

دراسة نوعية السائل المنوي وعدد الحيوانات المنوية المخزونه بالمجرى التناسلي
في ذكور سلالتين من الأغنام المصرية عند عمر عامين

ف . الحصص ، م . العلى

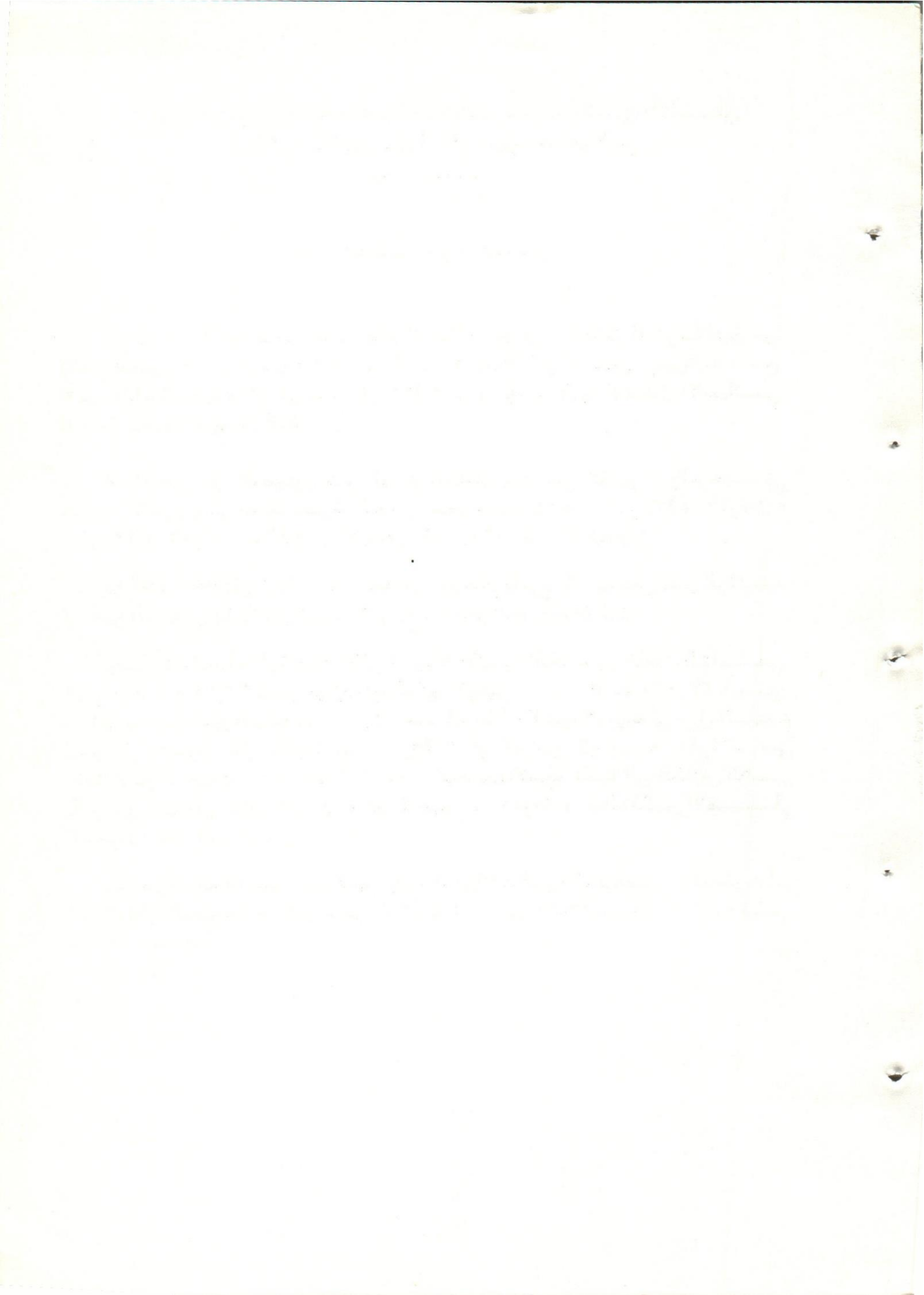
تم في هذا البحث دراسة بعض خواص السائل المنوي في ٧٢ قذفة لذكور سلالتين من الأغنام المصرية ، بان جمعت ٣٦ قذفة من كل من ٩ من الكباش الاوسى ونفس العدد من ٩ من الكباش الصعيدى عند عمر سنتين في خلال اسبوعين واجرى عليها التحليل الاحصائى لدراسة معنوية الفروق في النتائج .

