Proposed methods for limiting the significance of food composition errors. B. J. Westrich,[a] P. G. McGovern,[b] L. J. Su[b] & A. L. Eldridge.[b]

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Despite increased recognition of the importance of high-quality food composition data, little is known of the quantitative public health significance of food composition errors or the efficacy of methods used to limit the significance of these errors. Using computer simulation, we have estimated the impact of food composition errors on accuracy of nutrient intake calculations and also measured the efficacy of various methods for limiting the significance of these errors. Food composition errors were simulated for all entries of a widely used food composition database. The nutrient values were perturbed using a normal distribution with variance proportional to three different quantities: food weight, number of food servings, and dietary nutrient contribution of the food. Significance of these simulated errors was assessed by performing nutrient calculations on representative dietary recalls (n = 11,250) using original and perturbed nutrient values. Impact of the food composition errors on nutrient intake calculations will be presented along with findings on relative efficacy of the three methods for limiting food composition errors. The research is of interest to those wishing to limit the significance of errors occurring during chemical analysis of foods or imputing of nutrient values.

Reducing the significance of food composition errors: A simulation analysis. B. J. Westrich,[a]* P. G. McGovern,[b] A. L. Eldridge[b] & L. J. Su.[b]

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Despite increased recognition of the importance of high-quality food composition data, little is known of the public health significance of food composition errors or the efficacy of methods used to limit the significance of these errors. The most common method for assessing and limiting food composition errors is to establish maximum allowable nutrient errors, or tolerances, based on food weight. Using computer simulation, we estimated the impact of food composition error on the accuracy of nutrient intake calculation, and compared the ability of weight and serving based tolerance to limit the significance of these errors. The nutrient values in the food composition database associated with the 1991 United States Department of Agriculture Continuing Survey of Food Intakes by Individuals (CSFII) were perturbed using a normal distribution with variance proportional to either food weight or number of food servings. The significance of simulated errors was assessed by performing nutrient calculations for dietary fiber on CSFII dietary recalls (n = 9285) using original and perturbed dietary fiber values. Twelve simulation replications were performed for each recall. Assuming 95% of all food composition errors are less than the maximum tolerable error, food composition error was found to contribute significantly to error in nutrient intake calculation of individual intake records when either weight based tolerances or serving based tolerances were used. The mean absolute value of error in daily intakes of individuals was 4% lower using serving based tolerances (3.10 g) than with weight based tolerances (3.22 g). As expected, population means for dietary fiber intake using nutrients perturbed by either method did not differ from the mean daily dietary fiber intake of 13.4 g calculated using unperturbed fiber values. These data show that use of serving size based food composition error tolerances may slightly reduce the significance of food composition error compared to weight based tolerances, but there remains a substantial amount of error in the calculated intakes of individuals.

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Variances in major nutrients and minerals due to inter-household food preparations from recipes. Ia Torelm,[a]* Ann-Carolin Lundgren,[b] Magdalena Perers[b] & Åke Bruce.[a]

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Variance in nutrients as they reach the consumer have many different sources, such as the biological variability in the raw material itself, the differences in sampling and processing techniques, and how the preparations of the food to produce a ready-to-eat meal or dish are performed.

To investigate the variances in major nutrients and minerals due to preparations in ordinary households, ten families with children were asked to prepare three different dishes each, following recipes but according to their own choice regarding weighing and measuring. The dishes were sausage stroganoff, meat sauce and fish with egg sauce. The mean values and total variances in moisture, ash, nitrogen, fat, calcium, phosphorus, iron, sodium and potassium in the three dishes were evaluated, as well as variances due to preparation and chemical analysis, respectively (ANOVA).

The use of salt was according to taste and for instance in fish with egg sauce one family had used three times as much salt as the family with the lowest result. In sausage stroganoff low sodium results corresponded to high potassium results and vice versa. Great relative variances were revealed for iron in sausage stroganoff and meat sauce, containing tomatoes. All dishes revealed about 10% nitrogen relative variances.

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