



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# The Economics of Reducing Health Risk from Food

---

EDITED BY  
Julie A. Caswell

*Proceedings of NE-165 Conference  
June 6-7, 1995  
Washington, D.C.*

**PART FOUR: Economics of Processor-  
and Retailer-Level Supply of Food Safety**

**11. Nutritionally-Improved Foods in  
Supermarkets: 1989-93**

*Elizabeth Frazão and Jane E. Allshouse*

Food Marketing Policy Center  
Department of Agricultural and Resource Economics  
University of Connecticut

# **Nutritionally-Improved Foods in Supermarkets: 1989-93**

Elizabeth Frazão (efraza@econ.ag.gov)

Jane E. Allshouse

Economic Research Service, USDA  
Washington D.C. 20005-4788

**Keywords:** Nutrition, food products, new product introductions,  
scanner data

Copyright © 1996 by Food Marketing Policy Center, University of Connecticut. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

---

## Nutritionally-Improved Foods in Supermarkets: 1989-93

*Elizabeth Frazão and Jane E. Allshouse<sup>1</sup>*

Data on new food product introductions suggest that the food industry has been actively responding to consumer demand for foods with improved nutritional profiles. More than 3,000 claims were made about the improved nutrient content of new foods in the first nine months of 1995—almost 3 times the number made in 1988. Anecdotal evidence points to an increased availability of nutritionally-improved substitutes for many types of food products at the supermarket. Yet, little information is available on the size of the market for nutritionally-improved foods, and their cost relative to their traditional counterparts.

This chapter uses supermarket scanner data for 1989-93 to evaluate the size and growth of the market for nutritionally-improved foods relative to the regular versions, and to determine whether price differences exist between nutritionally-improved and traditional versions.

### Data

The scanner data, supplied by the A.C. Nielsen Company, measure sales in both quantity and dollars for all scannable food products in 3,000 supermarkets with at least \$2 million in annual sales. This sample is estimated to cover 84 percent of all supermarket food sales. The data are then projected to national estimates for all supermarkets with at least \$2 million in annual sales.

The data do not include sales of non-scannable food items such as fresh produce and fresh meats, or items that are prepared or packaged at the store, such as bakery items, deli items, and luncheon meats and cheese sliced in the store. Nor do the data include food sales from stores with less than \$2 million in annual sales—such as smaller grocery stores, convenience stores, and mom-and-pop stores.

The data include information regarding product attributes such as flavor, type of container, size, manufacturer, and nutrition-related characteristics. The nutrition-related characteristics are based on information coded from the product's front label (but not confirmed by nutrition labels). For most products, package sizes are converted into a standardized 16-oz equivalent unit (hereby simply referred to as "units," representing pounds for solids, and 16 fluid ounces—or pints—for beverages). Thus, the sale of two 16-oz cans of peaches and four 12-oz cans of peaches is typically recorded as the sale of 5 equivalent units.

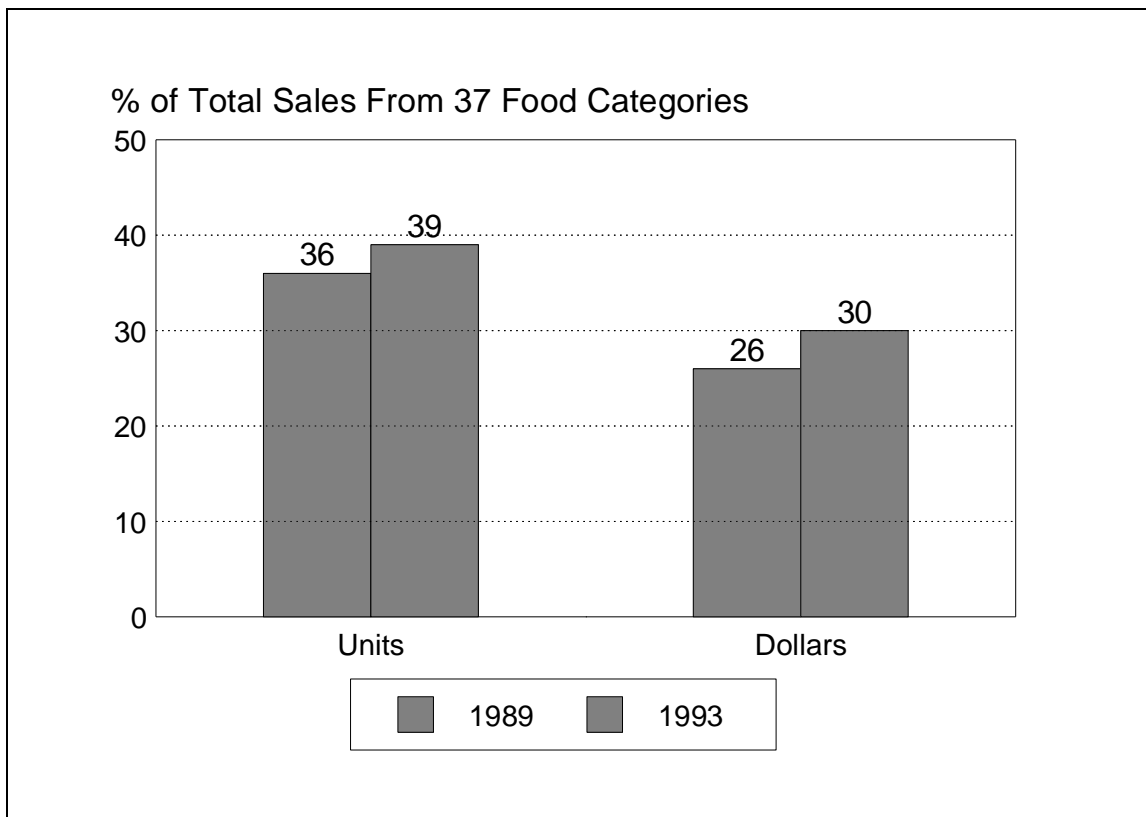
This study used 1989-93 data on 37 food categories, which accounted for 71 percent of total scanned food volume and 63 percent of scanned dollar sales in 1993. Individual food products within the 37 food categories were assigned to a "nutritionally-improved version" based on nutrition-related product characteristics. These included claims about reductions or increases in the level of specific nutrients

