Food provision in dietary intervention studies\(^1,2\)

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In this issue of The American Journal of Clinical Nutrition, Metz et al (1) present dietary compliance data from a 10-center randomized controlled trial comparing the effects of a self-selected diet with the effects of a prepackaged prepared meal plan. Both diets were designed to have 15–20\% of energy from fat, 55–60\% from carbohydrate, and 15–20\% from protein. Compliance with the diet, based on 3-d records collected biweekly over the 10-wk intervention, was better in those who were given the prepackaged food than in those who had to self-select their diet. Moreover, subjects who were given the food lost more weight over the 10-wk intervention and had larger decreases in blood pressure, although no differences between interventions were observed for lipid concentrations.

The benefits of food provision for increasing dietary compliance and maximizing physiologic responses have been shown in several previous studies. Probably the earliest was the National Diet-Heart Study (2), which aimed to modify dietary fat intake in free-living populations. An ancillary study showed that participants who were able to purchase appropriate fat-modified foods from study distribution centers had 35\% greater reductions in serum cholesterol than those given dietary instruction alone. Moreover, between-person variability in cholesterol response was reduced by providing food to the subjects.

More recently, my colleague Robert Jeffery and I assessed the effect of food provision in an 18-mo-long behavioral weight-control study (3). Overweight subjects were randomly assigned to a standard behavioral treatment, or to the behavioral treatment supplemented with financial incentives for weight loss, with food provision, or with the combination of food provision and incentives. Subjects in the food provision conditions were given a box of food each week for 18 mo that included all the food that they should eat for five breakfasts and five dinners that week. No special foods were used, just simple items such as a box of cold cereal, a piece of fruit, and a container of skim milk for breakfast and a frozen entree or a piece of meat plus frozen vegetables and a starch for the dinners. Providing subjects with food significantly increased weight losses at 6, 12, and 18 mo. The greatest effects of food provision were observed at 12 mo, when weight losses in participants given the behavioral treatment with food provision were double those of the standard behavioral group.

Several questions are raised by the Metz et al report and these earlier studies on food provision (2, 3), including, Why does food provision work? How long does it work? and How do you maximize its long-term effect? In answering these questions it is important to note that the self-selected diet group in the study reported by Metz et al was prescribed a set number of servings from the exchange lists of the American Dietetic Association and the American Diabetic Association and given a monetary allowance to purchase these foods, but was seen only twice by the study nutritionists (weeks 0 and 2). Given this very minimal counseling, it is understandable that subjects in the self-selected condition were not more successful in reducing their dietary fat, especially when more restricted fat intakes are considered as the criterion. When adherence to a <30\%-fat diet was used as the criterion, 78\% of subjects in the self-selected diet group achieved the goal compared with 95\% of subjects following the prepared meal plan. In contrast, only 23\% of participants in the self-selected diet group achieved a <20\%-fat goal compared with 78\% of prepared meal participants. Thus, food provision may be most helpful when the new diet is complex and time to teach patients how to make dietary changes is limited. Perhaps with greater training in techniques such as recipe modification, food preparation, and strategies for eating out in restaurants, as occurs in most clinical trials involving diet (4, 5) and for most patients placed on a Step 2 lipid-lowering diet, the differences between food provision and self-selected diets would be less. Moreover, the study lasted only 10 wk and data on adherence to the diet were averaged over this interval. Thus, there was no information on whether adherence declined over time or whether subjects would continue to eat these provided foods long term. Use of food provision as one component of a more extensive program of diet modification may increase the long-term effectiveness of this approach.

Wing et al (6) evaluated the various components of food provision to determine whether its benefits are due to the fact that the food is provided free, the fact that the food is actually given to subjects (reducing the difficulty of purchasing appropriate types of food in appropriate portion sizes), or the fact that when you provide food to subjects you are also telling them exactly what to eat for each meal. Subjects were randomly assigned to either a standard behavioral treatment program (group 1) or to a behavioral program supplemented with specific meal plans and grocery lists (group 2), with food

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The food provision on a cost-sharing basis (group 3), or with free food provision (group 4). All groups received a standard behavioral program for 6 mo: at 6 mo, all treatment contact and food provision were stopped. Subjects in group 1 lost less weight than did those in groups 2–4 both at the end of the 6-mo program and at 1 y follow-up; no differences between groups 2–4 were seen, suggesting that a meal plan in which subjects are told exactly what they should eat for each meal during the week was the crucial component of the food-provision strategy. The fact that the effect was maintained at 1 y suggests that the meal plans provided some long-term benefit for participants that was seen even after meal plans ended.

These data do not suggest that we should return to the old procedure of just handing patients a meal plan. In addition, they do not indicate that commercial weight-loss programs that sell food to members will necessarily be more effective than other diet programs, or that fancy and potentially expensive foods must be sold to produce changes in dietary intake. Rather, these studies and the new data presented by Metz et al suggest that patients need help in learning how to achieve the complex new eating plans we often recommend. Instruction and counseling are important aspects of such training. In addition, providing patients with examples of what we hope they will eat (either by providing the actual food or at least providing specific meal plans) may help patients learn how to make these changes and maintain them long term.

REFERENCES