

# Effects of Missing Meals on the Dietary Adequacy of the Elderly: The 1987-1988 National Food Consumption Survey

By: Green, B. L., Wang, M. Q., [Perko, M. A.](#), King, M. J., & Britt, M. F.

Green, B. L., Wang, M. Q., Perko, M. A., King, M. J., & Britt, M. F. (1995). Effects of Missing Meals on the Dietary Adequacy of the Elderly: 1987-1988 Nationwide Food Consumption Survey. *Wellness Perspectives: Theory, Research, and Practice*, 11(4), 62-67.

Made available courtesy of University of Texas Press: <http://www.utexas.edu/utpress/>

**\*\*\* Note: Figures may be missing from this format of the document**

## **Abstract:**

This study evaluated the differences in dietary adequacy between elderly (age 65 and older) who missed meals and those who did not. Data were obtained from the National Food Consumption Survey (1987-1988). Three-day food consumption records were used to collect the dietary data. Elderly persons who missed a meal during the 3-day period were classified as missing a meal (N=577), and those who did not miss a meal during the 3-day period were classified as not missing a meal (N=479). Nutrient adequacy ratios (NARs) for nutrients were computed and analyzed using analysis of covariance (ANCOVA). The results indicated that the elderly who missed a meal had significantly lower NARs for calcium, phosphorus, iron, magnesium, vitamin E, ascorbic acid, thiamin, riboflavin, folate, and vitamin B<sub>6</sub> compared to elderly people who did not miss a meal. These findings may suggest that elderly who miss meals may consume less than the recommended amounts of macronutrients and micronutrients. Nutritionists and other health practitioners should stress to the elderly the importance of proper nutrition and encourage them to avoid missing meals.

Elderly people who miss meals tend to possess specific characteristics. They tend to be older elderly (80 years of age or over), live alone, have a multitude of health problems, and are less mobile (Frongillo, Rauschenbach, Roe, & Williamson, 1992). The authors stated that missing meals may lead to inadequate nutrition. However, these researchers did not examine dietary adequacy of those who missed meals.

The USDA conducted a Nationwide Food Consumption Survey (NFCS) in 1987-1988 in which a national sample was used to gather data on food consumption behaviors. This study examines the effect of missing meals on nutritional adequacy of elderly persons 65 years of age and older using the NFCS.

## **Methods**

The 1987-1988 NFCS data base is based on a 3-day food and nutrient intake of individuals (N = 10,172) of all ages surveyed throughout the 48 contiguous states. This study examined those individuals 65 years of age or older (n=1056) who completed a 3-day dietary recall. Elderly persons who missed any meal (i.e., breakfast, lunch or dinner) during the 3-day period were classified as missing a meal (n=577), and elderly persons who did not miss a meal during the 3-day period were classified as not missing a meal (n=479).

Analysis of covariance (ANCOVA) adjusting for age and income levels was used to examine the macronutrients, micronutrients, and nutrient adequacy ratios (NAR). The NAR is the ratio of nutrient intake to the recommended dietary allowance (RDA) for that nutrient. A value of 1.00 or above indicates that the intake of that nutrient met or exceeded the RDA. Because of large numbers of comparisons, the alpha level was reduced to .005 instead of .05 to correct for possible Type I error inflation (Dawson-Saunders & Trapp, 1990).

## **Results**

### ***Macronutrients***

Table 1 reports the means and results of ANCOVA of macronutrients of the elderly people who missed a meal and elderly people who did not miss a meal. Overall, elderly people who did not miss a meal had higher intakes

of all the macronutrients reported than elderly people who missed a meal. Elderly people who did not miss a meal consumed significantly higher intakes of total calories, protein, carbohydrates, total fat, sodium and fiber than elderly people who missed a meal. It is important to note that although the intakes for macronutrients were higher for elderly people who did not miss a meal, there are negative health consequences for some of the higher intakes of macronutrients. For example elderly people who did not miss meals had higher intakes of total fat, sodium, and cholesterol than elderly people who missed meals. These nutrients may have negative effects on health.

Other differences in dietary composition were observed (see Table 1). Elderly persons who did not miss a meal had a greater percentage of total calories derived from carbohydrates (48.50% vs. 47.10%) than elderly persons who missed a meal. Elderly people who did not miss meals consumed diets composed of a smaller percentage of total fat (35.11%) than elderly people who missed meals (36.36%). In addition, elderly people who did not miss meals consumed diets composed of smaller amounts of saturated fat (12.17%) than elderly people who missed meals (12.81%). There was no difference found in the percentage of calories derived from protein.

