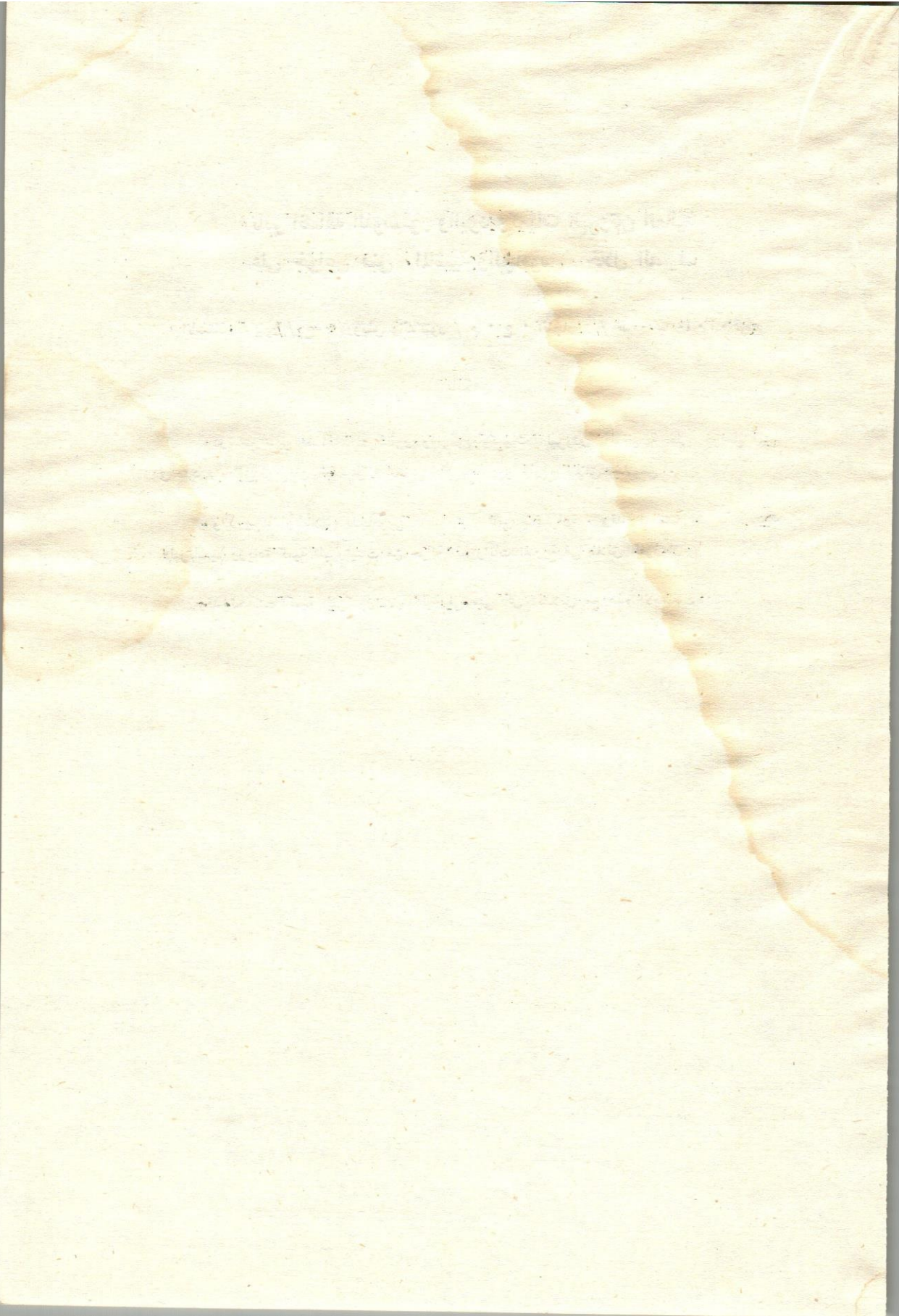


تأثير اضافة الفوسفور واليود وكميات البروتين العالية على خواص منى الماشية والجاموس خلال الصيف

الأستاذ الدكتور / ع . درويش والدكتور / م . ع . النجار و / ط . ب . ١٠١٠ فراج

المخلص

- درست تأثير اضافة الفوسفور واليود وكميات البروتين العالية على خواص المنى
في عدد ٨ طلائق فريزيان نقيه و ٨ طلائق جيرسي مهجن وأربع طلائق جاموس .
- وقد وجد أن طلائق الجاموس كانت أكثر تأثير بالحرارة . وقد حسنت اضافة أيوديده
البوتاسيم وزيادة كمية البروتينات من حركة الحيوانات المنوية في طلائق الفرزيان .
- وقد تحسنت كمية الفركتوز الابتدائية في منى كل الطلائق مع هذه الاضافات .



