

الصورة الطبيعية لمستوى الزنك في دم الجاهوس وعلاقته
بمستوى بعض العناصر الأخرى

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درس مستوى الزنك والكالسيوم والفوسفور الغير عضوى فى عدد ٦٣ عينة من سيرم دم جاهوس سليم اكلينيكيًا فى محافظات بنى سويف والمنيا وأسيوط. وقد أظهرت الدراسة :

- ١ - ارتفاع مستوى الزنك والكالسيوم والفوسفور الغير عضوى فى دم الحيوانات التامة النمو عنه فى العجول الصغيرة .
- ٢ - ارتفاع مستوى الزنك فى سيرم الجاهوس الموجود فى منقباد عنه فى المنيا وسدس محافظة بنى سويف .
- ٣ - انخفاض مستوى الكالسيوم فى سيرم الجاهوس بمنقباد عنه قليله فى المنيا وسدس .

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NORMAL STATUS OF ZINC IN BLOOD OF BUFFALOES
IN RELATION TO SOME MINERALS
(With 3 Tables)

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SUMMARY

Recently blood analysis is of outstanding importance as a base to compare between the range of normal blood constituents and those attained by pathological interference. 63 serum samples were collected from 21 newly-born buffaloe calves and 42 adult for the determination of their normal status of zinc and its relation to calcium and inorganic phosphorus. The samples were collected from different localities in Upper Egypt.

The results obtained revealed that the normal average zinc, calcium and inorganic phosphorus levels of the newly-born calves (2-5 months) were 58.8-91.5 ug%, 4.82-12.9 & 4.63-8.0 mg% while those of adults (15 months) were 78.57-98.8 ug%, 5.77 - 12.71 and 4.87-7.5 mg%, respectively.

The results obtained throw light on normal zinc serum levels of buffaloes, a finding of vital importance in detecting abnormalities due to physiological, diseased or/and deficiencies conditions.

INTRODUCTION

Minerals and trace elements had long been known to be of utmost importance in animal nutrition as they play a major role in metabolism as well as in enzyme system. Buffaloes, in Egypt,

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are of great economic importance as they are considered as the essential source of animal production.

BRICHNER (1919) was the first to indicate the importance of zinc for higher animals. MILLER and MILLER (1960) stated that, in calves, the reduction in serum zinc level after two months zinc deficiency, reached 170 ug%, while in normal calves the level was 290 ug%. WEGNER et al., (1964) proved that mean serum zinc level for normal cows of all ages was 117 ± 39 ug%. OTT et al. (1965) reported that serum zinc levels were 18 and 116 ug/100 ml in zinc deficient and control calves, respectively. MILLER et al., (1968) found a reduction in both serum zinc, calcium levels in swine with zinc deficiency.

Regarding calcium level in sera of clinically healthy buffaloes, HAFEZ and ANWAR (1954) found that calcium level ranged from 9-11 with a mean of 10 ± 1.056 mg%, while REDA and SALEM, in the same year, stated that the total serum calcium level in buffaloes was averaged 10 mg%. The authors determined higher serum calcium in young calves than their dams. SETTY and RAZDAN (1966) reported that serum calcium level in buffalo calves, less than one year, was 8.87-9.44 mg% which simulates that reported by RUSOFF et al., (1951) and PATEL et al., (1961). STAMPLES et al., (1969) found that serum calcium level in buffalo calves (2-6 weeks old) ranged from 4.7-6.5 mg%, PAUL and VADLAMUDI (1975) found that the normal serum calcium level in buffalo calves, less than one year old, was 10.28 mg%.

HAIBA et al. (1964) found that the mean value of inorganic phosphorus in normal buffaloes was 7.04 ± 1.42 mg% of serum. PAYNE and LEECH (1964) reported that the inorganic phosphorus level declined with increasing age. SAID et al. (1964) showed that the mean value of inorganic phosphorus in 20 normal buffaloes was 6.8 ± 0.94 mg 100ml serum. PAUL and VADLAMUDI (1975)

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observed that the mean level of inorganic phosphorus in buffalo calves (9-12 months old) was low as 5-12 mg%.

Although minerals and trace elements had been determined by many workers, there is relatively little published information concerning the normal zinc level in blood of buffaloes, therefore, the purpose of this work is to provide information about the normal zinc serum levels in buffaloes with different ages in Egypt.

