Including "Added Sugars" on the Nutrition Facts Panel: How Consumers Perceive the Proposed Change

EFFECTIVE TOOLS AND STRATEGIES for the prevention of chronic disease and the promotion of health are needed to reduce the disease burden in the United States. In the nutrition arena, the nutrition label, originating from the 1990 Nutrition Labeling and Education Act, is believed to be one such tool. Specifically, the Nutrition Labeling and Education Act established requirements for the inclusion of the Nutrition Facts Panel (NFP), its prominent display on most packaged goods, and its regulation by the US Food and Drug Administration (FDA).[1] Although some studies suggest that nutrition labels may positively influence consumers' dietary behavior, including intake of nutrient-rich foods,[2-5] other studies suggest that some consumers are confused by aspects of the food label and fail to make sufficient choices to facilitate meeting dietary recommendations.[6,7] Nutrition labels that are easy to understand and that provide useful dietary information are essential if consumers are to effectively apply the information when making dietary choices.

Current nutrition guidance includes the recommendation to reduce added sugars intake. The 2010 Dietary Guidelines for Americans advises Americans to limit intake of added sugars,[8] and the Scientific Report of the 2015 Dietary Guidelines Advisory Committee notes that while added sugars intake declined between 2001-2004 and 2007-2011, intake continues to exceed recommendations.[9] Because the current NFP does not provide specific information about added sugars, the FDA recently proposed adding a line on the NFP below "Sugars" titled "Added Sugars."[10]

With NFP revisions currently being considered by the FDA, this is the ideal time to look at how potential changes to the NFP format (appearance and content) may be interpreted by consumers. Registered dietitian nutritionists (RDNs) in particular can benefit from more detailed information about consumer NFP comprehension to better tailor their label education initiatives.

With this in mind, the International Food Information Council Foundation, with the aid of Turner Research Network, examined consumers' understanding of "Added Sugars" using the NFP while investigating attitudes and perceptions about carbohydrates and sugars (including added sugars) to assess the potential effect of including "Added Sugars" in the NFP.

A TWO-PHASE APPROACH TO CONSUMER ASSESSMENT

It was determined that for this descriptive, cross-sectional analysis, a two-phase approach—both qualitative and quantitative—would be ideal to look at consumers' understanding and use of the NFP.

Qualitative Phase

The qualitative phase involved 27 in-depth interviews (IDIs) with adult consumers in Los Angeles, CA; Baltimore, MD; and Atlanta, GA, to allow for diversity based on geographic location. The 30-minute IDIs assessed the perception, interpretation, and personal use of the NFP and nutrition information. IDIs were chosen over focus groups to obtain more intimate details and uninfluenced personal beliefs due to the one-on-one nature of the dialogue.

During the qualitative phase, both current and proposed NFP formats were viewed by consumers. From a purely visual perspective, participants took note of the calorie information in boldface type as well as the "Added Sugars" line on the proposed NFP formats. When probed about the observed "Added Sugars" line, consumers interpreted it in a variety of ways, including that the "Added Sugars" line was in addition to the gram amount shown in the "Sugars" line, that "Added Sugars" meant the manufacturer added more sugar to the product, and that the presence of the "Added Sugars" line made the product less desirable. The wide range of consumer perceptions and interpretations of "Added Sugars" information on the NFP gained from

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the qualitative phase provided key learning items for the quantitative phase.

Quantitative Phase

The quantitative survey sampled 1,088 men and women aged 18 years and older who were drawn from a national respondent panel that exceeds 2 million members. Participants were screened to be reflective of the US population with respect to census region, sex, age, race, and Hispanic national origin.[11]

The first question on the survey, "What information do you look at on the food or beverage packages when deciding to purchase or eat a food or beverage?" included five potential responses related to items on the food or beverage package along with an explanatory note about each item: the NFP, the ingredients list, serving size and number of servings per container, statements about nutrition or health benefits, and calorie and other nutrition information on the front of the package via an icon or graphic. Respondents could answer "Yes" or "No" indicating whether or not they use any or all of the five items. The response to these five items was used to group survey participants into self-reported NFP readers or nonreaders to allow for comparisons.

