Dept. Animal Production,
Faculty Agriculture, Assiut University,
Head of Dept. Prof. Dr. H.Y. El-Hammady.

SEASONAL VARIATIONS IN OESTRUS ACTIVITY IN GOATS UNDER UPPER EGYPTIAN CONDITIONS

(With 5 Table)

By

I.A. SALEM; F.F. EL-HOMMOSI ; F.M. ALLAM and A.E. SALEM

(Received at 9/10/1991)

الاختلافات الموسمية لنشاط دورة الشبق في الماعـــــز تحت ظروف مصر العليا

ابراهيم سالـم ، فيصل الحمصـي ، فاروق عـلام ، أنس العربـي

وجد أن متوسط طول دورة الشبق في كل من الماعز البلدي وخليط الانجلونوبيان × البلـــدي كانتا ٢٠٫٥٣ ± ٠٫٩٨ ، ١٩٫٥٣ ± ٠٫٥ يوم علي التوالي ـ معظم دورات الشبق القصيرة حدثت فـــي بداية كل موسم أي في شهر ديسمبر للشتاء وفي مارس بداية الربيع وفي بداية موسم الصيف فـــي الماعز البلدي ـ ووجد أن المتوسط العام لطول فترة الشياع كانت ٥٠٫٤٣ ± ١٫٦٥ ساعة في الماعـز البلدي ، ٤١٫٥٢ ± ٢٫١٧ ساعة خليط الانجلونوبيان × البلدي وكان الاختلاف معنويا للموسم علـى فترة الشبق . لذلك توصى الدراسة بأن يكون الميعاد المناسب لتزاوج الماعز خلال فصلى الصيـــف والخريف .

SUMMARY

The lengths of the normal oestrus cycle were 20.53±0.98 and 19.53±0.5 days in Egyptian Baladi and Anglo Nubian does, respectively.

Egyptian Baladi goats showed shorter oestrus (< 17 days) were noticed to be more than the Anglo Nubian. Most of these short cycles occurred at the beginning of winter (December), spring (March) and summer (June).

The overall mean of oestrus period length was 50.43±1.65 hours in Egyptian Baladi goats and 41.5±2.17 hours in Anglo Nubian does. There were significant differences between Baladi and Anglo Nubian goats according to effect of season on heat duration.

INTRODUCTION

Many investigators believed that both short and long oestrus cycles in sheep and goats are normal physiological phenomena, though the reason is obscure (SAHNI and ROY, 1967; PRASAD, 1969 and PRASAD and BHATTACHARYYA, 1979). The short oestrus cycle might be due to the failure of ovulation during the preceding cycle resulting in the failure of formation of corpus luteum (RAMACHANDRAIAH, et al. 1986). The observation of PRASAD and BHATTACHARYYA (1979) added that a few preovulatory follicles escape ovulation at the end of normal substraites at the above elucidated mechanism. They also mentioned that silent ovulation may lead to long oestrus cycle. From the available literature no information about the oestrus cycle in Baladi goat could be traced. Therefore, the present investigation was designed in order to achieve definite information to raise its reproductive efficiency.

MATERIAL and METHODS

This study was carried out in the Experimental Farm, Faculty of Agriculture, Assiut University. The study started at 1st of December 1985 until 1st of December 1986 on 24 does (12 Egyptian Baladi and 12 Anglo Nubian crossbred) for determination of oestrus cycle activity.

CHEMINEAU, 1983 classified the oestrus cycle into three types i.e. short ($<$ 17 days), normal (17-26 days) and long ($>$ 26 days). Oestrus period was also categorized into three types: short ($<$ 24h), medium (24-48 h) and long oestrus ($>$ 48 h) according to SINGH, et al. (1985). Baladi does were chosen randomly from the flock, having at least 2-3 successive kiddings before being included in the experiment. While Anglo Nubian crossbred does had only one kidding.

Goats fed on a Trifolium alexandrinum from December till April and Darawa from May till october and supplemented daily with pelleted concentrate mixture I kg per head. Animals were kept in semi-open pens under normal environmental conditions. Goats does were examined twice daily by teaser and using vaginal scope for confirming the teaser results.

The data were analysed using long-linear models described by BISHOP, et al. 1975 and computed by BMDP statistical package (DIXON and BROWN, 1977) as follows:

Modell I:

$$\text{lnm ijk} = U + u1^{x} + u_{j}^{s} + u_{k}^{b} + u^{bs}$$

Where U : the overall mean of a common element to all observations.

u^{xs}_{ij} : effect of season j^{th}

u^{xb}_{ik} : effect of breed k^{th}

$u^{xs}_{ij} + u^{xb}_{ik}$: effect of season and breed

Modell II:

$$lnm_{ijk} = U + u^{x}_{i} + u^{m}_{j} + u^{b}_{k} + u^{bm}$$

Where

$u_{ij} + u^{xb}_{ik}$: effect of month and breed.

