

Impact of Different Menu Labeling Formats on Healthiness Evaluation and Menu Choices for Side Menu Items in Fast Food Restaurants among the College Students in the US

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ABSTRACT

The current study examines the impact of different menu labeling formats for evaluating healthiness and menu choice for side menu items at fast food restaurants. The study was conducted with 665 college students attending a public university in the Midwestern region of the United States. Three formats of menu labeling were examined: no information, numeric, and color-coded formats. Our data revealed that providing menu labeling influenced customers' healthiness evaluations and menu choices. There was increased awareness of the menu's healthiness and healthier menu selections when the color-coded format was provided, which was greater than applying the numeric format and menu with no nutrition information. The findings from this study provide implications that can be applied to the foodservice industry and policy makers, in an attempt to utilize visual features (e.g., color-coded format) for menu labeling to promote awareness of customers for healthy eating options and healthy menu choices.

Key words: nutritional information, labeling format, numeric format, color format, fast food

INTRODUCTION

The United States (US) has been fighting the increased prevalence of obesity as approximately 64% of adults are either overweight or obese (Center for Disease Control and Prevention 2020). As obesity is becoming one of the most serious health problems in the United States (Flegal KM *et al* 2016), scholars and policy makers have sought a way to promote public health by creating a healthy eating environment (Story M *et al* 2008). Previous studies have discovered that an increase in the frequency of dining out is associated with the presence of obesity (Guthrie JF *et al* 2002; Kant AK *et al* 2015). The foods consumed in restaurants, especially in fast food restaurants, are higher in calories, total fat, and saturated fat or are lower in dietary fiber, calcium, and iron compared to home prepared foods (Guthrie JF *et al* 2002) and are served in larger portions (Young LR & Nestle M 2007). In order to assist customers in making healthier food choices, menu labeling was proposed as a mandated regulation for chain restaurants with 20 or more locations in the United States in 2010 (US Food and Drug Administration 2017).

Policy makers and public health scholars expected menu

labeling in restaurants to be an effective information channel to assist customers' informed dietary choices among alternative means (Drichoutis A *et al* 2012). However, previous studies showed mixed results regarding the impact of menu labeling on customers' decisions. For example, providing nutrition information in menus increased consumers' understanding of food healthiness and promoted healthy food choices (Ellison B *et al* 2013; Yoon B & Chung Y 2012). Burton S *et al* (2009) and Dowray S *et al* (2013) showed that labeling the calorie content reduces consumption of unhealthy food. In contrast, some scholars found small or no impacts from providing nutrition information (Drichoutis A *et al* 2006; Finkelstein EA *et al* 2011; Swartz JJ *et al* 2011). For instance, Elbel B *et al* (2009) compared the calories purchased in fast food restaurants before and after the implementation of menu labeling and found no significant changes in customers' caloric intake.

The literature review's mixed findings of the impact of menu labeling highlighted the need for researchers to consider other factors to improve the effectiveness of menu labeling. Scholars suggested that the impact of menu labeling may vary based upon demographic factors such as gender, income, age, education, and the level of health consciousness (Cowburn G & Stockley L 2005; Drichoutis A *et al* 2012; Swartz JJ *et al* 2011). Yoon B & Chung Y (2012) conducted the study with

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college students and found that presenting nutrition information in color formats was more effective in influencing the healthy menu choices than presenting the numerical nutrition information alongside the menu item. Ellison B *et al* (2013) confirmed that the color-coded labeling can lead customers to select lower-calorie items while numeric labels alone did not affect selections in the sit-down restaurant experimental setting.

In addition, the mixed findings also suggest that there may be more effective ways to present nutrition information to increase the menu-labeling policy's impact. For example, a consumer's lack of understanding of nutrition information or the complex label format often prevents consumers from understanding and evaluating the menu's healthiness and hinders making healthy decisions (Andrews JC *et al* 2011; Cowburn G & Stockley L 2005). Cecchini M & Warin L (2016) suggested that effective formats in menu labeling might assist customers to process food information, which helps them to select healthy items. Current menu labeling mandates the presentation of nutrition information (e.g., calories) with a numeric format, but the way of presenting information could be improved. Based on the exiting literature, the current study proposed the research question on what the better options there are to convey nutrition information to help consumers make healthier menu choices.

