

## Research and Professional Briefs

## Consumers May Not Use or Understand Calorie Labeling in Restaurants

REBECCA A. KRUKOWSKI; JEAN HARVEY-BERINO, PhD, RD; JANE KOLODINSKY, PhD; RASHMI T. NARSANA, MS; THOMAS P. DeSISTO

## ABSTRACT

This study was an investigation of the possible utility of calorie labeling legislation in restaurants in community (n=649) and college student (n=316) samples. Only 48% to 66% of participants presently looked at food labels, and 64% to 73% were able to report accurate knowledge of daily caloric needs. Furthermore, 44% to 57% reported that they were not likely to use food label information in restaurants if it were available. Therefore, public education campaigns focused on calorie requirements may need to precede restaurant labeling, and perhaps other possibilities in labeling formats should be considered (eg, defining foods as “low,” “moderate,” and “high” calorie).

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The prevalence of overweight and obese individuals has sharply increased in the United States in recent years (1), as a result, in part, of changes in the eating environment (2). Specifically, expanding portion sizes and increased consumption of food away from home have been implicated (3-6). The largest portion sizes for most foods have been found at fast-food establishments (4), where prices are set to create the illusion of getting more value for your money by ordering larger portions of food (7). As portion size influences overall caloric intake (8), large portion sizes at fast-food restaurants are particularly concerning, considering that 37% of adults in a large representative sample reported eating at a fast-food restaurant at least once during a 2-day period (5).

Recently, public health professionals and consumer advocacy groups have been calling for legislation that would mandate nutrition labeling for calories on menus at fast-

food and other chain restaurants (8). One such bill (H.R. 3444) introduced to the House of Representatives in November of 2003 states that “food, beverages, and meals served in restaurants and similar retail food establishments that are part of a chain with twenty or more outlets doing business under the same trade name, regardless of the type of ownership of the restaurant locations, shall list, adjacent to each food item listed, on menus, menu boards, and other signs, the total number of calories, grams of saturated plus trans fat, and milligrams of sodium per menu item, as offered for sale, in a clear and conspicuous manner.” This bill is currently being considered by the Subcommittee on Health.

This type of legislation could certainly assist individuals in making more healthful food choices while eating at restaurants. However, the utility of this new nutrition labeling in restaurants for decreasing rates of obesity in our country rests upon a critical assumption—that people read and comprehend the information on nutrition labels. There are two critical pieces of information on each nutrition label that are essential for weight control—serving size and the number of calories in each serving. In particular, caloric content is only helpful if one understands how many calories need to be eaten daily to maintain weight. If only a small portion of our society has the ability and desire to read and comprehend these labels, the usefulness of this proposed legislation may be in question.

In order to investigate this issue, three main questions were examined in two population-based samples: (a) Do most people have a reasonable estimate of how many calories should be eaten each day?; (b) Do people read food labels, and if so, what information do they look for?; and (c) Is there a desire for more caloric information about foods served in restaurants? In addition, the possibility of whether there were other variables (eg, sex, sample, frequency of eating out, and weight status) that may influence the current and possible future use of food labels was examined.

## METHODS

## Participants

Data were obtained from two separate but similar telephone surveys conducted by the researchers for this study: the 2004 Vermonter Poll Food and Agriculture Survey, Center for Rural Studies (n=649; the Community sample) and a comparable survey of Vermont college students (n=316; the College sample). Community members older than 18 years old (actual age range=18 to 92) and college students older than 18 years old (actual age range=18 to 48) were eligible to participate in the survey.

*R. A. Krukowski is a doctoral candidate, Department of Psychology, J. Harvey-Berino is department chair, Nutrition and Food Sciences, J. Kolodinsky is department chair, Community Development and Applied Economics and co-director of the Center for Rural Studies, R. T. Narsana is a process research specialist, and T. P. DeSisto is a research specialist, Center for Rural Studies, all at the University of Vermont, Burlington.*

*Address correspondence to: Rebecca A. Krukowski, Department of Psychology, University of Vermont, 2 Colchester Avenue, John Dewey Hall, Burlington, VT 05405. E-mail: Rebecca.Krukowski@uvm.edu*

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The sampling for both samples was random, and the response rates were 39.8% and 60.4% for the community and college samples, respectively. Written consent for participation was waived, as no identifying information was collected. This study was approved by the University of Vermont Institutional Review Board.

