قسم : التوليد والتلقيح الصناعي .
كلية : الطب البيطرى - جامعة أسيوط .
رئيس القسم : أ . د . / محمود عبد المحسن النجار .

# خمول المبايض في الأبقار والجاموس

## ٢- مكونات الدم

ممدوح عثمان ، محمود النجار ، أحمد فراج ، شحاته حسن

١- أجرى هذا البحث في المزارع الحكومية التابعة لمحافظة أسيوط ( مزرعة الابقار بعرب العوامر ، و مزرعة الجاموس بالحواتكه ) .

٢- تم في هذا البحث أخذ ٦٠ عينة دم من الأبقار والجاموس الخصيب والذى يعاني من خمول المبايض ، وتم تحليل السيرم لتعيين مستوى الكالسيوم والفوسفور الغير عضوى ومستوى النحاس والمنجنيز ، وكذلك الحديد ، وقد أوضحت الدراسة وجود فروق معنوية من الحيوانات الخصيبة ، والتي تعاني من خمول المبايض في عناصر الكالسيوم والفوسفور والنحاس . في حين لم توجد فروق بالنسبة لمستوى المنجنيز والحديد .

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# *OVARIAN INACTIVITY AMONG EGYPTIAN COWS AND BUFFALOES*
## *B- Blood analysis*
*(With Two Tables)*

*By*
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## *SUMMARY*

A total of 60 blood samples obtained from both fertile and infertile cows and buffaloes were analysed for serum calcium, inorganic phosphorus. magnesium. cupper and iron. The results showed that, the serum calcium. inorganic phosphorus and cupper were higher during the oestrogenic phase thn during the luteal phase. The values obtained for the cycling animals were signinficantly higher than those obtained for animals with inactive ovaries. Regarding the serum magnesium and iron there was no differences.

## *INTRODUCTION*

Nutritional errores and specially minerals had been repeatedly incriminated as an etiological factors of anoestrous in cattle (JORDON et al., 1906; HIGNETT and HIGNETT, 1952; FORD, 1956. TASSELL. 1967; ROBERTS, 1971; LOTTHAMMER and AHLSWADE, 1973 and NOLLER et al., 1977) and in buffaloes (FOUAD and SHOKEIR, 1954; AYOUB and AWAD, 1961; FARRAG, 1978 and MIKHAIL. 1979).

The aim of this work was to study the serum levels of calcium, inorganic phosphorus, cupper, magnesium and iron in cows and buffaloes of normal ovarian activity and those suffering from inactive ovaries as an essential step to deal with the problem scientifically.

## *MATERIAL and METHODS*

A number of 60 blood samples were taken from fertile and infertile cows and buffaloes. Rectal examination was performed twice with 10 days intervals to give accurate diagnosis for the conditions of the ovaries and to intify the stage of the cycle. Calcium was deterimed by the method of GINDLER (1972), inorganic phosphorus by the method of HENERY (1964), magnesium by the method GINDLER (1971), copper by the method of CANTAROW (1962) and iron by the method of PIOCARDI et al. (1972). The obtained data were statically analysed according to SNEDCOR and COCKRAN (1967).

## *RESULTS*

The obtained results of the blood serum constituents for cows and buffaloes are presented in table (1) and table (2) respectively.

In both cows and buffaloes, the serium calcium, inorganic phosphorus and cupper showed variations coincides with normal ovarian cyclic changes. Moreover, the values obtained during the follicular phase were higher than during the luteal phase. The values obtained for the

fertile animals were sinificantly (P/__ 0.01) higher than values obtained fore infertile animals. However. the serum magnesium and iron showed no significant differences.

## *DISCUSSION*

Concerning the serum calcium level in cycling cows. our values coincides with that reported by AYOUB et al. (1965). Morover. values obtained for the cycling cows were significantly (P __ 0.01) higher than values obtained for cows wih inactive ovaries. However,HIGNETT (1950) and ROBERTS (1971) cited that there was no good evidence that calcium deficiency influence the fertility in cattle.

In buffaloes. the average value obtained for the cycling animals agrees with the values recorded by RAGAB (1968). FARRAG (1978) and MIKHAIL (1979) for the cycling buffaloes. However. no significant differences were found between the fertile and infertile buffloes.

The serum phosphorus level obtained for the cycling cows (7.24 mg %) agrees to a large extent with 7.38 mg % and 6.99 mg % reported by AYOUB and AWAD (1961) and AYOUB et al. (1965) respectively. The average value for the serum phosphorus level obtained for cows with inactive ovaries (4.93 mg %) agrees completely with finding of ROBERTS (1971). In Assiut province FARRAG (1978) reported 4.82 mg % for Native cattle heifers with inactive ovaries.

The average serum phosphorus value abtained for cycling buffaloes was significantly (P __ 0.01) higher than that obtained for animals with inactive ovaries. The values obtained for fertile buffaloes (7.28 mg%) agrees with that reported by EL-NAGGAR et al. (1973) for cycling heifers. Moreover. the average value (5.19 mg %) obtained for buffaloes with inactive ovaries. agrees well with values recorded by AYOUB et al. (1965); RAGAB, (1968) and FARRAG (1978). However. MIKHAIL (1979) reported a lower values.

In both cows and buffloes the Ca/P ratio was found to be withen normal limits in cycling animals but it tends to be wider in animals with inactive ovaries similar results were reported by RAGAB (1968) and FARRAGE (1978). The same authors cited that wide Ca/P ratio than normal may be one of the factors respensible for functional infertility in Egyptian cows and buffaloes.