The scholars have started to examine the effectiveness of different menu labeling formats on consumers' perceptions and menu choices (Borgmeie L & Westenhoefer J 2009; Andrews JC *et al* 2011; Yoon B & Chung Y 2012; Kim E *et al* 2018). Many of the existing papers (Burton S *et al* 2009; Ellison B *et al* 2013) investigated the effect of menu labeling using a numeric format (i.e., providing nutrient amounts in numeric format). However, Dowray S *et al* (2013) argued that numerical nutritional information might not be a sufficient way to improve the effectiveness of menu labeling. This is because visual features or symbols can reduce cognitive effort and enable customers' faster information processing (Jones G & Richardson M 2007). Kahn BE (2007) also supported the argument by showing that visual features increase the ease of individuals' information processing compared to numeric information only as was presented in an online shopping setting.

In the same vein, the U.K. Department of Health (2013) proposed traffic light labeling (TLL) as standardized, unambiguous, and useful in consumer's decisions regardless of consumer demographics or nutrition knowledge. TLL is coded in

a system of three colors; *red*, *yellow*, and *green* indicate *high*, *medium*, and *low* levels of nutrients, respectively. As TLL has been considered a more simplified and visual feature format than typical menu labeling with only numeric information, it has been applied to the front-of-packet labels in supermarkets in the United Kingdom and Australia. The studies support that TLL (color-coded labeling) is the alternative for menu labeling since it provides "at a glance" information to customers (Van Herpen E & Trijp H 2011), which could help consumers pay more attention to the nutrition labeling of food in the sit-down restaurant setting in the United Kingdom (Dowray S *et al* 2013; Reale S & Flint SW 2016a). Ellison B *et al* (2013) also found that the color-coded labeling (TLL) leads customers to select lower-calorie items while numeric labels alone did not affect selections in an experimental restaurant setting in the United States. The findings support the study of Reale S & Flint SW (2016b), which show that semi-directive labeling (e.g. color-coded/TLL) significantly impacted customers' informed food choices. However, few studies have investigated the impact of visual labeling formats in menus (e.g. color-coded/TLL) on customers' behaviors in the context of fast food restaurants (Yoon B & Chung Y 2012; Kim E *et al* 2018). Given that the fast food restaurant environment only allows a short period of time to make the decision on a menu item, more research on the format in menu labeling that is suitable for fast food restaurants is needed. Therefore, the purpose of the study is to examine the impact of formats for menu labeling on customers' healthiness evaluations and menu choices in a fast food restaurant setting.

STUDY METHODS

1. Sample and Procedures

An online survey was conducted with college students who are attending a Midwestern university in the United States from March to April 2016. The study recruited participants through an email system at the university. The invitation email indicated that qualified participants should be at least 18 years old and must have purchased food at a fast food restaurant in the previous three months. A total of 687 completed surveys were collected and after checking for missing data, a total of 665 valid data were retained for further statistical analysis (valid analysis rate: 96.8%). This study was approved by the Institutional Review Board (IRB #: OSU IRB-HE-12-35).

2. Study Design and Experimental Condition

This study used a web- and scenario-based experiment with three conditions of menu labeling, which included using food names with different labeling schemes for the same items and listing the nutrient information (calories, fat, sodium, and sugar) of the menu items. Ten side menu items were randomly selected for the experiments based on the information presented in fast food restaurant chains in the United States (i.e., McDonalds, Burger King, Wendy's, KFC, Taco Bell, and Long John Silver's). The list of the US fast food restaurants was obtained from the top 50 brands in quick service and fast casual chains listed in the Quick Service Restaurant Magazine (QSR 2015), with the data based on U.S. system-wide sales in 2014. The nutrient data of the selected ten menu items was obtained from the fast food restaurant chains' websites. Menu items were presented randomly to prevent an order effect as Dayan E & Bar-Hillel M (2011) suggested that consumers are more likely to select food items at either the top or bottom of a menu.

In the study, the three experimental conditions were (a) a menu with no information, (b) a menu with nutrient information in a numeric format, and (c) a menu with nutrient information using a color-coded label. The current study categorized the amount of nutrients in the menu items as low, medium, and high to allow for determining a label's color-

coded format. The study used the color guidance from the U.K. Department of Health (2013) and the U.S. Food and Drug Administration's food labeling guidelines (U.S. Food and Drug Administration 2014). The color-coded labels from menu items utilized traffic light colors to describe the amount of nutrients in each item according to three levels; high (red), medium (yellow) and low (green). For the criteria of color coding, the study referred to the guidance from the U.K. Department of Health (2013) and the U.S. Food and Drug Administration (2014; 2017), and the criteria of color coding were modified to use in the specific context of the study. The detailed guidelines for the coloring coding criteria was presented in Table 1. For example, if the calories for individual side menu items were lower than 120 kcal, ranged from 120 to 240 kcal, and were higher than 240 kcal, the green (low), yellow (medium), and red (high) colors were assigned, respectively.