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THE EFFECT OF SUPPLEMENTATION WITH PHOSPHOROUS, IODINE OR HIGH PROTEIN ON SOME SEMEN CHARACTERIS- TICS DURING THE SUMMER TIME IN CATTLE AND BUFFALOES

(With one table)

by

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SUMMARY

Eight pure Friesian bulls, eight crossbred Jersey bulls and four buffalo bulls were experimented on to study the effect of supplementation with phosphorus, iodine or protein on semen characteristics.

Buffalo bulls were found to be mostly affected by heat. Feeding potassium iodide and raising the protein level improved the motility, in Friesian bulls.

The initial fructose content of semen of all bulls was found to be improved by such additions.

INTRODUCTION

Sexual activity in the bovine shows tendency towards seasonal variation. A number of investigators reported a decline in the breeding efficiency of cattle during the hot months. ERB, ANDREWS and HILTON, (1942) and other authors agree that male fertility reaches its peak in the spring and drops to a minimum level between June and September. The high temperature causes a depression of spermatogenesis (PHILIPSE KNAPP, HEMMSTRA and EATON 1943 and HILDER, FOHRMAN and GRAVES 1944).

However, Egyptian investigators noticed that semen quality and quantity were better during summer months in buffaloes (BADAWI, 1972) and native bulls (EL-WISHY, EL-SAWAF, ABDOU and OMER 1970).

The aim of this work is to study some of the semen characteristics in Friesian, crossbred Jersey and Buffalo bulls during the hot summer months.

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and at the same time try to find out the effect of feeding phosphorous, iodine or high protein on the studied qualities.

MATERIALS AND METHODS

The investigation was conducted on eight pure breed Friesian bulls and eight crossbred Jersey with native cattle and four buffalo bulls, varying in age between 2½ and 3 years and in weight between 362 and 424 kgs. The bulls were housed at EL-GHAREEB experimental station of the Faculty of Agriculture, Assiut University. All the animals were kept before the experiment on a basal maintenance ration which consisted of 65% undecorticated cottonseed cake, 16% wheat bran, 13% rice bran, 3% molase, 2% calcium carbonate and 1% sodium chloride. In addition wheat straw and Napier grass were given daily at a rate of 2 kgs from each, per head with the feed mixture. The starch value and the digestible protein given to all animals were calculated according to GHONIEM Standard (1958). The feeding value of the mixture was calculated from its ingredients (ABOU-RAYA, 1967) being 54.92 starch value (S.V.) and 14.92% digestible protein (D.P.). The feeding value of the wheat straw was taken as 25.27 S.V. and 0.00% D.P. (ABDEL-HAFIZ, 1969) and that of Napier grass was 15.84 S.V. and 2.86% D.P. (ABDALLA and DARWISH, 1973).

The bulls of each breed were divided in groups each of two animals. The first group was kept as a control, the second group received 50 gms dibasic sodium phosphate per head daily, while group 3 received 0.5 gm potassium iodide per head daily, group 4 received 25 gm digestible protein per 100 kg body weight daily in the form of decorticated cottonseed cake, i.e. 50% more digestible protein than the control group with keeping the energy constant.

The experiment was done during the hot summer months in this area. Semen samples were collected every two weeks during the experimental period by means of an artificial vagina. Two successive ejaculates were collected from each bull preceded by a false mount. A total of 4 ejaculates were collected from each bull before supplementation and 6 ejaculates after feeding the additions.

Field examination of the semen samples included recording the volume, mass activity and individual motility. At the time of collection, 0.1 ml. of

semen was deproteinized for further determination of fructose. At the laboratory, examination of the semen samples included counting the sperm density by means of haemöcytometer. Initial fructose content was determined colorimetrically by the method of ROE (1934).

RESULTS AND DISUSSION

The results are presented in Table 1. In the control group the volume of the ejaculate, showed a non significant increase in both the Friesian and the Jersey bulls, while a negligible decrease was noticed in the buffalo bulls. The effect of summer heat was most obvious in the motility where a decrease was observed in all breeds and was only significant ($P < 0.05$) in buffaloes. The sperm count followed almost the same trend as that observed in the volume. The amount of fructose increased and was significant $P < 0.05$ in the Friesian breed only.

