

Menu Label Reading Behaviors and Calorie Estimation among U.S. Consumers

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Overview



1. Introduction

Chronic diseases

Food away from home

Menu labeling

2. Research objectives

3. Methods

Sampling

Survey instrument

Data collection and Analyses

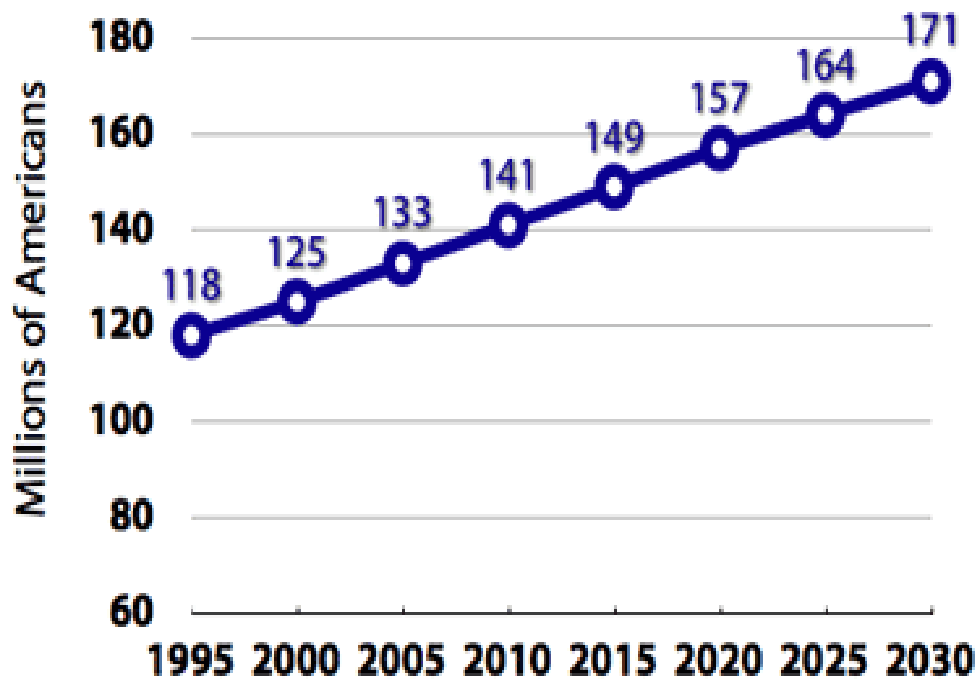
4. Results

5. Discussion

6. References

Introduction: Chronic Diseases

*Prevalence of Chronic Disease
In the U.S.¹*

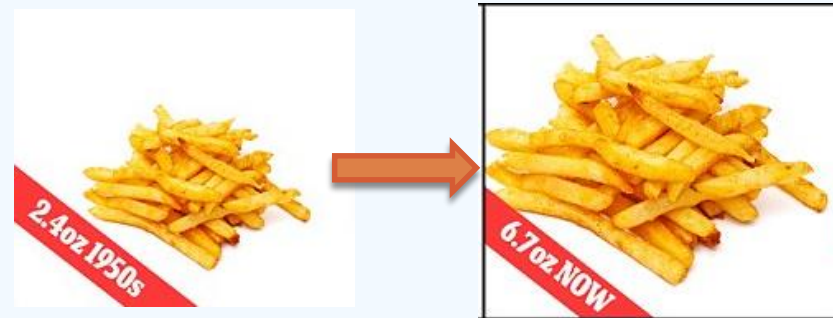
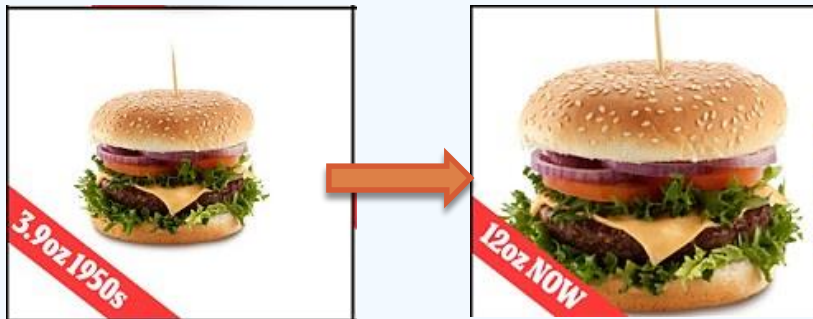


Causes^{2,3}



Introduction: Food Away from Home

- Away from home food not necessarily healthy.
 - Contain more calories/meal.
 - Higher in fat, saturated fat, and sodium/calorie.⁴
- Most frequently consumed food:
 - Pizza, fried chicken, hot dogs, mac and cheese, nachos, and cookies.⁵
- Consumers like “value sizing”.⁶⁻⁷



Introduction: Menu Labeling

- Consumers underestimated the calorie content of food in restaurants.⁸
- Provision of Menu Education and Labeling Act and the Labeling Education and Nutrition Act⁹
- Previous studies on the influence of menu labeling on the number of calories consumed and purchase intentions yielded mixed results.¹⁰⁻¹²
 - Geographical limitations
 - Study design
 - Study population



