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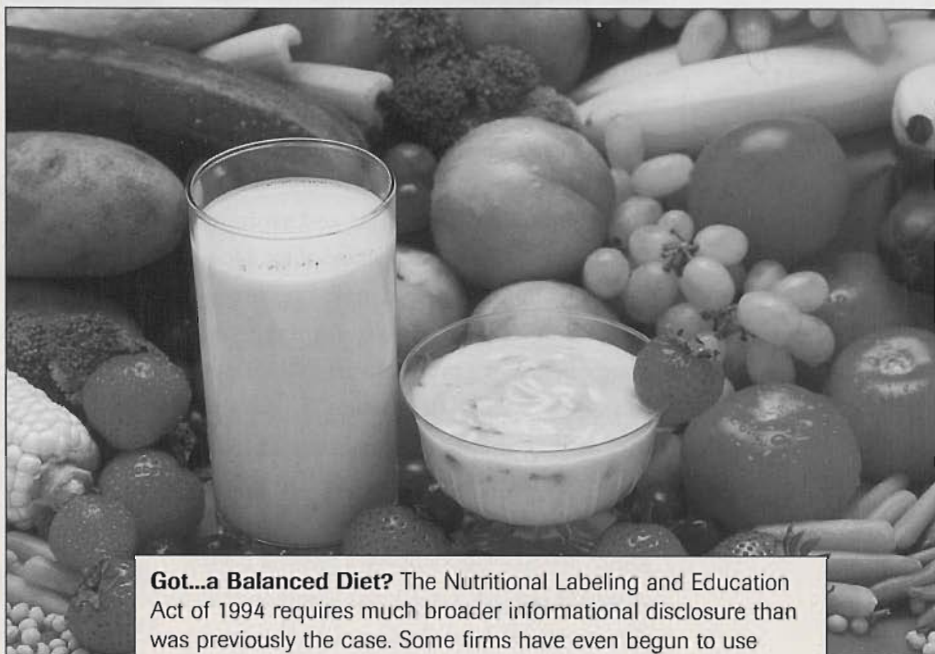
# Looking for the Nutritional Label: Does It Make a Difference?

BY RODOLFO M. NAYGA, JR.

Poor diet contributes to over 300,000 deaths a year in the United States. About one-third of all cancer deaths are attributable to poor diet, and four of the top ten causes of death in the United States — heart disease, cancer, stroke, and diabetes — are also associated with poor diet. Diet-related health conditions cost society an estimated \$250 billion annually in medical costs and lost productivity (Frazao). In an effort to make nutrition information available to consumers, new nutrition labeling regulations mandated by the Nutritional Labeling and Education Act (NLEA) went into effect in the United States in May 1994.

