

قسم الانتاج الحيوانى
كلية الطب البيطرى - رانشى - الهند
رئيس القسم : د . ح . مشرا

دراسة عن العوامل التى تؤثر على مدة الشبق فى ماعز البنجال الأسود

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استهدفت هذه الدراسة تقييم تأثير فصول السنة و الشهور على مدة الشبق
نى ماعز البنجال الأسود ، وقد أظهرت النتائج أن متوسط مدة الشبق هيـو
٣٣٩٤ + ٦٦ ساعة بمدى يتراوح بين ٥ - ٦٠ ساعة كما وأن فصول السنة
والشهور ذات تأثير معنوى على مدة الشبق فى هذه الحيوانات وكانت مدة الشبق
أطول فى فصل الربيع عنها فى فصلى الصيف والشتاء . كان معدل حدوث مدة
الشبق القصيرة (أقل من ٢٠ ساعة) والمتوسطة (٢٠ - ٤٠ ساعة) والممتدة
(٤٠ - ٦٠ ساعة) هيـو ١٩.٠٦٪ ، ٥٠.٣٥٪ ، ٣٠.٥٩٪ على التوالى .
أثر فصل السنة والشهر تأثيرا معنويا على عدد مرات حدوث الشبق قصير ومتوسط
وممتد المدة .

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**STUDIES ON FACTORS AFFECTING DURATION OF OESTRUS
IN BLACK BENGAL GOATS**
(With 4 Tables)

By
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SUMMARY

425 oestruses exhibited by 178 Black Bengal goats of different parities (Nulliparous, Primiparous & Pluriparous) during three seasons viz: winter (November-February), summer (March-June) and monsoon (July-October) were analysed to study the effect of parity, season, month and interaction of parity with season and month. The overall duration of oestrus was 33.94 ± 0.66 h. ranging between 5 to 60 h. The effect of month, season and interactions of parity with month and season were significant on duration of oestrus in these goats. Duration of oestrus during monsoon was significantly more (36.21 ± 0.98 h) than that of winter (31.78 ± 1.08 h) and summer (31.84 ± 1.40 h) which did not differ significantly among themselves. The overall incidence of short (< 20 h), medium (20.1-40.0 h) and prolonged oestrus (40.1-60.0 h) was 19.06, 50.35 and 30.95% respectively. The effect of season and parity was significant on the incidence of short, medium and prolonged oestrus.

INTRODUCTION

To provide a sound basis for successful artificial insemination/natural mating in goats, it is essential to study the duration of oestrus and factors influencing it. Only a few reports are available on duration of oestrus in Black Bengal goats.

The present study was therefore conducted to estimate the influence of various factors viz: parity, month, season and interactions of the duration of oestrus. Attempts were also made to study the incidence of short, medium and prolonged oestrus in the goats of different parities during three seasons.

MATERIAL and METHODS

A total of 178 Black Bengal females of different parities (Nulliparous, Primiparous and Pluriparous) exhibiting 425 oestruses during three seasons viz: winter (November-February); summer (March-June) and monsoon (July-October) during 1982-83 were included in this study. The oestrus was detected by vasectomized bucks at every 4 hours throughout the period. Time of onset and cessation was recorded as the time of first and last mounting of vasectomized buck on oestrus goats. Feeding and managemental conditions were similar during the period of study. The duration of oestrus was classified into three classes viz: short (< 20 h); medium (20.1-40.0 h) and prolonged 40.1-60.0 h) to study the incidence of different classes of oestrus exhibited by the goats of different parities during the seasons under study.

The data were analysed statistically to evaluate the effect of parity, season, month and interactions of parity with season and month by using following linear statistical model (SNEDECOR and COCHRAN, 1968).

$Y_{ijkl} = u + a_i + b_j + c_k + (ab)_{ij} + (ac)_{ik} + e_{ijklm}$ where, Y_{ijklm} is the m th observation of 1th goat in i th parity, j th season and of k th month

u is the overall mean

a_i is the effect of i th parity

b_j is the effect of j th season

c_k is the effect of k th month

$(ab)_{ij}$ is the interaction effect between parity and season

$(ac)_{ik}$ is the interaction effect between parity and month

e_{ijklm} is the error term NID ($0, S^2_e$)

The differences in frequencies of goats showing short, medium and prolonged oestrus during different parities and seasons were tested by Normal-Deviate test (SNEDECOR and COCHRAN, 1968).

