

قسم الولادة - كلية الطب البيطرى - جامعة أسيوط.  
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انخفاض معدل الاخصاب فى الأبقار والجاموس المصرية  
مع اشارة خاصة لمعدلات الكالسيوم والفسفور والنحاس فى السيرم

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- استهدف البحث دراسة مستوى السيرم لكل من عضوى الفوسفور والكالسيوم والنسبة بينهما وكذلك عنصر النحاس فى الأبقار والجاموس المصرى التى تعاني من هيدم الاخصاب والسليمه وقد أوضحت الدراسة الآتى :-
- 1- وجود فروق معنوية لكل من مستوى الفوسفور والنحاس بين الحيوانات الطبيعية (أبقار - جاموس) والحيوانات التى تعاني من الشجاع المتكرر بدون وجود أى أعراض اكلينيكية فى أجهزتها التناسلية.
  - 2- النسبة بين الكالسيوم : الفسفور كانت فى المعدل الطبيعى فى الحيوانات الطبيعية ولكنها كانت أكبر من مثلتها للحيوانات (أبقار وجاموس) التى تعاني من عدم الأخصاب.
  - 3- لم توجد أى فروق معنوية لمستوى الكالسيوم فى السيرم لكل الحيوانات التى شملتها الدراسة.

FAILURE OF CONCEPTION IN NATIVE COWS AND BUFFALOES WITH SPECIAL REFERENCE TO  
SERUM PHOSPHORUS, CALCIUM AND COPPER  
(WITH 2 TABLES)

BY

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SUMMARY

The role of serum phosphorus, calcium, and copper as a nutritional factors as well as Ca/P ratio were studied in native cows and buffaloes affected with failure of conception with or without clinical lesion (cervicitis and/or endometritis) at Assiut Province.

The results recorded in this work revealed a significant decrease in phosphorus and copper levels in animals affected with this group Ca/P ratio was noticed to be wider than normal. Serum calcium level showed no significant changes.

INTRODUCTION

Today infertility in Egyptian cows and buffaloes is one of the major problems and the failure to conceive after more than two successive services by fertile bull constitute difficult question to the veterinarians.

The different possible factors of failure of conception in the view of BHOSREKAR (1971) are non-specific infections, endocrine imbalance, immunological and nutritional or hereditary troubles. The nutritional aspect as mentioned by the same author, received little attention and phosphorus together with other minerals deficiency tend to occur.

Low phosphorus intake adversely affect the fertility in cattle (RIGGS, 1958 and OSMAN, ET AL. 1970). Moreover, ABRAMS (1951) cited that phosphorus deficiency reduces also fertility as a secondary effect to diseases associated with micro-organism.

SCHARP (1979) found that administration of copper to cattle suffering from hypocupraemia and low fertility leads to sudden improvement in fertility. High pregnancy rate in heifers supplied with copper, in copper deficient area, was also observed by DONALDSON (1964) and ENGEL, ET AL. (1964).

The present trial aimed to evaluate the role of serum inorganic phosphorus, calcium, and copper as nutritional factors as well as Ca/P ratio in native cows and buffaloes affected with failure of conception.

MATERIALS AND METHODS

A total of 47 native cows and 55 buffaloe cows, in Assiut Province of 5 - 12 years age were included in the present study. The history of these animals is failure of conception. All animals were subjected to clinical examination and all the rectal and vaginal findings were recorded.

Blood samples, by vein puncture of the jugular vein, were obtained to get clear sera. The gained serum samples were analysed for phosphorus (MORINL and BROX, 1973), calcium (GINDLER and KING, 1972) and copper (ZAK and RESSLER, 1956).

Animals were classified according to the condition of the genital tract into the following groups:

I- Control group: (12 cows and 10 buffaloes). The animals in this group had a healthy genital tract and normal conception rate (1-2 services per conception).

II-Animals suffered from failure of conception: (more than two services per conception). These included.

A- Animals (22 cows & 29 buffaloes) with clinical lesion in genital tract "endometritis and/or cervicitis".

B- Animals (13 cattle and 16 buffaloes) without any obvious clinical lesion.

Statistical analysis were performed according to SNEDECOR and COCHRAN (1967).



## RESULTS

Table I and II presented the changes in serum phosphorus, calcium and copper as well as Ca/P ratio in cows and buffaloes with normal conception and those suffered from failure of conception with or without clinical lesions.

## DISCUSSION

In both cows and buffaloes, affected with failure of conception without clinical lesion, the serum phosphorus level was significantly lower. Reduction in the fertility due to phosphorus deficiency was noticed by ABRAMS (1951). It is well known that phosphorus is a necessary factor associated with proteins and some members of vitamin B-complex group, in various enzyme systems and a vital agent in the formation and degradation of carbohydrate, lipids and perhaps of proteins.