The participants were given a scenario in which they could choose the side menu items at fast food restaurants within the same price and same portion size that helped to eliminate budget and portion pressures on food ordering. The price of each item was not included because it might generate an interference impact on the food choice process (Reale S & Flint SW 2016a). Fig. 1 presents the menu labeling formats used in the experiment.

Table 1. The guideline of color-coded labeling format (per serving)

	Green (low)	Yellow (medium)	High (red)
Calorie (kcal) ¹⁾	≤ 120	> 120 to ≤ 240	> 240
Fat (g) ²⁾	≤ 3.0	> 3.0 to ≤ 20.0	> 20.0
Sodium (mg) ²⁾	≤ 300	> 300 to ≤ 1,500	> 1,500
Sugar (g) ²⁾	≤ 5.0	> 5.0 to ≤ 12.5	> 12.5

¹⁾ U.S. Food and Drug Administration 2014, 2017.

²⁾ U.K. Department of Health 2013.

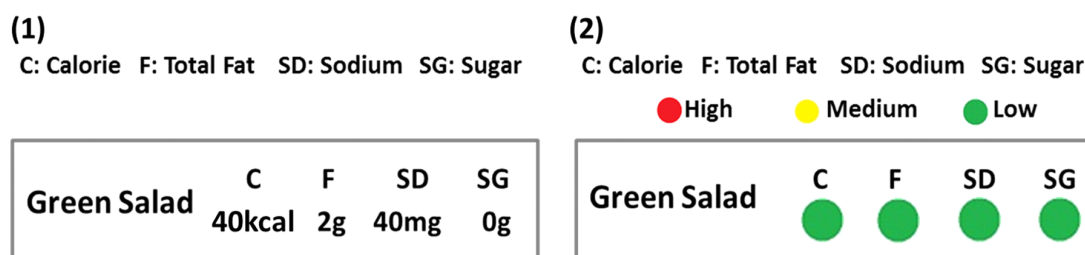


Fig. 1. The menu labeling format condition in the study: (1) numeric format and (2) color-coded format.

In the study, the participants were asked about their past dining behavior and demographic information (e.g., age, gender, and ethnicity). Participants were randomly assigned to one of three groups--color-coded group, numeric group, and no nutrition information group--to view the corresponding menu conditions that were varied by the types of labels. Afterwards, they answered questions about the healthiness of ten side items and their final menu selection (option to choose only side menu items). Healthiness was measured using a 5-point scale that ranged from 1 (*not very healthy*) to 5 (*very healthy*). In order to determine the healthy choice, individual items were categorized according to the number of colors of the menu items into three groups: healthy group, neutral group, and unhealthy group. Most nutrient profiling schemes do not clearly and conclusively identify healthy or unhealthy foods, so we categorized menu items into three groups by counting the number of color-coded items for nutrient profiles. The specific guideline of menu grouping information is listed in Table 2.

The healthiness evaluation for the items was determined by calculating the scores from comparing the menu grouping guidelines with the participants' perceived healthfulness evaluations. For example, if a participant checked the level of perception for a green beans' healthfulness as a level 4 (*healthy*) or 5 (*very healthy*), he or she received one point because the item was categorized in the healthy menu group. Then, the aggregated score of all points for each participant was used as the healthiness evaluation score. The percentage of healthiness evaluation scores were computed by summing the number of correct responses for ten menu items and then multiplying by 100. Scores ranged from 30% to 100%, and the mean score was 65.4%. With respect to the menu choices, respondents only choose one side menu item among the ten menus.

3. Data Analysis

The data used in this study were analyzed using SPSS (ver. 25.0) for Windows. Descriptive statistics (i.e., frequency, mean, and standard deviation) were used to identify respondents' demographic and healthiness evaluation scores. A one-way ANOVA was used to assess the differences in healthiness evaluations according to the different labeling formats. When significant differences were found, post-hoc tests were performed using the Tukey test. Chi-square (χ^2) testing examined the actual influence of menu labeling formats on participants' menu choices.

