

ABSTRACTS OF COMMUNICATIONS.

Seventh meeting.

*Peking Branch.**Peking, China, March 10, 1924.*

205 (2437)

The value of egg yolk in supplementing diets deficient in calcium.

By ERNEST TSO (by invitation).

[From the Department of Medicine, Peking Union Medical College,
Peking, China.]

According to McCollum¹ the deficiency of calcium in eggs is a serious limitation of their value as a supplementary or protective food.

On a diet containing 398 mg. of calcium per 100 gm. of ration² which was considered to be markedly deficient in calcium, young rats failed to grow normally in spite of the presence of 5 per cent of butter fat. On the other hand, the addition of 1 to 2 per cent of cod liver oil to the same diet was found to be strikingly more effective in stimulating growth and "protecting young animals against the harmful effects of partial calcium starvation."

More recently Bethke, Steenbock, and Nelson³ have correlated the calcium requirement of growing rats to the intake of cod liver oil or the vitamins contained therein. These investigators found "that no amount of Ca added to the basal ration without vitamin addition was effective in increasing growth, but when cod liver oil was added progressively in increasing amounts, less and less Ca was required for normal growth."

It is highly significant to compare these observations with the striking results I have obtained from feeding albino rats simply on egg yolk and millet. The main diet consisted of 30 parts by weight of fresh egg yolk and 70 parts ground millet seed (*Setaria*

¹ McCollum, E. V., *Newer Knowledge of Nutrition*, 1922, pp. 171 and 343.

² Shipley, P. G., Park, E. A., McCollum, E. V., and Simmonds, N., *Am. J. Hyg.*, 1921, i, 524.

³ Bethke, R. M., Steenbock, H., and Nelson, M. R., *J. Biol. Chem.*, 1923, lviii, 71.

italica). 100 gm. of this food mixture contained approximately 70 mg. of calcium.

A control diet, comparable with the egg yolk and millet ration in proportions of fat, carbohydrate, and protein, was made up of 20 parts by weight of whole milk powder (Merrell-Soule), 5 parts of butter, and 75 parts of millet seed. 100 gm. of this food contained 220 mg. of Ca.

As fed to the animals 100 gm. of each ration were cooked in 110 cc. of distilled water for 15 minutes or until the mixture had thickened into a pudding consistency and the raw odor of the cereal had disappeared. The food as well as additional amounts of distilled water was fed *ad lib.* and daily replaced.

On the egg yolk and millet diet male rats grew to the average weight of 260 gm. and female rats, 170 gm. in 20 weeks. One female rat had a litter of 8 young; however, none survived beyond the first week. The male animals on the milk diet grew somewhat more vigorously; their average weight was 280 gm. One female rat gave birth to 7 young. One of these died on the third day. The rest weighed on the average 22.6 gm. each at the age of eighteen days.

The results of these preliminary experiments seem to indicate that egg yolk given in equivalent amounts in terms of caloric values, is nearly as efficient as milk in promoting normal growth in young rats, notwithstanding the wide difference in calcium content between the two rations. Like cod liver oil, egg yolk is evidently possessed of a special property of increasing the Ca assimilation and thereby sparing the excess of Ca intake which is otherwise required in the food.

However, the Ca intake in the egg yolk and millet diet is obviously close to the minimum level and inadequate to meet the needs of lactating animals.