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بعض خصائص السائل المنوى فى الماعز البلدى

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أجرى البحث على ٢٠٤ عينة سائل منوى جمعت من ٦ ذكور من الماعز البلدى باستخدام
المهبل الصناعى . تناولت الدراسة بعض الخواص الطبيعية والمورفولوجية والفسىولوجية فى كسل
من القذفة الاولى والثانية ومدى درجة الاختلاف بينهما بعد التحليل الاحصائية . كذلك
بعض الخصائص الكيميائية فى مخلوط القذفتين . وجد أن الاختلاف بين القذفة الاولى والثانية
فى عدد الحيوانات المنوية لكل سم^٣ والمدد الكلى فى القذفة كذلك نسبة الحيوانات المنوية
الشاذة كان معنوى .

SOME SEMEN CHARACTERISTICS OF BALADI MALE GOATS (With 2 Tables)

By

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SUMMARY

Two hundred and four ejaculates (102 first and 102 second) were collected from six Baladi male goats, over a period of four months. The difference in reaction time noted before collection of the first (12.43 sec.) and second (32.79 sec.) ejaculates was highly significant ($P/0.01$). Significant differences ($P/0.05$) between the first and second ejaculates were found for sperm density ($\times 10^6/ml$), total sperm per ejaculate ($\times 10^7$) and total sperm abnormalities (%) with values of 2723.92, 2.5 and 7.45 for the first ejaculate and 2351.08, 2.05 and 10.28 for the second respectively. The mean values for ejaculate volume (ml), mass activity (score : 0-4) and individual motility (%) were 0.92, 3.06 and 61.12 for the first and 0.84, 3.16 and 64.75 for the second ejaculates respectively. Differences between the three attributes were not statistically significant. Samples pooled from first and second ejaculates displayed an average fructose and citric acid concentration of 806.11 and 484.02 mg% respectively.

INTRODUCTION

As goats are considered the least expensive animals to rear and to maintain increasing their population in Egypt is very important to cope with the insistent demand of animal protein. Studying semen characteristics of Baladi goats is of significant value for both increasing and improving the production of this breed. SHUKIA and BHATTACHARYA (1950), BLOKHUIS (1962), KNOBLAUCH (1962), IRITANI *et al.* (1964), KURIAN and RAJA (1965), AUSTIN *et al.* (1968), EL-WISHY *et al.* (1971), FRASER (1971), HEMEIDA (1972) and PARTIL and RAJA (1978) studied the semen characteristics in various breeds of goats. In the present investigation special attention was focussed on studying some physical, morphological and biochemical characteristics of Baladi male goat semen.

MATERIAL and METHODS

six male Baladi goats aged 2.5 years were used in the present study. Examination of the external genitalia, proved absence of any palpable abnormality. The body weight of bucks ranged from 40 to 45 kg at the beginning of the experiment. Each animal received 5 kg barseem and 1 kg of concentrate mixture daily. A total of 204 ejaculates were collected by using the artificial vagina from November (1980) to February (1981). Two successive ejaculates were collected within ten minutes intervals from each buck weekly. The sex drive of bucks was measured by the reaction time using conventional methods. Physical characteristics of semen were examined including the appearance, colour, volume, sperm cell concentration, mass activity, individual motility, percent of live sperms and percent of total sperm abnormalities. Pooled subsamples of the first and second ejaculate from each buck on day of collection were used to determine fructose (MANN, 1948) and citric acid (SOFFRAN and DENSTEDT, 1948). Statistical analysis of the data were done according to SNEDECOR and COCHRAN (1967).

RESULTS

As demonstrated in table (1), a highly significant ($P/0.01$) increase in reaction time was noted from the first ejaculate (12.43 sec.) to the second (32.79 sec.). The decrease in ejaculate volume from 0.92 ml (first) to 0.84 ml (second) was not significant. Both sperm density and total sperm per ejaculate displayed significant ($P/0.05$) drop in the second ejaculates. A significant increase ($P/0.05$) in total sperm abnormalities from 7.45% in the first ejaculate to 10.28% in the second was present. As shown in table (1), the concentrations of fructose and citric acid in pooled semen samples averaged 806.11 ± 337.97 and 484.02 ± 256.53 mg% respectively.

The correlation between the reaction time and the percent of live sperm in the first ejaculates was highly

significant ($P/0.01$). Also the correlation between the value and each of total sperm abnormalities and total sperm per ejaculates in the first ejaculate were highly significant ($P/0.01$) but negative for the former and positive for the later (Table 2).

For the second ejaculates the correlation coefficient between reaction time and individual motility was highly significant ($P/0.01$). Also highly significant correlations were calculated between ejaculate volume and each of total sperm abnormalities, live sperm percent and sperm density (Table 2).

DISCUSSION

In agreement with the finding of SHUKLA and BHATTACHARYA (1950, 1952) and HEMEIDA (1972) the consistency and colour of semen in goats were found to be influenced by the sequence of ejaculation, the second ejaculates were thinner in consistency and of pale yellow colouration.