RESULTS AND DISCUSSION

1. Demographic Characteristics

Table 3 shows the demographic characteristics of the research participants. The 665 total participants that were included for data analysis were divided into three experimental groups, consisting of 223, 220, and 222 subjects in the three groups, respectively. The experimental groups did not differ significantly with regard to sociodemographic factors and past dining behaviors. About 61% of the respondents were female, and a majority of the respondents were 18~23 years old (94.0%). The majority of respondents answered that they visited fast food restaurants at least one or two times in a week (98.8%). More than half of the respondents (65.5%) spent under \$8 at each fast food visit.

2. Impact of Menu Labeling Formats on Healthiness Evaluations

Table 4 shows the results of the one-way ANOVA, indicating a significant overall difference among formats in terms of

Table 2. The guideline of menu grouping

Menu group	Color	Number	Menu items (n)	Scale	Point
Healthy	Green	≥ 2	Green beans, garden side salad, apple slices (3)	4 or 5	1
	Yellow	≤ 2			
	Red	= 0			
Neutral	Green	≥ 1	Baked potato, corn cobbette, biscuits (3)	3	1
	Yellow	≥ 1			
	Red	≤ 1			
Unhealthy	Green	≤ 1	Cole slaw, caesar side salad, French fries, mozzarella sticks (4)	1 or 2	1
	Yellow	≥ 1			
	Red	≥ 2			

Table 3. Demographic characteristics of respondents

Characteristics	No information (n=223) n (%)	Numeric (n=220) n (%)	Color-coded (n=222) n (%)	Total (n=665) n (%)	<i>P</i> Value ²⁾
Gender					
Male	90 (40.4)	88 (40.0)	80 (36.0)	258 (38.8)	0.58
Female	133 (59.6)	132 (60.0)	142 (64.0)	407 (61.2)	
Age (years)					
18~20	77 (34.5)	83 (37.7)	103 (46.4)	263 (39.5)	0.07
21~23	127 (57.0)	130 (59.1)	105 (47.3)	362 (54.5)	
24~26	17 (7.6)	4 (1.8)	9 (4.1)	30 (4.5)	
Over 30	2 (0.9)	3 (1.4)	5 (2.2)	10 (1.5)	
Ethnicity					
White/Caucasian	184 (82.5)	177 (80.4)	185 (83.4)	546 (82.1)	0.81
African American	12 (5.4)	8 (3.7)	10 (4.5)	30 (4.5)	
Hispanic or Latino	12 (5.4)	14 (6.4)	9 (4.1)	35 (5.2)	
Asian American	10 (4.5)	16 (7.2)	11 (4.9)	37 (5.7)	
Native American or American Indian	4 (1.7)	2 (0.9)	5 (2.2)	11 (1.6)	
Others ¹⁾	1 (0.5)	3 (1.4)	2 (0.9)	6 (0.9)	
Frequency of dining at fast food restaurants / week					
0	3 (1.3)	2 (0.9)	3 (1.3)	8 (1.2)	0.98
1~2	102 (45.9)	103 (46.8)	97 (43.7)	302 (45.4)	
3~4	77 (34.5)	77 (35.1)	84 (37.8)	238 (35.8)	
5~6	25 (11.2)	20 (9.1)	23 (10.4)	68 (10.3)	
More than 7	16 (7.1)	18 (8.1)	15 (6.8)	49 (7.3)	
Spending per meal at each fast food visit					
Under \$5	62 (27.8)	55 (25.0)	58 (26.1)	175 (26.3)	0.19
\$6~\$8	100 (44.8)	77 (35.0)	84 (37.8)	261 (39.2)	
\$9~\$11	40 (18.0)	55 (25.0)	51 (23.0)	146 (22.0)	
\$12~\$14	18 (8.1)	22 (10.0)	22 (10.0)	62 (9.4)	
Over \$15	3 (1.3)	11 (5.0)	7 (3.1)	21 (3.1)	

¹⁾ Others include mixed and multiracial.

²⁾ Chi-square test was conducted to compare across experimental conditions.

Table 4. Healthfulness evaluation by menu labeling formats

	Label format			<i>F</i>
	No information (n=223) Mean (S.D.)	Numeric (n=220) Mean (S.D.)	Color-coded (n=222) Mean (S.D.)	
Healthfulness evaluation	53.1 (7.8) ^a	64.7 (10.3) ^b	78.8 (10.8) ^c	391.3 ^{***}

Healthfulness evaluation was the percentage of scores that were calculating by summing the number of correct responses for ten side menu items and then multiplying by 100.