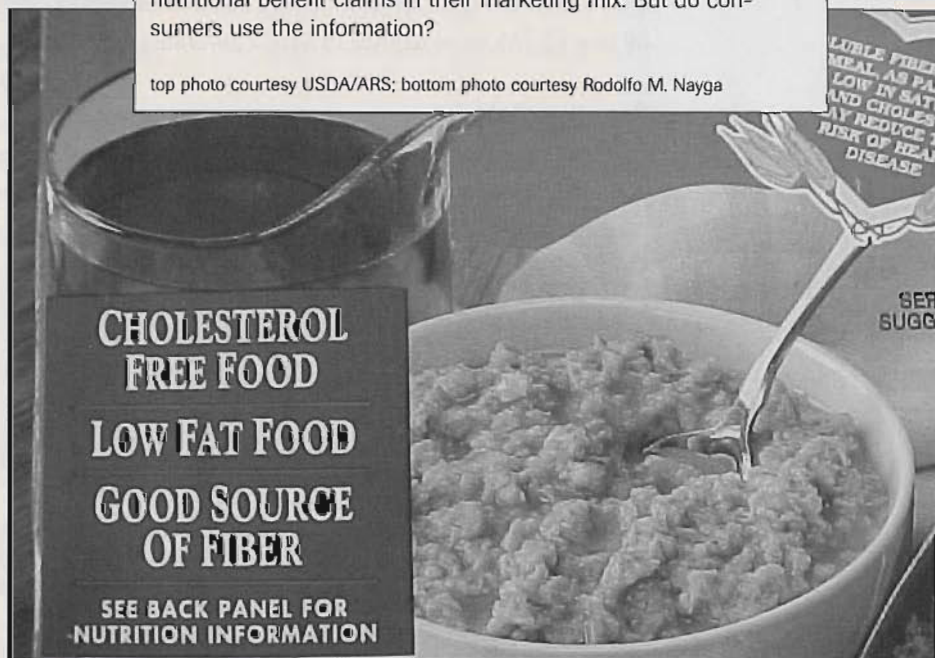
The law requires disclosure of the nutritional content of foods on a standardized label (Savur, Lipinski, and Nayga). The regulations update the list of nutrients that appear on the nutritional facts panel, standardize serving sizes, define nutrient content claims, and provide a mechanism for evaluating health claims. Prior to implementation of the NLEA, nutritional information was provided on a voluntary basis by food manufacturers. Government regulations related to nutrient content and health claims were much less stringent. The Food and Drug Administration estimated that the NLEA would cost industry \$1.4 billion to \$2.3 billion and the government \$163 million over the next 20 years, beginning in 1994.

The objective of the NLEA, is to provide consistent, understandable, and usable labels that can help consumers choose healthier foods. The main question is whether nutritional labels affect consumer choice and improve nutrient intake and diet quality among Americans. We used data from the U.S. Department of Agriculture's 1994-96 *Continuing Survey of Food Intakes by Individuals*, and the companion, *Diet and Health Knowledge Survey*, to estimate the effect of nutritional label on Americans' overall diet and their intake of specific nutrients (total fat, saturated fat,



**Got...a Balanced Diet?** The Nutritional Labeling and Education Act of 1994 requires much broader informational disclosure than was previously the case. Some firms have even begun to use nutritional benefit claims in their marketing mix. But do consumers use the information?

top photo courtesy USDA/ARS; bottom photo courtesy Rodolfo M. Nayga



cholesterol, dietary fiber, and sodium) (see Kim et al.). Diet quality is measured by the USDA's Healthy Eating Index (HEI) which measures how well the diets of Americans conform to the recommendations of the *Dietary Guidelines for Americans* and the Food Guide Pyramid.



HEI shows the type and quantity of foods people eat, their adherence to specific dietary recommendations, and the variety in their diet.

The HEI scale ranges from zero to 100 with higher numbers indicating a higher quality diet. The HEI is based on ten components, each representing different aspects of a healthful diet. Components one through five measure the degree to which a person's diet conforms with USDA's Food Guide Pyramid serving recommendations for the five major food groups — grains, vegetables, fruits, dairy products, and meat. Components six and seven measure total fat and saturated fat consumption as a percentage of total food intake. Components eight and nine measure total cholesterol and sodium intake, and component ten examines variety in a person's diet. We assessed variety by totaling the number of different foods that individuals ate in sufficient amounts to contribute at least half a serving of a particular food group. Each component has a possible range of zero to ten (see Table 1 and Bowman et al. for details). The mean HEI for data used in this study was about 64, which is lower than the minimum threshold level of 80 that USDA recommends to have a good diet.

### Counting Calories

Table 2 presents the effects of nutritional label use on the intake of selected nutrients. Nutritional label use decreases individual average daily intake of calories from

total fat by seven percent, calories from saturated fat by two percent, cholesterol by 68 milligrams, and sodium by 30 milligrams. In addition, nutritional label use increases average daily fiber intake by about eight grams.