### Questionnaire Development

Both surveys consisted of a set of core questions on demographic characteristics and attitudes and behaviors related to food labels (eg, frequency of food label use, information examined on food labels, number of calories each participant believed they should eat each day, frequency of eating at fast-food restaurants, attitude toward potential restaurant food labeling). (No further explanation of the terms *fast-food restaurant* and *restaurant* was given to participants in regard to the latter two questions.) The questions were developed by a team of professionals (eg, nutritionists, consumer economists) based on current gaps in the literature on food labeling. The survey was piloted on a student sample and revised accordingly, but validity and reliability were not formally evaluated.

### Statistical Analyses

$\chi^2$  statistics were calculated using SPSS (version 11.5, 2002, SPSS Inc, Chicago, IL) to test for sex, sample, frequency of eating out, and weight status differences for these questions with  $P < 0.05$  as the criterion for statistical significance. Descriptive statistics (means and standard deviations) were also calculated.

Participants were considered accurate with regard to their daily caloric intake if their estimates fell between 1,500 and 2,500 kcal per day. This range was selected as it corresponds to the Food and Drug Administration recommended Daily Value for calories on food labels (ie, 2,000 kcal). Because age, sex, and physical activity level affect calorie requirements,  $\pm 500$  kcal was added to establish a conservative estimate of energy needs. Participants were classified as overweight if they had a body mass index  $\geq 25$  (calculated as  $\text{kg/m}^2$  using self-reported height and weight).

## RESULTS AND DISCUSSION

There were 346 women and 284 men in the Community sample (19 individuals refused to report sex), and 177 women and 139 men in the College sample. Other demographic information can be found in **Table 1**.

Consistent with several previous studies (9,10), approximately half of the surveyed college students (52%) and a third of the individuals in the community sample (33%) reported that they did not generally look at food labels. A significantly greater proportion of respondents in the Community sample reported using food labels often compared to the College respondents [**Table 1**;  $\chi^2(2) = 34.90$ ;  $P < 0.001$ ]. In both samples, a significantly greater proportion of women (Community: 76.9%; College: 62.7%) reported using food labels often compared to men (Community: 53.2%; College: 29.9%) [Community:  $\chi^2(2) = 45.84$ ,  $P < 0.001$ ; College:  $\chi^2(2) = 47.07$ ;  $P < 0.001$ ] (**Table 1**). These findings are consistent with the previous literature (9,11,12) in terms of prevalence of food label

**Table 1.** Subject characteristics and reported food label use in a study to investigate the possible utility of calorie labeling legislation in restaurants

	Community (n=649)	College (n=316)
	<i>mean ± standard deviation</i>	
Age (y)	50 ± 14	20.5 ± 3.5
	← % →	
Male	45.1	44
Education	33.4	
≤ High school	19.7	
Some college	6.1	NA <sup>a</sup>
Associates/technical school	21.9	
Bachelor's degree	18.4	
Postgraduate education	11.8	
Income (salary/year)		
< \$20,000	27.5	
< \$35,000	19.7	NA
< \$50,000	29.9	
< \$65,000		
Overweight (BMI <sup>b</sup> ≥ 25)	49	22.3
	<i>mean ± standard deviation</i>	
Meals eaten at fast-food restaurants per week	1 ± 6.8	1.7 ± 2.1
Home-cooked meals per week	12.5 ± 10.1	9.6 ± 6.4
Use of food labels	← % →	
Often	66.2	48.4
Sometimes	18.9	22.9
Rarely	14.9	28.7
Use of specific food label information		
Calories	31	56
Fat	47.8	49.1
<sup>a</sup> NA = not available. <sup>b</sup> BMI = body mass index; calculated as $\text{kg/m}^2$ .		

use. In this study, even fewer individuals were found to consistently look at the key information for weight control on food labels; in the Community sample, 31% of participants looked for caloric information and 5% looked at serving size, while in the College sample, 56% looked for caloric information and 12% looked at serving size.

Overall, only 67% of the participants were able to identify the number of calories that they should be consuming (based on our liberal definition of 1,500 to 2,500 kcal per day). Women were typically more accurate in their self-reported estimation of daily energy requirements (**Table 2**). Further analyses that dichotomized this variable (ie, accurate vs inaccurate) revealed that the significant sex difference was only present in the College sample (ie, college women were significantly more likely to know the calorie range for which they were aiming than the other three groups).