^{a-c} Different letters mean statistically significant differences.

^{***} $p < 0.001$.

healthiness evaluations. The Tukey post-hoc test revealed that participants exposed to either the numeric or color-coded formats evaluate healthy menus correctly compared to those who evaluate from the no information condition. Without any nut-

rition information, the study participants correctly identified around 53.1 percentages of score, while participants who were in the color-coded format correctly evaluated the menu's healthiness around 78.8 percentages of score. The findings of this

study are consistent with the previous research, indicating visual feature labels (e.g., signs and color-coded format/TLL) help to identify healthier foods better than no-labelled foods (Borgmeier L & Westenhoefer J 2009; Yoon B & Chung Y 2012). The findings of the study provide the empirical evidence of advantage in using color-coded labeling format by revealing that customers perceive that semi-directive labeling (e.g., color-coded labels) easier to understand and thus helps them make better judgement on food evaluations. Therefore, the color-coded format could be effective in increasing customers' awareness of nutrition information and significantly reducing the effort needed to identify and interpret quality of food.

3. Impact of Menu Labeling Formats on Menu Choice

Fig. 2 shows the results of a chi-squared test, indicating a significant overall difference among formats in terms of selecting healthy menu items. Overall, 79 (35.4%), 152 (69.0%), and 174 (78.3%) of the participants made a healthy item choice among the three different experiment conditions, respectively. Participants were more likely to select healthy items when nutrition information (e.g., numeric format and color-coded format) was present. The findings of this study coincide with the findings of the study by Reale S & Flint SW (2016b) showing that semi-directive labelling (e.g., color-coded labels) significantly impacted informed food choices among the obese

participants. This is also consistent with similar studies within the restaurant context (Yoon B & Chung Y 2012; Ellison B *et al* 2013), which supported the rationale that a visual feature (e.g., color-coded labeling) for menu labeling would significantly affect customers' healthier eating choices. The findings of this study support the literature that indicates a theory that consumers tend to have a higher purchasing intention and attitude toward healthy foods (e.g., lower-calorie foods) when the nutrition information is provided (Burton S *et al* 2009; Yoon B & Chung Y 2012; Ellison B *et al* 2013). The findings provide a substantial evidence that the color-coded format helps to increase customers' awareness of healthier menu options by providing "at a glance" information to customers (Van Herpen E & Trijp H 2011) and facilitates customers' informed decisions due to reduced cognitive workload (Jones G & Richardson M 2007).

CONCLUSIONS

In summary, the results of this study showed that presenting nutrition information either with a numeric format and a color-coded format influences a customers' perception of the healthiness of menu items. Results from the current study found that the presence of the color-coded format helps to identify healthier foods better and choose healthier menu items than

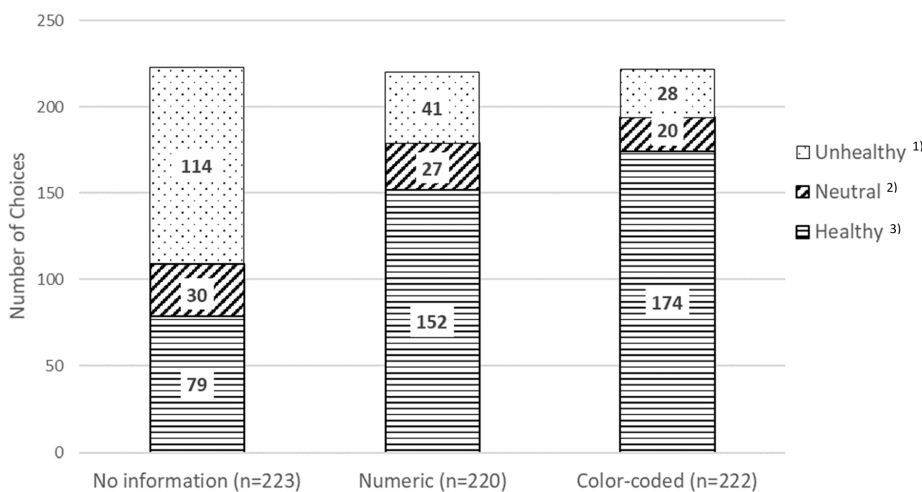


Fig. 2. Numbers of menu choices by the three labeling formats.