(such as "reduced fat," "no cholesterol," or "added calcium"), ingredient and preparation methods that might be associated with a nutritional benefit (such as "packed in water," "unsweetened," or "contains whole grain"), or some other product characteristic identified by the researchers as providing a nutritional advantage. For example, although poultry-based hot dogs and luncheon meats are not necessarily low in fat, they tend to be lower in fat than the traditional beef- or pork-based versions. Therefore, poultry-based hot dogs and luncheon meats were considered nutritionally-improved versions. Canola and olive oil, which have higher levels of monounsaturated fatty acids and lower levels of saturated fatty acids than other vegetable oils, comprised the nutritionally-improved versions of salad and cooking oils. Similarly, products containing canola or olive oil were included in the nutritionally-improved versions of the appropriate category. Frozen yogurt and sherbet, lower fat alternatives to ice cream, were included with nutritionally-improved versions of frozen dairy desserts. Appendix 11.A provides a description of the characteristics included in the nutritionally-improved version for each of the 37 food categories in this study.

### Trends in Volume Sales of Nutritionally-Improved Versions

Based on these definitions, nutritionally-improved versions of foods accounted for a growing share of retail sales among the 37 food categories over the 5-year period. In 1993, nutritionally-improved versions accounted for 39 percent of volume sales and 30 percent of dollar sales among the 37 food categories, up from 36 and 26 percent, respectively, in 1989 (Figure 11.1).

FIGURE 11.1 Nutritionally-Improved Versions Accounted for Growing Share of Food Sales



Volume sales of the 37 food categories increased by a total of 10.9 billion units between 1989 and 1993, reflecting an increase of 8.5 billion units among nutritionally-improved versions (78 percent of total increase) and 2.4 billion units among regular versions (Figure 11.2). Dollar sales for the 37 food categories increased by \$11.3 billion, with nutritionally-improved versions contributing \$6.3 billion (55 percent) and regular versions contributing the remaining \$5.0 billion.

From a slightly different perspective, total volume sales increased between 1989 and 1993 for 28 of the 37 food categories. However, 30 food categories experienced increased volume sales of nutritionally-improved versions, compared with 13 food categories which experienced increased volume sales of regular versions (Figure 11.3). The data on dollar sales reflect the influence of both the quantity sold and the price at which the product sold. For some food categories, higher prices offset the drop in volume sales, so increases in dollar sales were more common than increases in volume sales. Dollar sales increased for 32 food categories, 32 categories of nutritionally-improved versions, and 20 categories of regular versions.

Growth in volume sales of nutritionally-improved versions occurred under both expanding and shrinking markets for the food category (Figure 11.4). Among the 30 food categories with growing volume sales of nutritionally-improved versions, 27 occurred together with an expanding market for the entire category. Among these 27, 12 food categories experienced concurrent growth in volume sales for the regular versions in the category, and 15 food categories experienced declining growth in volume sales for the regular versions in the category. Among baked goods, for example, concurrent growth in both nutritionally-improved and regular versions suggests that nutritionally-improved versions might be attracting new customers. With cream cheese, on the other hand, increasing volume sales of nutritionally-improved versions and declining volume sales of regular versions suggests that some consumers might be switching from regular to nutritionally-improved versions.

FIGURE 11.2 Nutritionally-Improved Versions Were Large Contributors to Increased Sales