تم الحصول على الخصيتين وبقى المجرى التناسلي بعد ذبح الذكور ، وكان حجم الخصيه والبربخ والتي قيمت بطريقة الاحلال لحجم من الماء هي ١٣٨٠٦١ ، ٢٧٠٢٢ ، ١٣٨٠٤٤ ، ٢٣٠٥٦ سم^٣ لكل من الاوسى والصعيدى على الترتيب .

كما أظهرت النتائج ارتباطا موجبا ومعنويا بين حجم البربخ والخصية على نفس الجانب في ذكور السلالتين وكان حجم البربخ يقارب $\frac{1}{2}$ حجم الخصية بصفة عامة .

بيعت هذه الدراسة ان العدد الكلى للحيوانات المنوية المخزونه في المجرى التناسلي كان متوسطها ٣٣٠١١٥ بليون حيوان منوي لذكور الاوسى ، بينما كانت ٢٣٠٣٤ بليون حيوان منوي لذكور الصعيدى . وكان عدد الحيوانات المنوية المخزونه في ذيل البربخ منسوبا الى المخزون الكلى بالبربخ تمثل ٧٩٠٦١ % في الذكور الاوسى ، ٢٤٠٤٤ % فى حالة الذكور الصعيدى . بينما كان العدد المخزون بالابولة منسوبا الى المخزون الكلى بالمجرى التناسلي تمثل ١٠٢٩ % لذكور الاوسى ، ١٠٢٩ % فى حالة ذكور الاغنام الصعيدى عند عمر عامين .

وفي دراسة العلاقة بين حجم البربخ وعدد الحيوانات المنوية المخزونه به ، ظهرت ان العلاقة عالية المعنوية ، وكان معامل الارتباط ٠٠٨٥ فى حالة الاوسى ، ٠٠٦٢ فى حالة الصعيدى .



Faculty of Agriculture, Animal Production Dept.
Assiut University
Head of Dept. Dr. G. Hassen.

SEMEN QUALITY AND THE NUMBER OF STORED SPERMATOZOA IN THE
GENITAL TRACT OF TWO BREEDS OF EGYPTIAN SHEEP
(With 4 tables)

By

F.F. EL-HOMMOSI and M.A. EL-ALAMY

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SUMMARY

The physical properties were studied in seventy-two ejaculates collected from 18 two years-old rams (9 Ossimi and 9 Saidi). The data were tabulated and statistically analysed.

After slaughtering, the volume of each of the testis and the epididymis were determined by water displacement and averaged; 138.61, 27.27; and 128.44 and 23.56 cc. in the Ossimi and Saidi rams respectively. The volume of epididymis in the two breeds was significantly correlated to the volume of the testis of the same side, and in general it was about 1/5 the volume of testis.

The total number of spermatozoa stored in the genital tract averaged 33.115×10^8 in the Ossimi rams and 23.03×10^9 spermatozoa in the Saidi rams. The number of spermatozoa stored in the cauda epididymis constituted 79.61% and 74.44% of the whole epididymal reserve in Ossimi and Saidi rams respectively. In addition the number of spermatozoa stored in the ampulla and vas deferens constituted 1.29% and 1.79% of the total number of the genital tract in Ossimi and Saidi rams respectively.

Correlations between the volume of the epididymis and the number of spermatozoa stored in it were highly significant ($P < 0.1$) ($r = 0.58$ in Ossimi rams and $r = 0.62$ in Saidi rams).

INTRODUCTION

The average number of spermatozoa contained in an ejaculate of an adult ram lies between three and four billions (FOOTE, 1969; and EL-HOMMOSI, 1975). However, the obtained number of spermatozoa from one or two ejaculates of a male might not be enough to reflect the spermatozoa-storing capacity of the epididymides (EL-ALAMY, 1973).