Regarding serum magnesium levels. the obtained values showed no significant differences between the different ovarian conditions. The obtained values 2.24 mg % and 1.9 mg % for the fertile and infertile cows respectively agrees with the values 2.58 mg% & 2.28 mg% recorded by PATTEL et al.. (1966) and RAGAB (1968) respectively for normal cattle. However, FARRAG reported a highly significant difference (P/__ 0.01) in the serum magnesium level between the fertile and infertile cows.

In buffaloes the obtained values for the serum magnesium were similar to those reported by AYOUB and AWAD (1959). RAGAB (1968) and FARRAG (1978).

The serum copper level in cows and buffaloes showed marked variations which coincides to a large extent with the normal ovarian cyclic changes. Moreover, the values obtained for the fertite animals were significantly (P/__ 0.05) hihger than those those obtained for animals with inactive ovaries Similar results were reported by LOOSLI et al. 1946; Hignett, 1960; LAING. 1970 and HIDIROGLOW. 1979).

In buffaloes. EL-WISHY. et al. (1966) mentioned that. a higher incidence of heat occurance as well as pregnancy rate was obtained after administration of copper sulfate compared with

those without this trace element. Moreover, FARRAG (1978) reported that there was a significant difference between the serum copper level between the fertile and infertile animals (cows and buffaloes). In this respect we failed to find an explanation about the role played by copper in the reproductive process. FARRAG (1978) cited that Probably anemia and deprived apitite associated with hypocopraemia (CUNNIGHAM, 1950; LOOSLI et al.,1964 and LOTTHAMMER and AHLSWEDE, 1973) may adversely affect the general condition including the endocrine system and concequently the ovarian activity.

Concerning the serum iron level, these was no significant differences between the different ovarian conditions in cows and buffaloes. HIDIROGLOU (1979) cited that there is no good evidence of iron deficiency in cattle except with diseases or parasitic infestation. On the contrary, HANSEL (1965); WAGNER (1969) PAYNE (1970) and ADAMS et al. (1978) reported that anoemia may accur in herds with infertility problems.

Unfortunatly, the available literature lacks data concerning the serum iron level during oestrus cycle and in case of ovarian inactivity. Thus we are nat in a state of comparing our results.

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Table (1): Serum constituents in cattle.

| Ovarian condition | No.of animals | Serum calcium (mg/100 ml) | Serum phoesphorus (mg/100 ml) | Ca/P ratio | Serum magnesium mg/100 ml. | Serum copper ug/100 ml. | Serum iron mg/100 ml |
|---|---|---|---|---|---|---|---|
| Oestrus Phase. | 10 | 10.99±0.56 (8.57-14.28) | 8.27±0.62 (5.49-10.13) | 1.36±0.085 (1.10-1.99) | 2.44±0.12 (1.79-2.96) | 169.69±7.02 (66.67-266.67) | 0.15±0.023 (0.017-0.287) |
| Leuteal Phase | 10 | 9.53±0.33 (8.57-11.78) | 6.29±0.48 (3.80-8.44) | 1.63±0.18 (1.05-2.79) | 2.05±0.23 (1.11-3.05) | 151.66±14.78 (83.33-233.33) | 0.149±0.007 (0.11-0.200) |
| Total for average | 20 | 10.26±0.36** (8.57-14.28) | 7.24±0.78** (3.80-10.13) | 1.49±0.10* (1.05-2.79) | 2.24±0.13 (1.11-3.05) | 160.83±10.78* (66.67-266.67) | 0.150±0.011 (0.11-0.287) |
| Inactive ovaries | 10 | 8.22±0.38** (6.78-10.0) | 4.93±0.53** (3.38-6.33) | 1.95±0.16 (1.23-2.63) | 1.96±0.15 (1.20-2.59) | 103.33±13.25* (33.33-200) | 0.14±0.011 (0.080-0.187) |

Table (2): Serium constituents in buffaloes.

| Ovarian condition | No.of animals | Serum calicum mg/100 ml. | Serum phosphorous mg/100 ml. | Ca/P ratio | Serum magnesium mg/100 ml | Serum copper ug/100 ml | Drtum iton mg/100 ml |
|---|---|---|---|---|---|---|---|
| Oestrous phase | 10 | 11.37±1.63 (8.75-11.25) | 7.92±0.40 (5.5-9.6) | 1.31±0.09 (0.85-1.93) | 2.82±0.32 (1.75-3.62) | 137.85±16.58 (57.14-285.71) | 0.176±0.02 (0.08-0.325) |
| Luteal phase | 10 | 9.93±0.82 (6.87-14.06) | 6.54±0.28 (5.5-7.79) | 1.53±0.14 (1.12-2.19) | 2.08±0.34 (0.12-3.50) | 94.28±13.51 (57.14-171.43) | 0.34±0.015 (0.08-0.2) |
| Total | 20 | 10.65±0.55 (6.87-14.06) | 7.28±0.28** (5.5-9.6) | 1.42±0.08 (0.85-2.19) | 2.45±0.24 (0.12-3.62) | 116.07±13.74* (57.14-285.71) | 0.155±0.013 (0.08-0.325) |
| Inactive ovaries | 10 | 9.96±0.53 (7.5-13.43) | 5.18±0.17** (4.71-6.28) | 1.96±0.13 (1.36-2.82) | 2.04±0.21 (1.62-2.52) | 71.66±7.05* (33.33-100.0) | 0.130±0.008 (0.07-0.155) |