RESULTS

Average values of duration of oestrus have been shown in Table 1.

Table (1):

Analysis of variance to evaluate the effect of parity, season, month and interactions of parity with season and month was calculated and presented in Table (2).

Table (2):

The overall duration of oestrus was 33.94 ± 0.66 h (Table 1). The effects of season, month and interactions of parity with season and month on average duration of oestrus were significant (Table 2). The duration of oestrus was significantly longer during monsoon season (36.21 ± 0.98 h) than that of winter and summer (31.78 ± 1.08 and 31.84 ± 1.40 h respectively). The differences between parities was not significant but the primiparous goats exhibit longer duration of oestrus (35.10 ± 2.12 h) than that of nulliparous (33.83 ± 1.45 h) and pluriparous (33.75 ± 0.78 h). With respect to the effect of months, the duration of oestrus ranged between 39.18 ± 2.02 h (October) and 21.50 ± 3.50 h (April). The frequency of occurrence of oestrus during march was zero.

Frequencies of short, medium and prolonged oestrus have been presented in Table 3.

Table (3):

The overall frequencies of short, medium and prolonged oestruses were 19.06, 50.35 and 30.59 percent respectively. In nulliparous, primiparous and pluriparous goats the frequencies of short, medium and prolonged oestruses were 23.33, 48.89 and 27.78, 23.21, 33.93 and 40.62, 16.85, 54.12 and 29.03 percent respectively.

The difference in frequencies between parities and seasons were tested by Normal-Deviate test and presented in Table 4.

The effect of parity and season on the frequencies of short, medium and prolonged oestruses were significant (Table 4).

DURATION OF OESTRUS IN GOATS

DISCUSSION

One of the important factors for significantly longer duration of oestrus in goats during monsoon was increased nutrition in the form of availability of abundant green grasses. Another factor contributing it was probably a higher concentration of sex hormones in the herbage as reported by ROY *et al.* (1962). Start of winter probably had a stimulating effect on the duration of oestrus in goats as was evident from the longest during October (Table 1). Month of October seemed to have very favourable influence on reproductive system of the goats of this area not only in the form of longer oestrus but also having highest incidence of oestrus (MISHRA and BISWAS, 1966 and SINGH *et al.* 1978). Start of summer on the other hand had a diminishing influence on the reproductive system of the goats as evidenced by the shorter oestrus during February and April (being absent during March). SINGH *et al.* (1978) also observed that the incidence of oestrus was lowest during March. Effect of parity was not significant on duration of oestrus.

The overall frequencies of short, medium and prolonged oestrus were 19.06, 50.35 and 30.59 percent respectively, (Table 3). CARMENALE (1977) reported that the duration of oestrus averaged less than 24 h in 16 and 17% females; 24-36 h in 66 and 64%; 37-48 h in 17 and 14% and 48 h in 1 and 4% in Saanen and Toggenburg goats respectively.

A careful observation of the influence of season on the trend of duration of oestrus revealed that in winter there was a gradual decrease in the incidence of short oestrus with the increase in parity. During monsoon, there was an increase in the frequency of short oestrus from nullipara to primipara which declined in the pluripara. The frequency of medium oestrus decreased during winter, summer and monsoon from nulliparous to primiparous, to show an increase in pluriparous. In all the three seasons the frequency of prolonged oestrus increased from nullipara to primipara and then declined in pluripara.

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Table 1: Average values of duration of oestrus (hours)