CHANG (1945) found an average of 130×10^9 sperm cells in the epididymis of the ram, of which 79% were contained in the cauda, and the ampullae contained only 1.4%. ORTAVANT (1956) reported a number of $40 - 60 \times 10^9$ spermatozoa in the cauda epididymidis of the ram.

The present work was undertaken to evaluate the semen of rams of two Egyptian breeds at the age of two years and to determine the average number of spermatozoa stored in the genital tract at this age.

MATERIALS AND METHODS

Eighteen rams aging two years (9 Ossimi and 9 Saidi) were used. At the beginning of November 1974, two successive ejaculates were collected from each ram by the artificial vagina and repeated after one week. The properties of the seventy two semen samples were evaluated. This included: volume, motility, sperm concentration and percentage of live and abnormal spermatozoa.

Two weeks after the last semen collection the animals were slaughtered and the testis, epididymis, vas deferens and ampulla were removed. The volume of the testis and the epididymis together was determined by water displacement to the nearest cubic centimeter. After the disjunction of epididymis, the volume of the testis was determined separately

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and the volume of epididymis was obtained by subtracting the two figures.

The caput and corpus epididymidis was separated as one piece from the cauda epididymidis; each of the two parts, was sectioned into small pieces, macerated and homogenized using an electromixer in about 200 cc. of sodium citrate for about 10 minutes. The sperm content of the vas deferens and the ampulla was obtained by flushing out these organs with an additive known volume of sodium citrate delivered under pressure from a syringe. The total number of spermatozoa was determined for each side separately by counting with hemocytometer and using the formula reported by BAILY and SMITH (1958). The data were statistically analysed according to SNEDECOR (1962).

RESULTS AND DISCUSSION

The Saidi rams produced semen of better quality than that of Ossimi ones at two years of age (table 1). The difference between the two breeds in the semen volume, initial motility, total number of spermatozoa per ejaculate, live and abnormal spermatozoa were statistically significant (table 2). It could be observed from this table the difference between rams was the main source of variability in most of the semen characteristics studied.

Comparing the present results with that reported by EL-ALAMY and EL-HOMMOSI (1975), it could be concluded that the semen in the present work reached the level of the semen quality of the adult ones. Moreover, the variation within each breed gives the chance for better selection of sires of this young age which would be of great importance for an artificial insemination programme.

Both the testes and epididymides in the Ossimi rams were of significantly larger volume than that of the Saidi rams (tables 3 & 4). The volume of epididymis in the two breeds was significantly correlated to the volume of the testis on the same side ($r= 0.681$ for Ossimi rams and $r= 0.566$ for Saidi rams), and the volume of the epididymis was in general about $1/5$ the volume of the testis. OSMAN and EL-AZAB (1969) reported, significant correlation between the weight of the epididymis and the testis of buffaloe bulls at 1.5 years of age but such correlation was not significant in the 2.5 years aged group.

It is well known that the epididymis plays an important role in the preservation of spermatozoa, the verage number of spermatozoa found in this organ was 16.343×10^9 in Ossimi rams and it was 11.311×10^9 in Saidi rams both at two years of age (table 3). The difference between breeds was statistically insignificant but it was highly significant between rams (table 4). Correlations between the volume of the epididymis and the number of spermatozoa stored therein were highly significant ($r= 0.851$ in Ossimi rams and $r= 0.623$ in Saidi rams). In Ossimi rams this number ranged from 2.795×10^9 to 53.050×10^9 spermatozoa while it ranged from 2.818×10^9 to 15.818×10^9 spermatozoa in the Saidi rams. The figures obtained in this study are much lower than those reported by ORTAVANT (1956). The differences may be mainly due to either age, breed or the technique employed.