All respondents then answered questions while viewing three NFP versions (all in the proposed FDA format, not the one currently in use) from one of three food product categories (flavored yogurt, ready-to-eat cereal, and frozen meal). The three NFP versions viewed by each participant were of a nutritionally identical product that varied how sugars were presented (see the Figure). The food product categories and NFP nutrition profiles used in this study were selected to mirror the information tested by recently conducted FDA research.[12] The flavored yogurt, ready-to-eat cereal, and frozen meal NFP versions used in this analysis parallel FDA Yogurt 3, Cereal 3, and Meal 2 test stimuli.[12]

The NFP versions shown to survey participants were as follows. Version S contained a "Sugars" declaration only (because sugars information is displayed on the current NFP), Version S+A declared "Sugars" and "Added Sugars" as a subgroup, and version TS+A declared "Total Sugars" and "Added Sugars" as a subgroup. Respondents viewed and evaluated one of the three NFP versions in the first position before being exposed to the

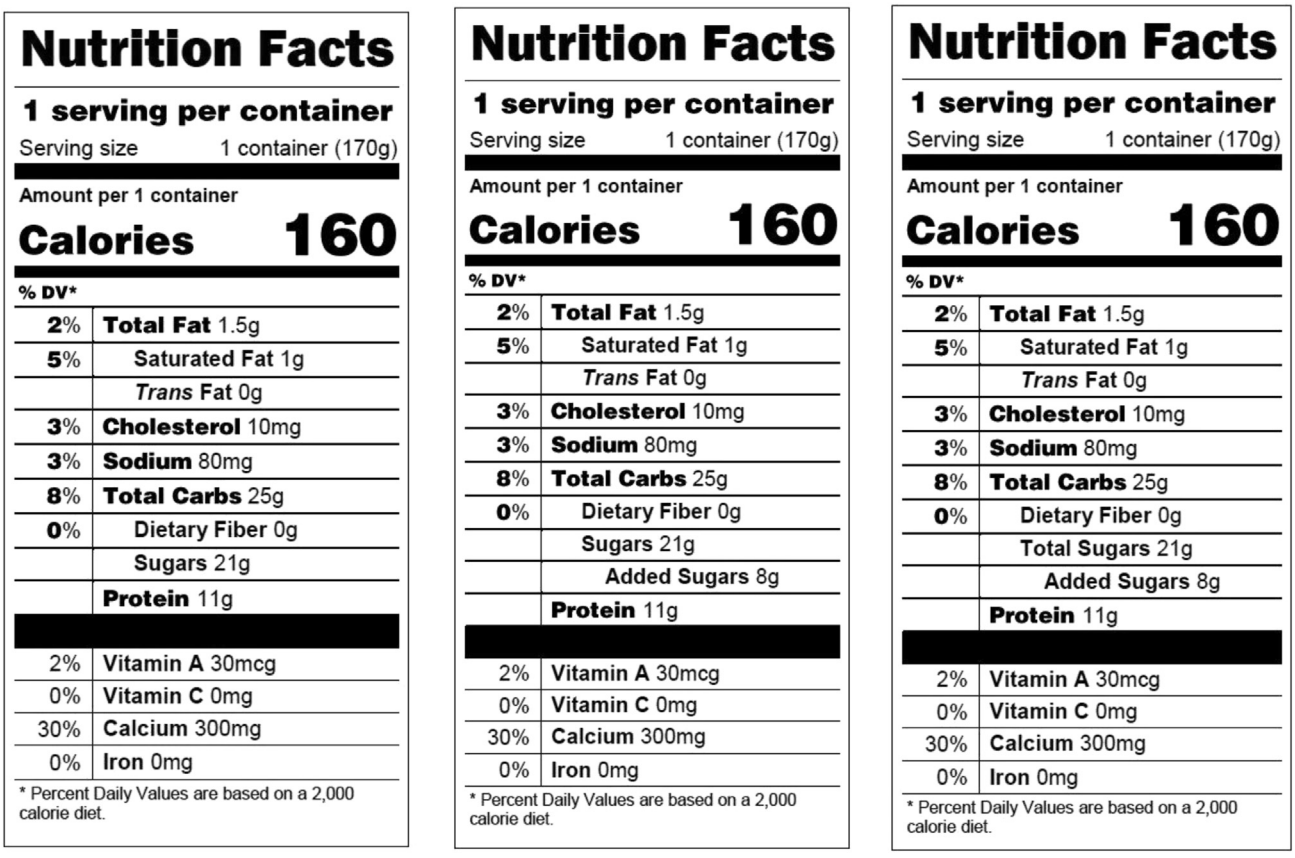

Figure. Example (flavored yogurt) of the different versions of the Nutrition Facts Panel (NFP) used to examine consumer knowledge, perceptions, and use. Other example product labels used were a ready-to-eat cereal and a frozen meal. Version S lists "Sugars" as in the current NFP; that is, indented from the carbohydrates declaration. Version S+A lists "Sugars" indented from the carbohydrate declaration and "Added Sugars" indented from "Sugars." Version TS+A lists "Total Sugars" indented from the carbohydrate declaration and "Added Sugars" indented from "Total Sugars."

Table 1. Comprehension of information about the amount of sugars on different proposed versions[a] of the Nutrition Facts Panel (NFP)[bcd]

Comprehension	Version S	Version S+A	Version TS+A
	←——— % (95% CI) ———→		
Correct (n=1,088)	92.0[x] (88.7-94.4)	54.8[y] (49.6-59.9)	66.3[z] (61.4-70.9)
NFP readers	92.7[x] (89.1-95.2) n=288	55.1[y] (49.1-60.9) n=267	66.6[z] (61.0-71.7) n=296
