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استخدام الميكروهيماتوكرت ثيوب فى تقدير تركيز الحيوانات المنوية فى عجول الابقار والجاموس

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أجريت محاولة لتقدير تركيز الحيوانات المنوية فى عجول الأبقار والجاموس بعد ملء انبوبة الهيماتوكرت بالسائل المنوى . وضعت فى جهاز قوة الطرد المركزى وقد ظهرت خلال الانبوبة ثلاث طبقات :-

١- الطبقة العليا :- اكبر الطبقات ومكونة من بلازما السائل المنوى .
٢- الطبقة الوسطى :- أصغر الطبقات وتحتوى على نسبة كبيرة من القطيرة الهلامية .
٣- الطبقة السفلى :- وتكونت من الحيوانات المنوية المطغوطة . وقد وجد أن هناك علاقة معنوية بين سمك هذه الطبقة وتركيز الحيوانات المنوية فى كل من عجول الابقار والجاموس.

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USE OF THE MICRO-HAEMATOCRIT TUBE TO ESTIMATE THE SPERM CONCENTRATION IN CATTLE AND BUFFALO-BULLS

(With Two Tables)

By

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SUMMARY

A trial was made to estimate the sperm concentration in cattle and buffalo bulls by using the Microhoematocrit tube (Capillary tube).

Centrifugation of the semen sample in the cappillary tube revealed three distinct layers. The upper layer, the largest one and is composed of the seminal plasma. The middle layer, the smallest one and is rich inthe free protoplasmic droplets. The lower layer: is composed of the packed spermatozoa. Its volume (P.C.V.) was greatly correlated with the sperm concentration in the semen sample.

INTRODUCTION

Among many other factors, concentration of the spermatozoa in the ejacualte is one of the most important criteria in evaluating male fertility.

Sperm concentration can be accuratly estimated by the Neubauer cytometer (LAING, 1971). Many others, but less accurate methods, were described such as, the absorptiometer (SALISBURY; BECK; ELLIOT and WILLIOT, 1943), the Brown's standard opacity tubes (KYAW, 1944), the Bloms comparator chamber (BLOM, 1946) and the photoelectric colorometer (PERRY, 1960). Recently, however, OSMAN and ABDEL-HAMID (1972) could use the California mastitis Test (C.M.T.) to estimate approximatly the sperm concentration in cattle and buffalo semen.

The aim of the present work is to estimate approximatly but rapidly the sperm concentration in cattle and buffaloe semen using the Micro-haematocrit tube (capillary tube).

MATERIAL and METHODS

A total of 68 semen samples were collected by artificial vagina from 2 Native bulls and 3 buffalo bulls. Direct count of sperm concentration in each sample was done twicely using the improved Neubauer cytometer (LAING, 1971). Packed cell volume (P.C.V.) for each sample was obtained using a disposable micro-haematocrit tube(FRANKEL and REITMAN, 1970) which is used to determine the P.C.V. of blood. The tube measures 75 mm. Length and 1.1 mm. diameter.

The proceduer was made as follows:

- The capillary tube was filled by the semen till about 5 mm. below its upper end.
- The lower end of the tube was sealed with wax.
- The tube was then fixed in a special standardized high speed centrifuge (Janetzki T H 12) which had a force of 14,490 r.p.m. to obtain the maximum P.C.V.
- Centrifugation was carried out for 3 min.
- The P.C.V. was measured on the hoematocrit line scale of the centrifuge.

Statistical analysis of the obtained data was performed according to SNEDCOR and COCHRAN (1967).

RESULTS

After centrifugation, the cappillary tube exhibited 3 distinct layers which could be measured (Table I & II).

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The upper layer was the largest and is nearly clear, it tends to be pale white in the buffalo sam .es and light straw in the cattle samples. This layer represent the seminal plasma. The intermediate layer was the smallest and has a greyish white colour in both species. Smears from this layer under the phase contrast micro-scope revealed high concentration of free protoplasmic droplet. The lower layer was white in colour and is composed of packed spermatozoa.

The results of P.C.V. as related to sperm concentration in the ejaculate of cattle and buffaloes are shown in tables I & II. It is noticed from these results, that the sperm concentration in the semen of buffalo bulls was higher than that of cattle at the same P.C.V. value. Moreover, the P.C.V. values for semen with normal concentration were ranged between 7-14 in cattle and 3-8 in buffaloes.

Significant correlation were present between the P.C.V. values and sperm concentration in cattle and buffalo.

DISCUSSION

The available literature revealed that all methods used to estimate sperm concentration in semen requires special laboratory equipments. Packed cell volume test give an idea about the volume of blood cells in relation to the blood plasma (JONES and MIALE, 1972). Depending upon this hypothesis, P.C.V. test for semen was decided, to measure simply the concentration of spermatozoa in animals.

The obtained results showed that the sperm concentration in the ejaculate of buffalo bulls was higher than that for Native bulls at the same P.C.V. value. This might reflect variable ratio between semenal plasma and spermatozoa in cattle and buffalo beside the differences in the size of the sperm cells in both species. OSMAN, (1965) reported that the seminal gland in buffaloes are smaller than those of cattle at the same age group. MAHMOUD, (1952) and ABDEL-RAOUF and EL-NAGGAR, (1965) reported that the different measurements (head length and width, middle piece and main tail piece length) of buffalo bull spermatozoa are smaller than those of balady bulls.

OSMAN, (1981) found a significant correlation between the free protoplamic droplets concentration in bull semen and each of the fuctolysis, mass activity, individual motility, sperm concentration and live sperm percentages. Thus, the intermediate layer of the capillary tube which represent the free protoplasmic droplets seems to be of valuable significance as it was significantly correlated with the P.C.V. values in both cattle and buffaloes.

Table (1): Proportions of the three distinict lasyer's of the capillary tube aftercentrifugation as related to sperm concentration in cattle.

No. of Sample	Sperm Concentration $10^6/mm^3$ (haemocytometer)	Lower layer (packed spermatozoa)	Intermediate layer (Protoplasmic Droplets)	Upper layer (seminal plasma)
		%	%	%
4	0.36	2	0.2	97.8
4	0.56	3	0.3	96.7
6	0.71	4	0.3	95.7
4	0.79	5	0.5	94.5
-	-	-	-	-
6	0.86	7	1.0	92.0
8	0.92	8	1.1	90.9
8	1.07	9	1.5	89.5
6	1.16	10	1.8	88.2
-	-	-	-	-
6	1.31	12	1.9	86.1
4	1.58	13	2.1	84.9
8	1.91	14	2.5	83.5
-	-	-	-	-
4	2.26	16	3.5	80.5

Table (2): Proportions of the three distinict layer's of the capillary tube after centrifugation as related to sperm concentration in cattle

No. of Sample	Sperm Concentration $10^6/mm^3$ (haemocytometer)	Lower layer (packed spermatozoa)	Intermediate layer (Protoplasmic Droplets)	Upper layer (seminal plasma)
6	0.79	3	0.3	96.5
9	1.00	4	1.0	95.0
9	1.21	5	1.2	93.8
6	1.92	6	1.6	92.4
6	1.89	7	3.0	90.0
3	2.02	8	3.3	88.7
-	-	-	-	-
3	2.54	10	3.5	86.5

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