The percentages of the stored number of spermatozoa in the cauda epididymis proportional to the total number stored in the whole epididymis and the genital tract were 79.61%, 78.58%, and 74.44%, and 73.11% in the Ossimi and Saidi rams,

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respectively. While the corresponding percentages of the number of spermatozoa stored in ampulla and vas deferens were 1.31%, 1.29%, and 1.82, and 1.79%. These results were some agreement of that had been reported by CHANG (1945) who found that 79% of the number of spermatozoa in the epididymis of the ram were contained in the cauda, and the ampulla contained only 1.4% of the spermatozoa.

The total number of spermatozoa stored in the genital tract of Ossimi rams was 33.115×10^9 while it was 23.034×10^9 in Saidi rams. This showed incomplete agreement with the results of the first part of the present work and this may be due to that the number of two ejaculates collected from a ram per week were not enough to reflect its spermatozoa storage capacity. But this indicates that high frequency or partial depletion of semen from rams at this age may be valuable to test their semen producing capacity more than collection of one or two ejaculates per week.

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Table 1: Some properties of semen of Ossimi and Saidi rams at two years of age.

Item	Ossimi		Saidi	
	Mean	SE _t	Mean	SE _t
Semen volum cc.	0.944	0.050	1.239	0.051
Initial motility %	66.111	1.838	73.888	1.452
Sperm conc./mm ³ X 10 ⁶	2.665	0.163	2.748	0.126
Sperm conc./ejac. X 10 ⁹	2.791	0.214	3.466	0.236
Live sperm %	68.278	2.035	77.028	1.551
Abnormal sperm %	8.472	0.826	6.639	0.634

* Average of 36 semen samples.

Table 2: Analysis of variance of some semen properties of Ossimi and Saidi rams (2 Years of age).

Source of variance	D.F.	Semen Volume	Init. motility	Sperm conc./mm X 10 ⁶	Total numb./ejac. X 10 ⁹	Live sperm	Abnormal sperm
Breed	1	1.561	0.29.66	0.006	0.3960	580.99	69.96
Rams	17	0.185	130.62	163.421	0.0646	166.75	44.94
First & sec. ejaculates	1	1.601	1.48	0.0327	0.2040	25.41	0.16
Error	52	0.0335	83.22	0.0139	0.0316	10.15	13.18

* Significant (P < 0.05)

* Significant (P < 0.01)

Table 3: Volume of the testis and the epididymis and the number of stored spermatozoa .

Item	Ossimi		Saidi	
	Mean	SE _±	Mean	SE _±
Testis volume cc.				
left	137.45	19.264	130.20	7.645
Right	139.78	19.189	126.67	8.477
Average	138.61	13.194	128.44	5.554
Epididymis volume cc.				
Left	27.11	2.144	24.11	2.214
Right	27.43	2.392	23.00	2.287
Average	27.27	1.550	23.56	1.657
Stored spermatozoa in couda epididymis X 10 ⁹				
Left	12.6700	3.192	9.4522	1.819
Right	13.3516	4.885	7.3872	1.454
Average	13.0108	2.869	8.4197	1.158
Caput and corpus X 10 ⁹				
Left	3.6492	1.328	2.7083	0.785
Right	3.0150	1.252	3.0744	0.704
Average	3.3321	0.888	2.8914	0.445
Whole epididymis X 10 ⁹				
Left	16.3192	4.373	12.1606	2.284
Right	16.3667	6.120	10.4617	1.854
Average	16.3429	3.655	11.3112	1.440
Vas deferens and ampulla X 10 ⁹				
Left	00.2226	0.0169	00.2219	0.0158
Right	00.2061	0.0156	00.1894	0.0111
Average	00.2144	0.0112	00.2056	0.0095
Total of the genital tract X 10 ⁹				
	33.1146	3.6749	23.03325	1.4425

Table 4 : Analysis of variance of the differences in the volume of testis and epididymis and the total number in the epididymis of the Ossimi and Saïdi rams.

Source of variance	D.F.	Volume of testis	Volume of epididymis	number of stored sperms in the epididymis
Breed	1	930.20 ^{###}	124.690 ^{###}	0.0290
Sides	1	3.30	1.360	0.1900
Rams	17.	3684.79 ^{###}	91.779 ^{###}	0.25 ^{###}
Error	16	3.875	0.9031	0.1460

Significant (p < 0.01)