7481 P

Effectiveness of Vitamin D in Infancy in Relation to the Vitamin Source.

P. C. JEANS AND GENEVIEVE STEARNS.

Department of Pediatrics, State University of Iowa, Iowa City.

This report concerns the preliminary findings regarding the utilization by the human infant of vitamin D from different sources. The criterion chosen was the quantity of calcium retained by well infants given the same amount of milk and the same rat unitage of vitamin D. Irradiated evaporated milk containing 50 units,* and evaporated milk containing the unsaponifiable fraction of cod liver oil (Zucker concentrate) allowing 150 units per quart of reconstituted milk respectively, were compared with evaporated milk plus vitamin D given separately as a cod liver oil containing 40 units of D per gram. The Zucker concentrate milk was mixed with plain evaporated milk, and the quantities of cod liver oil were so chosen that the vitamin D unitage of each diet was constant for any given intake of milk, and was regulated by the amount present in the irradiated milk. The youngest infants received only 22 units daily, but by 16 weeks of age, all the infants were ingesting approximately 50 units of D daily. The plan of study was to give each of the 3 experimental diets to a group of infants of the same age and milk intake; after a period of about 6 weeks, the diets were changed so that each infant received each diet in turn. At the beginning of the study, 3 infants were from 5 to 8 weeks of age; 3 from 16 to 24 weeks; and one infant a year old was given each diet in turn.

The relations observed between calcium intake and retention per kilogram body weight are shown in the chart. The source of vitamin D used in each experiment is indicated by the different symbols. The line shows the average curve of retention:intake obtained from over 200 experiments upon infants having the same age range and milk intakes, but given approximately 125 units of vitamin D daily in the form of cod liver oil. The range of results in the present series tends to show that no source of vitamin D studied differed materially from the others in its effect upon the calcium retention. The quantity of retention observed in the group as a whole averaged about 10 mg. per kg. lower for any given milk

* The amount of vitamin D is recorded in terms of Steenbock units throughout. The unitage of all 3 sources was verified by assay.

intake than the retentions observed in previous experiments with infants given larger amounts of vitamin D. No evidence of clinical or

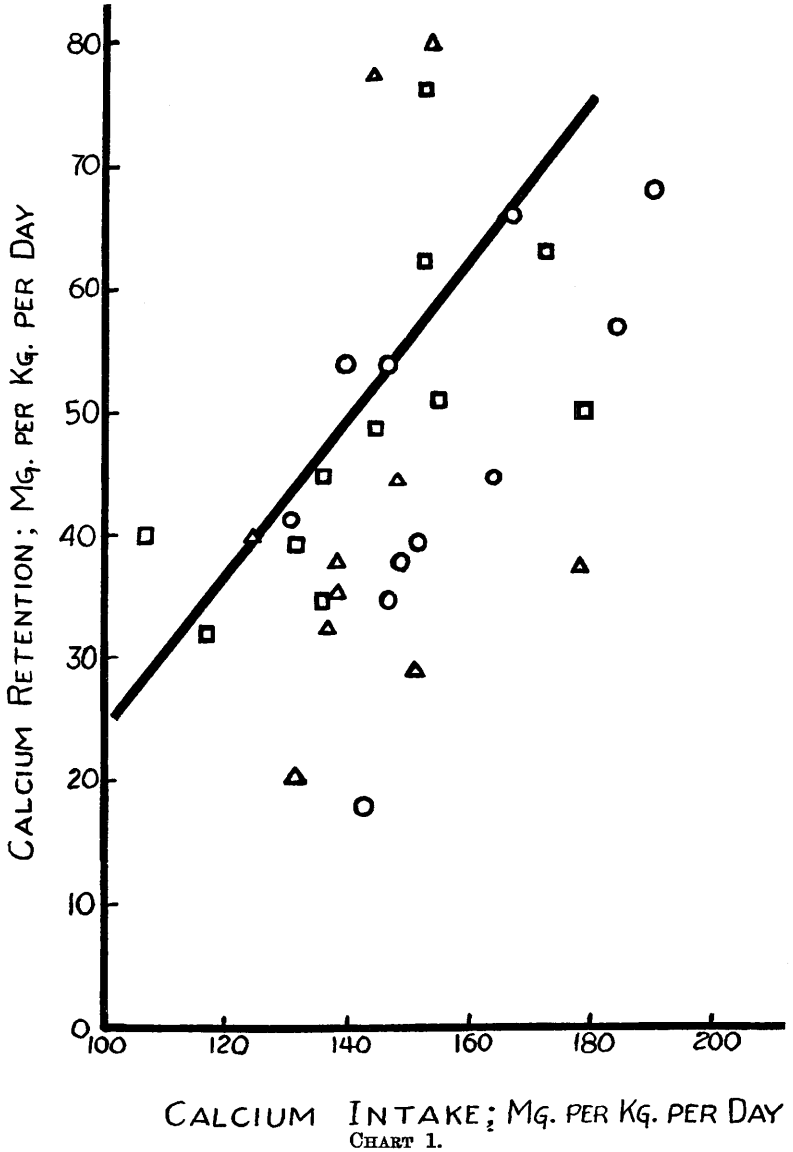

CHART 1.

Relation of intake and retention of calcium per kilogram per day of infants given from 22 to 50 rat units of vitamin D daily. Circles indicate experiments in which cod liver oil was source of vitamin D; triangles, irradiated evaporated milk; squares, cod liver oil concentrate homogenized in evaporated milk. Infants of same age were given same quantities of milk and same rat unitage of vitamin D. The line shows average curve of retention:intake of infants having same age range and milk intakes but given 125 units of vitamin D daily.

roentgenological rickets has been observed in any infant, although one baby has shown some evidence of decreasing bone density. The rate of growth in length of the group was definitely lower than the average growth of the infants given larger amounts of vitamin D.

The findings in this preliminary study indicate that for well infants, the amount of calcium retained from a given intake of milk will be determined in part by the quantity of vitamin D ingested, and that a given rat unitage of this vitamin from any one of the 3 sources studied is equivalent to the same rat unitage from either of the other 2 sources.

7482 P

Dinitrophenol in Diet, on Growth and Duration of Life of the White Rat.*

M. L. TAINTER.

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

In connection with the present extensive clinical use of dinitrophenol (2-4 or alpha) in treating metabolic disorders or obesity, an important problem is the possible influence of the drug on the rate of growth and duration of life. Experiments on this problem have been in progress for 18 months in this laboratory and may be reported in a preliminary way now.

Three separate series of feeding experiments are being conducted, using white rats from the same strain. The rats are fed a standard adequate diet, to which are added the required amounts of alpha dinitrophenol with thorough mixing to ensure homogeneity. Food and water consumption and weights of rats are recorded at 3-day intervals. The rats are divided into groups of 5 or 6 and given the dinitrophenol in concentrations ranging from 0.0002 to 0.24%, starting shortly after weaning.

All the rats on 0.24% died before the 90th day, and 3 of those on 0.12% died by the 275th day. The lower concentrations were well tolerated as far as fatalities were concerned. Inspection of Table I shows that there was a small degree of slowing of rate of growth in the higher dosage groups. The greatest retardation at any time, with concentrations of 0.08% or less, was never more than 19%.

* Supported in part by a grant from Rockefeller Fluid Research Fund of the School of Medicine, Stanford University.