It seems possible that the incidence of such failure of conception without the appearance of any clinical lesion may be associated with hypophosphoraemia. Under our environmental conditions related to winter feeding, in Egypt, such low levels of phosphorus are expected. In this respect, ABD EL-LATIF and AWAD (1964) and HASSAN (1977) noticed clinical signs of phosphorus deficiency in cattle and buffaloes fed on Tripholium Alexandrinum during winter season. MORRISON (1954) reported that barseem has a low phosphorus content "0.04 mg%".

Raising the phosphorus intake, a parallel increase in the conception rate was reported by HIGNETT (1956), RIGGS (1958), HART and MICHELL (1963), TASSELL (1967) and BODAI (1977).

Serum calcium level showed no significant differences between the three studied groups. This agrees with the statement of HIGNETT (1950), LAING (1970), ROBERTS (1971) and FARRAG (1978) that there is no good evidence about the effect of absolute calcium deficiency on fertility.

The ratio between calcium and phosphorus in the sera of the control group was found to lie between the normal limits (2:1). However, it tends to be wider in cows (3.9/1) and buffaloes (4.1/1) suffered from failure of conception without clinical lesion. These results are in agreement with that reported by LOOSLI, ET AL., (1946), HIGNETT (1950) and FARRAG (1978). A ratio of 2:1 (Ca/P) being more favourable for normal reproduction than wider ratio.

Serum copper level showed significant decrease in native cows and buffaloes affected with failure of conception without clinical lesion. Probably depraved appetite and anaemia associated with hypocupperaemia (LOSSLI ET AL., 1946; CUNNINGHAM, 1950; and LOTHAMMER and AHLWEDE, 1973) may adversely affect the general body condition with consequently failure of conception.

Supplementation of the ration with copper, led to higher pregnancy rate (MUNRO, 1957, DONALDSON, 1964, BODAI, 1977, HIDIROGLUQ, 1979 and SCHARP, 1979), in cows and in buffaloes EL-WISHY, SALAH EL-DIN and NEGIB, 1965.

Concerning the failure of conception in native cows and buffaloes with clinical lesions (cervicitis and/or endometritis), phosphorus, calcium and copper as well as Ca/P ratio were not significantly affected. It seems possible that both cervicitis and endometritis in these animals are responsible for failure of conception.

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TABLE (1)

Serum calcium, phosphorus and copper levels in normal Native cows and those suffered from failure of conception with and without clinical lesion.

Studied animal	No. of animals	Calcium mg%	Phosphorus mg%	Ca/ P ratio	copper mg%
I- Congrol group	12	9.6 $\pm$ 0.17 (8.1-10.9)	5.1 $\pm$ 1.25 (3.9-6.4)	1.9	161.6 $\pm$ 46.6 (120-210)
II- Cows failed to conceive:					
a- with clinical lesion	22	9.9 $\pm$ 0.68 (8.6-10.2)	4.14 $\pm$ 1.57 (3.6-6.1)	2.4	134.3 $\pm$ 58.77 (90-210)
b- with clinical lesion:-					
1- Accompanied with hypophosphataemia	7	8.9 $\pm$ 0.16 (8.3-9.7)	" 2.3 $\pm$ 0.58 (1.3-2.8)	3.9	141.9 $\pm$ 62.18 (110-190)
2- Accompanied with hypocupraemia	6	9.1 $\pm$ 1.2 (8.5-10.1)	" 4.5 $\pm$ 0.85 (4.1-6.1)	2.02	63.34 $\pm$ 12.03 (40-80)

TABLE (2)

Serum calcium, phosphorus and copper in normal buffaloes and those suffered from failure of conception with and without clinical lesion.

Studied animal	No. of animals	Calcium mg%	Phosphorus mg%	Ca/ P ratio	copper mg%
I- Control	10	10.1 $\pm$ 0.68 (9.8-11.2)	4.8 $\pm$ 0.98 (3.8-6.1)	2.1	143.0 $\pm$ 49.4 (86.6-210)
II- Buffaloes failed to conceive:-					
a- with clinical lesion	29	9.7 $\pm$ 1.08 (8.5-11.5)	4.03 $\pm$ 1.0 (3.7-5.9)	2.4	136.3 $\pm$ 31.4 (98-186)
b- without clinical lesion:					
1- Accompanied with hypophosphataemia	9	9.2 $\pm$ 0.28 (8.3-10.1)	" 2.2 $\pm$ 0.43 (1.5-2.8)	4.1	140.6 $\pm$ 36.4 (112-190)
2- Accompanied with hypocupraemia	7	9.8 $\pm$ 0.58 (8.7-10.6)	" 4.7 $\pm$ 0.52 (4.1-5.3)	2.09	60.2 $\pm$ 28.96 (34-82)

$\pm$  = Standard error

" = P 0.05