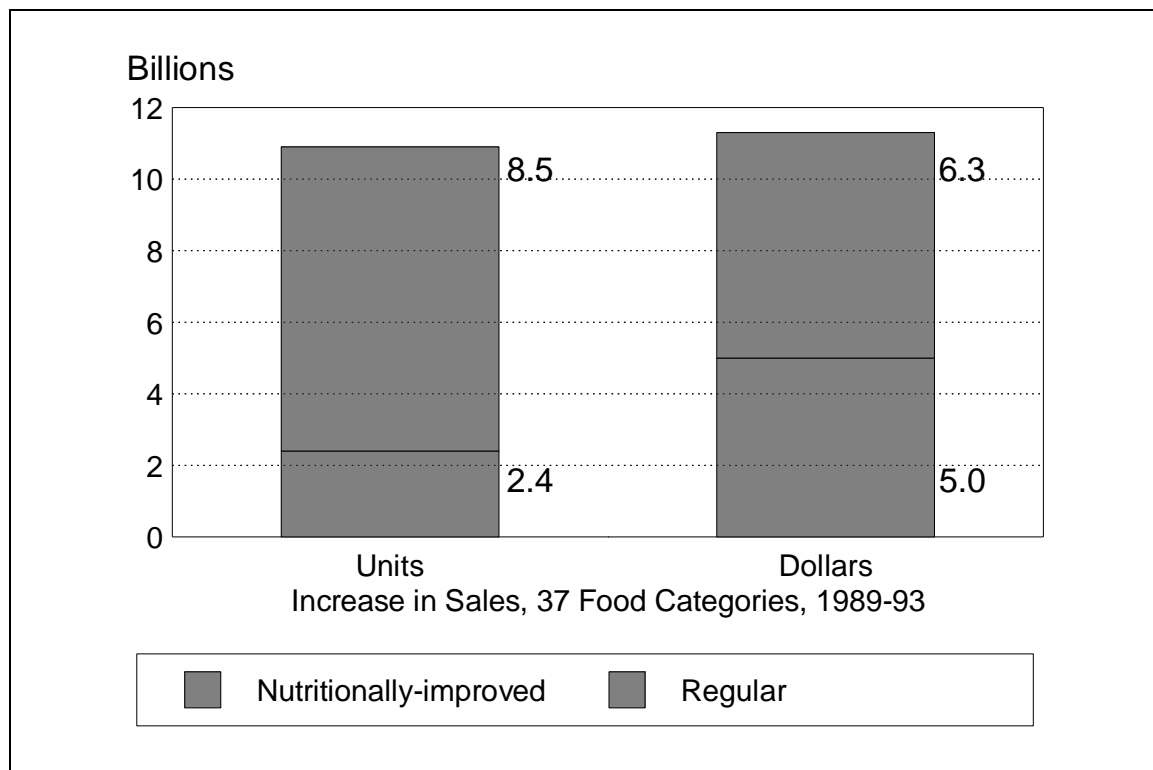


FIGURE 11.3 Growth More Prevalent Among Nutritionally-Improved Versions

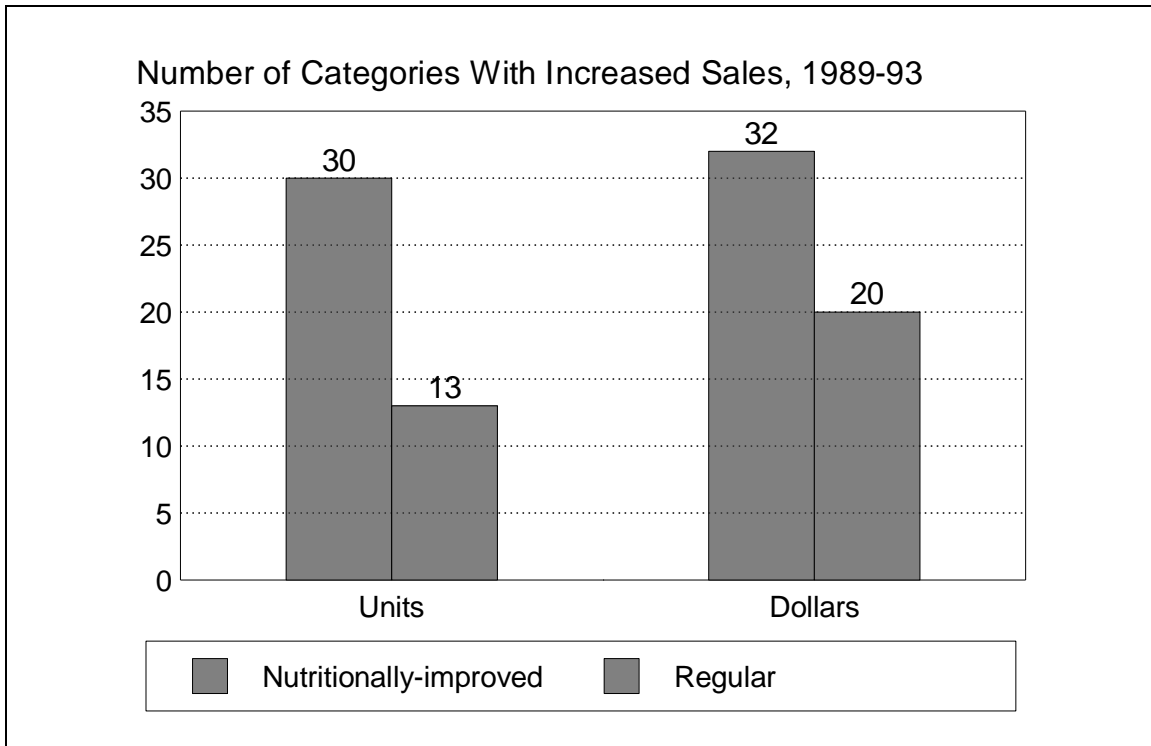


FIGURE 11.4 Nutritionally-Improved Versions Grew Under Three Different Conditions

