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## Determination of Phosphorus (P) and Potassium (K) in the Blood of Desert Goats at Khartoum State

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**Abstract:** This research aims to find the concentration of phosphorus (P) and potassium (K) in the blood of desert goats living at Jabal Awlia rural area (Khartoum State). Twenty six does depend only on grazing were selected to determine the concentration of K and P in their blood. The results show that there is deficiency in K and P in their blood due to low quality forage and the poor soil of the grazing area. The research recommended supplementing the goats with surplus feed at home with additives containing potassium (P) and phosphorus (K).

**Key words:** Phosphorus, potassium, abortion, osteoporosis.

### Introduction

Minerals are very important in animal feed, they classified into micro, macro and trace elements (Abdelhameed, 2000). Phosphorus and potassium play a major role in the life of animals. The physiological role of phosphorus is very important in bones and teeth formation i.e. 80% of the phosphorus presented in bones. Moreover phosphorus is very essential for glucose and glycerol absorption, urine formation, metabolism of carbohydrates and protein and molecular protein (DNA) which include (ATP). In addition phosphorus helps in (pH) regulation of the body (Tukrori, 1989). The actions of potassium as indicated by Abdelhameed (2000) are as follows:

- Regulate intercellular osmotic pressure.
- Helps in muscles contraction and relaxation especially the muscles of the heart and this obviously seen in electrocardiograph.
- Formation of glycogen.
- Helps in protein anabolism.

Sabir (2005) mentioned that, deficiency of potassium leads to weak muscles and bones and hormonal defects which appeared in extra secretion of adrenal gland, loss of appetite and botulism, also the animals eats bones and stones. Further more hypopottasia leads to general debility weakness and infertility. Akinsoyino (1986) mentioned that hypopottasia leads to renal shrinkage, blocking heart muscles, hypo blood pressure, acute diarrhea, reduction of gastric juice, Anorexia, delays growth, poor production, calcification of posterior muscles and hyperpottasia lead to animal mortality. Potassium naturally not presented alone but in compounds with other substances like (KALSO<sub>8</sub>), KAL<sub>2</sub>SIO<sub>10</sub>(OH<sub>2</sub>) and K<sub>2</sub> (Mg, Fe) AL<sub>2</sub>O<sub>10</sub>. (Sulieman and Eishafie 1984). In animals phosphorus detected in the

tissues and the gland as alkaline. Abdelhameed (2000). On the other hand calcium naturally found in the form of phosphate or phospholipids in the bones, muscles, mammary tissues, hide nerves and the bloods (Coates and Ternouth 1992). Sabir (2005) indicated that the presence of phosphorus and potassium in some fodder crops is detected as follows.

Table 1: Percentage of calcium and phosphorus (DM) in some fodder crops

Fodders	P%	K%
Alfalfa	25%	3.2%
Egyptian alfalfa	33%	4%
Dolcious lablab	32%	2.5%
Ri-grass	31%	3.2%
Sorghum	21%	0.20%
Elephantgrass	20%	3.2%
Beet hay	33%	10%

Source: Sabir (2005).

The normal concentration of K in the blood of goats as observed by Sabir (2005) was 14-100 mg/100ml, he also added that the phosphorus has antagonistic relationship with sodium (Na). On the other hand the normal phosphorus ratio in the serum varies between 35-40mg/100ml (Abdelati, 2005). The daily intake of K is 0.2-0.3% of total DM while the (P) is 2.2-2.9 gm/day.

### Materials and Methods

Twenty animal (goat) grazing around Jabal Awlia 40 kgms southern Khartoum were selected for study. Random blood samples were taken, using 5 ml syringes Tubes to be used which filled with anti coagulant. Centrifuge was used for serum separation and estimation of K and P. The spectrophotometer was used for determination of phosphorus and the flame photometer for detection of the potassium.

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Table 2: The concentration of phosphorous in the blood of studied goats

Sample No	1	2	3	4	5	6	7	8	9	10
P(mg/100ml)	4.4	4.0	4.3	4.1	4.0	3.9	4.2	4.1	4.0	3.8
Sample	11	12	13	14	15	16	17	18	19	20
P(mg/100ml)	4.5	4.4	4.3	4.4	4.5	4.4	4.2	4.3	4.4	4.3

Table 3: The concentration of potassium in the blood of the studied goats

Sample No	1	2	3	4	5	6	7	8	9	10
Concentration of K(mg/100ml)	10.9	11.7	11.3	14.5	13.3	13.7	10.9	11.3	12.1	11.7
Sample No	11	12	13	14	15	16	17	18	19	20
Concentration of K(mg/100ml)	12.1	13.3	13.7	13.7	14.1	12.9	12.5	14.1	13.3	14.5

### Results and Discussion

The results show that the average concentration of the phosphorus (P) in the serum of studied goats is 4.22mg/100ml and it is far away from what was observed by Abdelati (2005) which was 35-45mg/100ml. Also the results indicates that the research area is very poor in (P) furthermore it may lead to Ricketesia in kids due to the defects in P:Ca ratio. Moreover, sandstone (calculi) can be expected which may consequently block the male urinary tract (Table 2). In case of potassium (K) it's average concentration was 12.7mg/100ml and the tabulated was 14mg/100ml so it is insignificant different (Table 3). The research concluded that the area of the research is very poor in (P) hence the quality of forage is low and clearly seen in general health of the studied animals. On the other hand, the research recommended to consider this hypopottasia in feeding and keeping animals in the research area by supplementing mineral licks containing (P).

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