

Database Considerations for In-Store Nutrition Shelf Labeling

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The supermarket may be the most regularly consulted resource for nutrition information because of the availability of nutrient information on the product label and the frequency with which the supermarket is visited. While product labels will soon carry consistent and more easily understood nutrition data, as a result of the new FDA labeling regulations, the interpretation of that data from "2 grams of fat" to "Low Fat", as an example, may be most effective in influencing purchases and therefore consumption.

The interpretation may be offered on the product label, or on the shelf label. When provided on the shelf label, a database must be maintained with product-specific nutrition data, which must append to data usage for daily store operations. The interpretation must be based on the specific criteria as defined by the FDA (1).

Reviewed here are the mechanics of supplying nutrition information on the shelf label and the status of consumer understanding of nutrition issues. Finally, repeated studies supply proof that nutrition information presented on the shelf label is used by the consumer and does indeed influence purchase decisions.

The Basic Shelf Label

The shelf edge label, located directly under the product, is primarily in place for store operations. A supermarket may have upwards of 25,000 pre-packaged products, including non-consumables, so inventory management is feasible only with an efficient tracking system.

The key to this system is the UPC number, most commonly seen as a 10 digit number (2). The UPC, or Universal Product Code, is the number that distinguishes an individual product from another.

The first 5 digits of the number are assigned to a manufacturer by the Uniform Code Council, and identify the manufacturer of the product. The last 5 digits refer to a specific size of a specific product. The total of 10 digits identifies the manufacturer and the specific product produced by that manufacturer. The UPC number, is critical to the efficient tracking of price and inventory information, as well as nutrition information.

With 25,000 products, entering the 10 digits by hand would significantly impede supermarket activity. Efficiency, then, requires the use of the bar code. This series of lines is a representation of the UPC number. A laser beam provided by the scanner measures the black *and* white area to interpret a number. The clarity with which the bar code is printed, will determine its' scanability. When a product will not scan, the store clerk must stop to enter a series of 10 numbers by hand - they comprise the UPC number.

The UPC number is always referred to as a 10-digit number, but the Uniform Code Council refers to it as a 12-digit number - 6 digits referring to the manufacturer and 6 digits referring to the product. The 6 digits allow for the day when 5 digits are insufficient to account for all manufacturers or all of the products they manufacturer. At present, the first and last digits of the 12-digit number are 0's, and are ignored for data processing. A total of 12 digits must be anticipated in any building database, but at this time only 10 are critical.

There is a 6 digit UPC number, referred to as the Version E UPC. It is most often used on products with labels too small to illustrate all 10 digits. The 6 digits are also representative of a 10-digit number, and based on the value of the last digit, a series of digits will automatically be inserted somewhere in the digit series to expand the 6 digits to 10 when scanned.

Since the shelf label is used primarily for store operations, the nutrition data must be attached to the flow of existing data. That is accomplished by attaching the nutrition data to the UPC number.

Considerations for the Shelf Label With Nutrition Added

On the basic label, the only information directed to the consumer is the price, and the unit price. Adding more consumer information, in the form of nutrition descriptors, requires that more attention be given to attracting the customer to the shelf-edge label. Adding color and graphics, therefore, become important enhancements to the nutrition label.

The description on the shelf label is nearly always shortened to 25 characters to fit on the small label. This shortened description becomes an additional field in the database, which must store both the full and shortened description.

Because 9% of the overall U.S. population speaks Spanish as a first language (26% in Texas and California), GTI offers nutrition descriptors in Spanish and English (3). "Bi-lingual" is a difficult issue for product manufacturers to address because of the limitations of product label size and the complete duplication of information required. For the shelf-edge label, it is feasible to provide the nutrition descriptors in Spanish as well as English.

The most important consideration for adding nutrition information to the shelf edge label, however, is the FDA-established criteria that defines each descriptor. The shelf label is seen as an extension of the product label, when nutrition information is displayed, and it is important that the same criteria apply to the shelf label descriptor as to any product label descriptor. The consumer expects and must receive consistent definitions for the terminology, wherever it is seen.

FDA Criteria for Nutrition Descriptors

The criteria for descriptors is changing with the finalization of the FDA labeling regulations, issued in January of this year (1). The enforcement date for the regulation is May of 1994. The new definitions for the 6 categories used in the GTI program, are as follows;

