

3259

Phosphate and Kidney Weight*

LOIS LOCKARD MACKAY, EATON M. MACKAY AND T. ADDIS.

From the Department of Medicine, Stanford University Medical School, San Francisco, Calif.

The addition of a certain amount of sodium phosphate to the food of young albino rats is followed by a remarkable increase in the weight of the kidneys, an increase which considerably exceeds that which is found after the ingestion of excessive amounts of other minerals or of protein.

Female rats, 30 days of age at the beginning of the experiment, were given a casein-starch-lard diet in which adequate concentrations of cod liver oil, yeast, wheat germ and salt mixture were incorporated. To other groups of animals the same diet was given, except that part of the corn starch was replaced by acid or alkaline sodium phosphate. The total phosphate (PO_4) concentration in the control diet was 0.68 per cent, in the acid phosphate diet 5.03 per cent, and in the alkaline phosphate diet 5.02 per cent. Measurements of food consumption showed that nearly equal amounts of food were taken by each group. After 44 days the rats were killed. The kidney weights are given in Table I.

TABLE I.

	Number of rats	Average body weight gm.	Average kidney weight mgm.
Control	25	121	898
NaH_2PO_4	24	117	1698
Na_2HPO_4	18	97	1710

No such pronounced increases in kidney weight were seen in similar experiments in which as much or more sodium than was taken in the above experiments was given in the form of sodium chloride or sodium bicarbonate.

Parallel experiments showed that neither acid nor alkaline phosphate had any effect on the degree of compensatory hypertrophy of the kidney after unilateral nephrectomy.

* This work was aided by a grant from the Ella Sachs Plotz Foundation.