Also significant difference was detected between summer and autumn in semen pH. Nivsarkar *et al.* (1971) Rajasthan, Parkeer (1974) in India and Hilal (1979) in Egypt found that the season of the year affected significantly semen pH values.

The IM was about 77.0% in semen ejaculated during spring and winter. However, during summer and autumn the IM decreased significantly ($p < 0.01$) to reach about 70% only (Table 5). The effect of season on IM of ram spermatozoa was reported by EL-Fouly *et al.* (1977b), Hilal (1979) and Aboul-Naga *et al.* (1980b) in Egypt.

The semen ejaculated during spring had significantly ($p < 0.01$) larger SCC (2.87×10^6 //ml semen) than that of the other three seasons. Whereas Duncan multiple range test did not reveal significant differences between each of

summer, autumn and winter season in SCC of semen. The total average of SCC was 2.67, 2.64 and 2.52×10^9 /ml semen ejaculated during autumn, winter and summer season, respectively. Season differences in semen SCC were found in Egypt also by El-Fouly *et al.* (1977b) and Aboul-Naga *et al.* (1980b).

The highest average of AS was 14.3 and 13.2% in semen ejaculated during autumn and summer seasons, respectively. However, the lowest average AS was 12.16% in spring. Significant difference was found between all pairwise seasons except between winter and each of spring and summer. The highest DS% was also in semen ejaculated in autumn (13.06) and summer (12.53) seasons as shown in Table (5). All pairwise season were significantly differed in semen DS% except that between winter and summer. These findings are in agreement with those conducted in Egypt by Al-Hakim *et al.* (1989). In Egypt also, Hilal (1979) and Aboul-Naga *et al.* (1980b) studies indicated significant season effect AS and DS of ram semen.

The TMS gradually increased from summer throughout spring. The highest TMS was $2.40 \pm 0.05 \times 10^9$ in semen obtained during spring, while, the lowest was $1.95 \pm 0.08 \times 10^9$ obtained during summer season. Significant differences were found between summer and each of other three seasons. The differences in TMS among autumn, winter and spring were not significant. Ejaculated semen characteristics are expressing semen production processes occurring in the male sex organs, several month earlier. Spermatogenesis rate, motility and SCC are increasing during the cold months of the year. In contrast sperm cells abnormalities increases during the warm month of the year (Mann and Mann, 1981). The present results on Rahmani and Sinai semen are in harmony with Mann and Mann (1981) statements.

The semen ejaculated during autumn contained IFC (716.38 mg/100ml) which was higher than that of the other three seasons (Table 5). The lowest IFC averaged 447.5 mg/100 ml semen in spring. Duncan's test revealed significant differences between all pairwise seasons except between summer and spring which was insignificant. Season effects on IFC in the present work is in agreement with that reported by Moule *et al.* (1966), Mann and Mann (1981) and Cirao and Filho (1991).

The present semen evaluation indicated that the semen

collected throughout the four seasons of the year in both breeds is considered to be of good quality. Summer collected semen had the lowest TMS in both breeds. The highest TMS was in winter for Rahmani semen, however Sinai rams produced the highest TMS in spring. This result indicates that the Sinai rams may need quite different day light length and/or ambient temperature suitable for better quality semen production than that suitable for Rahmani rams.

This result needs better clarifying on Sinai semen in different season of the year, this is also clear from AS result. The highest AS in Rahmani semen was found in the hot season (summer), while the highest AS in Sinai Semen was in autumn. The effect of photoperiod and ambient temperature had been reported to be the main climatic factors affecting pituitary functions and seasonal variations in semen quality (Hafez, 1987 and Mann and Mann, 1981). The interaction breed and season was significant in most semen characteristics of the present study (Table 6). This indicates that the Sinai breed is differently affected by season (light and temperature) as compared to Rahmani.

