

and dorsal curvature of the tail. The heart rate slowed during this phase of the effect and was accelerated during the recovery period. Profuse salivation occurred. The intense motor excitation lasted usually from 5 to 15 minutes, but the animals were ataxic and had an unsteady wide-based gait for a somewhat longer period. In a minority of cases a generalized tonic and clonic convulsion followed the original motor spasm. The animals were usually normal 30 minutes after the injection.

In some of the experiments, the needle was left in the cisterna following citrate injection and, as soon as the motor reaction was obtained, calcium chloride or magnesium chloride was injected in amounts equivalent to the sodium citrate. The hypertonic muscles relaxed in a few seconds and within a few minutes the animal appeared to be normal.

Injections of Ringer's solution and sodium chloride in these small doses were without apparent effect. Injection of calcium citrate did not provoke a motor response.

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Influence of Salt Intake on Susceptibility of Albino Rats to Diets of Low Vitamin B Content.

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Fifty-six rats were used in the studies here summarized. Before the experiment they had been kept on a stock diet of Purina Fox Chow, Miller's Puppy Meal, and oats fed daily, with the addition of meat, cheese, and cabbage once or twice a week. Litter mates of the same sex, and as nearly the same weight as possible, were selected. The animals were divided into 2 age groups, one varying from 25 to 55 days and the other from 91 to 148 days.

The controls, including half the rats in each age group, received diet No. 1, consisting of starch 64%, casein 18%, butter 10%, salts 3% (Osborne and Mendel's mixture as prepared by Harris Laboratories) and yeast 5% (Fleischmann's bakers' yeast, fresh). The yeast is at least 70% water, and the amount given is evidently inadequate for vitamin B requirement, since we have found that rats kept on this diet invariably die within a few weeks. The ani-

mals thrive on the diet if it is modified by trebling the yeast content. Diet No. 2, given to the remaining animals, was similar to No. 1 except that the salt mixture was entirely omitted and replaced by additional starch. The rats of both series received food and tap water in excess of the amount consumed.

During the first 14 days of the experiment the average weight was much greater for the control rats than for those on diet No. 2. The survival period, however, was longer for the latter group. By the 55th day all the mature controls were dead, while 85.7% of their litter mates on diet No. 2 were surviving, though with an average loss of 28.5 gm. from their initial weight. On the 58th day the last of the younger control rats died, while 58.1% of their litter mates on diet No. 2 were still living, with an average gain of 5 gm. over the initial weight. The weight curve for these younger rats was complicated by the growth factor and did not show the marked loss in weight exhibited by the mature animals.

The age of the rats within the range of 25 to 148 days did not seem to be an important factor in determining their resistance to vitamin B deficiency. The average initial gain in weight was somewhat greater for the young controls but their average duration of life was about the same as for the mature animals on the similar diet.

The average initial gain for the males of all ages studied was greater than the gain made by the females. The resistance to vitamin B deficiency, however, as measured by the duration of life did not seem to be greatly influenced by sex.

During the last few days of life, the control animals showed typical polyneuritic spasms which were frequently very severe. The animals receiving the salt deficient diet seldom showed even mild spasms. The majority of these rats died in coma.

The average survival period for all the controls was 46.5 days, while the animals receiving the salt deficient diet showed an average exceeding 77.2 days. On the 58th day when the last of the controls died, 67.8% of the rats on diet No. 2 were still living.

Shinza¹ reported that rabbits given an excessive amount of sodium salt developed a condition closely resembling experimental beri beri. He suggested that this might be due to a withdrawal of the potassium ion by the sodium. Whether our results can be explained on the basis of an imbalance between the potassium and sodium ions in the dietary salts remains to be studied.

¹ Shinza, R., Scientific Rep. from the Govt. Inst. for Infect. Dis., The Tokyo Imp. Univ., 1923.