If it were available, 44% to 57% of the combined sample self-reported that they would not likely use restaurant food caloric information. A significantly greater proportion of women in both samples reported that they would use restaurant food labels to look for low-calorie foods as compared to men [ $\chi^2(2) = 45.60$ ,  $P < 0.001$ ] (**Table 2**). A significantly greater proportion of respondents in the

**Table 2.** Knowledge of calorie intake and interest in restaurant labeling by sex and sample

		<i>Knowledge of recommended caloric intake (ie, between 1,500-2,500 kcal)</i>													
		Men				Women				Total				Sex difference	Sample difference
		n	Too low	Accurate	Too high	n	Too low	Accurate	Too high	n	Too low	Accurate	Too high		
Community (%)	231	19.0	64.9	16.0	299	30.1	65.2	4.7	543	26.1	64.3	9.6	$P<0.001$	$P<0.001$	
College (%)	116	8.6	61.2	30.2	162	13.0	80.9	6.2	278	11.1	72.7	16.2	$P<0.001$	$P<0.001$	
<i>Interest in caloric information at restaurants</i>															
		Men				Women				Total				Sex difference	Sample difference
		n	Would look for low-calorie foods	Would not use information	Would look for high-calorie foods	n	Would look for low-calorie foods	Would not use information	Would look for high-calorie foods	n	Would look for low-calorie foods	Would not use information	Would look for high-calorie foods		
		Community (%)	275	31.3	66.9	1.8	339	48.7	49.3	2.1	614	40.9	57.2	1.9	$P<0.001$
College (%)	139	31.7	64.0	4.3	176	69.9	28.4	1.7	315	53.0	44.1	2.9	$P<0.001$	$P<0.001$	

Community sample reported that they would use restaurant food labels to look for low-calorie foods compared to the College students [Table 2,  $\chi^2(2)=13.73$ ,  $P<0.001$ ].

In further analyses, other variables that may influence the frequency of label use were examined. There were clear sex differences, with women consistently reporting greater use of food labels and desire for further information than men. The sample differences (which are largely based on age differences) were less clear—the men in both samples consistently had similar food label behavior and desire for more information, but whether college or community women had better food label use behavior depended upon the behavior.

In addition, those individuals who had 50% or more home-cooked meals were significantly more likely to report looking at food labels often (68%) compared to those who had <50% home-cooked meals (54%) [ $\chi^2(2)=20.45$ ,  $P<0.001$ ]. Compared to those who ate zero or one fast-food meal in the past week, the individuals who ate more than one fast-food meal in the past week were significantly more likely to report that they rarely look at food labels [ $\chi^2(2)=49.15$ ,  $P<0.001$ ] and would not use restaurant food labels to look for low-calorie foods [ $\chi^2(2)=92.15$ ,  $P<0.001$ ]. Consistent with previous research (13-15), these results may indicate that those that have a less nutritious diet are less likely to use food labels and have less interest in doing so.

The influence of weight status on the use of food labels was examined and no significant patterns in reported food label use or desire for more information in restaurants were found. This finding is somewhat inconsistent with previous research that has suggested that those who have less healthful dietary habits are more likely to ignore food label information (13-15); however, weight status and the quality of one's dietary habits are not always related. Information about reasons why the participants in our study would not want more nutrition information about restaurant foods was not collected; this topic could be interesting to examine in future studies.

The results of this study may be restricted in their generalizability based on the low response rate (39.8%) in the Community sample. Another limitation of this study is the self-reported nature of the data; it could be important to further investigate the hypotheses of this study by comparing consumers' behavior in situations in which nutrition information is and is not available. The lack of information on reliability and validity of the survey is a further limitation of this study. In interpreting these results, it is also important to consider the restrictions that many college students have on their food choices and access to food label information, particularly those eating in university cafeterias. In addition, information about dieting status of the participants was not collected; it is possible that individuals attempting to lose weight would report more awareness and desire for food labeling.

Regardless, these pilot data suggest that the recent legislation advocating for greater labeling of restaurant food may not be particularly effective in combating the obesity epidemic if people are not looking at existing food labels and are not able to use this information for nutrition planning. While it is always better for consumers to have access to more, rather than less, information, these preliminary results indicate that public health efforts to

control obesity perhaps should first focus on an education campaign designed to teach appropriate calorie intake values and food label reading skills to the general public. Without this knowledge, calorie labels may not be able to be fully utilized. The development of definitions for “low-,” “moderate-,” and “high”-calorie foods (similar to the low-fat designation) may also be more meaningful than calorie labels. Finally, strategies to change portion size and pricing of foods (16) may be more effective than continuing to stress personal responsibility.

## CONCLUSIONS

Dietetics professionals have a clear role to play in educating the public about the principles of energy balance. This information should include calorie intake guidelines, as well as how to use available information on food labels or other nutritional information in other forms (eg, menus, menu boards, signs, websites) to facilitate energy balance and prevent obesity.

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