

# Guiding Stars Influences Perception of Healthy Food Choices at a 4-Year University

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## INTRODUCTION

Point-of-purchase nutrition information has the potential to help consumers make informed, healthful food choices.<sup>1</sup> Traffic lights,<sup>2</sup> stars,<sup>3,4</sup> Eat Smart,<sup>5</sup> The Right Stuff,<sup>6</sup> and Choices<sup>7</sup> are all examples of nutrition information creatively embedded into visual labeling systems. Not all labels are effective in their ability to change food purchasing and/or consumption behaviors.<sup>2-7</sup> In their review of 31 studies on the effectiveness of calorie labeling at point-of-purchase settings, Kiszko et al<sup>8</sup> concluded that calorie labels were not consistently effective in reducing calories purchased and/or consumed, whereas Long et al<sup>9</sup> found only a slight (18 kcal/meal) reduction in calories ordered when menus were labeled with calories. Researchers suggested that coupling calorie labeling with novel ways of presenting nutrition information may be a more effective approach.<sup>8</sup>

One novel way to present nutrition information may be *Guiding Stars*. The *Guiding Stars* program is aligned with the 2010 Dietary Guidelines for Americans and uses the Nutrition Facts label and US Department of Agriculture National Nutrient database to evaluate nutrient content of foods.<sup>10-12</sup> Analysis is based on a proprietary algorithm that debits foods for transfat, saturated fat, cholesterol, sodium, and added sugars,

and credits foods for vitamins, minerals, fiber, and whole grains. The nutrient density algorithm is translated into a simple, visually appealing point-of-purchase consumer tool that categorizes foods as good (1 star), better (2 stars), or best (3 stars).<sup>11</sup> Originally developed in 2006 for grocery stores, *Guiding Stars* provides a colorful, clear, and succinct message about the healthfulness of foods, circumventing distracting displays, eye-catching packaging, and information clutter.<sup>10</sup> The *Guiding Stars* program increased consumer purchasing of healthy cereals for up to 2 years after implementation.<sup>10,13</sup>

In 2010, the University of New Hampshire (UNH), a midsized public school of some 11,000 undergraduate students, adopted *Guiding Stars* as a nutrition guidance tool in its 3 campus dining halls that offer full-service, all you can eat, sit-down breakfast, lunch, and dinner meals prepared in-house. All food items, recipes, and beverages were submitted to *Guiding Stars* for analysis, and 1, 2, or 3 stars were placed next to each qualifying food and beverage item in the dining halls. However, the ability of *Guiding Stars* to influence patrons' perceptions of healthy food choices was not measured. To evaluate the impact of a visually appealing point-of-purchase nutrition information tool on a university campus, the objective of this study was to assess the influence

of *Guiding Stars* on patrons' perceptions of food choices at 2 smaller pay per item eating establishments: a student-centered food court and a sustainability-minded, mixed-patron venue.

## OVERVIEW

### Venues

Two campus venues were chosen for this project. The first venue is a centrally located, high traffic food eatery known as Union Court (UC). The UC (capacity = 340 people) is open from 7 AM to 3 PM and is frequented primarily by students. This venue is composed of 6 specialized eateries ranging from a focus on salads to grilled foods and smoothies, and stations providing beverages, cereals/snack bars/candies, and soups. The second venue, the Dairy Bar (DB), is an edge of campus, sustainability-minded, mixed-patron establishment (capacity = 80 people). Open from 8 AM to 4 PM, the DB boasts wholesome breakfasts, upscale sandwiches, and local produce from the UNH Organic Garden and 11 local vendors, and is frequented by students, faculty, staff, and community members.

### *Guiding Stars* Analysis and Implementation

Recipes for all items were reviewed in detail and standardized by a registered dietitian (RL). Along with the name and brand of all food products (278 from UC and 126 from DB), these recipes were sent for *Guiding Stars* analysis by the *Guiding Stars* nutrition guidance program. This evidence- and policy-based program uses an algorithm developed by a scientific advisory panel<sup>11</sup> that monitors nutrition information from the Food and Drug Administration, US Department of Agriculture, National Academy of Sciences and World Health Organization.<sup>12</sup>

A total of 36% of UC items received  $\geq 1$  stars: 11% received 1, 14% received

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2, and 11% received 3. For DB, 25% of items received  $\geq 1$  stars: 11% received 1, 9% received 2, and 5% received 3. The appropriate number of bright yellow *Guiding Stars* was placed before the name of the food item on a shelf edge or menu boards and/or posters. *Guiding Stars* and nutrition information were also available onsite in spreadsheet format at each UC station and were posted on the UC and DB Web site menu page. The *Guiding Stars* system was promoted in a variety of additional ways, such as colorful posters, video monitors, campus communications, and social media.