REFERENECES

- Abd El-Bary, H.T.M., 1978. Reproductive efficiency of some Egyptian breeds of sheep. M.Sc. Thesis in Dept. of Anim. Prod., Fac. Agric., Al-Azhar Univ.
- Aboul-Naga, A.M., 1976. Location effect on the reproductive performance of three indigenous breeds of sheep under the subtropical conditions of Egypt. *Indian J. Anim. Sci.*, 46 (12):630-636.
- Aboul-Naga, A.M., M.B. Aboul-Ela and F. Hassan, 1985b. Comparative study of oestrus activity in Finn ewes and two Egyptian fat-tailed under subtropical conditions. *J. Agric. Sci., Camb.*, 105:469-473.
- Aboul-Naga, A.M. and M.B. Aboul-Ela, 1987. Performance of subtropical Egyptian sheep breeds, European breeds and their crosses. I. Egyptian sheep breeds. *World review of Anim. Prod.*, Vol. XXIII, No.1.
- Aboul-Naga, A.M, A.S. El-Shobokshy and E.A. Afifi, 1980a. Effect of length of suckling period on the performance of the local ewes bred three times per two years. *Egypt. J. Anim. Prod.* 50, No.2: 147-

- 152.
- Aboul-Naga, A.M., G. Ashmawy and S. El-Nakhla, 1980b. Some factors affecting semen characteristics, mating and lambing performance of Rahmany rams. Egypt, J. Anim. Prod. 20, No. 1: 23-30.
- Ahmed, M.H., 1972. Study on some economic traits in local sheep. M.Sc. Thesis, Fac. of Agric., Assiut Unive.
- Al-Hakim, M.K., H.H. Ossa, S.A.H. Al-Juburi, 1989. Monthly and seasonal variation in some semen charatcers of Awassi rams. Animal Breeding Abstract (1991), (59), 4 Abstract 2509 page 339.
- Duncan, N.B., 1955. Multible Range and Multiple F-test. Biometrics, 11:1-24.
- El-Fouly, M.A., M.M. Shafie, A.S. Abdel-Aziz and S.A. Kandeal, 1977a. Seasonal variation in estrous activity in Ossimi and Rahmani ewes. Egypt. J. Anim. Prod. 17, No.1:75-85.
- El-Fouly, M.A., M.M. Shafie and A.S. Kandeal, 1977b. Seasnol variations in semen quality of Ossimi and Rahmani rams. Egypt.J. Anim. Prod. 17, No.2:101-116.
- El-Alamy, M.A., G.A. Abd-El-Hafiz and F.F. El-Hommosi, 1980. Nutritional and physiological studies in sheep. II effect of plane of nutration on semen characteristics and animal fructose metabolism of Ossimi and Saidi rams. Alex. J. Agr. Res. 28(3): 71-78.
- Ghoneim, A., 1967. Animal Nutrition. El-Anglo Libarary, Cairo, Egypt. (Arabic text book).
- Girao, R.N. and M.A. Filho, 1991. Concentration of fructose and citric acid in semen from corriedale rams subjected to natural or artificial phototoperiod and temperature. Animal Breeding Abstract, (59), 2, Abst. 1056, page 139.
- Hilal, F.I.S., 1979. Semen studies in sheep. M.Sc. Thesis. Thesis Dep of Anim. Prod., Fac. Agric., Al-Azhar Univ., Egypt.
- Hafez E.S.E., 1987. "Reprodduction in Farm Animals". 5th edition. LEA & Febiger, Philadelphia. PA 19106-4198. USA.
- Mann, T., 1948. Fructose content and fructolysis in semen. Practical application in the evaluation of semen quality. Agric. Sci., 38: 323.
- Mann, T. and L. Mann, 1981. Male reproductive function