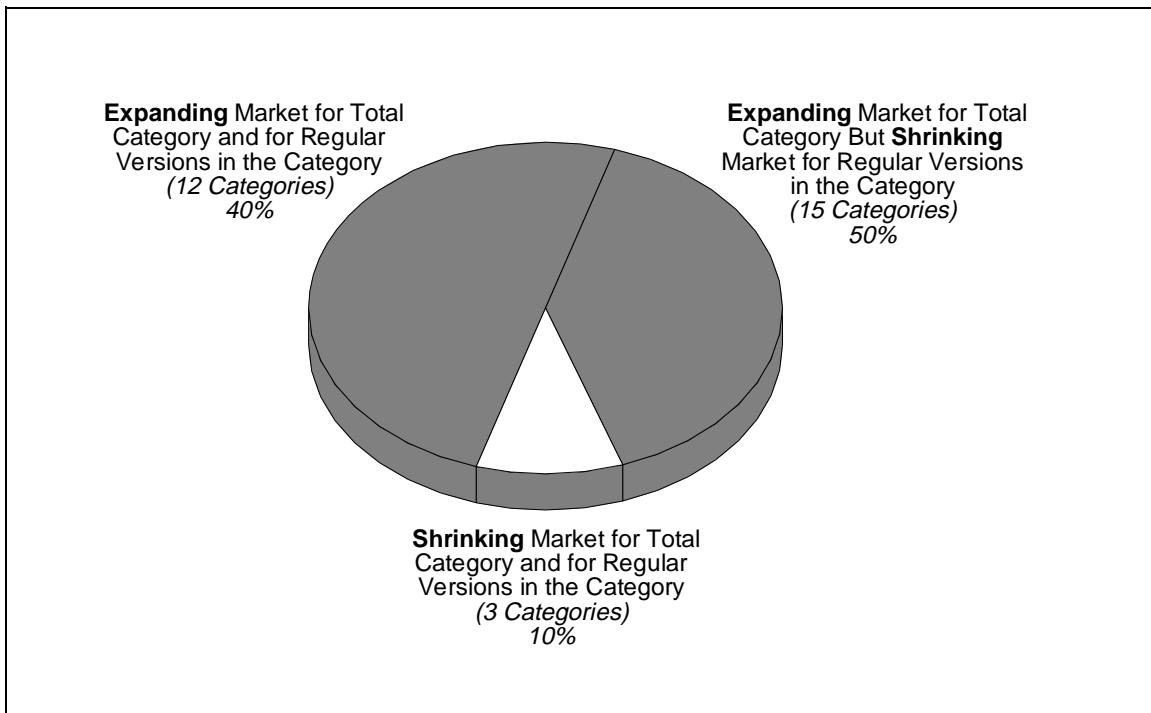
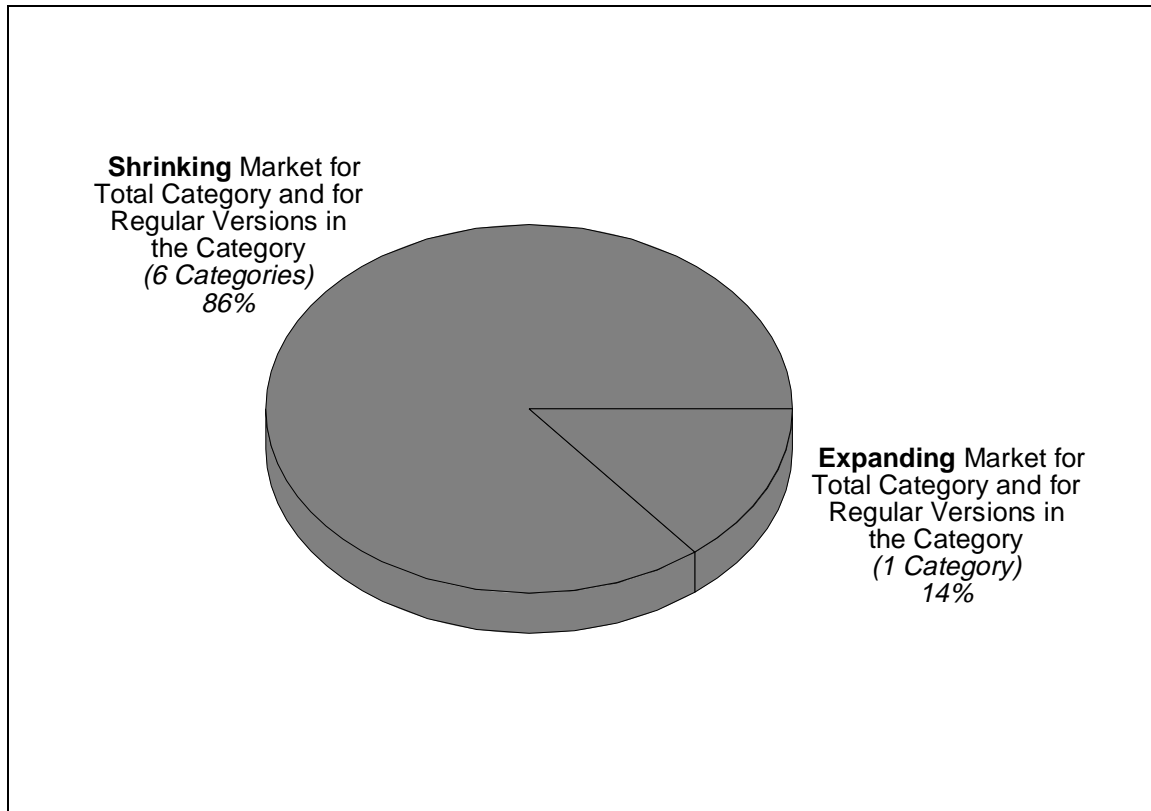


FIGURE 11.5 Declining Sales of Nutritionally-Improved Versions Were Mostly Associated With Shrinking Demand for the Category



Three food categories expanded their volume sales of nutritionally-improved versions in the presence of a shrinking market for both the total category and the regular versions in the category. Volume sales of nutritionally-improved bacon, for example, increased 59 percent during a time period when total volume sales of bacon declined 5 percent, and volume sales of regular versions declined 10 percent.

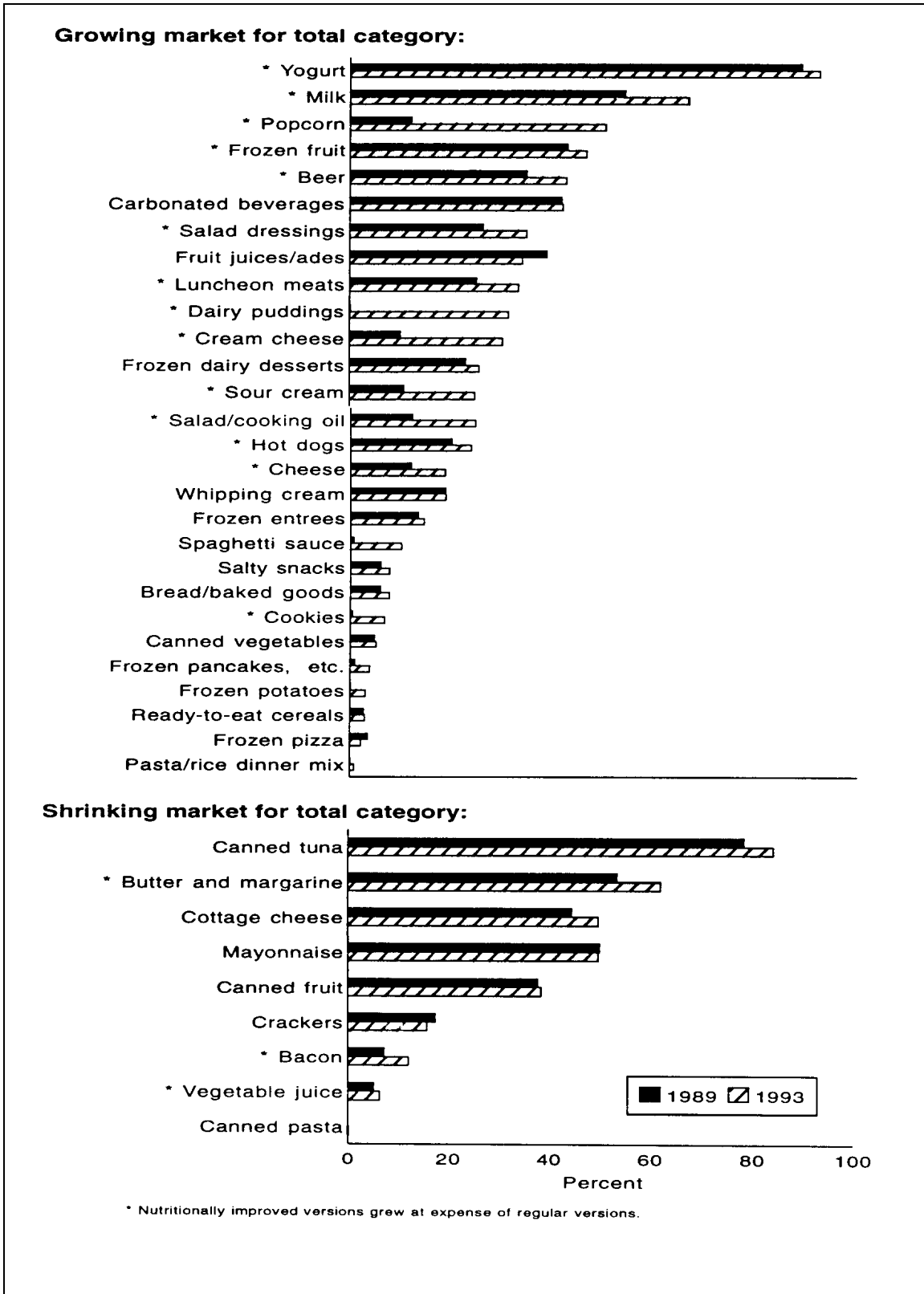
Declining volume sales of nutritionally-improved versions typically occurred concurrently with shrinking sales for the category as a whole and for the regular versions in the category (Figure 11.5). Volume sales of nutritionally-improved mayonnaise, for example, declined 8 percent between 1989 and 1993, along with a decline in volume sales of regular versions and for the category as a whole. Frozen pizza presents an exception, with declining volume sales of nutritionally-improved versions but increasing volume sales of regular versions.