Chi-square test between the percentage of total menu choices in three labeling format conditions ($\chi^2=108.225, p<0.001$).

¹⁾ Unhealthy group includes cole slaw, Caesar salad, French fires, and mozzarella sticks.

²⁾ Neutral group includes baked potato, cobbette, and biscuits.

³⁾ Healthy group includes green beans, garden salad, and apple slices.

does the numeric format.

This study has several implications for foodservice managers and policy makers to promote customers' awareness of healthy eating options. From a public policy standpoint, the study suggests that there are potential benefits of applying the visual-feature menu labeling in the fast food restaurant industry. Presenting nutrition information with a numeric format, as is currently mandated for many restaurants, may change the diners' perception of the menu's healthiness and their menu choices. However, the color-coded labeling, as an add-on to numeric labeling, is suggested to effectively reach the goal of promoting healthier choices from menus. The color-coded format could be especially effective in the fast food restaurant environment, which encourages customers to order food among a variety of options with constraints and time pressure. Therefore, adding a color-coded feature on menu labeling appears to be an effective alternative for increasing awareness of nutrition information while significantly reducing the effort needed to identify and interpret quality of food.

Additionally, restaurateurs could adopt color-coded menu labeling to meet the needs of customers who pay attention to the nutrient quality of food. Restaurant managers may hesitate to adopt the color-coded menu labeling format due to the less healthful menus that are common in many typical fast food restaurants. However, the provision of effective formats of menu labeling, such as the use of color-codes, a health sign, or a logo, could help restaurateurs take the initiative in creating a healthy eating environment for the public. With the increasing interest in healthy eating and food, the restaurant industry puts effort into promoting healthy eating initiatives to resolve the obesity epidemic; thus, restaurants may gain more positive brand images, leading to customers' trust and loyalty. Moreover, foodservice practitioners could consider color-coded menu labeling for promoting kids' menus for parents who pay attention to and purchase quality kid's meals so they can easily understand the information for their selections. Therefore, providing effective menu labeling (e.g., color-coded) is not only offered as a strategy to differentiate from other restaurants, but also to assist in promoting healthy eating with increased efficiency of communication.

Despite the contributions of the study to foodservice management, this study has several limitations. First, the current study adopted a sample from university students, which may propose a generalizability issue to other demographic groups.

Therefore, replicating this experiment among other generations would be a meaningful avenue for future research. Second, the context of this study was fast-food outlets. The effect of nutritional labeling on menus at fine-dining or casual-dining restaurants versus fast-food restaurants would be different since customers at fine-dining or casual-dining restaurants may ignore concerns for caloric content in exchange for indulgence. Conversely, customers at fine-dining or casual-dining restaurants may have the opportunity to spend more time evaluating menu labeling than customers at fast-food restaurants. Therefore, future research may benefit by replicating the experiment of the present study for these other two types of dining establishments. Lastly, the findings of the study within an experimental setting may be different in the real world. Therefore, observation or evaluation of customers' menu choices in a real restaurant setting would be a more realistic procedure and is recommended to assess the effectiveness of labeling on menus. Notwithstanding these limitations, this study helps to understand the effectiveness of different menu labeling formats on customers' eating behaviors and to provide practical implications for restaurant managers to promote customers' awareness of healthy eating options.

REFERENCES

- Andrews JC, Burton S, Kees J (2011) Is simpler always better? Consumer evaluations of front-of-package nutrition symbols. *J Public Policy Mark* 30(2): 175-190.
- Borgmeier L, Westerhoefer J (2009) Impact of different food label formats on healthiness evaluation and food choice of consumers: A randomized-controlled study. *BMC Public Health* 9(1): 184.
- Burton S, Howlett E, Tangari AH (2009) Food for thought: How will the nutrition labeling of quick service restaurant menu items influence consumers' product evaluations, purchase intentions, and choices? *J Retailing* 85(3): 258-273.
- Cecchini M, Warin L (2016) Impact of food labelling systems on food choices and eating behaviours: A systematic review and meta-analysis of randomized studies. *Obes Rev* 17(3): 201-210.
- Center for Disease Control and Prevention (2020) Prevalence of Obesity and Severe Obesity among Adults: United States, 2017-2018. <https://www.cdc.gov> (accessed on 10. 8. 2020)
- Cowburn G, Stockley L (2005) Consumer understanding and