Calorie	Low Calorie	40 calories or less per reference serving size, as long as the serving size is over 30 grams or over 2 tablespoons. Meals or meal products are 120 calories or less per 100 grams
	Calorie Free:	5 calories or less per reference serving size.
	Sugar substitutes are excepted.	
Sodium	Low Sodium	140 milligrams or less per reference serving size, as long as the serving size is over 30 grams or 2 tablespoons. Meals or meal products are 140 milligrams or less per 100 grams.
	Sodium Free:	5 milligrams or less per reference serving size.
	Very Low Sodium:	35 milligrams or less per reference serving size.
Fat	Low Fat:	3 grams or less per reference serving size, as long as the serving size is over 30 grams or 2 tablespoons or more. Meals or meal products are 3 grams fat per 100 grams and not more than 30% calories from fat.
	Fat free:	.5 grams or less per reference serving size.
Cholesterol	Low Cholesterol:	20 milligrams or less of cholesterol, 2 grams or less of saturated fat, and 13 grams or less of total fat per reference serving size.
	Cholesterol free:	2 milligrams or less of cholesterol, 2 grams or less of saturated fat, and 13 grams or less of total fat per reference serving size.
	If fat or saturated fat is over the criteria amount, the actual amount must be declared on the label.	
Fiber	Good source of fiber:	10 - 19% of 25 grams for dietary fiber, or 2.5 to 5 grams per reference serving size.
	Excellent source of fiber:	20% or more of 25 grams, or 6 grams or more of dietary fiber per reference serving size.
	If product is not also low fat, the label must disclose total grams of fat.	
Calcium	Good Source Of Calcium:	10 - 19% of 1000 milligrams or 100 milligrams to 190 milligrams of calcium per reference serving size.
	Excellent Source Of Calcium:	20% or more of 1000 milligrams or 191 milligrams or more of calcium per reference serving size.

The change that affects every category is the serving size. The new regulation provides a list of 131 reference serving sizes. The serving size referred to in the new criteria is no longer the

manufacturers' serving size but the reference serving size. "Low Calorie", as an example, must fit at least the reference serving size and if it does not also fit the manufacturers serving size, the reference serving size must appear in parenthesis behind the Low Calorie descriptor.

If a product fits the descriptor "Low Calorie", like Birdseye Asparagus, but all frozen asparagus fits the "Low Calorie" criteria, it must be referred to as a "Low Calorie Food". This part of the regulation fits every category, as does the serving size regulation.

The Database

A database, for the purpose of providing a descriptor or descriptors at the shelf edge, requires constant updating (4). New products and new product formulations enter the market daily. Too complex for any one grocer, central data handling makes nutrition descriptors at the shelf edge, obtainable by most grocery chains. The nutrition database maintained by Graphic Technology contains over 30,000 items, including regional products from across the country.

There are 13 nutrient categories on the new product label, and GTI provides shelf labels in 6 of those categories. The database, however, must accommodate many other pieces of information relating to the product, in order to provide the nutrition descriptors in the 6 categories:

- A shortened word description for the shelf label and a complete word description for reference.
- A commodity class code, which allows the implementation of "edit" checks (5) across a category of foods - this code makes it possible to compare the product with the serving size section of the regulation and the application of a term like "Low Calorie Food", when all products in the class fit into the same category.
- Easy access to the manufacturers' address and phone number - there are 800 manufacturers represented in the GTI database.
- The UPC number - several sizes of the same are represented different UPC numbers.

The 13 categories of nutrition information, therefore, are only a small part of the 110-field database. To classify a product as "Low Cholesterol", for example, amounts for cholesterol, saturated fat and total fat must be considered. Additionally, the commodity class, UPC's, and many other fields must be considered to classify a product as "Low Cholesterol" - up to 62 fields in all.

Data Collection

The source of our nutrition data is the manufacturer, either directly or indirectly. Though updated information is routinely requested, it is likely that the product will appear on store shelves before it is received from the manufacturer. Nutrition information is collected and confirmed weekly in local Kansas City stores and several grocery customers actively supply label information on new *regional* products.

The manufacturer most often supplies nutrition data in the form of the product label. Sometimes the laboratory analysis is provided.

A form is occasionally requested, for the manufacturer to complete and return. In fact, data is not accepted in this form. True for any data assembly, the greater the number of hands that touch the data, the greater the chance for error. As an example, nutrition information was supplied for a well known brand of vegetable oil, that claimed 14 grams of carbohydrate and 0 grams of fat. These figures were erroneously reversed and this error was obvious. A more obscure error of this kind, however, could have resulted in an error on the shelf label. Therefore, data is requested in label or lab analysis format.

The Store Match

The data processing that remains, is to match the nutrition data in the GTI-DDS database with the master file of the grocers' products. The items on both lists are recorded side by side where a final visual edit check compares the product description of the grocers' file with the product description in the nutrition file. Since both files have shortened descriptions, any ambiguity of description matches results in deletion of the item. Presently, between 3500 and 4000 items are matched per store.

Consumer Perceptions

Beyond the technical issues, how the customer perceives the value of nutrition information at the shelf edge, is critical. Fortunately, Giant Food Inc. and the FDA have done repeated studies of the effectiveness of nutrition shelf labeling. First, it is helpful to further understand customer perception, by determining their current level of knowledge.

