RECIPE COMPOSITION: CALCULATED VALUES AND CHEMICAL ANALYSIS

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Chemical analysis of nutrients is the accepted "gold standard" for the validation of nutrient determinations from food composition tables. The reproducibility of chemical determinations of 17 duplicate school lunch food items and the comparison of chemical analysis with nutrient analysis calculated from a computerized database were examined for 60 school lunch food items as part of the feasibility phase of the Child and Adolescent Trial for Cardiovascular Health (CATCH), a large-scale school-based intervention study. Results are presented for two nutrients, fat and sodium. The within-duplicate coefficient of variation for the chemical analyses of the 17 duplicate samples was 8% (95% confidence interval: 5.2, 10.7) for fat and 15% (95% confidence interval: 9.5, 19.9) for sodium. For the 60 school lunch food items, both chemical and calculated methods yielded similar mean fat contents. The mean ($\pm$SD) fat content was 10.2 $\pm$ 7.1 g/serving from chemical analysis and 10.3 $\pm$ 7.3 g/serving from the calculated method. The data for sodium, however, were indicative of systematically higher determinations by the calculated method (482 $\pm$ 353 mg/serving) compared with chemical analysis (301 $\pm$ 234 mg/serving). Large differences between the two methods were noted for individual food items. For fat, the mean difference between the two methods was only 11.0%, but differences exceeded 15.0% for 68% of the foods. For sodium, however, the mean difference between the two methods was 73% and differences exceeded 15.0% for 85% of the foods. This study shows that the fat content calculated from a computerized database yields average values comparable with those obtained from chemical analysis, but large discrepancies for individual food items occur. For sodium both the overall mean and the individual food items show large differences in which the calculated values consistently overestimate the analyzed values. Food composition tables contain summary data reflecting a highly diverse national food supply and therefore can only approximate the composition of an individual food sample. In addition, sample collection, variability between the recorded and prepared recipes, laboratory procedures, and coding and entry of recipes also may contribute to the differences observed. These results suggest that food composition tables are adequate for estimating the overall mean fat content of food, but chemical analysis may be required to estimate the overall sodium content.

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