

High and low protein diets and excretion of nitrogenous compounds in normal and undernourished children.

CHI CHE WANG, MARGARET FRANK and BERTHA HAYES.

[From the Elizabeth McCormick Metabolism Fund of the Nelson Morris Institute of the Michael Reese Hospital, Chicago, Ill.]

The work presented is part of a series of investigations of the metabolism of undernourished children of school age, who showed no pathological complications on medical examination, except that they were underweight for their height. The normals were not only normal in weight, but were healthy in every respect.

In this study the children were put first on a high and then on a low protein diet of at least 6 days each, and for the last 3 days 24-hour specimens of urine were collected and analyzed for total nitrogen, ammonia nitrogen, creatinine, and creatine. The nitrogen of the foods was also determined.

There is no marked difference in nitrogen absorption in the two groups. Both of them absorbed more nitrogen on a high protein diet, although the percentage absorption was lower. Ammonia excretion was decidedly higher in the undernourished children both computed in terms of mg. per kilo of body weight and in percentage of total nitrogen. This high ammonia excretion is probably due to the greater demand for alkali for neutralization of the excessive fatty acids produced in the intestines and eliminated as soaps in undernourished children. The alkali loss in the tissues is made up by ammonia formed in the body and excreted in the urine.

Creatinine excretion is independent of protein intake and there is no difference in the amount excreted by the two groups of children. On the other hand creatine seems to vary with protein intake in both groups, although the undernourished children excrete more creatine on low protein diet than the normals. The ratio of creatine nitrogen to total nitrogen output is remarkably constant. The higher creatine excretion in the undernourished children on a low protein diet suggests that they excrete more endogenous creatine.