NFP nonreaders	89.1[x] (79.1-94.5) n=64	53.9[y] (43.6-63.9) n=89	65.5[y] (54.8-74.8) n=84
Incorrect (n=1,088)	8.0[x] (5.6-11.3)	45.2[y] (40.1-50.4)	33.7[z] (29.1-38.6)
NFP readers	7.3[x] (4.8-10.9) n=288	44.9[y] (39.1-50.9) n=267	33.4[z] (28.3-39.0) n=296
NFP nonreaders	10.9[x] (5.5-20.9) n=64	46.1[y] (36.1-56.4) n=89	34.5[y] (25.2-45.2) n=84

[a]The NFP versions shown to survey participants were as follows: Version S contained a "Sugars" declaration only (as sugars information is displayed on the current NFP), Version S+A declared "Sugars" and "Added Sugars" as a subgroup, and version TS+A declared "Total Sugars" and "Added Sugars" as a subgroup.
[b]Statistical analyses were computed using with the Statistical Package for the Social Sciences software (version 22.0, IBM-SPSS Inc). Significance testing was conducted on first position formats using *z* tests. The survey margin of error at the 95% CI was ±3.0%.
[c]The question was stated as follows: "Based on what you see on this label, what is the total amount of sugars in one serving of this product?"
[d]Percentages not sharing a common superscript letter (x, y, z) are significantly different from one another ($P<0.05$). Comparisons made horizontally.

other two NFP versions to eliminate potential bias when evaluating subsequent NFPs.

SURVEY FINDINGS AND OTHER SUPPORTING EVIDENCE

Identifying the Total Amount of Sugars in the Product

The ability of consumers to identify the total amount of sugars in a product using NFP information significantly varied among NFP versions with and without "Added Sugars" information. Participants were asked to report the total amount of sugars in the NFP version they viewed first. Of those seeing Version S first, 92% correctly identified the amount of total sugars (see Table 1). This accuracy was significantly higher compared with those viewing Versions S+A (54.8%) and TS+A (66.3%) first. Also, a significantly higher percentage of respondents answered incorrectly when asked about the total amount of sugars when "Added Sugars" was included on the NFP.

