Table 1. THE EFFECT OF CALCIUM IONS ON THE UPTAKE OF CHROMIUM-51 BY HUMAN ERYTHROCYTES *in vitro*

Incubation medium	Percentage of uptake
ACD-solution* whole blood = 1/4	90
ACD-solution* whole blood = 1/4 + Heparin	89
ACD-solution* whole blood = 1/4 + Heparin + 2 mgm. Ca^{2+}/ml.	58
Saline Packed RBC = 2/1	91
Saline Packed RBC = 2/1 + 0·1 mgm. Ca^{2+}/ml.	63

* Natr. citr. tribas., 1·32; acid. citr., 0·48; glycos., 1·47; aqua dest., ad 100 ml.

studies on the mechanism of the inhibition of chromate-binding to erythrocytes or hæmoglobin by calcium ions, and on the influence of calcium ions on the elution of chromium-51 from the erythrocytes, are in progress in this laboratory.

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Volume and Acidity of Urine of Sheep fed Hay Rich in Silica and Effect of Dietary Salt Additions

THE results reported in this communication were obtained as part of a study related to a condition of silica urolithiasis which had been observed in steers on the Western Ranges of Canada and the United States. Experiments in this laboratory have shown that sheep fed a hay from Western Canada containing 8·28 per cent silica (expressed on air-dry basis) excreted urine with a *p*H of approximately 5·5. Sheep in the control group that were fed a hay from Eastern Canada containing 0·78 per cent silica excreted urine with a *p*H of approximately 8·2. Consumption of water and excretion of urine by sheep fed the high-silica hay were about one-half that of the sheep in the control group.

The polymerization of silicic acid in aqueous systems is dependent on concentration and *p*H. Rate of polymerization is stated to be inversely proportional to the square of the silica concentration[2] and most rapid at *p*H 5·5–6 (ref. 3), 5·8 (ref. 4), 5–7 (ref. 5). It is therefore possible that the effects on volume and *p*H of urine that resulted from the feeding of Western grass hay may play a part in the formation of silica calculi.

The proximate composition and cation content of the two hays is given in Tables 1 and 2. The Western hay was mainly *Stipa*, probably *Stipa comata*, whereas that from Eastern Canada consisted of second cut red clover (*Trifolium pratense*). In the experiment reported here two groups of three sheep were used. One group was fed the Eastern and the other the Western hay, with salts added in order to render the cation content of the two diets approximately equal. Each sheep on Western hay received daily the following additions based on an average daily hay consumption of 1,000 gm.: sodium hydrogen phosphate, 2·4 gm.; magnesium carbonate, 3·3 gm.; magnesium sulphate, 4·7 gm.; calcium carbonate, 15·0 gm.; potassium bicarbonate, 15·6 gm.; potassium chloride, 6·5 gm. Sheep fed the Eastern hay were given a daily addition of 112·5 gm. silica in the form of a commercial silica gel based on an average daily consumption of hay of 1,500 gm. Four samples of urine were collected daily over a 4-week period and the *p*H values determined on the fresh urine. 24-hr. urine volumes were determined three times a week.

Table 1. PROXIMATE PERCENTAGE ANALYSES OF EASTERN AND WESTERN HAYS

	Protein N × 6·25	Fat	Crude fibre	Ash	N-free extract
Eastern hay	11·74	1·46	31·32	6·72	48·76
Western hay	5·87	1·89	32·63	13·06	46·55

Table 2. MINERAL ANALYSES OF EASTERN AND WESTERN HAYS

	Na	K	Ca	Mg	P	SiO_2
Eastern hay	0·06	1·35	0·92	0·27	0·15	0·78
Western hay	0·02	0·44	0·32	0·08	0·12	8·28

Addition of silica to the diet had very little effect on either the volume or the *p*H of the urine. On the other hand, addition of salts to the diet of sheep fed the Western hay resulted in a urine volume comparable to that of the control group. In addition there was some elevation in urine *p*H but this was subject to considerable fluctuation. In order to overcome this fluctuation in *p*H, equivalent amounts of magnesium and potassium as magnesium carbonate and potassium bicarbonate were used to replace the magnesium sulphate and potassium chloride. This resulted in *p*H values of approximately 8·0. No ill effects attributable to the administration of salt were observed during the experiment.

Our studies on urolithiasis so far have suggested that low *p*H and low excretion of urine may be important factors contributing to the formation of silica calculi. If this is correct, proper additions of salts to the diet may contribute to the reduction of silica urolithiasis.

A more detailed account of these experiments will be published in the near future.

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