The contribution of nutritionally-improved versions to a category's volume sales varied widely by food category. In 1993, the volume share of nutritionally-improved versions ranged from nearly zero for canned pasta to 94 percent for yogurt (Figure 11.6). For 32 of the 37 food categories, this contribution was larger in 1993 than in 1989—including some categories that experienced a decline in volume sales of nutritionally-improved versions.

Eight food categories more than doubled their volume sales of nutritionally-improved versions and greatly increased their volume share of nutritionally-improved versions between 1989 and 1993 (Figure 11.7). However, these large percent increases in volume sales must be viewed cautiously since they are typically associated with small categories with few nutritionally-improved versions in 1989. For



FIGURE 11.6 Volume Share of Nutritionally-Improved Versions Increased for Most Categories



example, refrigerated dairy puddings sold a total of 112 million units in 1989, of which less than 0.2 percent (191,000 units) consisted of nutritionally-improved versions. The nearly 24,000 percent growth in nutritionally-improved versions between 1989 and 1993 increased the volume share of nutritionally-improved versions of refrigerated dairy puddings to 32 percent in 1993 and translated into an increase of 46 million units of nutritionally-improved refrigerated dairy puddings. Contrast this with milk, which sold an additional 3.5 billion units of nutritionally-improved versions between 1989 and 1993, equivalent to a 23 percent increase in volume sales of nutritionally-improved versions. Other categories with large volume growth among nutritionally-improved versions include carbonated beverages, beer, frozen dairy desserts, and yogurt. In contrast, categories experiencing decreases in volume sales of nutritionally-improved versions included mayonnaise, canned tuna, crackers, canned fruit, cottage cheese, frozen pizza, and canned pasta (which sold 8 thousand fewer units in 1993 than in 1989).

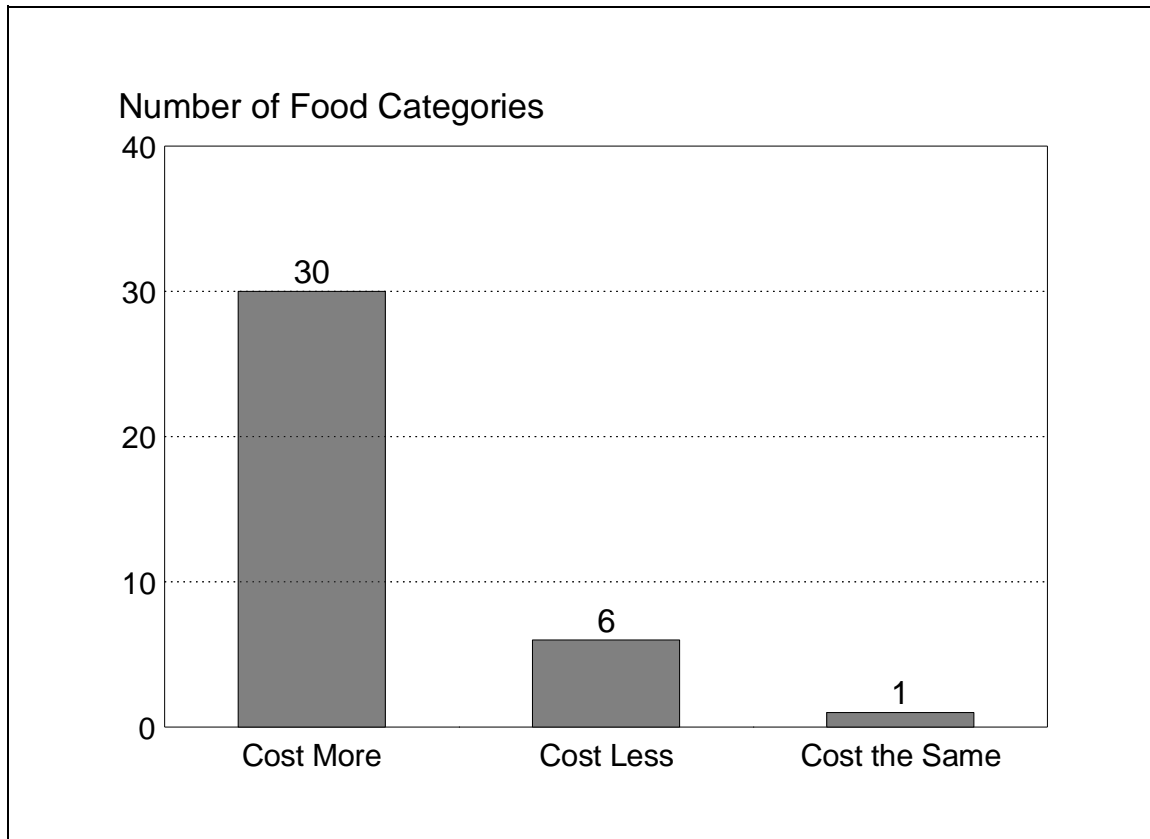
### Trends in Prices of Nutritionally-Improved Versions