Interestingly, even individuals who claimed to be NFP readers exhibited difficulty identifying the total amount of sugars when viewing labels with the "Added Sugars" declaration. This is illustrated by the 44.9% of self-reported NFP readers who incorrectly identified the total amount of sugars when first viewing Version S+A. The word *Total* in Version TS+A helped to clarify the issue, but did not entirely eliminate the inaccuracies observed in identifying total sugars content. When Version TS+A was viewed in the first position, 33.4% of self-reported NFP readers still answered incorrectly.

Comprehending the Meaning of "Added Sugars"

In addition to struggling to identify total sugars content, participants in this study also misinterpreted the meaning of the "Added Sugars" declaration. Respondents who viewed Versions S+A and TS+A in the first position were asked, "Is the number of grams of 'Added Sugars' in this product included in the grams of sugars shown in the [Sugars/Total Sugars] line, or is it in addition to the amount of sugars shown in the [Sugars/Total Sugars] line?" (The words "included" and "in addition to" were also underlined in the survey). More than half of respondents (52%) who first viewed Version S+A said the number of grams of "Added Sugars" were in addition to

Table 2. Interpretation of "Added Sugars" on the Nutrition Facts Panel (NFP) on the S+A and TS+A versions[a] of the NFP (N=736)[bcd]

Interpretation	S+A Version (n=356)	TS+A Version (n=380)
	←——— % (95% CI) ———→	
Included	36.5[y] (31.7-41.6)	51.6[z] (46.6-56.6)
In addition to	52[y] (46.8-57.1)	33.4[z] (28.9-38.3)

[a]Version S+A declared "Sugars" and "Added Sugars" as a subgroup and version TS+A declared "Total Sugars" and "Added Sugars" as a subgroup.
[b]Statistical analyses were computed using with the Statistical Package for the Social Sciences software (version 22.0, IBM-SPSS Inc). Significance testing was conducted on first position formats using *z* tests. The survey margin of error at the 95% CI was ±3.0%.
[c]The question was stated as follows: "Is the number grams of Added Sugars in this products included in the grams of sugars show in the (Sugars/Total Sugars) line, or is it in addition to the amount of sugars shown in the (Sugars/Total Sugars) line?"
[d]Percentages not sharing a common superscript letter (y, z) are significantly different from one another ($P<0.05$). Comparisons made horizontally.

Table 3. Comparison of Nutrition Facts Panel (NFP) readers vs nonreaders: Interpretation of "Added Sugars" on the NFP on the S+A and TS+A versions[a] of the NFP[bcd]

	S+A Version		TS+A Version	
Interpretation	Readers (n=267)	Nonreaders (n=89)	Readers (n=296)	Nonreaders (n=84)
	←——% (95% CI)——→			
Included	39.3[y] (33.7-45.3)	28.1[y] (19.8-38.2)	54.4[z] (48.7-60.0)	41.7[y] (31.7-52.4)
In addition to	49.8[y] (43.9-55.8)	58.4[y] (48.0-68.1)	34.1[z] (29.1-39.7)	31.0[z] (22.1-41.5)

[a]Version S+A declared "Sugars" and "Added Sugars" as a subgroup and version TS+A declared "Total Sugars" and "Added Sugars" as a subgroup.
[b]Statistical analyses were computed using with the Statistical Package for the Social Sciences software (version 22.0, IBM-SPSS Inc). Significance testing was conducted on first position formats using *z* tests. The survey margin of error at the 95% CI was ±3.0%.
[c]The question was stated as follows: "Is the number grams of Added Sugars in this product included in the grams of sugars shown in the (Sugars/Total Sugars) line, or is it in addition to the amount of sugars shown in the (Sugars/Total Sugars) line?"
[d]Percentages not sharing a common superscript letter (y, z) are significantly different from one another ($P<0.05$). Comparisons made horizontally.

