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

by

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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, cannot 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.