RESEARCH
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Attitude and Behavior Factors Associated with Front-of-Package Label Use with Label Users Making Accurate Product Nutrition Assessments

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ABSTRACT

Background Front-of-package (FOP) labels are increasing in popularity on retail products. Reductive FOP labels provide nutrient-specific information, whereas evaluative FOP labels summarize nutrient information through icons. Better understanding of consumer behavior regarding FOP labels is beneficial to increasing consumer use of nutrition labeling when making grocery purchasing decisions.

Objective We aimed to determine FOP label format effectiveness in aiding consumers at assessing nutrient density of food products. In addition, we sought to determine relationships between FOP label use and attitude toward healthy eating, diet self-assessment, self-reported health and nutrition knowledge, and label and shopping behaviors.

Design A between-subjects experimental design was employed. Participants were randomly assigned to one of four label conditions: Facts Up Front, Facts Up Front Extended, a binary symbol, and no-label control.

Participants/setting One hundred sixty-one US primary grocery shoppers, aged 18 to 69 years. Participants were randomly invited to the online study.

Intervention Participants in one of four label condition groups viewed three product categories (cereal, dairy, and snacks) with corresponding questions.

Main outcome measures Adults' nutrition assessment of food products based on different FOP label formats, along with label use and attitude toward healthy eating, diet self-assessment, self-reported health and nutrition knowledge, and label and shopping behaviors.

Statistical analyses performed Data analyses included descriptive statistics, χ^2 tests, and logistical regression. Significant outcomes were set to α=.05.

Results Participants selected the more nutrient-dense product in the snack food category when it contained an FOP label. Subjective health and nutrition knowledge and frequency of selecting food for healthful reasons were associated with FOP label use ($P<0.01$ and $P<0.05$, respectively).

Conclusions Both Facts Up Front (reductive) and binary (evaluative) FOP labels appear effective for nutrition assessment of snack products compared with no label. Specific attitude and behavior factors were associated with label use.
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THE COMPLEXITY OF FOOD CHOICES IN GROCERY stores has increased over the years, creating the need for proper nutrition knowledge and understanding about products to make healthful decisions.[1] US retail food products are required to contain nutrition information on the back of food packages through the Nutrition Facts Label program.[2] As a supplement, front-of-package (FOP) labels have become popular on retail food products. FOP labels summarize and reinforce, rather than replace, Nutrition Facts labels, which may be overlooked by consumers due to their complexity and difficulty to understand.[3,4] Because FOP labels have the potential to help consumers understand the nutrient quality of products[5] and influence food choices,[6] they have become more prominent on packaged food items during the past 10 years.[7] FOP labels also have the potential to encourage manufacturers to develop healthier products that are preferred by consumers.[8-10] In addition, FOP labels may assist consumers in seeking nutrient-dense foods; in other words, foods containing vitamins, minerals, fiber, and other healthful nutrients and calories in the amounts needed to maintain a healthy weight.[11]

During recent years, retailers, manufacturers, and nonprofit organizations have created voluntary FOP nutrition labels or shelf tags to assist consumers in selecting healthier options at grocery stores.[12] Many are private initiatives with distinct nutrition-related criteria that food products must meet to

display the label.[12] However, FOP label systems are not consistent throughout grocery stores, which can be a barrier to consumers using labels altogether,[6] and be confusing and overwhelming to shoppers.[13,14]

FOP labeling systems are grouped into two categories: reductive or evaluative. Evaluative symbols are an objective FOP labeling approach, typically iconic in appearance and meeting predetermined nutrition-related criteria to qualify to display the label.[15,16] A few examples of evaluative-type labels include the American Heart Association's Heart Check,[17] the Whole Grain Stamp by the Whole Grains Council,[18] and manufacturer labels such as PepsiCo's Smart Spot and the Kraft Foods Sensible Solution.[19] Research suggests that evaluative FOP labels influence perceived healthiness[16] and aid in faster processing[20-22]; however, these labels provide a less accurate perception of product healthfulness.[13]

