



WATER INGESTION AND URINARY EXCRETION OF ETHER-SOLUBLE MATERIAL IN B AND G AVITAMINOTIC RATS*

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Investigators have occasionally expressed the opinion that the voluntary fluid intake of animals is diminished when the antineuritic vitamin B is absent from the diet. No experiments have been reported in which the water intake of animals deprived of this vitamin has been compared with that of control animals maintained on the same caloric intake.

A paired-feeding experiment has been carried out with nine pairs of Albino rats, each pair consisting of litter mates of the same size and sex and normally showing about the same food and water intake. During a 14-day preliminary period in which the animals ate at will, the vitamin B content of the diet was gradually decreased. Vitamin B was then completely removed from the diet of the experimental animal; the control was given an adequate amount of vitamin B but its food intake was limited to that of its pair mate. Both experimental and control animals were permitted to drink *ad libitum*. The water and food intake was determined daily.

In seven of the nine pairs, the animals deprived of vitamin B drank less water than did the control animals over a period of 14 to 21 days. The average daily water intake of the experimental animals was 8.2 cc; of the controls, 9.7 cc. Over a period of 16 days, the experimental animal of one pair showed an average daily water intake of 5.8 cc; the control drank 7.2 cc water daily. The animals of this pair were then reversed, the experimental animal becoming the control and vice versa. For the succeeding 21 days the average daily water intake of the new experimental animal was 6.4 cc; of the control, 8.0 cc. In view of the manner in which this experiment was carried out, this result is especially significant.

These experiments give evidence of a definite decrease in water consumption during vitamin B deprivation.

Kon¹ has reported that rats deprived of vitamin G show an increased carbon:nitrogen ratio in the urine as compared with individual controls receiving equivalent amounts of a complete diet. This difference was less marked for animals deprived of the vitamin B complex and was negligible in the case of rats deprived of vitamin B alone. In view of the findings of Collaso and Mumilla², who report a greatly increased excretion of urinary fat by dogs deprived of all vitamins, it appeared possible that the

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marked increase in the urinary carbon:nitrogen ratio observed by Kon in G avitaminotic rats might be the result of an increased excretion of urinary fat.

Recently, determinations were made of the amounts of total solids and of ether-soluble substance present in the urine of rats deprived of either one or both vitamins B and G and their controls under conditions of controlled food intake.

Sixteen adult Albino rats were arranged in four groups so that each series consisted of animals of the same sex and approximately the same weight. They were kept in individual metabolism cages designed for the effective separation and collection of urine and feces. The food cup was placed in a jar at the base of a side arm of the cage to prevent scattering.

The first animal of each series received the basal vitamin B and G free diet unsupplemented; the second, third and fourth animals of each series received vitamin B, vitamin G and vitamins B and G respectively. The daily food intake of each of the animals of the series was restricted to that of the animal which received no supplement. The urine was collected daily and at the end of each five-day period the screens and collection dish were carefully washed with hot distilled water. The samples were then evaporated on a water bath and made up to a volume of 100 cc. Toluene was used as a preservative and the samples were kept in a refrigerator until analyzed.

An aliquot of the sample was absorbed on a roll of fat-free filter paper, dried, and extracted for 24 hours with anhydrous ether. Ether-soluble material was determined by difference.

In each of the four series the animals that were deprived of vitamin G, or of both vitamins B and G, excreted the smallest amounts of urinary solids. In one instance the amount of solids excreted by the animal deprived of vitamin G was only 55 per cent of that excreted by the litter-mate control. Withholding vitamin B decreased the excretion of urinary solids in only two of the series and in these instances the decrease was not marked.

Little difference was found between the amounts of the ether-soluble material excreted by the animals suffering vitamin deficiencies and their controls. In one of the series the G-avitaminotic animal showed a definitely greater excretion of ether-soluble material than was shown by the other animals of the series. This tendency was less marked in two of the series and was not evident in the fourth.

BIBLIOGRAPHY

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