These results generally indicate that nutritional label use improves consumer intake of selected nutrients. In terms of the *Dietary Guidelines for Americans*, nutritional label use increases the percentage of individuals meeting the guidelines for calories from total fat by just over two percent, calories from saturated fat by about nine percent, and cholesterol by 34 percent (Figure 1). Nutritional label use increases the percentage of individuals whose fiber intakes are between 15 and 25 grams (just under the recommended dietary guideline of 25 grams or more per day) by about 63 percent. Those already meeting the guideline apparently did not increase fiber consumption. We also observed a slight reduction (four percent) in the percentage of individuals meeting the guideline for sodium. It

appears that nutritional label use has the largest effect on cholesterol intake, in terms of increasing the number of consumers who meet dietary guidelines.

### Quality Control

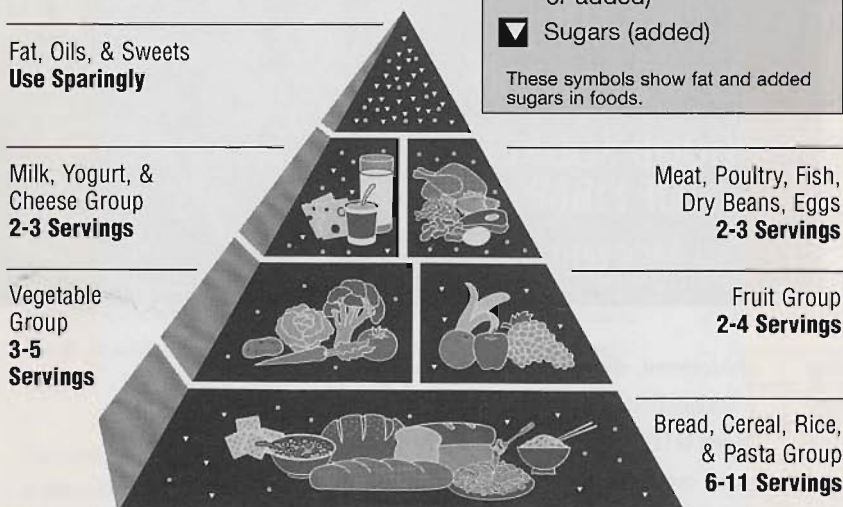
Figure 2 shows the effects of consumer use of different types of information on nutritional labels: (a) lists of ingredients, (b) nutrient content claims such as "low fat" or "light," (c) nutrition panels that tell the amount of calories, protein, fat, etc., (d) serving size information, and (e) health claims that describe health benefits of nutrients or foods on diet quality. These findings indicate that nutritional labels provide measurable benefits by improving the diet quality of Americans, as measured by the HEI, from a range of 3.5 points (list of ingredients) to 6.1 points (health claims), depending on the type of label information.

In an effort to evaluate the overall quality of the American diet, USDA developed a grading scale. HEI scores greater than 80 are rated "good," scores of 51 to 80 are rated "needs improvement," and scores less than 51 are rated "poor." Do nutritional labels help consumers make healthier food choices? Our findings suggest that nutritional labels provide some improvement in dietary qual-

Nutrition Facts	
Serving Size 1/2 cup (114g)	
Servings Per Container 4	
Amount Per Serving	
<b>Calories 90</b>	<b>Calories from Fat 30</b>
% Daily Value*	
<b>Total Fat 3g</b>	<b>5%</b>
Saturated Fat 0g	0%
<b>Cholesterol 0mg</b>	<b>0%</b>
<b>Sodium 300mg</b>	<b>13%</b>
<b>Total Carbohydrate 13g</b>	<b>4%</b>
Dietary Fiber 3g	12%
Sugars 3g	
<b>Protein 3g</b>	
Vitamin A 80%	Vitamin C 60%
Calcium 4%	Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
Calories: 2,000 2,500	
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

## Food Guide Pyramid

A Guide to Daily Food Choices



Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services



ity of consumers. However, the magnitude of these improvements appears to be rather small.