In contrast to evaluative labels, reductive FOP labels have nutrient-specific information and provide a summary of the traditional Nutrition Facts label.[13,16] Nutrient-specific labels typically display percent guideline daily amounts[12] of nutrients that should be limited for consumption, like calories, sugar, saturated fat, and sodium in grams and percentages per serving based on the average adult intake in the United States.[12,23] Reductive FOP labels improve perceived healthiness,[5,10,16,24-26] positively influence purchase intentions,[13,16] improve label comprehension,[13] and assist consumers in comparing nutritional quality between products.[13,26-29] The majority of FOP labeling in the United States is the reductive-type Facts Up Front label,[30] which is a voluntary labeling system developed by the Grocery Manufacturers Association and the Food Marketing Institute.[31]

Label use is portrayed in the literature as consumers reading and using nutrition label information on food products, most often to make food choices.[26,32] Research indicates that demographic characteristics such as income, education level, and health status play a role in label use.[32] In addition, beliefs and behaviors (ie, subjective nutrition knowledge,[33] interest in healthy eating,[25] time to shop,[32,34] and nutrition self-efficacy[35]) are associated with label use.

Due to the limited amount of research in the United States specifically focusing on the Facts Up Front label and/or evaluative-type labels,[5,16,27] and their increasing popularity,[30] further examination of FOP labels is important. Therefore, the objectives of this study were to identify relationships between reductive and evaluative FOP label use, as well as to determine whether there are relationships between FOP label use and factors such as attitude toward healthy eating, diet self-assessment, self-reported health and nutrition knowledge, and label and shopping behaviors.

RESEARCH SNAPSHOT

Research Question: Do front-of-package (FOP) label formats help consumers assess the nutrient density of food products? Does attitude toward healthy eating, diet self-assessment, self-reported health and nutrition knowledge, and label and shopping behaviors influence FOP label use?

Key Findings: In this between-subject experimental design, 161 participants selected the more nutrient-dense product in the snack food category when it contained an FOP label. Furthermore, subjective health and nutrition knowledge ($P<0.01$) and frequency of selecting food for healthful reasons ($P<0.05$) were associated with FOP label use.

MATERIALS AND METHODS

This study explored three different types of FOP labeling schemes currently used in the United States. The majority of the survey questions came from a previous study conducted in four European countries.[21] This study was deemed by The University of Mississippi's Institutional Review Board as exempt under Code of Federal Regulations Title 45 46.101(b)(2).

Participants

Participants in this study were randomly recruited to the online survey through Qualtrics (www.Qualtrics.com) using a partner's panel. A total of 586 individuals who met the criteria of being at least 18 years old and the primary grocery shopper residing in the United States were randomly computer generated from the panel, invited into the study, and participated in the online survey on January 19 and 20, 2016. Of those, 235 individuals clicked on the request.

Participants in the partner panel are recruited in numerous ways: website intercept recruitment, member referral, targeted E-mail lists, gaming sites, customer loyalty web portals, permission-based networks, and through social media.[36] The partner panel uses specialized recruitment campaigns to include hard-to-reach individuals so they are equally represented in the database. Their security program, CAPTCHA, seeks to identify fraudulent respondents at the time of recruitment and when taking surveys, such as monitoring respondents' response patterns, survey speed, and straight-line responses to ensure the validity of panel members.[36]

Research Design

Using a between-subjects experimental design, participants were randomly assigned to one of four label conditions: Facts Up Front (reductive); Facts Up Front Extended (reductive); a binary symbol, Health Check (evaluative); and no-label control (Table 1).

1. The Facts Up Front label displays calories, saturated fat, sodium, and sugar in percent Daily Value.[31]
2. The Facts Up Front Extended label displays calories, saturated fat, sodium, and sugar as well as two "nutrients to encourage."[31]
3. A binary symbol label, Health Check, was created due to the absence of evaluative FOP label format in the United States that was not associated with a brand,[16,22] and to provide a comparison of reductive and evaluative FOP label formats. As previously mentioned, food brands and manufacturers implement most of the iconic symbol FOP labels in the United States. These labels, such as the American Heart Association Heart Check, have criteria too specific for this study.[17]
4. No-label control.

Procedures

Participants were randomly assigned to one of the four label conditions representing three product categories: cereal,