

3. Title: "Study of Urinary Methionine, Cystine and Lysine Excretion"

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Objective

To study the urinary methionine, cystine and lysine excretion of children living in Nong Kohn village and Ubol city. Low excretion of these amino acids may be interpreted as an indication of low intake.

Description

Aliquots of urine samples, collected from children 2 to 10 year old, were determined for the methionine, cystine, and lysine contents. These 24-hour urine specimens were collected during the hot-dry (April), rainy (August) and cool-dry (November) seasons of 1963.

The modification of Langer and Kratzer (Poultry Science 43:127. 1964) of the microbiological method described in the 9th edition Difco Manual was used for determination of these 3 amino acids.

Progress

Determinations have been completed and the results are shown in Table I, II, and III.

Normal range for free amino acids in urine of adult is as follows:

- a. Lysine 6.6-108.2 mg/24 hr urine.
- b. Methionine 0.6-67 mg/24 hr urine.
- c. Cystine 37.7-137.7 mg/24 hr urine.

Normal range is the mean \pm (2 x standard deviations) taken from "Documenta Geigy-Scientific Tables" 6th edition pp. 529 (1962).

Urinary methionine excretion in the village children is significantly lower than in the city during the hot and rainy seasons but is significantly higher in the cool season. Urinary lysine excretion of the village children is significantly lower in the two hot seasons while there is no significant difference in the cool and raining season.

As compared to the normal range, the urinary excretion of both methionine and lysine in Ubol children is low but the cystine excretion is approximately the same. However, the excretion of these 3 amino acids has a wide normal range in urine of adults. The range of normal in children is not available for comparison.

Low urinary excretion of both methionine and lysine may indicate low intake of these two amino acids. Consistently low excretion during the hot season support our dietary survey study which showed that the villagers consumed less food in the hot season as compared to the other two seasons of the year 1963.

Study of the urinary amino acid pattern in infants under 1 year old living in villages and city is in progress. Thus far, only 12 urine samples were studied. No conclusion can be drawn at present time.

Table I
Urinary Methionine Excretion in Children 2 to 10 yr. old
(mg/24 hr)

Period*	Nong Khon	Ubol City	t - test	P
I	(15) 0.257 ± 0.054	(8) 1.132 ± 0.435	1.997	0.1-0.05
II	(25) 0.208 ± 0.034	(18) 0.404 ± 0.058	2.925	<0.01
III	(33) 0.129 ± 0.027	(12) 0.023 ± 0.027	2.789	<0.01
IV	(29) 0.024 ± 0.003	(25) 0.093 ± 0.034	2.02	0.05

Table II
Urinary Lysine Excretion in Children 2 to 10 yr. old
(mg/24 hr)

Period*	Nong Khon	Ubol City	t - test	P
I	(13) 9.79 ± 2.25	(7) 75.81 ± 35.68	1.886	0.1-0.05
II	(24) 17.20 ± 2.58	(17) 12.42 ± 2.84	1.167	0.5-0.2
III	(32) 8.40 ± 1.03	(12) 14.08 ± 2.55	2.065	0.05
IV	(28) 8.76 ± 1.70	(26) 20.66 ± 3.63	2.975	<0.01

Table III
Urinary Cystine Excretion in Children 2 to 10 yr. old
(mg/24 hr)

Period*	Nong Khon	Ubol City	t - test	P
I	(12) 66.7 ± 12.2	(6) 118.3 ± 35.5	1.38	0.20
II	(15) 162.8 ± 50.0	(17) 126.7 ± 20.2	0.67	0.50
III	(34) 92.2 ± 16.9	(11) 129.5 ± 29.9	1.08	<0.20
IV	(27) 90.2 ± 8.2	(24) 113.1 ± 11.4	1.63	0.10

Number in bracket indicates the number of subjects

* I - April, 1963; II - August, 1963; III - November, 1963; IV - May 1964