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## Use of calorie information at fast-food and chain restaurants among US Adults, 2009

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### Abstract

**Background**—The aim of this study was to examine reading and use of calorie information at fast-food/chain restaurants.

**Methods**—A cross-sectional analysis was conducted on a sample of 4363 US adults using the 2009 HealthStyles survey. The outcome variable was reading calorie information when available while ordering at fast-food/chain restaurants. Among those who go to fast-food/chain restaurants, we conducted multivariable logistic regression to examine associations between sociodemographic variables and reading calorie information when available. Among those who report reading calorie information when available, we assessed the proportion using calorie information.

**Results**—Among those who reported eating at fast-food/chain restaurants, 36.4% reported reading calorie information when available. Reading calorie information was not related to race/ethnicity, income or education. Compared with men, women had higher odds [adjusted odds ratio (OR) =1.8; 95% confidence interval (CI) =1.5–2.1] of reading calorie information when available while those who frequented fast-food/chain restaurants 3 times/week (aOR =0.6; 95% CI =0.4–0.8) had lower odds compared with those going <4 times/month. Of those who reported reading calorie information when available, 95.4% reported using calorie information at least sometimes.

**Conclusions**—Almost all who read calorie information when available use the information at least sometimes. Research is needed on how calorie information is being used.

### Keywords

Food and nutrition; Individual behaviour; Population-based; preventative services

## Introduction

In 2009–10, 35.7% of US adults were obese.<sup>1</sup> Although there are multiple causes of obesity, one potential contributor is regularly consuming foods prepared away from home, such as those eaten at fast-food or chain restaurants. Foods from these venues are often high in calories,<sup>2</sup> thus, not surprisingly, there is an association between fast-food consumption and excessive energy intake<sup>3</sup> and obesity.<sup>4–6</sup> Further, many customers underestimate the number of calories in restaurant items and meals.<sup>7–9</sup>

Before 2007, nutrition information was seldom available in restaurants at the point of purchase.<sup>10</sup> When it was available, it was often difficult to find.<sup>11,12</sup> Displaying calorie information on menus and menu boards has been hypothesized as a strategy that may influence energy intake by increasing consumer awareness of the caloric content of menu items to inform their decision-making. In recent years, local municipalities in the USA have passed policies requiring restaurants to post-calorie and other nutritional information.<sup>13</sup> In 2010 Congress passed the Patient Protection and Affordable Care Act which, when implemented, will require chain restaurants with 20 or more locations to make certain nutritional information publicly available.<sup>14</sup>

Research conducted in jurisdictions that have implemented calorie labelling policies have found mixed results for adults' use of calorie information at fast-food and chain restaurants. Dumanovsky *et al.*<sup>15</sup> found that the percentage of adults in New York City (NYC) who reported seeing calorie information increased from 25% before the regulation requiring calories be posted on menu boards to 64% after implementation. Among customers who saw calorie information post-enforcement, 27% said they used the information.<sup>15</sup> In a separate study, Dumanovsky *et al.*<sup>10</sup> conducted cross-sectional surveys on adults before and 9 months after enforcement of NYC's calorie labelling regulation to determine the mean caloric content purchased among customers who said that they used the calorie information when deciding what to order. The 15% of customers who reported using calorie information purchased 106 fewer calories than customers who did not see or use the calorie information. However, in King County, WA, researchers found no difference in the number of calories purchased following menu labelling legislation.<sup>16</sup>

The purpose of our research was to (i) determine the proportion of US adults that read calorie information when it is available at fast-food or chain restaurants and describe the sociodemographic and behavioural characteristics associated with reading the calorie information and (ii) determine the prevalence of using this information to help select their food purchases among those who read it.

## Methods

Our cross-sectional study was based on the 2009 HealthStyles Survey. HealthStyles is a national mail survey administered annually as a follow-up survey to ConsumerStyles, a consumer panel survey administered by Synovate, Inc. ConsumerStyles is sent to a stratified random sample of 21 420 US adults in Synovate's panel of participants. Low income and minority groups are oversampled in ConsumerStyles to have sufficient representation.<sup>17</sup>

Respondents receive a small monetary incentive. The response rate for the 2009 ConsumerStyles Survey was 49.4%.

