Limitations of the Various Methods for Collecting Dietary Intake Data

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The dietary intake of population groups may be assessed using food consumption level estimates on a national basis and household food surveys. These may be useful for monitoring secular trends and geographical differences with stable and well-documented populations, but analytical studies of diet and health require data on individuals. Assessment techniques designed to assess the diet of individuals ranging from records with weights of food to questionnaires and biological markers have been critically reviewed in order to assess the accuracy of each. Quantitative estimates of the errors involved will be given. For example, the co-efficients of variation of differences incurred from asking subjects to estimate the weight of food portions, rather than weighing them, may regularly be in the 50% range for foods and 20% for nutrients. A variety of studies suggests that the co-efficients of differences in nutrient intake estimated over 1 day from the 24-hour recall method when compared with observed intakes ranged from 4 to 400 %. These errors are believed precision can be improved by increasing the numbers of observations on each individual or by increasing the numbers of individuals within each group. However a substantial loss of power is incurred with errors of this magnitude. A more serious potential source of error is systematic bias due either to differences between different methods of dietary assessment or from deliberate over- or underreporting by the subjects themselves. Studies with the doubly labelled water technique have suggested that substantial underrecording of food intake can occur both in free-living individuals and in athletes. 24-hour urine nitrogen can be used to validate dietary assessments in individuals in nitrogen balance and on-going studies in Cambridge show that within a group underreporting occurs in specific individuals rather than in the group as a whole. Independent methods of validating dietary assessments such as the doubly labelled water technique or the 24-hour urine nitrogen output must be included in any study of free-living individuals. to be random, and