

Limitations on the adage “eat a variety of foods”?^{1,2}

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The study by McCrory et al (1) in this issue of the Journal explores the association between obesity, body fatness, and dietary variety. As we continue to search for potential determinants of obesity, no doubt every aspect of nutrient and food intake will be explored. This report correlates increased dietary variety within food groups with increased body fatness. This is initially surprising because dietary variety is a concept most of us would intuitively associate with positive nutritional outcomes.

For example, past editions of the US Department of Agriculture, Department of Health and Human Services *Dietary Guidelines for Americans* have opened with the recommendation to choose a diet of varied food choices (2, 3). The variety guideline is substantiated by the need to consume >40 different essential nutrients (2). The notion is that if persons restrict their intake to a small number of foods, important nutrients such as iron, calcium, vitamin C, vitamin A, or its precursors might be limited because these are examples of important nutrients concentrated in a few foods. In the third edition of the *Dietary Guidelines*, food groupings are mentioned in the variety guideline, but there is no discussion of portion size. By the fourth edition, “choosing a varied diet” is defined by the groupings of the Food Guide Pyramid and the recommendation includes choosing the recommended number of daily servings from each food group (3). Thus, the guideline implies a minimum but not a maximum of food choices per day per food group.


Nevertheless, the guideline is most commonly translated to mean “eat a variety of foods.” It is surprising that the analysis of food consumption data from a large and varied group of adults found that increased variety within food groups was associated with increased body fatness and increased energy intake (1). The analysis indicates that for 8 food groupings, increased variety correlated with increased energy intake, including fruit and vegetables. Further analysis, controlled for age and sex, found that vegetable variety was negatively correlated with percentage body fat and variety from the combined group of sweets, snacks, and condiments; variety in lunch and dinner entrées positively correlated with percentage body fat. Clearly, this report sends a message to those of us communicating dietary advice of the importance of a portion size along with variety. Surprisingly, in this report, dietary fat as percentage of energy was not related to percentage body fat once dietary variety and fat were included in the regression model.

What have other studies revealed about the association of dietary variety, energy intake, and nutrient adequacy of food choices? Krebs-Smith et al (4) reviewed food-consumption data from the Food Consumption Survey and found that there was a

benefit for meeting nutrient requirements up to a certain level of variety in food groups beyond which the meeting of nutrient requirements was not improved. In exploring issues of dietary quality and variety in a French population, Drewnowski et al (5) found that dietary variety scores correlated inversely with a dietary quality index, indicating that a good diet may be achieved at the expense of variety. In their study, dietary quality was largely based on total fat and saturated fat intakes. When they applied a dietary diversity score based on the number of food groups consumed per day, they found that low diversity scores were associated with low energy intakes. When Drewnowski et al examined dietary variety based on numbers of foods eaten, not classified within food groups, they found no increase in energy intake with increasing variety. In fact, they found improved dietary quality scores with increased variety. However, unlike the current study, the ranges of total energy intake were within 300 kcal (1.2 MJ) (6).

As pointed out by Kant (7) in a review of dietary quality indexes, emphasis is placed on nutrient adequacy and macronutrient distribution. Little emphasis has been placed on total energy intake and the contribution of variety to obesity.

On the other hand, as we try to understand determinates of obesity in our population, increased variety may be a factor associated with increased body fatness in adults. Concerns about combating the epidemic of obesity prompt us to first cure the environment (8). This report suggested that consumer education efforts focus on reduced portion sizes, which may help limit opportunities for passive overeating. Also, the food and restaurant industry should be encouraged to take responsible actions by reducing portion sizes, especially of high-energy-density foods.

One concept that seems to be borne out in this review is that dietary quality and dietary variety are not synonymous. Because body mass indexes (in kg/m²) and energy intakes varied greatly from 22 to 38 and from 5.6 to 16.0 MJ/d, respectively, in the subjects studied by McCrory et al, evaluation of body mass index by quartiles or tertiles might yield suggestions of minimum and maximum ranges of dietary variety within food groups that would be positively associated with body fat and energy intake. 

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