Although the bucks used in the present study were well trained for semen collection and teasers were frequently changed, individual responses were great. Moreover, the reaction time was found to increase markedly after the first collection. The shortest reaction time recorded for the first ejaculate, was three second compared to five second for the second one. The maximal values were 150 to 300 second for each collection respectively. Nearly similar values were recorded by HEMEIDA (1972) for bucks of the same breed.

The average volumes for the first and second ejaculates in the present study were 0.92 and 0.84 ml respectively. Both were higher than 0.50, 0.63 and 0.50 as reported by ROLLINSON (1950), EATON and SIMMONS (1952), IRITANI *et al.* (1964) and PARTIL and RAJA (1978) respectively. The present values were, however, lower than those of 1.20, 1.00, 1.37 and 1.32 ml obtained by SHARMA *et al.* (1957), KNOBLAUCH (1962), TEWARI *et al.* (1968) and EL-WISHY *et al.* (1971) respectively. These differences could be attributed to breed and age factors.

The non significant decrease in the semen volume from the first to the second ejaculates is in agreement with the findings of LUNCA (1964) and TEWARI *et al.* (1968). However, IRITANI *et al.* (1964), FIELDEN and BARKER (1964) and HEMEIDA (1972) reported significant differences between the volumes of the first and second ejaculates.

The sperm density ($\times 10^6/\text{ml}$) of first (2723.92) and second (2351.08) ejaculates was nearly similar to the values recorded by EATON and SIMMONS (1952), OZKOCA (1965), TEWARI *et al.* (1968). Higher figures of 4000, 5424, 4080, 3625 and 3534 $\times 10^6/\text{ml}$ were, however, published by POLOCEVA and FOMENK (1936), SHARMA *et al.* (1957), MISRA and SENGUPTA (1965), HEMEIDA (1972) and PARTIL and RAJA (1978) respectively. The mass activity did not differ significantly between the two ejaculates although a significant drop in sperm density was noted. HEMEIDA (1972) suggested that mass activity in goat semen appears to depend on the individual motility rather than on sperm density.

The percentage of live sperm in the present study was 69.74 and 72.44 for first and second ejaculates respectively. Higher values of 91.2 and 91.6 were reported by HEMEIDA (1972). The non-significant difference between ejaculates was in accordance with the findings of TEWARI *et al.* (1968) and HEMEIDA (1972).

The percentage of total sperm abnormalities averaged 7.45% and 10.28% for the first and second ejaculates respectively. Lower values of 4.41% and 4.39% were obtained by HEMEIDA (1972). Results comparable with those of the current study (8.8 and 9.9%) were reported by EATON and SIMMONS (1952) and ZACHARIAS (1953). However, a higher value of 15.5% was reported by ARBEITER (1964). According to EATON and SIMMONS (1952), differences between breeds may be responsible for such variable abnormality rates. The mean percentage of abnormal spermatozoa was found to constitute 5.7% in Black Bengal bucks (NASIM *et al.*, 1964), 6-12% in Malabari goats (KURIAN and RAJA, 1965) and 9.01% in Angora goats (OZKOCA, 1965).

The average fructose concentrations reported in the current work (806.11 mg%) was nearly similar to that (794 mg%) recorded by HEMEIDA (1972), but such higher than the value (381.56 mg%) reported by GHALLAB (1981). Citric acid concentration reported herein (484.02 mg%) was almost similar to that (449.80 mg%) obtained by GHALLAB (1981).

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Table (1)
Reaction time and seminal attributes of Baladi bucks

Ejaculate	Reaction time/sec	Ejaculate vol./ml	Mass activity scores	Indiv. motility %	Sperm density $\times 10^6$ /ml	Total sperm/ ejac _g 10	Live sperm %	Total sperm abnor. %	Concentration (mg%)	
									Fructose	Citric acid
First ejaculate	12.43 (30.59)	0.92 (0.45)	3.06 (1.10)	61.12 (20.12)	2723.92 (1297.39)	2.5 (1.73)	69.74 (13.48)	7.45 (9.66)		
Second ejaculate	32.79 (58.82)	0.84 (0.39)	3.16 (1.18)	64.75 (19.26)	2351.08 (1151.86)	2.05 (1.45)	72.44 (13.86)	10.28 (10.48)		
<u>t-values 1st&2nd</u>	3.087**	1.379	0.628	1.319	2.170*	2.015*	1.082	2.012*		
Pooled 102 semen samples									806.11 (337.97)	484.02 (256.53)

Figures in parenthesis represent the standard deviation.

* : P / 0.05

** : P / 0.01

Table (2)
Simple correlation coefficient

		Total sperm abnormalities		Live sperm %		Individual motility %		Sperm conc.		Total sperm per ejuc.		Ejaculate Volume	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
Reaction Time	1st	-0.106		0.315**		-0.043		-0.136		-0.071		0.063	
	2nd		0.109		0.099		0.379**		-0.20*		-0.101		0.012
Ejaculate Volume	1st	-0.534**		-0.534		0.003		0.014		0.730			
	2nd		0.294		0.138		0.138		0.274		0.544		

* : P 0.05

** : P 0.01