HealthStyles is based on a random sample of panel households that return ConsumerStyles. HealthStyles surveys US adults (18 years) and is designed to assess health-related attitudes, knowledge and behaviours through a mail survey. The response rate for 2009 Health Styles was 65.0% (4556/7004). The data were weighted on gender, age, income, race and household size to match the 2008 US Current Population Survey to make the sample representative of the US population.

To determine the proportion of adults who read calorie information when it is available at fast-food and chain restaurants, participants who go to fast-food or chain restaurants were asked: 'Do you typically read calorie information for foods and drinks when it is available at fast-food and chain restaurants?' Response options were 'Yes', 'No', 'Never noticed or looked for calorie information', 'Usually cannot find calorie information' and 'Don't Know'.

To determine the proportion of adults who use calorie information to decide their order, those who reported 'Yes' to reading calorie information to the question described above were asked 'How often does this calorie information help you decide what to order?' Response options were 'Always', 'Most of the time', 'About half of the time', 'Sometimes', 'Never' and 'Don't Know'. We dichotomized responses as 'Yes' ('Always', 'Most of the time', 'Half of the time', 'Sometimes') and 'No' ('Never').

Covariates included gender, age group (18–34, 35–44, 45–54, 55–64 and 65+ years), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic and non-Hispanic other), marital status (married/domestic partnership and not married, which included widowed, divorced and single persons), household income (<\$30 000, \$30 000 to <\$60 000, \$60 000 to <\$85 000 and \$85 000), education (high school or less, some college, college graduate or more), region of the country (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain and Pacific) and frequency of eating at a fast-food or chain restaurant per week (never, less than four times per month, one to two times per week and three or more times per week).

Selection of several of the explanatory variables was based on previous findings for the use of calorie information when provided on menu labelling or on the Nutrition Facts Panel. For example, women are more likely to read calorie information compared with men,<sup>10</sup> adults in wealthier neighbourhoods are more likely to report using calorie information than those in poorer neighbourhoods<sup>10</sup> and those who go to fast-food restaurants are less likely to use calorie information compared with those who do not go to fast-food restaurants.<sup>18</sup>

The data set included 4556 respondents. We excluded 193 respondents because of missing data or a non-classifiable response (i.e. 'don't know') leaving an analytic sample of 4363. Specifically, we excluded respondents with missing data for marital status ( $n=5$ ), education ( $n=39$ ), fast-food or chain restaurant frequency ( $n=30$ ), read calorie information when available ( $n=72$ ) and use calorie information ( $n=13$ ) and respondents for selecting 'Don't know' to the read calorie information ( $n=22$ ) and use calorie information ( $n=12$ ) questions.

We assessed the prevalence of reading calorie information when available among adults who go to fast-food or chain restaurants. The analytic sample used ( $n=3512$ ) included those who go to fast-food or chain restaurants and responded 'Yes' or 'No' to the read calorie information when available question. From the sample of 4363 adults, we excluded those who do not go to fast-food or chain restaurants ( $n=441$ ), those who responded 'Never noticed or looked for calorie information' ( $n=202$ ) and those who reported 'Usually cannot find calorie information' ( $n=208$ ).

We conducted multivariable logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the explanatory variables in the model. The multivariable logistic regression model adjusted for gender, age, race/ethnicity, marital status, annual household income, education, region and frequency of eating at a fast-food or chain restaurant. We also assessed the prevalence of using calorie information while ordering among those who read calorie information when available. Weighted percentages of using calorie information were compared by each sociodemographic and behavioural characteristic using  $X^2$  tests (unadjusted) and a  $P$ -value of 0.05; we also calculated the standard error (SE) for each sociodemographic and behavioural characteristic for using calorie information. All statistical analyses were performed using the Statistical Analysis Software (SAS), version 9.3, which accounted for the sample design.

## Results

The sociodemographic and behavioural characteristics are described for the total sample in Table 1 (first numeric column). Just over half were women (51.7%), and 30.8% were in the 18–34 year age group, 69.4% were non-Hispanic White and 59.9% were married or in a domestic partnership. One-tenth of the sample (10.1%) reported never going to fast-food or chain restaurants, over half (55.6%) reported going to fast-food or chain restaurants less than four times per month, and 10.4% reported going three or more times per week.