Nutritionally-improved versions generally cost more than regular versions. In 1993, nutritionally-improved versions cost more than regular versions for 30 categories, cost less than regular versions for 6 categories, and cost the same as regular versions for one category (Figure 11.8).

FIGURE 11.7 Nutritionally-Improved Food Categories Exhibiting . . .

The largest % growth in volume sales, 1989-93	Percent
Dairy puddings	24,000
Spaghetti sauce	2,000
Cookies	1,500
Whipping creams, etc.	1,000
Popcorn	500
Cream cheese	350
Sour cream	250
Salad/cooking oils	200
...the largest volume growth...	Million Units
Milk	3,522
Carbonated beverages	2,406
Beer	812
Frozen dairy desserts	218
Yogurt	179
...and the largest volume losses	Million Units
Mayonnaise	-40
Canned tuna	-30
Crackers	-24
Canned fruit	-22
Cottage cheese	-16
Frozen pizza	-3

FIGURE 11.8 Most Nutritionally-Improved Versions Cost More Than Regular Versions in 1993



Among the 30 categories with higher-priced nutritionally-improved versions, the price difference ranged from \$0.02 to \$1.86 per unit in 1993, equivalent to a 2 to 94 percent difference (Figure 11.9) (canned pasta had an exceptionally large price difference of \$3.68, a 372 percent difference). Among the 6 categories with lower-priced nutritionally-improved versions, the price difference ranged from 2-25 cents per unit, a 3-15 percent difference.

Although consumers tend to reduce their purchases of a product when the price increases, sometimes consumers are willing to pay more for a product with "more desirable" characteristics—such as improved nutritional attributes in foods. The "relative price" indicates how the price of the nutritionally-improved versions of a category compare with the price of regular versions for the same category. Measured as the ratio of the price of nutritionally-improved versions to regular versions, an increase in the relative price indicates that nutritionally-improved versions have become more expensive compared with regular versions.

Between 1989 and 1993, nutritionally-improved versions became relatively more expensive than regular versions for 21 of the 37 food categories (57 percent) (Figure 11.10). Even so, volume sales of nutritionally-improved versions expanded for 16 of the 21 categories. Among the 16 categories for which nutritionally-improved versions became relatively less expensive compared with regular versions, volume sales of nutritionally-improved versions expanded for 14 categories.

FIGURE 11.9 Nutritionally-Improved Versions Generally Cost More Than Regular Versions