### Whose Diet Is It Anyway?

There are also some differences in diet quality among consumers having different characteristics. For instance, age of both nutritional label users and non-users is positively related to HEI for all types of label information. African-American label users and non-users have HEI scores that are about three or four points lower than the HEI scores of Caucasian label users and non-users, respectively. Male users of nutrient content claims or serving sizes have higher HEI scores than female label users.

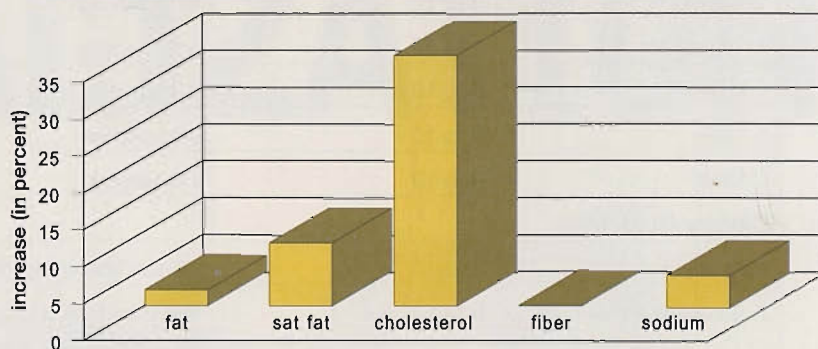
Interestingly, employed label users have lower HEI scores than unemployed label users which may reflect the opportunity cost of the time differential between employed and unemployed individuals. Finally, non-label users from central cities have HEI scores that are about two points higher than non-label users from suburban areas.

### Some Perspective

The NLEA has three major aims: (1) to enable consumers to make more healthful food choices, (2) to promote consumer nutritional education, and (3) to provide incentive to the food industry to create innovative and healthier new products for consumers. The findings discussed here provide some evidence that the NLEA is achieving the first aim. This is of great importance in terms of public policy because improved diets can provide society with dramatic health benefits resulting in life-year gains and medical care cost savings.

However, considering the relatively small magnitude of diet quality improvements from label use, it appears possible that even when consumers read labels, they do not always understand them. Mojduszka found that food markets did not reliably signal nutritional information prior to the implementation of the NLEA. Therefore, according to the second aim of the NLEA, relating to education, it might be beneficial to complement the law by consumer education on how to understand and

Figure 2. Net Change in Percentage of Individuals Meeting the Dietary Guidelines for Americans



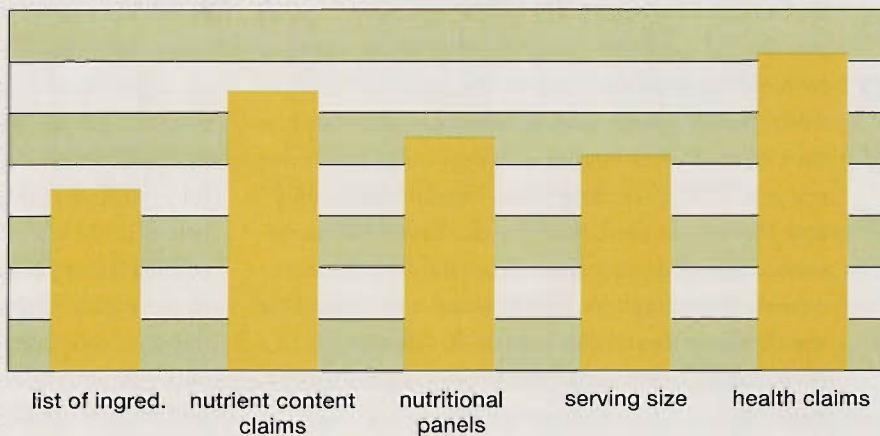
use the information on nutritional labels. It would then be interesting to determine whether such a campaign actually helps consumers improve the quality of their diets through nutritional labels.

As for the third aim, there are doubts as to whether the NLEA has provided an incentive to the food industry to create innovative and healthy new products for consumers. Data on the nutritional quality of products from food manufacturers pre- and post-NLEA are needed to allow the examination of this issue. A very important question remains: Does reading nutritional labels pay off and if so, by how much? The results presented here

have not been extended to suggest that the benefits of the NLEA outweigh the costs to government, the food industry, and to consumers. This is indeed an important topic for future efforts.

