

ESTIMATING USUAL DIETARY INTAKE DISTRIBUTIONS:
ADJUSTING FOR MEASUREMENT ERROR
AND NONNORMALITY IN 24-HOUR FOOD INTAKE DATA

by

Sarah M. Nusser and Wayne A. Fuller
Iowa State University
Patricia M. Guenther
Agricultural Research Service, U.S. Department of Agriculture

ABSTRACT

The distribution of usual intakes for dietary components plays an important role in the development of U.S. government nutrition and food safety programs. However, the usual intake of a dietary component for a person, defined as the long run average of daily intakes of the component for that person, can not be directly observed. Recent research has centered on a measurement error model approach to estimating the distribution of usual intakes of nutrients using daily intake data. We present an extension of this methodology to estimate usual food intake distributions. The method allows for varying degrees of departure from normality and homogeneity of variances, and recognizes the measurement error associated with 1-day dietary intakes. The usual intake for an individual is specified to be equal to the usual intake on days when the food is consumed multiplied by the probability of consumption. The consumption day usual intake distribution is estimated using a modification of methods developed for nutrients. An estimate of the joint distribution of the consumption day usual intakes and the probability of consumption is then used to estimate usual food intake distribution for all days. The method is illustrated with examples from USDA food intake surveys.