Among those who went to fast-food or chain restaurants and noticed calorie information when it was available, the prevalence of reading calorie information was 36.4% (Table 1, second numeric column). Those who ate at fast-food or chain restaurants three or more times per week had a lower prevalence of reading calorie information when available compared with those who went less often (25.9% for  $\geq 3$  times per week versus 34.4% for one to two times per week versus 39.3% for  $<4$  times per month). Among those who went to fast-food and chain restaurants, multivariable logistic regression found that women were more likely than men to read calorie information when available [adjusted OR (aOR) =1.8, 95% CI =1.5–2.1; Table 1, last numeric column]. In addition, those who ate at a fast-food or chain restaurant three or more times per week were less likely to read calorie information (aOR =0.6, 95% CI =0.4–0.8) than patrons who went less than four times per month.

Among those who reported going to fast-food or chain restaurants and reading calorie information, the proportion of adults who reported using calorie information when available for each response option was: 13.8% 'always', 40.3% 'most of the time', 15.9% 'half of the time', 25.4% 'sometimes' and 4.6% 'never' (data not shown). Thus, 95.4% (1251/1309) used calorie information at least sometimes (Table 2). Chi-square tests found that the only

statistically significant difference among subcategories for the sociodemographic and behavioural characteristics was for region of the country, although the difference between males and females approached significance ( $P = 0.06$ ).

## Discussion

### Main finding of this study

We estimate that just over one-third of adults who eat at fast-food and chain restaurants read calorie information when available, and among these ~95% use the information at least some of the time. Women were more likely than men to report reading calorie information and those who go to fast-food or chain restaurants three times a week or more were less likely to read calorie information compared with those who go less than four times per month.

### What is already known on this topic

Our findings on the associations of gender and frequency of going to fast-food or chain restaurants with reading calorie information are consistent with previous research. Women in our sample were more likely to report reading calorie information than men and this approached significance for using calorie information. Previous findings have shown that women report using calorie information in fast-food settings<sup>10</sup> and report using nutrition facts panels<sup>19–21</sup> more than men. In addition, the association between reading calorie information when available and going to fast-food or chain restaurants less frequently is consistent with our findings among youth<sup>22</sup> and other research among adults. It has been shown that adults who reported noticing and using calorie labels in NYC chain restaurants consumed fast-food less frequently compared with adults who did not notice the labels (4.9 versus 6.6 meals per week).<sup>18</sup> It is possible that calorie labelling may inform those who typically avoid fast-food and chain restaurants over concern that they cannot eat within their calorie limits about menu items lower in calories and within their personal caloric goals. In contrast, it is also possible those who frequent fast-food and chain restaurants already know what they will order, thus they may not look at the menu while ordering or may already know the number of calories in the meal they are ordering.

Our findings highlight the need for further research on the public health impact of menu labelling. While we cannot assume patrons will select a lower calorie option, it has been shown that those who reported using calorie information purchase ~100 fewer calories than customers who did not see or use calorie information.<sup>10</sup> In a study modelling the effect of menu labelling on population weight gain in Los Angeles County, Kuo *et al.*<sup>23</sup> found that if only 10% of restaurant patrons ordered fast-food meals that were 100 calories less when seeing calorie information at point of purchase, then menu labelling could avert almost 41% of the expected annual weight gain in the county population aged 5 years and older. However, Kuo *et al.*<sup>23</sup> acknowledged that there may be limitations in their estimate because they assumed that the rate of increase in obesity prevalence would continue at the same rate and that all subgroups of the population would use menu labelling similarly. In contrast, it has previously been shown in a simulated study that some young adult males will choose a higher calorie meal when calorie information is displayed.<sup>24</sup> Our finding that 95% of adults

who read calorie information (when available) use the information at least sometimes indicates a potential for public health to be affected by menu labelling. However, more research is needed to support this hypothesis, such as understanding how patrons use the information.

### What this study adds

We found that of adults who go to fast-food or chain restaurants, more than one-third reported reading calorie information when available and of those, ~95% reported using this information when making their selection at least sometimes.