MATERIAL AND METHODS

Sera were gained from 63 blood samples collected from clinically healthy buffaloes with varying ages (21 newly-born and 42 adult) from different localities in Upper Egypt. Each serum sample was subjected to determination of calcium and inorganic phosphorus levels as described by BERSCHNIDER (1971) and RAABE (1951), respectively. Calcium and phosphorus ratios were calculated. Zinc levels estimated spectrophotometrically using PEY unicum (Sp. 1900 atomic absorption spectrophotometry).

All results obtained are recorded in Table 1 and 2.

RESULTS AND DISCUSSION

Concerning the obtained zinc levels (Table 1), the results showed that buffaloes found at Mankabad area had a relatively higher levels than those found at Menia and Seds.

The results, in Table 2, revealed that there was a significant decrease in serum calcium levels in buffaloes at Mankabad than those at Menia and Seds. Lack of natural green fodder in Mankabad area seems to be the cause of such low levels. Ca: P ratio balance changed in a similar pattern.

There is a relation between serum calcium and zinc levels, the high dietary calcium would interfere with absorption of zinc (TUPPER et al., 1954; STEVENSON and EARLE, 1956 and LUECKE et al., 1957).

All results obtained were compared with those reported by other workers at different localities (Table 3).

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Table 1: Zinc levels in sera of normal buffaloes with different ages.

Locality	age	No. of animals	Maximum	Zinc levels (ug/100ml.)	
				Minimum	Average
Menia	2-2½ m.	5	90.00	42.00	58.80
	15 m.	17	100.00	50.00	78.57
Mankabad	2½-5 m.	5	115.00	68.00	91.15
	15 m.	15	100.00	56.00	88.00
Seds	2-2½ m.	11	96.00	41.00	96.57
	15 m.	10	110.00	78.00	98.80

m. = Month.

Table 2: Calcium, inorganic phosphorus levels and their ratios in sera of buffaloes with different ages.

Locality	Age	No. of animals	Calcium			Inor.phosph.			Ca:P		
			M ^{xm}	M ^{nm}	Aver.	M ^{xm}	M ^{nm}	Aver.	M ^{xm}	M ^{nm}	Aver.
mg /100 ml. serum											
Menia	2-2½ m.	5	15.9	10.9	12.9	11.7	5.7	8.00	2.25	0.93	1.71
	15 m.	15	15.7	7.3	12.7	15.7	3.1	7.5	2.84	0.78	1.78
									:1	:1	:1
									:1	:1	:1
Mankabad	2½-5 m.	5	5.5	3.9	4.8	5.3	4.5	4.8	1.5	0.75	1.00
	15 m.	15	6.3	4.1	5.77	9.4	3.8	5.42	1.61	0.87	1.13
									:1	:1	:1
									:1	:1	:1
Seds	2-2½ m.	11	11.1	4.1	6.5	6.1	3.3	4.63	2.23	0.85	1.43
	15 m.	10	12.2	9.4	10.55	5.2	4.5	4.87	2.65	1.88	2.17
									:1	:1	:1
									:1	:1	:1

M. = Month

Inorphosph.= Inorganic phosphorus

M^{xm}---Maximum

M^{nm}---Minimum

Aver.= Average.

Table 3: A comparison between the results obtained from this work and those reported by other worker.

Reference	Year	Animal	Calcium mg%	In.phosph mg%	Zinc ug %
RUSOFF et al.	1951	Calves(les than one year)	9.65	--	--
HAFEZ & ANWER	1954	Buffaloe	10 \pm 0.156	--	--
REDA & SALEM	1954	Buffaloe	10	--	--
AYOUB et al.	1960	Buffaloe	10 \pm 0.5	--	--
MILLER & MILLER	1960	Calves	--	--	290
PATEL et al.	1961	Calves(les than one year)	8.82	--	--
SAID et al.	1964	Buffaloe	--	6.8 \pm 0.94	--
WEGNER et al.	1964	Cows	--	--	117 \pm 39
OTT et al.	1965	Calves	--	--	116
SETTY & RAZDAN	1966	Calves(less than one year)	8.87-9.44	--	--
HAIBA et al.	1969	Buffaloe	--	7.04 \pm 1.42	--
STAMPLES et al.	1969	Buff.Calves (newly-born) (2 - 6 weeks)	4.7-6.5	--	--
PAUL & VADLAMUDI	1975	Buff.Calves (9-12 months)	10.28	5 - 12	--
OWN results	1979	Buff.Calves (2-5 months)	4.82-12.9	4.63-8.0	58.8-91.15
		Buff.Calves (15 months)	5.77-12.71	4.87-7.5	78.57-98.8