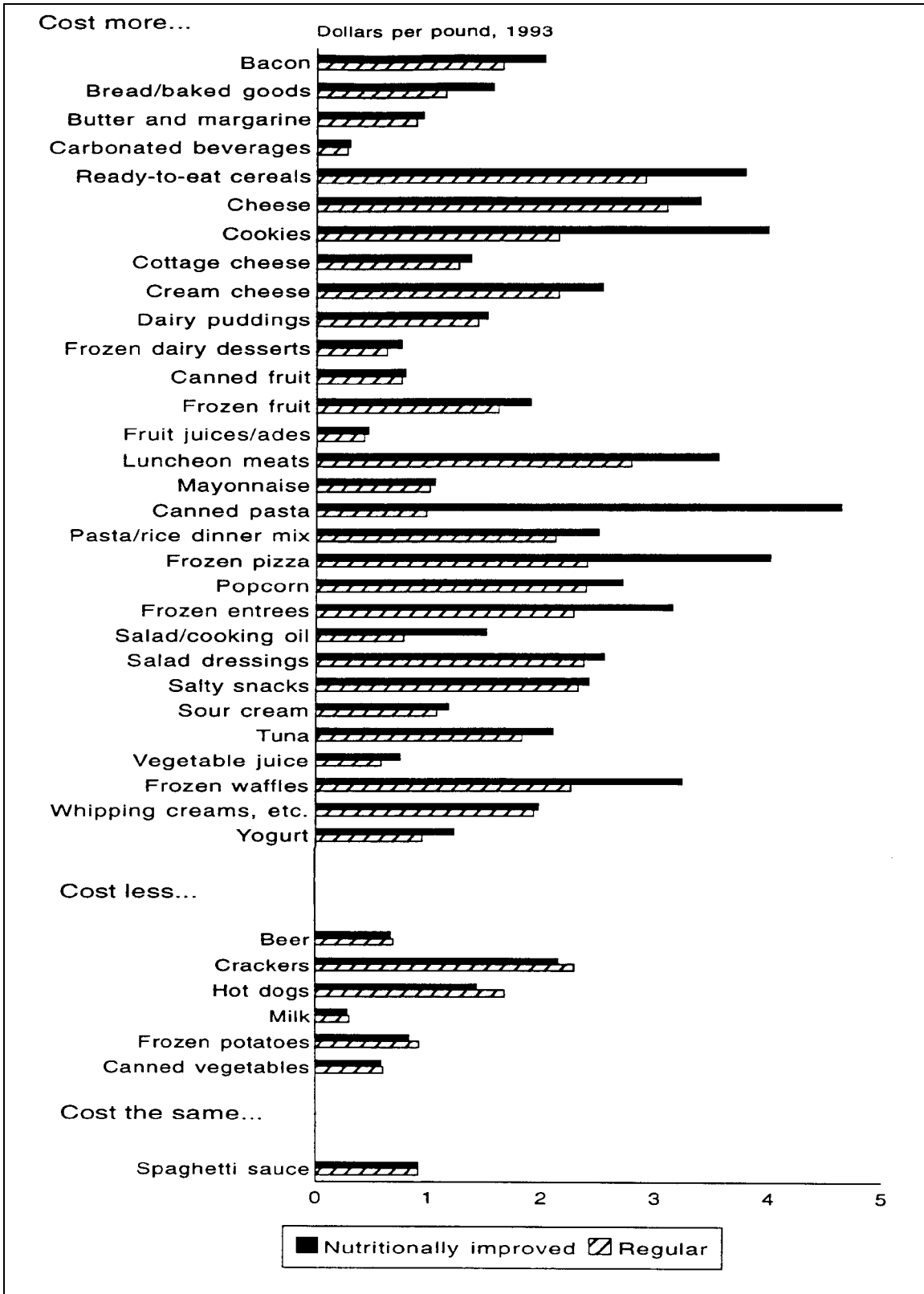
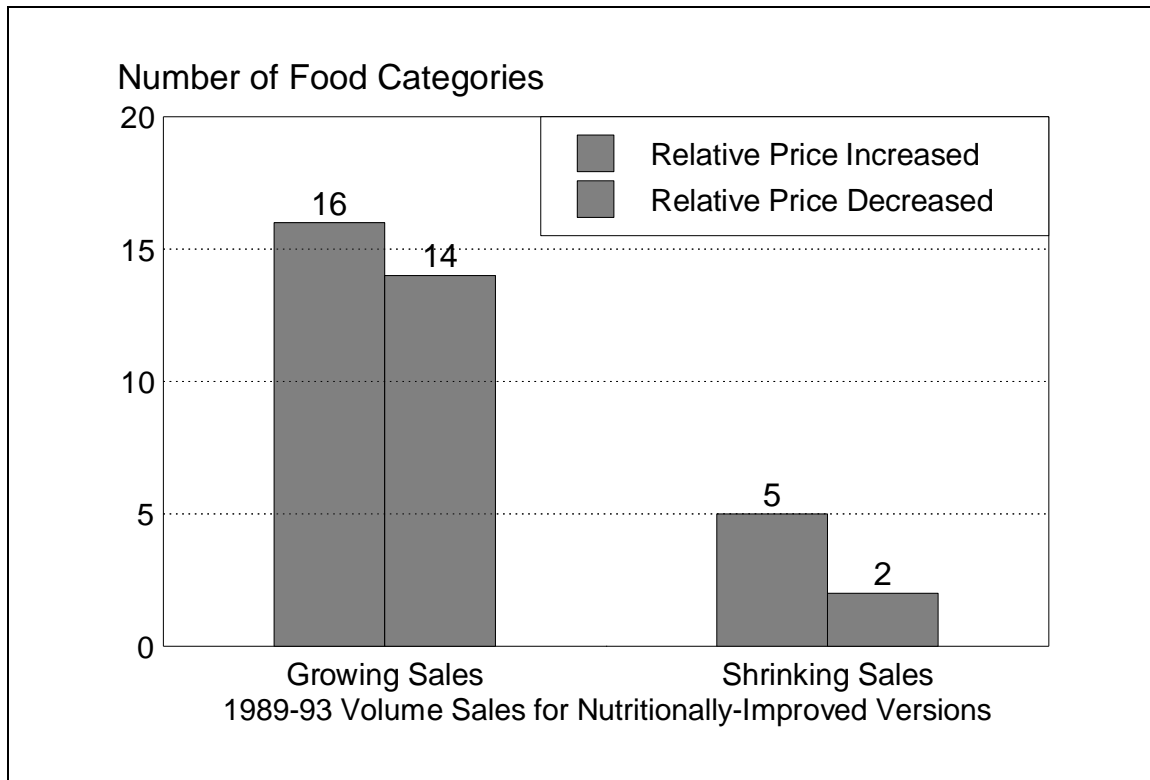


FIGURE 11.10 Growth Status of Nutritionally-Improved Versions by Change in Relative Price<sup>a</sup>



### Conclusions

Based on the definitions used for "nutritionally-improved versions," the analysis confirms that there was strong growth in the availability of nutritionally-improved versions in grocery stores among the 37 food categories between 1989 and 1993. Volume sales of nutritionally-improved versions grew at a faster pace than regular versions between 1989 and 1993, and contributed 78 percent to the increased volume sales between 1989 and 1993 among the 37 food categories.

For 12 food categories, growth among nutritionally-improved versions occurred concurrently with growth among regular versions for the category, suggesting that nutritionally-improved versions might be attracting new buyers. For 18 food categories, growth among nutritionally-improved versions occurred at the expense of growth among regular versions, suggesting that consumers might be switching from regular to nutritionally-improved versions. The remaining 7 food categories experienced declining volume sales of nutritionally-improved versions. With the exception of frozen pizza, this decline occurred together with declining volume sales for regular versions—and thus overall decline for the category as a whole.

The analysis also found that nutritionally-improved versions generally cost more than regular versions. Among the 37 food categories, 30 had nutritionally-improved versions that cost more than the regular versions in 1993. Price premiums associated with nutritionally-improved versions typically ranged from 2-94 percent (\$0.02-\$1.86), with the exception of canned pasta, which had an unusually large price difference of \$3.68. Further, nutritionally-improved versions became relatively more expensive in 1993 than in 1989 for nearly 57 percent of the food categories examined.

## Note

<sup>1</sup>Elizabeth Frazão is Agricultural Economist and Jane E. Allshouse is Database Coordinator for the Food and Consumer Economics Division, Economic Research Service, U.S. Department of Agriculture. The views are the authors' and do not necessarily represent those of the Economic Research Service or the U.S. Department of Agriculture.

## Appendix 11.A

### Description of Product Characteristics in Nutritionally-Improved Versions

**Bacon:** Includes turkey, pork and turkey, lite, lean, extra lean, low fat, fat free, low salt, low sodium, and/or no salt.