### Limitations of this study

Our study has strengths and limitations. The study is strengthened by the fact that the sample is of adequate size to stratify results and the data are weighted to represent the distribution of the US population. However, this study has several limitations. First, the study uses a convenience sample of participants in a consumer panel survey. Although data are weighted to US demographics, participants in the panel survey may be different from those who did not participate on their use of calorie information. Secondly, we do not have documentation of the prevalence of availability of calorie information in our settings of study. Third, the questions have not undergone psychometric testing. Fourth, because this was a cross-sectional survey, we were unable to further question respondents regarding use of calorie information. For example, we do not know how respondents used calorie information in food choice selection.

### Conclusion

The findings of this study raise additional research questions. First, there is a need to understand why two-thirds of fast-food or chain restaurant attendees do not read calorie information when available. Secondly, there is need to understand how readers are using calorie information and how use can be improved or expanded as needed. The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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**Table 1**

Demographics, prevalence of reading calorie information when available at fast-food or chain restaurants, and unadjusted odds ratios and adjusted odds ratios for use of calorie labelling information while ordering at fast-food or chain restaurants, HealthStyles, 2009

	Number (%) <sup>a</sup>	Prevalence of reading calorie information when available, % <sup>b</sup> <i>n</i> = 3512	Unadjusted OR (95% CI) <sup>b</sup> <i>n</i> = 3512	Adjusted OR (95% CI) <sup>b</sup> <i>n</i> = 3512
Total	4363 (100.0)	36.4		
Gender				
Men	2132 (48.3)	30.2	Referent	Referent
Women	2231 (51.7)	42.3	1.7 (1.4 – 2.1) <sup>c</sup>	1.8 (1.5 – 2.1) <sup>c</sup>
Age				
18–34 years	550 (30.8)	35.5	0.9 (0.7 – 1.3)	0.9 (0.7 – 1.3)
35–44 years	823 (18.8)	36.2	0.9 (0.7 – 1.2)	0.9 (0.7 – 1.2)
45–54 years	1295 (19.5)	37.5	1.0 (0.8 – 1.2)	1.0 (0.8 – 1.2)
55–64 years	817 (14.9)	36.3	1.0 (0.7 – 1.2)	0.9 (0.7 – 1.2)
65+ years	878 (16.0)	37.4	Referent	Referent
Race/ethnicity				
Non-Hispanic White	2858 (69.4)	36.7	Referent	Referent
Non-Hispanic Black	573 (11.2)	32.9	0.8 (0.6 – 1.1)	0.9 (0.7 – 1.2)
Hispanic	607 (13.3)	37.9	1.1 (0.8 – 1.5)	1.3 (0.9 – 1.7)
Non-Hispanic other	325 (6.1)	36.4	1.1 (0.8 – 1.4)	1.0 (0.7 – 1.4)
Marital Status				
Married or domestic partnership	3062 (59.9)	38.8	Referent	Referent
Not married	1301 (40.1)	32.3	0.8 (0.6 – 1.0)	0.8 (0.6 – 1.1)
Annual household income				
<\$30 000	1300 (29.4)	31.3	0.7 (0.5 – 0.9) <sup>c</sup>	0.7 (0.5 – 1.0)
\$30 000 to <\$60 000	1030 (27.7)	35.7	0.8 (0.6 – 1.1)	0.8 (0.6 – 1.1)
\$60 000 to <\$85 000	755 (17.0)	40.6	1.0 (0.8 – 1.3)	1.1 (0.8 – 1.4)
\$85 000	1278 (25.9)	39.9	Referent	Referent
Education				
High school or less	1363 (29.8)	31.9	0.8 (0.6 – 1.0)	0.8 (0.6 – 1.0)
Some college	1601 (38.1)	38.3	1.0 (0.8 – 1.3)	1.0 (0.8 – 1.3)
College graduate or more	1399 (32.1)	38.4	Referent	Referent
Region of country				
New England	149 (4.0)	43.1	1.6 (0.7 – 3.8)	1.5 (0.6 – 3.7)
Middle Atlantic	598 (13.9)	38.0	1.3 (0.9 – 2.0)	1.3 (0.8 – 2.0)
East North Central	804 (19.0)	33.8	1.1 (0.7 – 1.6)	1.1 (0.8 – 1.7)
West North Central	320 (7.3)	31.5	0.9 (0.6 – 1.5)	1.0 (0.6 – 1.6)
South Atlantic	841 (19.0)	37.6	1.2 (0.8 – 1.8)	1.4 (0.9 – 2.0)
East South Central	304 (6.4)	39.0	1.4 (0.9 – 2.2)	1.5 (0.9 – 2.4)
West South Central	456 (9.6)	31.8	Referent	Referent
Mountain	329 (8.1)	36.1	1.2 (0.7 – 2.0)	1.2 (0.7 – 1.9)