**[I]t appears possible that even when consumers read labels, they do not always understand them.**

Figure 2. The Effect of Nutritional Label Use on Diet Quality as Measured by Healthy Eating Index





**Table 1. Components of Healthy Eating Index**

Food Group	Range of Scores	Perfect Score of 10 <sup>1</sup>
1. Grains	0 to 10	6-11 servings
2. Vegetables	0 to 10	3-5 servings
3. Fruits	0 to 10	2-4 servings
4. Milk	0 to 10	2-3 servings
5. Meat	0 to 10	2-3 servings
<b>Dietary Guidelines</b>		
6. Total Fat	0 to 10	30% or less energy from fat
7. Saturated Fat	0 to 10	less than 10% energy from saturated fat
8. Cholesterol	0 to 10	300 mg. or less
9. Sodium	0 to 10	2400 mg. or less
10. Variety	0 to 10	16 different food items over 3-day period

<sup>1</sup>Depends on recommended energy intake; all amounts listed are based on a per day basis with the exception of food variety (Source: Bowman et al.).

**Table 2. The Effect of Nutritional Label Use on Average Daily Intake of Selected Nutrients**

Nutrient Intake	Net Change (rounded)
Calories from Total Fat	-7 percent
Calories from Saturated Fat	-2 percent
Cholesterol	-68 milligrams
Dietary Fiber	+8 grams
Sodium	-30 milligrams

**For More Information:**

Bowman, S.A., M. Lino, S.A. Gerrior, and P. Basiotis. *The Healthy Eating Index: 1994-96*, U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, July 1998.

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Frazao, E. *The American Diet: Health and Economic Consequences*, U.S. Department of Agriculture, Economic Research Service, AIB-711, 1995.

Kim, S., R. Nayga, Jr., O. Capps, Jr., and B. Tepper, "Consumer Label Use and Diet Quality." Paper presented at the Food and Agricultural Marketing Consortium Conference, Alexandria, VA, 14-15 January 1999.

Kim, S., "Econometric Analysis of Food Label Use, Nutrient Demands, and Diet Quality." PhD Dissertation, Texas A&M University, College Station, 2000.

Modjuszka, E.M., "Manufacturer's Responses to New Nutrition Labeling Regulations," PhD Dissertation, University of Massachusetts, Amherst, 1997.

Savur, N., D. Lipinski, and R. Nayga, Jr., "Consumer Response to Nutrition Labeling: Results from an Exploratory Study." New Jersey Agricultural Experiment Station Report No. P-02264-2-96, Rutgers University, New Brunswick, New Jersey, August 1996.

## More So They Say

■ **GOOD ENOUGH TO USE?** Rosenwein worries that "...rarely has the economic climate changed so radically from one year to the next, as it did in 2001. So the question naturally arises: What do you do with the Census Bureau's findings contained in two reports, "Money Income in the United States, 2000" and "Poverty in the United States, 2000?" What relevance, if any, do they have today and how can economists, demographers, and business executives best use these numbers?" Rosenwein, R. "2000 Data in a New World." *American Demographics*, January 2002, page 18.

■ **FOOD FOR THE CHILDREN:** Summarizing an extensive study, L.C. Smith and L. Haddad say, "...as per-capita food supplies are increased in any country, they become an increasingly blunt tool for reducing malnutrition [among children]. The effect is very strong for countries with per capita dietary energy supplies below 2,300 kcal. Between 2,300 and 3,120 kcal it is still significant, but above 3,120 kcal, further increases in per-capita food availability are likely to have little impact..." Smith, L.C. and L. Haddad. "How Important is Improving Food Availability for Reducing Child Malnutrition in Developing Countries?" *Agricultural Economics*. 23(December, 2001):191-204.