- use of nutrition labelling: A systematic review. *Public Health Nutr* 8(1): 21-28.
- Dayan E, Bar-Hillel M (2011) Nudge to nobesity II: Menu positions influence food orders. *Judgm Decis Mak* 6(4): 333-342.
- Dowray S, Swartz JJ, Braxton D, Viera AJ (2013) Potential effect of physical activity based menu labels on the calorie content of selected fast food meals. *Appetite* 62, 173-181.
- Drichoutis A, Lazaridis P, Nayga Jr RM (2006) Consumers' use of nutritional labels: A review of research studies and issues. *Acad Mark Sci Rev* 9(9): 1-22.
- Drichoutis A, Nayga Jr RM, Lazaridis P (2012) Food away from home expenditures and obesity among older Europeans: Are there gender differences?. *Empir Econ* 42(3): 1051-1078.
- Elbel B, Kersh R, Brescoll VL, Dixon LB (2009) Calorie labeling and food choices: A first look at the effects on low-income people in New York City. *Health Aff* 28(6): 1110-1121.
- Ellison B, Lusk JL, Davis D (2013) Looking at the label and beyond: The effects of calorie labels, health consciousness, and demographics on caloric intake in restaurants. *Int J Behav Nutr Phys Act* 10: 21.
- Flegal KM, Kruszon-Moran D, Carroll MD, Fryar CD, Ogden CL (2016) Trends in obesity among adults in the United States, 2005 to 2014. *JAMA* 315(21): 2284-2291.
- Finkelstein EA, Strombotne KL, Chan NL, Krieger J (2011) Mandatory menu labeling in one fast-food chain in King County, Washington. *Am Jof PrevMed* 40(2): 122-127.
- Guthrie JF, Lin BH, Frazao E (2002) Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: Changes and consequences. *J Nutr Educ Behav* 34(3): 140-150.
- Jones G, Richardson M (2007) An objective examination of consumer perception of nutrition information based on healthiness ratings and eye movements. *Public Health Nutr* 10(3): 238-244.
- Kahn BE (2017) Using visual design to improve customer perceptions of online assortments. *J Retailing* 93(1): 29-42.
- Kant AK, Whitte, MI, Graubard BI (2015) Away from home meals: associations with biomarkers of chronic disease and dietary intake in American adults, NHANES 2005-2010. *Int J Obes* 39(5): 820-827.
- Kim E, Tang L, Meusel C, Gupta M (2018) Optimization of menu-labeling formats to drive healthy dining: An eye tracking study. *Int J Hosp Manag* 70: 37-48.
- Quick Service Restaurant Magazine (QSR 2015) The Top 50 Brands in Quick Service and Fast Casual. <https://www.qsrmagazine.com> (accessed on 10. 8. 2020)
- Reale S, Flint SW (2016a) Menu labelling and food choice in obese adults: A feasibility study. *BMC Obes* 3(1): 17-25.
- Reale S, Flint SW (2016b) The impact of menu label design on visual attention, food choice and recognition: An eye tracking study. *J Sens Stud* 31(4): 328-340.
- Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K (2008) Creating healthy food and eating environmental policy and environmental approaches. *Annu Rev Public Health* 29: 253-272.
- Swartz JJ, Braxton D, Viera AJ (2011) Calorie menu labeling on quick-service restaurant menus: An updated systematic review of the literature. *Int J Behav Nutr Phys Act* 8: 135.
- U.K. Department of Health (2013) Guide to Creating a Front of Pack (FoP) Nutrition Label for Pre-Packed Products Sold through Retail Outlets. <https://www.food.gov.uk> (accessed on 30. 7. 2020)
- U.S. Food and Drug Administration (2014) Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments. <https://www.federalregister.gov> (accessed on 30. 7. 2020)
- U.S. Food and Drug Administration (2017) Menu Labeling Requirements. <https://www.fda.gov> (accessed on 30. 7. 2020)
- Van Herpen E, Trijp H (2011) Front-of-pack nutrition labels. Their effect on attention and choices when consumers have varying goals and time constraints. *Appetite* 57(1): 148-160.
- Yoon B, Chung Y (2012) Can nutrition information for side menu items improve customer awareness and choice in fast food restaurants? *Int J Tour Sci* 12(2): 44-62.
- Young LR, Nestle M (2007) Portion sizes and obesity: Responses of fast-food companies. *J Public Health Policy* 28: 238-248.

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