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Rahmani Sheep : Oestrus and Mating Performance as Affected by Season of Mating and Type of Feed

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A TOTAL number of 102 Rahmani ewes were mated either in summer or winter. Within each mating season the ewes were allotted into two subgroups. One subgroup received a green feed type while the other was given a dry feed type. Percentage of ewes that showed oestrus or returned to oestrus was higher for winter-mated ewes. Summer-mated ewes had a longer heat period, a higher conception rate, a shorter gestation period and took more days to conception. But all differences between the two season of mating did not reach a significant level. Feeding ewes a green fodder increased percentage of ewes exhibited or returned to oestrus, length of gestation period and decreased conception rate. The differences attributed to type of feed were all non-significant expect for number of days to conception which was significantly ($P < 0.01$) increased by providing a green fodder.

It is customary to breed sheep in Egypt during summer. There is marked shortage of feeds available for sheep during this season. Several trials have been carried out to breed sheep out of the regular mating season to obtain three lambs crop/two years, and to improve the reproductive performance by introducing a summer green fodder.

This study was designed to evaluate the productive efficiency of one of the main sheep breeds (Rahmani) when bred in winter vs. summer and when given green fodder vs. dry roughage.

Material and Methods

This study was carried out at El-Serw Experimental Farm, Animal Research Institute, Ministry of Agriculture, located at the East-North of the Nile Delta, Egypt. A total number of 102 Rahmani ewes, 3-8 years old were derived from the farm flock in two successive mating seasons ; summer, 1978 ; and winter, 1979. In each season the ewes were randomly allotted into two sub-groups. Within each season, one sub-group was fed on a dry ration

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consisted of wheat raw and pelleted concentrate mixture. The other sub-group was given same pelleted concentrate mixture along with a green forage which was Elephant grass (*Pennisetum purpureum*) for the summer mating group and clover (*Trifolium alexadrinum*) for the winter mating one The allowances of the N.R.C. (1968) were applied two weeks before and along the course of each experimental period. Animals were group-fed. Each sub-group was kept in a separate semi-open. partially shaded pen. Ewes were weighed befor joining and at bi-weekly intervals thereafter.

During a mating period of 45 days in each season, heat detection was carried out daily by introducing a vasectomised ram for 30 min at 8.00 a.m. and 4.00 p.m. Ewes, proved to be on heat with were mated with an intact ram of the same same flock, previously tested for good quality semen. Remating of the oestrus ewes was performed after the following check interval (at 8·30 a.m or at 4·00 p.m) and was repeated until the ewe refused the ram (end of the oestur). The heat period was estimated by adding half the interval from last check trial preceeding to the first positive check together with half the interval from the last positiv check to the next negative check, to the actual period during whih the the ewe exhibited oestrus.

Snedecor and Cochran (1971) was consulted for the statistical analysis carried out

Results and Dicussion

Oestrus activity ; The overall percentage of ewes that showed oestrus was 97.1 % (Table 1). Difference due to season in percentage of ewes exhibited oestrus was slight (2.19 %) and non-significant (Tables 1 & 2). This result is in agreement with that of Mounib *et al.* (1956) who reported that the occurrence of oestrus in Rahmani ewes did not var with the changes in ambient temperaure all the year round. But dissimilar results were given by El-Fouly *et al.* (1977) who recorded a marked peak of oestrus activity of the Rahmani sheep in summer and autumn. However, the disagreement in results, although concerning the same breed, might arise from difference in locality. The present study as well as that of Mounib *et al.* were carried out in North Delta while that of El-Fouly *et al.* was conducted at a southern zone (Giza) of the Nile Delta.

Percentage of ewes exhibited oestrus in summer was almost the same whether the ewes were given green fodder or dry feed (Table 1) For ewes mated in winter, green fodder increased the occurrence of oestrus by 3·7 % (Table 1).

