THE LEVELS OF SOME BIOCHEMICAL COMPONENTS IN THE SERUM OF GOATS IN THE SAVANNAH ZONE OF NIGERIA

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Little work has been done to determine blood protein and electrolyte levels in healthy goats in the savannah zone of Nigeria. With the increasing interest in goats as experimental animals and for production, there is an obvious need to determine these parameters.

The free range goat husbandry methods in this zone are such that the intake of minerals needs to be known and thus correlated with the blood levels. Since most of the goats receive no concentrate supplementation, serum protein levels under the grazing conditions needs to be known so as to form a baseline for intensive farming methods. Reported are some biochemical components of serum in goats.

¹Model Perkin Elmer, Corp. Norwalk, Conn.

MATERIALS AND METHODS

Clinically healthy male and female Sokoto Red (Maradi) goats were sampled. Ages, determined by dental examination ranged from three to sixty months. The goats grazed freely under supervision of herdsmen and received little or no mineral or concentrate supplementation.

Serum was separated within three hours of jugular venapuncture and frozen at -5°C until required. Total serum protein and albumin (A) were estimated by the biuret method (Coles, 1967), globulin (G) and A/G values were calculated. Serum sodium and potassium were determined by standard spectrophotometry¹, chloride by the method of Schales and Schales (1941) and inorganic phosphate by the method of Gomori (1942).

RESULTS AND DISCUSSION

The number of goats examined (98) was sufficient to justify division into adults and kids. Serum magnesium, sodium and albumin levels were significantly higher ($P < 0.05$) in adults than the kids whereas, globulin and serum inorganic phosphate and potassium were significantly higher in the kids ($P < 0.05$) than in the adults. There were no significant differences in serum calcium, chloride and total protein between adult and kids ($P > 0.05$). Serum calcium, sodium and magnesium values were significantly higher in female goats than males ($P < 0.05$). There were no significant sex differences in serum total protein fractions, potassium, chloride and inorganic phosphate values.

The serum sodium and chloride values were (Table 1) generally lower in temperate goats than reported (Dittmer, 1961). This could be due to physiological adaptations as well as dietary intake of salt needed to cope with losses of sodium and chloride from sweating under humid tropical Nigerian environmental conditions (Oduye and Fasanmi, 1971). Serum protein fraction values and A/G ratio (Table 2) were higher than those reported by Gorczyca, McCarty and Lazon (1960). Such variation could be due to nutritional, immunological and pathological influences to which the grazing goats had been exposed, similar to reports by Saror and Coles (1973). Calcium and magnesium values compared favourably with values obtained by Spector (1956) and inorganic phosphate values are similar to findings by Rapport and Guest (1941).

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TABLE 1

Summary of Results Showing the Serum Electrolyte Levels of Goats in the Savannah Zone of Nigeria

No. of Animals	Type	Na ⁺ mEq/l	K ⁺ mEq/l	Cl ⁻ mEq/l	Cu ⁺ mg/100ml	Mg ⁺ mg/100ml	PO ₄ ⁻ mg/100ml
51	F	141.40 ± 19.80	5.62 ± 8.51	115.40 ± 8.51	9.98 ± 1.45	2.39 ± 0.60	5.89 ± 1.02
49	M	128.0 ± 37.71	6.12 ± 3.56	115.67 ± 12.08	8.24 ± 2.27	2.06 ± 0.59	5.81 ± 1.31
65	A	153.25 ± 19.20	3.82 ± 1.10	110.41 ± 6.44	9.13 ± 1.48	2.33 ± 0.53	5.97 ± 1.10
33	K	96.00 ± 9.20	5.25 ± 1.33	113.81 ± 9.82	8.31 ± 2.06	2.00 ± 0.53	6.62 ± 0.91
Mean	—	134.97 ± 32.94	5.08 ± 3.00	113.54 ± 10.25	9.01 ± 1.51	2.23 ± 0.61	6.02 ± 1.06

TABLE 2

Summary of Results Showing the Serum Protein Levels of Goats in the Savannah Zone of Nigeria

No. of Animals	Type	Albumin g/100ml	Globulin g/100ml	Total Protein g/100ml	A/G Ratio
51	F	4.81 ± 1.36	2.03 ± 1.33	6.85 ± 1.42	2.37
47	M	4.85 ± 1.76	2.17 ± 1.90	7.01 ± 1.85	2.24
65	A	5.12 ± 1.44	1.68 ± 1.19	6.80 ± 1.56	3.05
33	K	4.81 ± 1.54	3.15 ± 1.93	7.36 ± 1.78	1.33
Mean	—	4.92 ± 1.05	2.14 ± 1.08	6.96 ± 1.60	2.30

F = Female, M = Male, A = Adult, K = kid ± = Standard Deviation.

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