RESULTS

Results are presented in tables 1 - 5.

DISCUSSION

The differences between the two studied groups in the length of the type of oestrus cycle (short, normal and long) was small, Table 1, 2 indicated that, the overall mean of normal cycle length in Egyptian Baladi was 20.53±0.98 days and for Anglo Nubian crossbred was 19.53±0.50 days. Similr findings were obtained by RAJKONWAR and BORGOHAIN, 1978; PRASAD and BHATTACHRYYA, 1979 and RAMACHANDRAIAH, et al. 1986, they mentioned that, the oestrus cycle lasted 10-28 days with an average of 21 days in a different breeds.

Table 3 showed that the Egyptian Baladi had achieved higher percentage of short oestrus cycle than the crossbred. Most of these short cycles occurred at the beginning of winter season till summer, while the highest percentage of long cycles in crossbred occurred in summer.

PRASAD (1979) and PRASAD and BHATTACHARYYA (1979) found in Barbari goats, that the oestrus cycle length ranged from 3 to 62 days. They recorded also significant monthly difference. CAMP, et al. (1983) in Nubian goats stated that about 85.7% of short cycles occurred in the beginning of breeding season and the normal cycles concentrated from September to October. SAHNI (1960) and SINGH and SENGAR (1978) indicated that the differences between months in the length of oestrus cycle was significant.

Table 4, showed that Egyptian Baladi had achieved longer year average of heat duration than those of crossbred 50.34±1.65 v.s. 41.52±2.17 hours. The heat duration differed significantly (P/ 0.05) in the two studied groups according to season and month as shown by table 5.

Considering number of cycles and heat duration it can be concluded that summer and autumn were the best seasons exhibiting oestrus compared with other seasons of the year for both Baladi and Anglo Nubian. These results are in agreement with those reported by SALAMA (1972) who found wide variations in heat duration with a mean of 62.82 h in Egyptian Baladi goats. SINGH and SENGAR (1978) and SINGH, et al. (1985) found no variation in heat duration in Capra hircus with average of 38 and it ranged between 24 to 72 h. Longer duration was in Juli to October in Black bengal goats. Therefore, it can be concluded, that the best time of mating of the two studied groups is in August and October. Since the level of long heat duration was high in summer and autumn. This increase may be due to the effect of available green fodder.

REFERENCES

Bisshop, Y.M.; Fiemberg, S.E. and Holland, P.W. (1975): Discrete multivariate analysis, Theory and practic MIT press, Cambridge, Rutlege, A.C.B. and Gunsett, F.C. (1981) Analysis of categorical data in the animal science. J. Anim. Sci., 5: 1072-1088.

Camp, J.C.; Wildt, D.E.; Howard, P.K.; Stuart, L.D. and Chakraborty, P.K. (1983): Ovarian activity during normal and abnormal length estrus cycles in goat. Biol. Reprod. 28, 3: 673-681.

Chemineau, P. (1983): Effect on oestrus and ovulation of exposing Creole goats to the male at three times of the year. J. Reprod. Fert., 67, I: 65-72.

Dixon, W.J. and Brown, M.B. (1977): Biomedical computer programms. P. Series University of California Press. Berkeley.

Prasad, S.P. (1969): Studies on some reproductive traits of Barbari goats. M.V.Sc. Thesis, Agra University, Agra-India.

Prasad, S.P. (1979): A note on the occurrence of short oestrus cycle and possible association of ovarian activity in Barbari nannies. Ind. J. Anim. Sci., 49, 10: 854-856.

Prasad, S.P. and Bhattacharyya, N.K. (1979): A note on the characteristics of puberal estrus and estrus cycle in Barbari nannies. Ind. J. Anim. Sci., 49, II: 969-970, 1058-1062.

Rajkonwar, C.K. and Borgohain, B.N. (1978): A note on the incidence and signs of oestrus in local does Capra hircus of Assam. Ind. J. Anim. Sci., 48: 758-779.

Ramachandriah, S.V.; Narasimharao, P. and Ramamohanarao (1986): Length of oestrus cycle, duration of oestrus and oestruc behaviour in native does Capra hircus. Ind. J., Vet. Med., 63: 848-850.

Shani, K.L. (1960): Studies on certain aspects of reproductive and growth in sheep and goats. M.V.Sc. Thesis, Agra University, India.

Sahni, K.L. and Roy, A. (1967): A study on the sexual activity of the Barbari goats Capra hircus. Ind. Vet. Med. Sci., 37: 269-276.

Salama, A. (1972): Ovarian changes in goats during oestrus. Ind. J. Anim. Sci., 42, 6: 437-445.

Singh, S.N. and Sengar, C.P.S. (1978): Studies on the combining ability of desirable characters of important goat breeds for meat and milk separetly and in combination. Techn. Progress Rep. PL. 480, Proj. No. A, 7- AH 89.