The overall increase in % of ewes that came into heat due to green feeding reached 2.33 % (Table 2). Such increase did not reach a significant level (Table 3). It seems that the nutritional level rather than the type of feeding is responsible for decreasing the occurrence of oestrus In view of the the obtained findings it may be recommended not to provide a green fodder to ewes at matting time the intention of increasing the intensity of oestrus among Rahmani ewes.

TABLE 1. **The effect of season and type of feeding on oestrus and mating performance**

Trait	Summer mating		Winter mating		Overall
	Green fodder	Dry feed	Green fodder	feed Dry	
Number of ewes at mating	24	25	26	27	102
Percentage of ewes that showed oestrus	95.80	96.00	100	96.30	97.10
Percentage of ewes returned to oestrus	17.39	4.17	15.38	23.08	15.15
Duration of heat, hr. ($\bar{x}$ ± SE)	31.8±2.6	27.5±2.0	25.8±1.8	31.4±2.2	29.1±1.91
Number of days to conception ($\bar{x}$ ± SE)	12.8±1.9	9.9±1.3	13.2±2.0	6.8±1.2	10.6±0.83
Gestation period length, days ($\bar{x}$ ±SE)	152.0±0.4	150.1±0.4	152.0±0.6	152.5±0.7	151.8±0.83
Conception rate (per ewe joined)	79.17	84.00	61.54	77.78	75.49

TABLE 2. **The overall effect of season and type of feeding on oestrus and mating performances**

Parameter	Season of mating		Type of feeding	
	Summer	Winter	Green	Dry
Percentage of ewes showed oestrus	95.92	98.11	98.00	96.00
Percentage of ewes returned to oestrus	10.64	19.23	16.33	14.00
Duration of heat, hr ($\bar{x}$ ± SE)	29.6 ±1.6	28.6 ±1.5	28.7 ±1.6	29.5 ±1.5
Number of days to conception	11.3 ±1.1	9.9 ±1.3	13.2 ± 2.0	6.8 ±1.2
Gestation period length, days ($\bar{x}$ ± SE)	151.53±0.30	152.24±0.47	151.97±0.36	151.71±0.4
Conception rate (per ewe joined)	81.63	69.81	70.00	80.70

Percentage of ewes returned to oestrus

The percentage of ewes returned to oestrus did not follow a specific trend in relation to changes in season or type of feed (Table 1). It is obvious (Table 2) that while dry feeding resulted only in slight decrease in number of returned ewes, this number was nearly doubled when ewes were mated in winter. Differences attributed to season or type of feed were non-significant (Table 3). It seems however, that one can not draw a specific conclusion because of the relatively small number of ewes used in experimental groups of the present study.

TABLE 3. X^2 values for significance between seasons and types of feeding.

Trait	d.f.	Between seasons	Between types of feeding
Oestrus manifestation	1	0.429	0.304
Return to oesture	1	1.418	0.104
Conception rate	1	2.040	1.651
X^2 (1,0.05) = 3.841			
X^2(1,0.01) = 6.635			

Duration of heat

The overall average duration of heat (Table 1) was less than the previously recorded estimates (34·4 $\pm$ 1·20, Mounib *et al.*, 1956 ; & 31·5 $\pm$ 1·7, Kandeal, 1978) on the same breed. Differences may be attributed to differences in techniques adopted for measuring heat period. Duration of heat was longer in summer and when ewes received green fodder. But both season and type of feed did not contribute significantly to the length of the heat period (Table 4).

This result is in accordance with the findings of Mounib *et al.* (1956) on Rahmani ewes, Badawy *et al.* (1956) using Barki sheep and Anderson (1964) studying seasonal changes in oestrus duration of Merino breed. It is interesting to note that the interaction between season and type of feed had a highly significant ($P < 0.01$) influence on the length of heat period. Such effect might arise from the inverse order of the two green fodders effect as clover contains compounds of oestrogenic activity while Elephant grass was found to have a slight anti oestrogenic activity (Awad *et al.*, 1980).