	Number (%) <sup>a</sup>	Prevalence of reading calorie information when available, % <sup>b</sup> <i>n</i> = 3512	Unadjusted OR (95% CI) <sup>b</sup> <i>n</i> = 3512	Adjusted OR (95% CI) <sup>b</sup> <i>n</i> = 3512
Pacific	562 (12.6)	40.4	1.5 (1.0 – 2.2)	1.4 (0.9 – 2.1)
Frequency eat at a fast-food or chain restaurant				
Never	441 (10.1)	—	—	—
Less than four times per month	2500 (55.6)	39.3	Referent	Referent
one to two times per week	1003 (23.9)	34.4	0.8 (0.6 – 1.0)	0.8 (0.6 – 1.0)
Three or more times per week	419 (10.4)	25.9	0.5 (0.4 – 0.7) <sup>c</sup>	0.6 (0.4 – 0.8) <sup>c</sup>

<sup>a</sup>Unweighted frequencies, weighted percentages.

<sup>b</sup>Excludes those who do not go to fast-food or chain restaurants (*n* = 441), those who never noticed or looked for calorie information (*n* = 202) and those who reported they usually cannot find calorie information (*n* = 208).

<sup>c</sup>95% Confidence interval (CI) does not include 1.

**Table 2**

Prevalence of adults who use calorie information among those who read calorie information when available when ordering at fast-food or chain restaurants ( $n = 1309$ )

	Total $n^a$	Prevalence of respondents who used calorie information at least sometimes among those who read it, % (SE) <sup>b,c</sup>
Total	1309	95.4 (0.6)
Gender		
Men	559	93.4 (1.0)
Women	750	96.7 (0.7)
Age		
18–34 years	172	93.0 (2.0)
35–44 years	257	95.3 (1.3)
45–54 years	398	96.5 (0.9)
55–64 years	243	97.2 (1.1)
65+ years	239	97.0 (1.1)
Race/ethnicity		
Non-Hispanic White	854	95.2 (0.7)
Non-Hispanic Black	175	93.4 (1.9)
Hispanic	182	98.5 (0.9)
Non-Hispanic other	98	92.7 (2.6)
Marital status		
Married or domestic partnership	971	95.3 (0.7)
Not married	338	95.5 (1.1)
Annual household income		
<\$30 000	330	93.6 (1.3)
\$30 000 to <\$60 000	315	94.2 (1.3)
\$60 000 to <\$85 000	240	99.3 (0.5)
\$85 000	424	95.3 (1.0)
Education		
High school or less	353	95.1 (1.2)
Some college	494	94.8 (1.0)
College graduate or more	462	96.3 (0.9)
Region of country <sup>d</sup>		
New England	39	99.3 (1.3)
Middle Atlantic	182	88.7 (2.4)
East North Central	239	93.6 (1.6)
West North Central	83	95.7 (2.3)
South Atlantic	273	97.4 (1.0)
East South Central	87	97.0 (1.8)
West South Central	130	96.4 (1.6)
Mountain	96	97.6 (1.6)
Pacific	180	97.1 (1.2)

	Total <i>n</i> <sup><i>a</i></sup>	Prevalence of respondents who used calorie information at least sometimes among those who read it, % (SE) <sup><i>b,c</i></sup>
Frequency eat at a fast-food or chain restaurant		
Less than four times per month	862	95.7 (0.7)
One to two times per week	331	94.3 (1.3)
Three or more times per week	116	96.1 (1.8)

<sup>*a*</sup>Unweighted frequencies.

<sup>*b*</sup>Includes respondents who replied always, most of the time, about half of the time, or sometimes when asked if calorie information helps them decide what to order at fast-food or chain restaurants.

<sup>*c*</sup>Weighted percentages.

<sup>*d*</sup> $\chi^2$  test significant at 0.05.

SE, standard error.