

Food Analysis 101: How To Get Good Data

Joanne M. Holden, Nutrient Composition Laboratory, BHNRC, ARS/USDA,
Beltsville, MD 20705

Food composition data are essential to the understanding of the relationship between dietary intake and nutritional status. Dietary effects on health may be acute or long term. In order to accurately assess these effects, accurate and precise component estimates are required. Variance in component levels due to the measurement process (sample selection and preparation, chemical analysis, and mathematical estimation) can be partitioned from variance inherent to the food product (brand, season, geographic location) and should be minimized. In addition, food composition estimates should be unbiased and representative of foods and components in the diets of the study population. To assure the accurate and precise execution of a given analytical method, the method should be validated before samples of unknown composition are measured. Reference materials of known composition can be analyzed as part of a comprehensive quality assurance program to validate the analytical method, to monitor day-to-day accuracy, and to avoid bias and drift of the on-going measurement process. The selection of representative samples is based upon an appraisal of food products, their descriptions, and consumption characteristics. Sales data and manufacturers descriptions, including food labels, can be used to define specific product categories. Demographic data can help to identify sampling locations. Pilot studies provide estimates of component variance, a critical element in calculation of numbers of samples required to obtain statistically sound estimates.