- and Semen. Berlin, Heidelberg, New York.
- Mabrouk, M.M., E.S.E. Galal, Y.S. Ghanem and H.A. El-Oksh, 1976. A study of some reproduction aspects in sheep under semi-arid conditions. *Egypt. J. Anim. Prod.*, 16, no.1 : 1-6.
- Mayer, D.T., C.D. Squires, R. Bogart and M.M. Oloufa, 1951. The technique characterizing mammalian spermatozoa as dead or living by differential staining. *J. Anim. Sci.*, 10: 226.
- Mahajan, J.M., S.D.J. Bohra and D.S. Chauhan, 1970. Studies on gestation period of local Gaddi sheep and exotic Romaney Marsh, South Down and Rambouillet sheep. *Indian, Vet. J.* 47:547.
- Mehta, P.R., S.N. Toshniwal and J. Homode, 1973. Norms of semen rams of Russian Merino, Malpura and their cross breed reared under semi-arid conditions *Ind. Vet. J.* 49: 1000.
- Moule, G.R., A.W.H. Braden and P.E. Mattner, 1966. Effect of season, nutrition and hormone treatment on the fructose content of ram semen. *Aust. J. Agric. Res.*, 17: 993.
- Nivsarkar, A.E., O.N. Kunzru and P.K. Dwarkanath, 1971. Studies on the seminal characters of Magra rams. *Animals of Arid Zone*, 10:58 (A.B.A., 27: 865).
- Parkeer, P.K., 1974. Some seminal parameters of Bilkaneri sheep. *Societa Italiana per il progresso della Zootecnica.* 801 (A.B.A., 42:4382).
- Rao, B.R. and B. Singh, 1975. Studies on fructose and ascorbic acid concentration in the semen of corriedale and Nali breeds of sheep. *Indian Vet. J.*, 52: 779.
- Sharma, R.D., K.L. Arora and C.L. Arora, 1973). Reaction time and semen quality in NaliLohi breed of sheep. *J. Anim. Health and Prod.* 1 (!) 23.
- SAS Institute, 1987. *SAS/STAT Guide for Personal Computers.* Version 6 edition. SAS Institute Inc., Cary. Nc.
- Trejo, G. P.E. Gonzalez and P.C., 1990. Seasonal effects on fertility in rams of five breeds on the high plateau in Mexico. 2. Semen traits. *Animal Breeding Abstract (1991)*, (59), 2, Abstract 1084, page 143.

دراسة مقارنة بين الاغنام السيناوى والرحمانى ١- بعض المقاييس التناسلية للنعاج والاختلافات الموسمية لصفات السائل المنوى

رضا محمد خليفة - محمد احمد يس

قسم الانتاج الحيوانى، كلية الزراعة، جامعة قناة السويس، الاسماعيلية، مصر

استخدم ١٨ نعجة سيناوى و ٩ نعاج رحمانى خلال سنتين متتاليتين لدراسة طول دورة الشبق وفترة وقوف النعجة فى الشباع وطول فترة الحمل ومعدل الحمل . اوضحت النتائج ان النعاج السيناوى تماثل النعاج الرحمانى فى طول دورة الشبق وفترة الحمل ومعدل الحمل . بينما طول فترة وقوف النعجة السيناوى فى الشباع كانت (1.6 ± 46.3 ساعة) اطول معنويا (مستوى اقل من ١%) منها فى النعجة الرحمانى (1.9 ± 23.3 ساعة) . استخدم ايضا ثلاث كباش من كل سلالة لدراسة بعض الصفات الطبيعية والكيميائية للسائل المنوى خلال فصول السنة الاربعة . كان متوسط صفات السائل المنوى للكباش السيناوى هو ١.٠٥ مل /قذفة ، تركيز ايون الايدروجين ٦.٦٨ ، ٧٣.٧% حركة اولية تقديمية للحيوانات المنوية ، ٢.٦٦ بليون حيوان منوى /مل سائل منوى ، ١٢.٥٩ حيوانات منوية شاذه ، ١١.٧٨% حيوانات منوية ميتة ، ٢.٠٨ بليون حيوان منوى فى القذفة و ٤٤٩.٥ ملجم فركتوز /١٠٠مل سائل منوى طازج . فى حين كانت المتوسطات المقابلة للرحمانى على الترتيب هى ١.٢١ ، ٦.٧٣ ، ٧٣.٥٧ ، ٢.٦٩ بليون ، ١٣.٥٢ ، ١٢.٦٨ ، ٢.٤٤ بليون و ٦٨٦.٨٧ . كل صفات السائل المنوى المدروسة تأثرت معنويا (مستوى اقل من ١%) بالسلالة فيما عدا الحركة الاولية للحيوانات المنوية وتركيز الحيوانات المنوية . كان حجم القذفة المنوية الصفة الوحيدة التى لم تتأثر بفصول السنة . كان متوسط عدد الحيوانات المنوية المتحركة فى القذفة اقل خلال فصل الصيف فى كل من السيناوى (١.٨٦ بليون) والرحمانى (٢.٠٥ بليون) . كان التوالى جمع السائل المنوى (قذفة اولى مقابل الثانية) اثر عالى المعنوى (مستوى اقل من ١%) على كل الصفات المدروسة فيما عدا درجة تركيز ايون الايدروجين ومحتوى الركتوز فى السائل المنوى الطازج . اوضحت هذه الدراسة ان كلا من كباش السيناوى والرحمانى اعطت سائل منوى ذو صفات نوعية جيدة خلال فصول السنة الاربعة فى كل من القذفة الاولى والثانية .