**Bread and baked goods, fresh:** Includes light/lite, whole grain, fiber/high fiber, fat free, low fat, no fat, low calorie, reduced calorie, low cholesterol, no cholesterol, low salt/sodium, no salt/sodium, low sugar, no sugar, and/or no oil versions of fresh bread, buns, rolls, muffins, cakes, breakfast cakes and sweet rolls, doughnuts, pies, bagels, biscuits, cheesecake, and other.

**Beer:** Includes near beer/malt beverage, light beer (low calorie/alcohol).

**Butter and margarine:** Includes diet, lite, extra lite, low fat, fat free, low calorie, reduced calorie, unsalted, whipped, canola oil and/or canola blends, butter/margarine blends, and all butter- or margarine-type spreads.

**Carbonated beverages:** Includes diet and/or caffeine free.

**Cereals, ready-to-eat:** Includes high fiber, low fat, no salt, and/or whole grain.

**Cheese:** Includes diet, light/lite, low calorie, reduced calorie, low cholesterol, no cholesterol, reduced cholesterol, fat free, low fat, reduced fat, low salt/sodium, reduced salt/sodium, no salt/sodium, skim milk, and/or part skim milk.

**Cookies:** Includes diet, low fat, fat free, no cholesterol, low salt, no salt, and/or sugar free.

**Cottage cheese:** Includes 2 percent and lower fat versions.

**Crackers:** Includes diet, light/lite, no cholesterol, low salt, and/or no salt.

**Cream cheese:** Includes fat free, reduced fat, no cholesterol, low cholesterol, lite/light, low sodium, diet, and/or "Neufchatel" (recently renamed "lite"). Whipped cream cheese is not included in nutritionally-improved versions, even though on a tablespoon equivalence basis it provides less fat than regular cream cheese. However, on a serving equivalence (with a serving defined as 3 tablespoons for whipped cream cheese and 2 tablespoons for regular cream cheese), both products provide 11 grams of fat per serving. Only those whipped cream cheese products that made a nutrient content claim were included in the nutritionally-improved versions.

**Dairy puddings, refrigerated:** Includes fat free, light, or nonfat.

**Dry pasta/rice dinner mixes:** Includes low fat.

**Fruit, canned:** Includes diet, light/lite, unsweetened, light syrup, no salt, low salt/sodium, juice pack, and/or water pack versions of canned applesauce, apples, apricots, berries, figs, fruit cocktail, fruit mixes and salad fruit, grapefruit, oranges, peaches, pears, pineapple, grapes, cherries, plums, prunes, and remaining fruits.

**Fruit, frozen:** Includes unsweetened versions.

**Fruit juices and ades** (all types of fruit-based drinks, canned, bottled, and frozen juices, measured in single-strength equivalent): Includes diet, light/lite, low calorie, low and/or no salt/sodium, no caffeine, unsweetened, and/or calcium or vitamin fortified.

**Frozen dairy desserts (ice cream, frozen yogurt, and sherbet):** Includes diet ice cream, ice cream mixed with sherbet or sorbet, all frozen yogurt (whether or not they specifically claim to be low in fat), ice milk, and/or sherbets. Although some premium types of frozen yogurt may contain more fat than some types of regular ice creams, in general the fat content of frozen yogurt is lower than among ice creams.

**Hot dogs:** Includes poultry-based or mixtures with poultry, light/lite, fat free, low fat, less fat, low salt, and/or sugar free.

**Luncheon meats (packaged, sliced):** Includes poultry-based, fat free, low fat, less fat, reduced fat, lean, premium lean, light/lite, unsalted, low salt, and/or sugar free.

**Mayonnaise and mayonnaise-type salad dressings:** Includes fat free, low fat, no cholesterol, low cholesterol, no salt, low salt, light, low calorie, reduced calories, and/or shelf-stable mayonnaise-style salad dressings such as Kraft's *Miracle Whip*.

**Milk (flavored and unflavored):** Includes 2% and lower fat versions, and/or low or no cholesterol.

**Pasta, canned:** Includes "Healthy Choice" and "Featherweight Healthy Recipe" brands.

**Pizza, frozen:** Includes light/lite, whole wheat crust, vegetarian, and/or turkey sausage.

**Popcorn, microwavable:** Includes less fat, light/lite, low fat, lite salt, low salt, low sodium, no salt, salt free, and/or unsalted.

**Potatoes, frozen:** Includes cholesterol free potatoes, and/or "Healthy Choice," "Lean Cuisine," or "Weight Watchers" brands.

**Frozen entrees and dinners, prepared:** Includes low calorie, low fat, and/or light/lite. Excludes frozen Mexican entrees which are sold by the unit. Nutritionally-improved frozen Mexican entrees include low calorie, low fat, and/or light/lite.

**Salad and cooking oils:** Includes canola and olive oil.

**Salad dressings (liquid or refrigerated):** Includes low cholesterol, cholesterol free, low fat, fat free, no oil, low salt, no salt, and/or sugar free.

**Salty snacks:** Includes unsalted, light salt, low salt/sodium, slightly salted, light/lite, no oil, and/or no fat versions of potato chips, tortilla chips, corn chips, pretzels, puffed cheese, and potato sticks.

**Sour cream:** Includes light/lite, non-fat, low fat, reduced fat, diet, reduced calorie, and/or low calorie.

**Spaghetti and marinara sauce, shelf stable:** Includes low and/or no salt or sodium, low and/or no fat, and/or no sugar.

**Tuna, canned:** Includes packed in water or olive oil, lite, and/or diet.

**Vegetables, canned:** Includes diet, low salt, no salt, light syrup, and/or no sugar.

**Vegetable juice:** Includes low and/or no salt or sodium.

**Frozen waffles, pancakes, and french toast:** Includes lite versions.

**Whipping cream, refrigerated toppings, and frozen whipped toppings:** Includes medium or light whipping cream, and lite refrigerated toppings and frozen whipped toppings.

**Yogurt:** Includes light/lite, low fat, and/or non fat.