Singh, D.K.; Singh, R.A. Singh, C.S.P.; Mishra, H.R. and Singh, M.P. (1985): Studies on factors affecting duration of oestrus in Black bengal goats. Assiut Vet. Med. J., 29: 215-220.

Table 1: Estrous cycle lengths in Baladi and Anglo Nubian crossbred goats at different months of the year.

Month	Baladi Goats		Crossbred Goats	
	NO. of cycles	$\bar{X} \pm$ S.E	NO. of cycles	$\bar{X} \pm$ S.E
Dec.	12	21.08 ± 0.63	2	19.00 ± 0.00
Jan.	11	22.09 ± 0.75	-	----------
Feb.	5	22.60 ± 0.59	-	----------
March	5	20.40 ± 0.67	-	----------
April	11	19.90 ± 0.60	-	----------
May	8	21.00 ± 0.73	0	00.00 ± 0.00
June	8	19.25 ± 0.64	1	21.00 ± 0.00
July	20	19.50 ± 0.35	11	18.72 ± 0.23
Aug.	15	20.06 ± 0.37	12	19.08 ± 0.45
Sep.	14	20.00 ± 0.53	13	19.00 ± 0.66
Oct.	11	19.54 ± 0.56	3	20.00 ± 1.00
Nov.	8	21.00 ± 0.73	5	21.00 ± 1.37
overall mean	128	20.53 ± 0.98	47	19.53 ± 0.50

Table 2: Normal cycle lengths in Baladi and Anglo Nubian crossbred goats at different seasons of the years.

Season	NO.of cycles	Baladi Goats $\bar{X} \pm$ S.E	NO.of cycles	Crossbred Goats $\bar{X} \pm$ S.E
Winter	28	21.72 ± 0.44	2	19.00 ± 0.00
Spring	24	20.43 ± 0.55	0	00.00 ± 0.00
Summer	43	19.60 ± 0.41	24	19.60 ± 1.22
Autumn	33	20.18 ± 0.74	21	20.00 ± 1.00
Overall mean	128	20.53 ± 0.98	47	19.53 ± 0.50

Table 3: Distribution of oestrous cycle types (Short, Normal and Long) according to season and breed.

Season	Baladi Goats				Crossbred Goats			
	No	Short %	Normal %	Long %	No	Short %	Normal %	LONG
Winter	56	24.56	49.13	26.31	2	00.00	100.00	00.00
Spring	48	35.41	50.00	14.59	2	00.00	00.00	100.00
Summer	55	20.00	78.18	1.82	36	19.44	66.67	13.89
Autumn	63	34.92	52.38	12.60	34	32.35	58.83	8.82
Overall percentage	222	28.60	57.50	13.90	74	23.60	60.60	15.80

OESTRUS ACTIVITY

Table 4: Distribution of heat duration (hours) according to the means, standard errors, range and number of oestruses (No) at different months of the year for Baladi and crossbred goats.

Month	Baladi Goats			Crossbred Goats		
	No.	$\bar{X} \pm$ S.E	Range	No.	$\bar{X} \pm$ S.E	Range
Dec.	21	44.00 ± 4.48	12_108	4	60.00 ± 8.48	48_84
Jan.	18	39.33 ± 3.47	12_72	-	----------	-----
Feb.	18	46.66 ± 5.59	12_120	-	----------	-----
March	9	42.66 ± 3.59	12_72	-	----------	-----
April	16	53.25 ± 6.47	24_132	-	----------	-----
May	23	53.73 ± 6.95	12_144	2	66.00 ±18.00	48_84
June	12	56.00 ± 8.14	24_120	2	36.00 ± 0.00	36_36
July	23	54.26 ± 5.11	24_120	16	39.00 ± 6.24	12_120
Aug.	20	46.20 ± 3.82	24_84	18	30.66 ± 2.60	12_48
Sep.	21	53.14 ± 5.27	24_132	17	44.47 ± 4.46	12_96
Oct.	22	52.36 ± 4.90	24_108	10	42.00 ± 3.69	12_60
Nov.	20	59.40 ± 8.05	24_144	7	51.42 ± 6.24	12_84
Overall mean	223	50.34 ± 1.65	12_144	76	41.32 ± 2.17	12_84

Table 5: Loglinear models as liklihood ratio statistics for heat duration length per season and month for Baladi and cross bred goats.

Per season			per month		
d.f.	Liklihood ratio chisquare	Prob.	d.f,	Liklihood ratio chisquare	Prob.
4	58.77	0.0000**	53	II6.40	0.0000**
4	32.52	0.0000**	22	48.3I	0.00I0**
6	37.84	0.0000**	22	I16.40	0.0000**
5	4.86	0.I82I	II	I9.83	0.0000