Groups	No. of observation	Mean values	C.D. values at 5%
Overall	425	33.94±0.66	
Parities:			
Nulliparous (P ₁)	90	33.83±1.45	
Primiparous (P ₂)	56	35.10±2.12	
Pluriparous (P ₃)	279	33.75±0.78	
Seasons:			3.16
Winter (S ₁)	125	31.78±1.08 ^a	
Summer (S ₂)	94	31.84±1.40 ^a	
Monsoon (S ₃)	206	36.21±0.98 ^b	
Months:			12.89
January	13	31.88±3.52 ^{abc}	
February	3	24.67±2.91 ^{ab}	
April	2	21.50±3.50 ^a	
May	13	32.84±4.17 ^{abc}	
June	79	31.94±1.52 ^{abc}	
July	3	32.33±8.35 ^{abc}	
August	30	33.63±2.31 ^{abc}	
September	124	35.76±1.67 ^{bc}	
October	49	39.18±2.02 ^c	
November	57	31.96±3.07 ^{abc}	
December	52	31.97±1.52 ^{abc}	
Parity x Seasons:			7.04
P ₁ S ₁	21	23.30±1.61 ^a	
P ₁ S ₂	21	35.61±2.92 ^{bcd}	
P ₁ S ₃	48	37.67±2.02 ^{cd}	
P ₂ S ₁	12	30.83±4.16 ^{bc}	
P ₂ S ₂	12	38.65±4.81 ^d	
P ₂ S ₃	32	35.36±2.87 ^{bcd}	
P ₃ S ₁	92	33.84±1.24 ^{bcd}	
P ₃ S ₂	61	29.21±1.59 ^{ab}	
P ₃ S ₃	126	35.87±1.21 ^{bcd}	

Mean values bearing same superscripts for seasons, months, and parity x season did not differ significantly.

DURATION OF OESTRUS IN GOATS

Table 2: Analysis of variance showing the effect of parity, season, month on duration of oestrus

Source of variation	d.f.	Mean squares (MS)	F
Between parities	2	43.1125	0.2594
Between months	10	314.2551	1.8912*
Between seasons	2	1029.2712	6.1942**
Parity x season	4	811.2668	4.8822**
Parity x month	20	267.6349	1.6106*
Error	386	166.1670	

*: P/0.05; **: P/0.01.

Table 3: Frequencies (%) of short, medium and prolonged oestrus in goats

Type of oestrus	PARITIES												Overall
	Nulliparous				Primiparous				Pluriparous				
	Winter	Summer	Monsoon	Total	Winter	Summer	Monsoon	Total	Winter	Summer	Monsoon	Total	
Short (\leq 20 hrs)	61.90	4.76	14.58	23.33	33.33	16.67	21.88	23.21	14.13	27.87	13.89	16.85	19.06
Medium (20.1-40.0hrs)	38.10	52.38	52.08	48.89	33.33	25.00	37.50	33.93	61.96	50.82	50.00	54.12	50.35
Prolonged (40.1-60.0hrs)	0.00	42.86	33.34	27.78	33.33	58.33	40.62	42.86	23.91	21.31	36.51	29.03	30.59

Table 4: Normal deviate values for comparison of different types of oestrus in Black Bengal goats

Parity/seasons	PARITIES											
	Nulliparous			Primiparous			Pluriparous			Pluriparous		
	Winter	Summer	Monsoon	Winter	Summer	Monsoon	Winter	Summer	Monsoon	Winter	Summer	Monsoon
Nulliparous:												
Winter	0.91** (3.41)	3.88**	4.04**	1.60	2.50*	2.94**	2.91**	2.81**	5.21**			
Summer		1.07** (3.00)	1.10	2.17*	1.54	1.14	3.00**	2.19*	1.05			
Monsoon				1.53	0.26	0.81	0.00	1.75	0.34			
Primiparous:												
Winter	0.17** (2.82)	1.17 (0.57)	1.18 (0.00)		0.90	0.75	0.90	0.36	1.85			
Summer	0.76** (3.95)	1.51 (0.83)	1.49 (1.59)	0.43 (1.23)		0.37	0.28	0.80	0.39			
Monsoon	0.06** (5.47)	1.08 (0.14)	1.31 (0.73)	0.25 (0.48)	0.75 (1.01)		1.07	0.62	1.27			
Pluriparous:												
Winter	1.28** (2.53)	0.85 (1.77)	1.14 (1.14)	1.14 (0.38)	2.45* (2.46)	2.45* (1.85)						
Summer	2.03* (2.03)	0.08* (1.96)	0.10 (1.39)	1.14* (2.22)	1.66** (2.64)	1.28* (2.00)	1.34 (0.437)	2.12*	0.21			
Monsoon	1.02** (3.30)	0.17 (0.61)	0.23 (0.49)	0.81 (0.21)	1.65 (1.50)	1.31 (0.42)	1.76 (1.90)	0.13* (2.08)	2.33*			

Values above diagonal, below diagonal and under parentheses are Normal deviate values for short, medium and prolonged oestrus respectively.

*, P/0.05; **, P/0.01