### ***Micronutrients***

Means and results of ANCOVA on NARs for the two groups are presented in Table 2. Vitamin adequacy for both groups is sufficient according to RDA standards. Although the intake of all vitamins was adequate for both groups, there was a trend in which the group that did not miss a meal had higher intakes of all the vitamins than the group that missed a meal. The mineral intake for the elderly who missed a meal was below the RDA on all minerals while the elderly who did not miss a meal consumed diets below the RDA on calcium magnesium, and zinc. The elderly who did not miss a meal had significantly higher intakes of all minerals with the exception of zinc. The NAR for zinc was higher for the group that did not miss a meal but not significant.

### **Discussion**

The major advantage of using national data is that it permits use of a large sample that represents the population of the United States. To our knowledge, this is the first study that examined the effect of missed meals on dietary adequacy of the elderly using the 1987-1988 NFCS.

On the whole, the magnitude of the differences between elderly people who missed a meal and those who did not miss a meal did not seem substantial. Two areas of concern, however, were evident; 1) the elderly group that did not miss a meal consumed significantly higher intake of sodium, suggesting that people in this group do not monitor their intake of sodium and therefore might be at risk of high blood pressure and 2) the fiber intake of the elderly who missed a meal was significantly lower compared to the elderly who did not miss a meal (12.52g vs. 15.30g). Fiber intakes for both groups were below the recommended amounts of 25-30 grams/day (Whitney & Rolfes, 1993). This suggests that missing meals might affect fiber intake and increase the risk for colon cancer, a major killer of older people.

The elderly who miss meals may have diets that are less than adequate in some areas (i.e., total calories, and micronutrients) when compared to the elderly who do not miss meals. Elderly who do not miss meals may need to reduce their intakes of fat, cholesterol and sodium. Furthermore, though elders who missed a meal had lower intakes of vitamins and minerals than elders who did not miss meals, the NAR scores for these nutrients seem to be adequate.

**Table 1.**  
*Macronutrients' Means and Percent of Total Caloric Intake of  
Macronutrients of the Elderly Who Missed and Who Did Not Miss a  
Meal.*

Variable	Missed Meal (n=577)	No Missed Meal (n=479)
Caloric intake (kilocalories)	1489.00	1645.00
Protein(g)	62.29	69.08
Carbohydrate(g)	173.96	198.91
Total Fat(g)	60.87	64.89
Saturated (g)	21.49	22.47
Cholesterol(mg)	260.44	266.58
Sodium (mg)	2538.12	2786.33
Fiber(g)	12.52	15.30
Protein (% of calories)	17.10	17.20
Carbohydrate (% of calories)	47.10	48.50
Total Fat (% of calories)	36.36	35.11
Saturated (% of calories)	12.81	12.17

**Table 2.**  
*Nutrient Adequacy Ratios (NAR) Means for Elderly Who Missed and  
Did Not Miss a Meal.*

Variable	Missed Meal (n=577)	No Missed Meals (n=479)
<b>Vitamins</b>		
Vitamin E	.84	1.05[**]
Vitamin B <sub>6</sub>	1.20	1.28[**]
Niacin	2.69	2.73
Ascorbic Acid	1.63	2.00[**]
Thiamine	1.06	1.25[**]
Riboflavin	1.18	1.35[**]
Folate	1.30	1.58[**]
<b>Minerals</b>		
Calcium	.62	.72[**]
Phosphorus	.99	1.11[**]
Iron	.97	1.12[**]
Magnesium	.71	.83[**]
Zinc	.74	.78

*ANCOVA results for NAR values of the elderly who missed a meal and elderly who did not miss a meal.  
\*\* Significant at the .005 alpha level*

## References

Chernoff, R. (1987). Aging and nutrition. *Nutrition Today*, 22:4-11.

Dawson-Sanders, B., & Trapp, R.G. (1990). *Basic and clinical biostatistics*. Norwalk, CT: Appleton and Lange.

Food and Nutrition Board. (1989). *Recommended dietary allowances*. 10th ed. Washington, D.C.: National Academy Press.

Frongillo, E.A., Rauschenbach, B.S., Roe, D.A., & Williamson, D.F. (1992). Characteristics related to elderly persons' not eating for one or more days: Implications for meal programs. *American Journal of Public Health*, 82(4), 600-602.

Hegsted, D.M. (1989). Recommended dietary intakes of elderly subjects. *American Journal of Clinical Nutrition*, 50, 1190-1194.

Natow, A.B., & Heslin, J.A. (1980). *Geriatric nutrition*. Boston: CBI. U.S. Department of Health and Human Services. (1988). *The Surgeon General's Report on Nutrition and Health*. WA: U.S. Government Printing Office.

Whitney, E.N., & Rolfes, S.R. (1993). *Understanding nutrition* (6th ed.). St. Paul: West.