Number of days to conception

The period elapsed from the first mating to conception averaged 10·6$\pm$ 0·83 days for all ewes that gave birth (Table 1). It was observed that in both

seasons, as much as 90 % of the ewes joined came to heat and were mated within the first 17 days of the mating period. As for the influence of season, the results showed that although the number of days to conception was longer in summer than winter (Table 2), yet the differences between the two seasons were non-significant (Table 4). Feeding ewes on a green fodder nearly doubled the number of days to conception (Table 1). Differences due to type of feed were proved to be highly significant ($P < 0.01$) (Table 4). Such finding may be attributed to the hormonal intervention arising from feeding on green fodder with oestrogenic activity as it was reported in Clover (Sharaf *et al.*, 1962 ; Kapoor and Pal, 1964) and in Elephant grass (Awad *et al.*, 1980).

TABLE 4. **Analysis of variance for the effect of season and type of feed on some reproductive traits.**

Source of variance	Duration of heat		No. of days to conception		Gestation period length (days)	
	d.f	M.S	d.f.	M.S	d.f.	M.S.
Between seasons	1	24.768	1	32.512	1	9.307
Between types of feed . .	1	18.599	1	364.268**	1	1.527
Season × type	1	559.972**	1	54.960	1	8.463
Residual	95	114.767	69	45.638	69	5.305
Total	98		72		72	

Gestation period length

The overall average length of gestation period (Table 1), is less than that previously recorded for the same breed (155.4 days) by Hafez (1953). But the obtained average is almost the same as that given by the same author for Rahmani ewes that failed to lamb a year before. The present results also showed that neither the season of lambing nor the type of feed affected the gestation period length in a significant way (Table 4). However, the increase in gestation period length when ewes were mated in winter is in agreement with the results obtained on Awassi sheep (Amir *et al.*, 1980) and three Indian breeds of sheep (Kishore *et al.*, 1980).

Conception rate

In the present study, 77 ewes conceived out of 102 ones joined. Conception rate was higher by 11.82 % for ewes mated in summer (Table 1). Similar findings were reported by Anderson (1964) ; Saraswat *et al.*, 1968) ;

Morag *et al.* (1973) ; and Singh *et al.*, (1980) who found a marked increase in conception rate during summer and/or autumn. However, the difference recorded in this study for the influence of season on conception rate was non-significant (Table 4). On the other hand, feeding ewes on green fodder reduced conception rate by 10·7 %. In this connection, it was suggested by Shutt (1976) that clover induced infertility was brought about by a combination of factors including interferences with sperm transport within the female genital tract, abnormal ova transport and interference with fertilization. Again, the influence of type of feeding on conception rate was non-significant (Table 4).

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أغنام الرحمانى : تأثر الأداء الشبقى والتزاوجى بموسم التزاوج ونوعية الغذاء

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أجرى تلقيح ١٠٢ نعجة رحمانى اما فى الصيف أو فى الشتاء ، وقسمت النعاج الملقحة فى كل موسم الى تحت مجموعتين ، غذيت احداهما بنوعية من العلف الأخضر بينما أكلت الأخرى نوعية من الغذاء الجاف .

كانت نسبة النعاج التى حدث لها شبق أو عادت اليه أعلى للمجموعة التى لقحت شتاء ، أما المجموعة التى لقحت صيفا فكانت فترة شبقها أطول ، ومعدل اخصابها أعلى ، ومدة حملها أقصر ، كما أخذت مدة أطول حتى اخصبت . بيد أن كل الفروق بين موسمى التلقيح لم تكن معنوية .

ولقد أدت التغذية الخضراء الى زيادة النسبة المئوية للنعاج التى أظهرت الشبق أو تلك التى تكرر شبقها ، والى طول فترة الحمل والى نقص معدل الاخصاب . ولقد كانت الفروق الراجعة الى نوعية الغذاء غير معنوية باستثناء الصفة الخاصة بعدد الأيام التى انقضت حتى الاخصاب والتى زادت زيادة عالية المعنوية عندما غذيت النعاج على علف أخضر .