

Occurrence of oestrus in the Boer goat doe

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The natural occurrence of oestrus in Boer goat does was recorded for the period 1980 – 1982. Although periods of complete anoestrus were never observed, it would appear that the doe is seasonally polyestrous, with an extended breeding season. The pattern of the seasonal occurrence of sexual activity in the Boer goat doe exhibited a peak in activity during April and May (autumn) and low activity from October through to January (late spring to mid-summer). Regarding sexual activity and daylight length, a significant ($P < 0,05$) negative correlation ($r = -0,654$) was recorded in adult female goats. No significant correlation ($r = -0,503$) was recorded between ambient temperature and seasonal sexual activity, although there was a trend that higher sexual activity occurred during the cooler months. Body mass (mean 67,2 kg) in the adult female goat was not significantly correlated ($r = 0,358$) to sexual activity. The mean number of oestrus periods per doe per year was $11,7 \pm 4,4$ for Boer goat does not being mated that year. Natural breeding programmes during the year with Boer goat does must be executed taking into account this seasonal sexual activity.

Die natuurlike voorkoms van estrus in Boerbokooie is gemonitor vir die tydperk 1980 – 1982. Alhoewel periodes van algehele anestrus nooit waargeneem is nie, wil dit voorkom of die bokooi seisoenaal poli-estrus is, met 'n uitgestrekte teelseisoen. Die seisoenale voorkoms van brongstigtheid toon 'n piek in April/Mei (herfs) en 'n laagtepunt van Oktober tot Januarie (laat-lente tot middel-sommer). Die voorkoms van brongstigtheid en dagliglengte toon 'n betekenisvolle ($P < 0,05$) negatiewe korrelasie ($r = -0,654$) in volwasse ooi. Geen betekenisvolle korrelasie ($r = -0,503$) kon tussen geslagsaktiwiteit en omgewings-temperatuur vasgestel word nie, alhoewel daar 'n tendens was dat hoër geslagsaktiwiteit voorkom tydens die koeler maande. Geen betekenisvolle korrelasie ($r = 0,358$) tussen liggaamsmassa (gemiddeld 67,2 kg) is in die volwasse ooi en geslagsaktiwiteit gevind nie. Die gemiddelde aantal estrusperiodes per ooi per jaar was $11,7 \pm 4,4$ vir ooi wat nie gepaar is nie. Natuurlike telingsprogramme met Boerbokooie gedurende die jaar moet uitgevoer word met inagneming van hierdie seisoenale geslagsaktiwiteit.

Keywords: Boer goat, oestrous activity, season

The level of reproductive performance depends on the interaction of genetic and environmental factors, but it is particularly susceptible to the influence of the latter (Riera, 1982). Although indigenous goat breeds have an excellent ability to accommodate and adapt to fluctuations in environment, this often involves some degree of reproductive failure (Devendra & Burns, 1970). Seasonal fluctuations in daylight length and temperature are important factors affecting the length of the breeding season. There is evidence that in some species the pineal gland, through its secretion of melatonin, is involved in mediating the effects of photoperiod of gonadal function with the breeding season usually commencing as the days become shorter (Hafez, 1974). As reproductive efficiency in the female goat is greatly determined by seasonality (length of the breeding season), a thorough knowledge of the potential of the animal and, in this case, the Boer goat doe, is essential. The present study was thus carried out to monitor the cyclic activity of Boer goat does during the various seasons of the year.

With the aid of 10 vasectomized rams (rotated to minimize the possibility of the rams losing interest), 40 maiden does (from 5 to 17 months of age) were tested for the occurrence of oestrus (20-minute periods) twice daily (08h00 and 15h00) for a period of 12 months (1980). Similarly 76 parous Boer goat does per annum were tested twice daily (08h00 and 15h00) for the occurrence of oestrus (20-minute periods) for a 2-year period (1981/82). All the does' masses were monitored weekly.

In Figure 1 the actual number of oestrus periods recorded is shown in relation to the highest oestrus frequency possible during the period. The intensity of sexual activity over a specific period was calculated according to Marincowitz (1962). For the purpose of calculating the highest oestrus frequency possible, the normal length of the oestrous cycle in the Boer goat doe was taken as 22,03 days (Hofmeyr, Joubert, Badenhorst & Steyn, 1966). The sexual activity is plotted against the mean monthly daylight lengths and the mean monthly ambient temperatures recorded (Figure 1).

The annual sexual activity recorded in adult does differed significantly ($P < 0,01$) between each of the months January to April and June to July; ($P < 0,05$) between

