

out in the urine and might be considered wastage. The logical inference is that intakes of vitamin C between 60 and 100 mg. daily are adequate to maintain good vitamin C nutrition generally and a state of tissue saturation in some instances. At intakes of vitamin C designated as low or deficient the urinary excretion of ascorbic acid seems to be lower, but since no clinical symptoms of a vitamin deficiency were reported, one cannot assume that low values necessarily are abnormal.

The discrepancies in values reported for urinary excretion of vitamin C may be accounted for to some extent by differences in analytical procedures for the determination of ascorbic acid in urine. Chemical methods for the detection of vitamin C in urine are based on the indol reducing capacity of the vitamin (Bessey and King, 1933). If experimental conditions are suitable the dye will be reduced specifically and quantitatively by vitamin C. However, there are present in urine other substances as glutathione, cysteine and phenolic compounds which also are capable of reducing the dye. These non-ascorbic acid reducing substances may account for 90 per cent of the reducing substances in urine (Evelyn et al., 1938). The reaction of ascorbic acid with dye is instantaneous while that of dye with other reducing substances takes place more slowly. Evelyn's method of measuring the reaction of dye with urine in the photoelectric colorimeter at regular time intervals, plotting a reaction velocity curve from the

readings and then extrapolating to zero time determines the amount of decolorization due to vitamin C alone. Numerous investigators have not recognized a possible source of interference from other indol reducing substances in urine or have failed to detect the end point of rapid reduction.

b. Saturation tests. Individual requirement for ascorbic acid has been determined not only from 24-hour excretion values but by the saturation or test dose method. The saturation test evaluates vitamin C nutrition by measuring the percentage of a test dose of the vitamin that is excreted in a certain time interval, usually 24 hours, following its administration. One advantage of this technique is that the relatively small differences seen in basal excretions are magnified (Abbasy et al., 1935).

Test doses have been administered orally or injected intravenously or intramuscularly. Shaffer (1944) states that the excretion of ascorbic acid after a test dose varies with the route of administration of the vitamin. If the test dose is administered orally almost complete absorption occurs, but a certain time period is required and excretion reaches a maximum in three to six hours. If the test dose is given intravenously, plasma concentration increases quantitatively and immediately, and maximum excretion occurs in less than two hours. The intravenous method of vitamin C administration causes vitamin C to be presented to tissues at a rate that exceeds their ability to absorb it, and urinary loss of