According to the second annual National Nutrition Quiz conducted by the Food Marketing Institute (6), when asked about the source of cholesterol only 34% knew that it was found only in foods that come from animals. Approximately 50% thought that beef and chicken had some fiber.

A Roper poll published in 1989, reported a total of 52% of consumers examine the *food label* (nutrition panel and ingredients listing) as a source of nutrition information - more than any other source (7).

The Trends Report, published by the Food Marketing Institute (8), measures consumer attitudes about a variety of issues important to the grocery industry. Just released was the 22nd annual report. One question asked of those surveyed, was "What is it about the nutritional content of what you eat that concerns you and your family most?" The responses were, in this order, fat content 54% (up from 13% in 1985), salt content 26% (up from 19% in 1985), *cholesterol* levels 23% (up from 10% in 1985), and of all the major issues, *calories* was only 15% (up from 9% in 1985).

Consumer Reports, May 1993 (9), reported that consumer interest in fats is greater than interest in any other food component. The market has driven food technologists to produce no-fat foods, which have either no detectable fat or negligible amounts (no more than half a gram of fat per serving).

Fat replacers, according to the article, have not made the splash their manufacturers had hoped for. It was predicted that annual sales of fat replacers would quickly exceed \$1 billion, but by 1992, they still had not topped \$100 million.

Today, the most successful fat-free foods are Entenmann's, and other baked goods that can have an appealing texture with hardly any fat. In contrast, dairy products such as no-fat ice cream have been less successful because of the difficulty in duplicating the full flavor and creamy texture, or "mouth feel", of authentic fat. The Low Fat options, therefore, may have the most appeal.

From Trends, an important figure to any nutrition educator and to any grocer, is that 97% of shoppers cited nutrition as important to their food selection. Nearly everyone who walks through the door of the grocery store is influenced in some way by nutrition value. More importantly, this figure has changed very little in the past 5 years.

Giant Food - Repeated Studies

If the grocer is to provide assistance to the shopper looking for nutrition information, the most effective location is at the point-of-purchase where it is estimated that 65% of purchase decisions are made (10). Efforts to provide nutrition information on posters or handouts, have been able to

raise awareness about certain health issues, but have not succeeded in changing purchase behavior (11).

Posters and handouts are most effective when used to support the nutrition shelf label which has been proven to effect purchase behavior. The proof comes from 2 studies; the first dated 1985 (11) and the second dated 1992 (12), conducted by Giant Foods, Inc. and the FDA *Division of Consumer Studies*. Giant, a 154 store chain based in Landover, Maryland, has posted nutrition shelf labels since 1981.

In the study, 10 stores from the Washington D.C. area which varied in size and socio-economic characteristics, were matched on the basis of those characteristics with 10 stores from the Baltimore, Maryland area. The Washington stores had a nutrition program called "Special Diet Alert" with nutrition labels posted at the shelf edge. The Baltimore stores did not have the program.

For 2 years after "Special Diet Alert" was introduced in Washington, consumer purchases were tracked through computer assisted checkout data, provided by Giant Foods. The relative market shares of these products were tracked. The pattern of differential sales trends across 16 individual food categories of shelf-marked products, increased an average of 6% over the 2-year evaluation period in the Washington D.C. stores.

A second study replicated the previous successful trial of the program in Washington, D.C. Over the 2-year evaluation period, market shares of shelf-tagged products increased 12% on average in 8 of 16 product categories that had been included in the original program trial. Data for the second section actually was collected in 1989, so in 8 years, the effectiveness had doubled.

Measuring by Market share offers a *control* for differences in store size. The length of time, 2 years, controls for other variations like seasonal differences.

Increasing market share does not indicate that more merchandise is being sold - it means that sales within product categories have shifted in favor of a brand labeled with a nutrition descriptor. A 12% increase in market share tells the grocer that he is supplying a program customers are using. If they use it, they will *return to his store to use it*, so he is building customer loyalty.

Conclusion - The Real Value of Nutrition at the Shelf Edge

Finally, shoppers of Giant Foods were surveyed at the end of the study - *31% of all shoppers said they were using the labels with greatest use in those between ages 40 and 64.*

The opportunity to capture the attention of the hurried shopper is defined in seconds and any nutrition message communicated in the grocery store must be simple, and clearly presented. Another example of an effectively communicated nutrition message is "5 a Day" (13), a program co-sponsored by the National Cancer Institute and the Produce for Better Health Foundation. Consumers are instructed to consume at least 5 servings daily of a combination of fruits and vegetables. "5 a Day" has been adopted by 85% of the major supermarket chains in the country. When it is completely adopted by the consumer, this simple message, effectively communicated at the point-of-purchase, could be instrumental in reducing cancer and heart disease.

Effecting purchase behavior, as shelf labels do, does indeed effect consumption behavior. That is the desired goal of any nutrition education program, and certainly the goal of nutrition labeling at the shelf edge. It is possibly the most universally effective form of nutrition education.

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