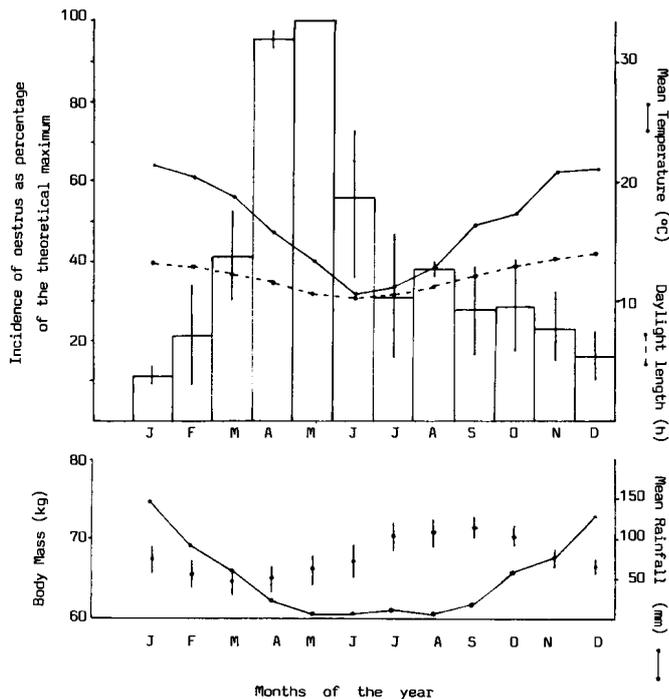


Figure 1 The mean (\pm SE) sexual activity and body mass of mature Boer goat does during the period 1981/82

August and September, whereas from September to December the sexual activity in the consecutive months did not differ significantly from each other. Sexual activity measured during all the months of the year differed significantly ($P < 0,01$) from that observed in April and May (autumn) and activity during these 2 months did not differ significantly (Figure 1). Although periods of complete anoestrus within the Boer goat flock were never observed, it is evident from the data that the Boer goat doe is seasonally polyestrous, with an extended breeding season. The pattern of sexual activity in the adult and Boer goat kid (5 – 17 months of age), was very similar with the peak of sexual activity occurring during April and May (autumn) and the lowest sexual activity from October through to January (late spring to mid-summer). This finding is in agreement with earlier work by Hofmeyr, Badenhorst & Steyn (1966) but differs from that observed in the Angora goat, since Marinowitz (1962) found a distinct breeding season of $117 \pm 3,5$ days, ranging from mid-March to the end of July. In the present study, it was found that daylight length and sexual activity in the adult female were closely correlated; sexual activity increased as daylight length decreased. A significant ($P < 0,05$) negative correlation ($r = -0,654$) was recorded for this relationship but in young females this correlation ($r = -0,530$) was not significant. In the young female kid (about 5 months) the photoperiod-regulating mechanism may not be fully operational or may be more susceptible to exteroceptive factors, hence the non-significant correlation between daylight length and sexual activity. According to Hofmeyr, *et al.* (1966) it appears that the commencement and cessation of the active sex season does not solely depend on the photoperiod and may be modified by exteroceptive factors. One of the main factors might be the stimula-

Table 1 The mean ambient temperatures, rainfall and daylight length recorded at Irene ($25^{\circ}55'E$, $28^{\circ}13'S$) for the period 1980.

Month	Ambient temperature $^{\circ}C$			Rainfall (mm/month)	Daylight length Mean \pm SD (h/day)
	Max.	Min.	Mean \pm SD		
January	26,1	14,1	20,1 \pm 6,6	151,6	13,6 \pm 0,13
February	25,3	14,4	19,5 \pm 7,0	168,3	13,0 \pm 0,19
March	25,4	12,7	19,1 \pm 6,6	41,5	12,2 \pm 0,23
April	24,2	8,6	16,4 \pm 8,3	8,2	11,5 \pm 0,21
May	21,9	5,0	13,5 \pm 8,9	1,8	10,9 \pm 0,15
June	17,7	1,8	10,8 \pm 9,6	0	10,6 \pm 0,03
July	18,2	1,4	9,8 \pm 8,5	0	10,7 \pm 0,11
August	21,0	4,3	12,8 \pm 8,6	0	11,2 \pm 0,20
September	22,1	8,2	15,2 \pm 7,9	71,1	11,9 \pm 0,22
October	27,2	11,2	19,3 \pm 8,6	16,4	12,7 \pm 0,22
November	25,2	13,2	19,2 \pm 6,5	173,4	13,4 \pm 0,16
December	26,7	14,2	19,6 \pm 8,9	62,7	13,7 \pm 0,04

tory effect of the male to induce and to a certain degree synchronize oestrous behaviour early in the breeding season (Ott, Nelson & Hixon, 1980). The mean minimum and maximum temperatures, the photoperiod and rainfall figures for the respective months during the 1980 period are presented in Table 1. No significant correlation ($r = -0,503$) was recorded between ambient temperature and annual sexual activity in adult does although there was a tendency that greater sex activity is achieved at lower ambient temperatures. One of the factors contributing to the months of low sexual activity, is the high frequency (approximately 30%) of long cycles (40 – 60 days) observed in the Boer goat. The factors responsible for these long oestrous cycles being the effect of daylight length, temperature, other exteroceptive factors, or an interaction between these factors.

The mean number of oestrous periods recorded per adult doe per annum for the Boer goat ($11,7 \pm 4,4$) is very similar to that obtained by Hofmeyr, Joubert, Badenhorst & Steyn (1965) ($11,3 \pm 2,5$), but, as could be expected, much greater than in the seasonal Angora doe ($4,7 \pm 2,5$). The body mass (mean 67,2 kg) of the adult Boer goat doe had no significant effect on the annual sexual activity observed. From these observations it can be concluded that natural breeding programmes with Boer goat does must be executed taking into account the peak natural sexual activity (April/May) of the animals for optimal reproductive performance.

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