The present findings concerning the changes in some of the semen characteristics during the summer months agree to a great extent with the findings of EL-SAWAF (1966), for the native bulls, on the other hand the changes in the buffalo semen concerning the volume, motility and sperm cell concentration agree with that observed by SHALASH (1963). However these findings did not coincide with the previous observations of ERB *et al.* (1942), JOHANSTON and BRANTON (1953), PATRICK, KELLGR-EN, JOHNSTON, HINDERY, SHELWICK and BANKSTON (1959). It is generally accepted that exposure of the bulls to a period of one or more months result in a depression in spermatogenesis. The opposite results observed in this work concerning the friesian and Jersey breeds, may however be due to the counteracting effect of feeding or other environmental conditions such as increase in the day light and decrease in humidity (RUSSEL, PATRICH, KELLEGREN, PROMUTOL and KUSÖBF 1963 a & b). and ROUSSEL *et al.*, 1963 b.

Feeding phosphorous, resulted in non significant improvement in the volume of the ejaculate in all breeds, however a non significant decrease was observed in the sperm count and motility in both Jersey and buffalo.

SIC (1969), found that the volume of the ejaculate raised following feeding Semintal bulls on a mineral-vitamin mixture. This finding was observed in the present work. LEMESQUNDAFEVZNER (1968), found that adding phosphorous to the ration of bulls resulted in raising the sperm cell concentration. Such observations were noticed with the Friesian bulls in the present work, on the contrary a decrease was observed in both Jersey and buffaloes.

TABLE 1 : Semen characteristics in the control and supplemented bulls

Group	Breed	Volume		Motility		Sperm count $\times 10^3$		Fructose mg%	
		Before	After	Before	After	Before	After	Before	After
Control :	Friesian	4.36	4.57	76.0	69.5	389.8	950.0	233	379
	Jersey	4.66	4.83	81.9	77.9	1,059.0	1,168.0	288	403
	Buffalo	3.18	3.16	97.5	62.9	934.0	918.0	258	355
Phosphorous :	Friesian	3.73	5.18	60.0	70.4	835.0	934.0	163	364
	Jersey	5.99	6.44	89.4	76.7	1,220.0	956.0	281	394
	Buffalo	2.00	2.72	65.0	62.9	1,044.0	782.0	109	255
Iodine :	Friesian	3.81	4.81	58.3	64.6	565.0	738.0	223	380
	Jersey	5.54	5.32	89.3	82.5	1,115.0	1,090.0	235	385
Protein :	Friesian	4.69	4.58	73.1	79.0	675.0	959.0	200	397
	Jersey	5.65	5.08	81.3	78.6	894.0	1,200.0	260	398

Before = Start of experiment before supplementation.

After = End of experiment.

Feeding iodine, improved the motility, volume and sperm count in the Friesian. The improvement observed in semen quality of the Friesian bulls after the addition of potassium iodide may be due to the stimulation of the thyroid hormone to secrete thyroxine. It had been shown by AFIEFY, ZAKI, ABUL-FADLE, AYOUB and MICHAEL (1973), that the thyroid activity is reduced during summer time, in both Friesian, Balady and buffalo bulls. AFIEFY, ZAKI and ABUL-FADLE (1969), reported a beneficial effect of thyroxine on the reaction time and semen quantities of native bulls in Egypt. However, the addition of potassium iodide resulted a non significant decrease in both volume, sperm count and notility of the ejaculate of Jersey bulls, such observations were found by EL-WISHY *et al.* (1970) in Balady bulls. EL-WISHY, ABDOU, EL-MIKKAWI and EL-SAWAF (1967), reported that feeding potassium iodide did not result in any statistically significant change in the semen characters of rams.

Raising the protein requirements, resulted in a marked increase in sperm count in both Friesian and Jersey bulls, however, slight decrease was observed in the volume in both breeds. The motility was improved in the Friesian alone. Similar findings were observed by FILIPSE, and ALMQUIST (1963), in Friesian bulls, and by TOMME, and MARTYNENKO, (1965), in Black pied and Khlomoger bulls and by PRAHBU & BHAYA (1962) in Indian buffaloe bulls.

As far as the fructose content is concerned, the increase observed in the control group was similarly observed with feeding phosphorous, iodine or raising the protein requirements in all breeds. Nevertheless, in all the latter cases, the increase was significant at various levels of probability.

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