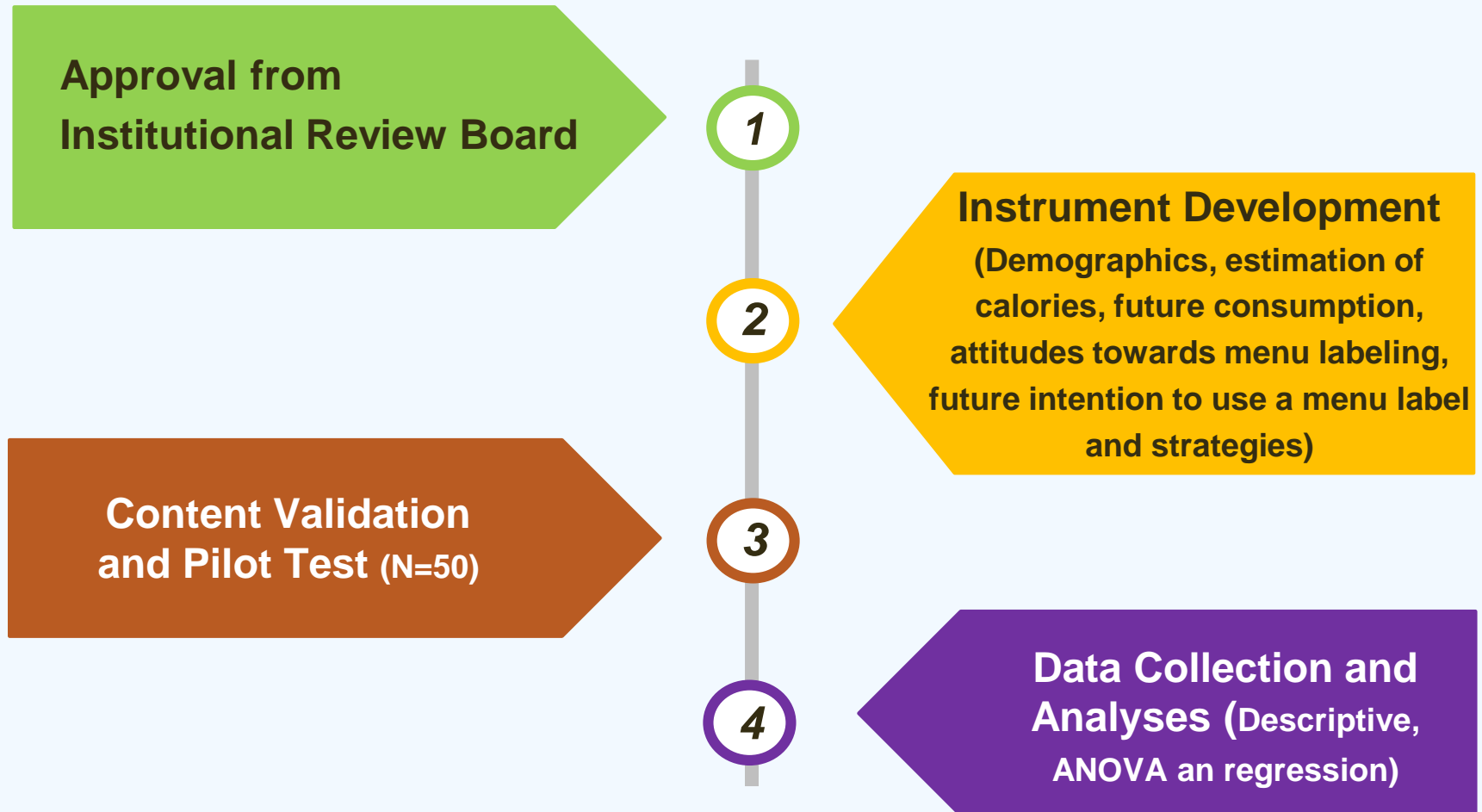
Image derived from
<http://www.publichealthnewswire.org/?p=11702>

Research Objectives



- 1) Investigate if consumers have a reasonable estimate of the top five Americans' favorite foods (i.e., pizza, hotdog, fried chicken, mac and cheese, and nachos).
- 2) Explore if disclosure of actual calorie content change future consumption intention of top five Americans' favorite foods.
- 3) Investigate consumers' perception towards menu labels.
- 4) Identify variables that associated with consumers' future intention to use a menu label.
- 5) Identify strategies that make nutrition information more noticeable.

Methods



Survey Instrument

Please estimate the amount of calories in a slice of 14" pan crust, pepperoni pizza (1/8 of a whole 14" pizza).



Previously we asked you to estimate the calories of ten different food items. Now, we will reveal the correct calories (based on USDA Food Database) to you. After knowing the true calories of these food items, please indicate if your future consumption of these items will change.

	Reduce tremendously	Reduce slightly	Remain the same	Increase slightly	Increase tremendously	Undecided
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Pepperoni pizza - 1 slice
(actual calorie = 390 kcal).