the amount shown in the "Sugars" line (see Table 2). This was significantly higher than the 33.4% who first viewed Version TS+A and thought the "Added Sugars" were in addition to the amount in the "Total Sugars" line. The "Added Sugars" line was therefore interpreted as indicating that the products had more sugars than was identified in the "Sugars" line or the "Total Sugars" line. When NFP readers' and nonreaders' responses were compared, 54.4% of NFP readers who viewed Version TS+A first answered correctly that the "Added Sugars" were included in the "Total Sugars" declaration, and this was significantly higher than the 41.7% of NFP nonreaders. For those viewing Version S+A first, there were no significant differences between the percentage of NFP readers (49.8%) compared with nonreaders (58.4%) who responded incorrectly that the "Added Sugars" were in addition to the amount in the "Sugars" line (Table 3).

Ranking Products for Purchase Based on Perception of Sugars Content

One of the many consumer uses of food labels is comparing products during purchasing decisions. Changes to the NFP will likely influence consumer purchasing behavior, but the extent to which this may occur is uncertain. A portion of our study was dedicated to understanding the interpretation of NFP "Added Sugars" information and potential applications in purchasing.

When respondents were asked to rank order which product they would buy based on the NFP information, an average of 76.2% ranked Version S highest. This purchase preference for Version S was observed regardless of the NFP version that participants viewed first. By contrast, Versions TS+A and S+A were, respectively, ranked highest by 14.1% and 9.7% of the sample.

Survey participants were also asked to choose the product containing the least amount of sugars. 56.5% of those who viewed Version S first chose Version S as having the least amount of sugars. This was significantly higher than those who viewed Version TS+A first where 48.4% chose Version S as having the least amount of sugars. The misinterpretation of sugars content persisted among the respondents who said they were NFP readers (Table 4). Regardless of the NFP version viewed first, 40% of the total sample responded that they saw no difference or did not know whether there was a difference in sugars content among the label versions. In other words, nearly six in 10 (59.8%) believed that there was a difference in the total sugars content among the three NFP versions, despite the fact that all three were nutritionally identical.

Overall, 78% of respondents self-reported that they read the NFP when purchasing or eating a food or beverage. As shown in Table 5, a significantly higher percentage of those who self-reported reading the NFP (compared with those who did not read the NFP) responded that they had a bachelor's

Table 4. Product selection based on perceived sugars content, according to a survey of three proposed versions[a] of the Nutrition Facts Panel (NFP)[bcd]

	Version S Seen in First Position	Version S+A Seen in First Position	Version TS+A Seen in First Position
	←——% mentioning Version S (95% CI)——→		
Total sample	56.5[y] (51.3-61.6) n=352	51.4 (46.2-56.6) n=356 NS[e]	48.4[z] (43.4-53.4) n=380
NFP readers only	58.3[y] (52.6-63.9) n=288	49.8[z] (43.9-55.8) n=267	48.6[z] (43.0-54.3) n=296

[a]The NFP versions shown to survey participants were as follows: Version S contained a "Sugars" declaration only (as sugars information is displayed on the current NFP), Version S+A declared "Sugars" and "Added Sugars" as a subgroup, and version TS+A declared "Total Sugars" and "Added Sugars" as a subgroup.
[b]Statistical analyses were computed using with the Statistical Package for the Social Sciences software (version 22.0, IBM-SPSS Inc). Significance testing was conducted on first position formats using *z* tests. The survey margin of error at the 95% CI was ±3.0%.
[c]The question asked was, "If you wanted to buy the product that has the least amount of sugars based on this label, which one of these would you select?" Answers could also include "I see no difference" and "I don't know."
[d]Percentages not sharing a common superscript letter (y, z) are significantly different from one another ($P<0.05$). Comparisons made horizontally.
[e]NS=not significantly different from either value.