## Evaluation

A short anonymous survey was developed for use at UC and DB (Figure 1). As patrons exited the UC or DB, they were invited to take the survey. Survey participants were eligible to enter into a drawing for a gift card to a local bookstore. The survey took approximately 1–2 minutes to complete and was distributed between 11 AM and 1 PM for up to 6 days or until approximately 200 surveys had been completed at each survey time point. Survey information collected included demographics, nutrition education background, and ease of identifying healthy food choices. In addition, survey participants were asked to select any of 9 (UC) or 11 (DB) factors, or to list other factors that influenced their food selection that day.

For both venues, pre-*Guiding Stars* surveys were conducted in early November, *Guiding Stars* implementation occurred during spring break (mid-March), and 1 month post-*Guiding Stars* surveys were conducted in mid-April. A 7-month survey post-*Guiding Stars* implementation was conducted at UC; a 7-month post-*Guiding Stars* survey was not conducted at DB due to a lack of available research personnel.

Categorical data are reported as percent distribution; continuous variables are reported as means  $\pm$  SD. A series of chi-square tests of independence were conducted to evaluate patrons' frequency of responses between time points (pre-*Guiding Stars*, and at 1 and 7 months post-*Guiding Stars*) and location (UC vs DB) pre-*Guiding Stars*; independent samples *t* tests were conducted to assess mean differences of patrons'

**1. Please put an "X" by the factors that influenced your food selections/purchases TODAY.**  
Check all that apply.

<input type="checkbox"/> Appearance of food	<input type="checkbox"/> Nutrient content/health
<input type="checkbox"/> Convenience	<input type="checkbox"/> Posted nutrition/calorie info.
<input type="checkbox"/> Guiding Stars	<input type="checkbox"/> Price
<input type="checkbox"/> Hunger	<input type="checkbox"/> Organic*
<input type="checkbox"/> Locally grown and/or produced*	<input type="checkbox"/> Taste
<input type="checkbox"/> Other: _____	

**2. Do you think healthy food choices are easily identified here? (Please circle one.)**

1 – Always    2 – Most of the time    3 – Sometimes    4 – Rarely    5 – Never

**3. Tell us about YOU.**

How old are you? \_\_\_\_\_ Gender? Male \_\_\_\_\_ Female \_\_\_\_\_

Which of the following best describes you?

<input type="checkbox"/> First Year	<input type="checkbox"/> Grad Student
<input type="checkbox"/> Sophomore	<input type="checkbox"/> Faculty/Staff
<input type="checkbox"/> Junior	<input type="checkbox"/> Community Member
<input type="checkbox"/> Senior/5 <sup>th</sup> Year	<input type="checkbox"/> Other: _____

**4. Have you taken any of the following? (Check all that apply.)**

Nutrition course at UNH (for credit)

Nutrition course at another college (for credit)

Course/workshop with a nutrition-theme (non-credit based)

Other: \_\_\_\_\_

I have NOT taken any nutrition-related courses or workshops.

**Figure 1.** Four-question survey administered to patrons at Union Court and Dairy Bar before, 1 month after, and 7 months after (Union Court only) the *Guiding Stars* intervention was implemented. \*Included in Dairy Bar survey only. UNH indicates University of New Hampshire.

ages at UC vs DB. Analyses were conducted using IBM SPSS Statistics for Macintosh (version 22.0, IBM Corp, Armonk, NY, 2013); statistical significance was set at  $P < .05$ .

## RESULTS

Demographics of patrons aged  $\geq 18$  years at UC before, immediately after, and 7 months after implementation of *Guiding Stars* (range, 207–237 patrons/survey point) revealed that an average of 73% of patrons were female students (mean age, 22 years) in their third year of school or beyond (Table 1). Demographics of patrons at the DB differed from those at UC in that patrons were older (mean age, 30 years;  $n = 200$ /survey point) and an average of 41% of patrons were nonstudents (Table 1). Perception of availability of healthy choices was distinctly different between the 2 venues pre-*Guiding Stars*; 34% of UC patrons vs 79% of DB patrons noted that healthy food choices were easily identified always or most of the time (Figure 2).

More UC patrons perceived that healthy food choices were always/mostly easily identified 1 month post-*Guiding Stars* implementation (49%) than before (34%;  $P < .05$ ), and this perception persisted 7 months later (53%;  $P \leq .05$ ) (Figure 2). Immediately after *Guiding Stars* implementation, there was a significant 62% decline in the percentage of participants who perceived that healthy foods were rarely/never easily identified (from 21% pre-*Guiding Stars* to 8% 1 month post-*Guiding Stars*), and this perception persisted for 7 months post-*Guiding Stars*.

In contrast, DB patrons were significantly less influenced by price and posted nutrition information than were UC patrons pre-*Guiding Stars* (Table 2). Although *Guiding Stars* were not cited as an influence on food selection (Table 2), a greater percentage of DB patrons perceived that healthy foods were always/mostly easily identified 1 month post- vs pre-*Guiding Stars* (87% vs 79%;  $P \leq .05$ ) (Figure 2).

At UC, hunger, taste, and convenience were primary factors that patrons reported as influencing their food

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