Your answer was

540



Results: Demographics

Gender

61%
Female



01

Education

40%
Bachelor's degree



02

1005
Questionnaire



Age
66%
20-40 years old

BMI

4% Underweight
38% Normal
30% Overweight
28% Obese



04

03

Income

30%
\$70,000 or more



Results: Calorie Estimation of Top Five American's Favorite Foods

Top 5 favorite food items calorie estimation	True Calorie (USDA food database)	Normal Range ($\pm 30\%$)	Under-estimated	Estimated correctly within the normal range	Over-estimated	Mean \pm SD
Pizza 1/8 of a whole 14" pepperoni	390	273-507	269 (26.8%)	594 (59.1%)	142 (14.1%)	394.23 \pm 192.132
Fried Chicken chicken thigh, with skin and breading	373	261-485	187 (18.6%)	506 (50.3%)	312 (31.0%)	440.52 \pm 212.621
Hotdog plain, without condiments	242	169-315	126 (12.5%)	550 (54.7%)	328 (32.6%)	306.52 \pm 173.939
Nachos one serving (3.0 oz.) of nachos with cheese	343	240-446	206 (20.5%)	555 (55.5%)	244 (24.3%)	386.96 \pm 203.497
Mac&Cheese (7 oz.)	310	217-403	136 (13.5%)	540 (53.7%)	327 (32.5%)	411.13 \pm 241.956

Results: Future Consumption Frequency of Top Five Americans' Favorite Foods

Food Items	Classification based on calorie estimation	Future Consumption	P value
Pizza	Underestimated	2.63±.77	<.001
	Correct	2.87±.58	
	Overestimated	3.08±.78	
Fried Chicken	Underestimated	2.55±.80	<.001
	Correct	2.86±.66	
	Overestimated	2.93±.77	
Hotdog	Underestimated	2.63±.87	<.001
	Correct	2.88±.59	
	Overestimated	3.02±.77	
Nachos	Underestimated	2.48±.88	<.001
	Correct	2.81±.67	
	Overestimated	3.03±.74	
Mac&Cheese	Underestimated	2.51±.90	<.001
	Correct	2.95±.67	
	Overestimated	3.09±.79	

*5-point Likert scale: 1=reduce tremendously; 5= Increase tremendously

Results: Attitudes towards Menu Labeling

- Usefulness (4.11 ± 0.78)
- Importance (4.05 ± 0.90)
- Ease to understand (3.96 ± 0.80)
- Accuracy (3.64 ± 0.78)
- Trustworthiness (3.59 ± 0.86)

Item	Sm	Med	Lg
80-220	2.49 120	2.79 160	3.29 440
80	2.99 120	3.59 160	3.99 160
80	2.49 120	2.79 160	3.29 160
5 CAL			1.39
0	1.59 0	1.89 0	2.09 0
m	CAL Med	CAL Lg	CAL X-Lg
9 320-340	2.49 420	2.99 450	3.49 520

<https://ddifo.org/section-4205-of-the-affordable-care-act-new-menu-labeling-requirements/>

Results: Predictors of Future Intention to Use a Menu Label

Models	Intention to Use a Menu Label	Sig.
Gender	.087**	0.001
Age	0.036	0.186
Education Level	0.044	0.117
Income	0.30	0.286
BMI classification	-0.008	0.757
Perception about Menu Labeling	.510***	0.001
R square	0.286	

Results: Strategies to Make Nutrition Information More Noticeable

- About 80% participants indicated noticing nutrition information; 37% of those used it to make purchase decision.

- Font**



- Location**



- Separate insert on the menu**
- No need to change**
 - “Please don't. People who monitor this shouldn't leave the house. Ever.”
 - “I don't think any consumer would bother much with the content information.”
 - “I don't think people pay attention when they are hungry.”

Discussion

Objective 1& 2: Investigate if consumers have a reasonable estimate of the top five Americans' favorite foods; Explore if disclosure of actual calorie content change future consumption intention of top five Americans' favorite foods.

- Able to estimate the calories of the top five Americans' favorite food items within the $\pm 30\%$ range .
- Calories of food increase = Underestimation increases.
- Disclosure of food calorie = Changes in future consumption frequency.
- Making nutrition information available may influence consumption intention.

Discussion

Objective 3: Investigate consumers' perception towards menu labels.

- Participants perceived menu labels as useful and important; **NOT** accurate and trustworthy.
- Future research to investigate why consumers perceived so and identify strategies to change their attitudes.

Objective 4: Identify variables that associated with consumers' future intention to use a menu label.

- Gender (women) & attitude (positive) predicted future intention to use menu label; Income, educational level and weight – not significant.
- Other variables (i.e., nutrition knowledge & health consciousness) may predict future use behavior .

Discussion

Objective 5: Identify strategies that make nutrition information more noticeable

- Presentation of calorie information has an effect on food ordered.¹³⁻¹⁴
- Menu designers may consider various formats and presentations of the nutrition information.

Limitations

- Length of the survey
- Pictures and descriptions of the food items included but participants' experience with each of these foods varies.

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Thank you

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