Table 5. Differences between individuals who responded to a question asking whether they looked at the Nutrition Facts Panel (NFP)[abc] in a survey of consumer perceptions of three proposed versions of the NFP regarding "Added Sugars"

Individuals' characteristics	NFP Yes 78.2% (n=851)	NFP No 21.8% (n=237)
	←——% (95% CI)——→	
Bachelor's degree or higher	60.0[y] (56.7-63.3)	46.4[z] (40.2-52.8)
Information viewed[d]		
Ingredients list	81.4[y] (78.7-83.9)	24.5[z] (19.4-30.3)
Serving size and number of servings	74.6[y] (71.5-77.4)	31.6[z] (26.1-37.8)
Statements about nutrition or health benefits	61.5[y] (58.1-64.7)	19.4[z] (14.9-24.9)
Calorie or other nutrition information on the front of the package	76.7[y] (73.4-79.4)	27.8[z] (22.5-33.8)

[a]Statistical analyses were computed using with the Statistical Package for the Social Sciences software (version 22.0, IBM). Significance testing was conducted on first position formats using *z* tests. The survey margin of error at the 95% CI was ±3.0%.

[b]Percentages not sharing a common superscript letter (y, z) are significantly different from one another ($P<0.05$). Comparisons are made horizontally.

[c]95% CI in parentheses.

[d]The question was stated as follows: "What information do you look at on the food or beverage packages when deciding to purchase or eat a food or beverage? Mark Yes or No for each."

degree or higher. When asked about information on the label, a significantly higher percentage of NFP readers (vs nonreaders) reported that they look for the ingredients list, serving size and number of servings per container, statements about nutrition and health benefits, as well as calorie and other nutrition information on the front of the package via icon or graphic.

The actual purchase of foods or food consumption was not evaluated; instead, intent to purchase was assessed. It is not clear whether actual behavior might differ when consumers make real-world food purchasing decisions. Also, income and education were not controlled in our analysis, which may explain some of the differences noted between NFP readers and nonreaders. Still, these data indicate that NFP readers seemed as perplexed as nonreaders about the "Added Sugars" terminology. Lastly, by design, respondents viewed only the NFP and not the entire food label to control for any label variables other than the NFP itself. There is a possibility that also having access to the ingredient list may have provided additional information on added sugars that could aid in consumers' understanding.

FURTHER RESEARCH AND FUTURE STEPS

The findings of this investigation have clear and important implications for nutrition labeling research and counseling. NFP changes that are intended to clarify product nutrition facts may have the unintended consequence of causing misinterpretations of the label information. In this analysis, rather than improving consumer understanding about the amount of total sugars in a product, NFPs with "Added Sugars" declarations were misleading and the resulting misperception influenced purchase intent. Designing research on the NFP that tests comprehension and applied use is important if the proposed label is to be used as a tool for making food choices. Assessing consumer understanding must go beyond simply asking consumers whether the "Added Sugars" designation on the NFP is "helpful" or "confusing."[13] Rather, consumer understanding must be studied in an applied format where consumers actually use NFP information.

RDNs, due to their background and training, are in a unique position to evaluate the information on the NFP. In addition to conducting research that addresses how clients use and interpret information on the NFP, RDNs can use the data to tailor their client counseling about healthful packaged food choices. Not all clients have the motivation, training, or skills to learn and assess the NFP information accurately. Van der Vleuten and colleagues[14] state that learning is "more than providing information." Clients learn when information is placed in context and when they actively engage in the learning process. Nutrition counseling sessions offer the opportunity to engage clients using an active learning approach. RDNs can also use research findings and practical applications to respond to requests for public comment from the FDA for future revisions of the NFP. These proactive measures can help guide evidence-based policies that elicit meaningful improvements in the marketplace and public health.

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DISCLOSURES

STATEMENT OF POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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