



Impact of Displaying Calorie Information on Menus: A Causal Experiment

BA 830 Final Project

QUESTROM
SCHOOL OF
BUSINESS

OUR TEAM



Hector He



Kwan Wing Tuet



Yu Ting Hung



Jay Chaudhary



Yuesen (Sam) Zhang

Background

Chipotle

BURRITOS, TACOS & SALADS

BURRITO	740-1210 cal	CHICKEN	180 cal	\$7.15
BOWL	420-910 cal	STEAK	150 cal	\$8.15
3 TACOS	390-1140 cal	CARNITAS	170 cal	\$7.65
SALAD	420-900 cal	BARBACOA	210 cal	\$8.15
		SOFRITAS	150 cal	\$7.15
		VEGIE	230 cal	\$7.15

2,000 calories a day is used for general nutrition advice, but calorie needs vary.
Additional nutrition information available upon request.

McDonald's



McDonald's® (Kenmore Sq)

★ 4.7 (200+ ratings) • American • \$ - \$
10-25 min • \$2.49 Delivery Fee
Tap for hours, info, and more

Group order

\$125 until \$5 reward

Lunch 10:30 AM – 4:59 PM Breakfast Thu 6:00 AM – 10:29 AM

Free with \$20 Purchase (add to cart)

McCrispy
\$6.19 - 470 Cal.
Free with \$20 purchase

Not available after midnight



Subway

ROTISSERIE-STYLE CHICKEN

350/690 cal RAISED WITHOUT ANTIBIOTICS



SUBWAY CLUB®

310/630 cal



6" SUBWAY FRESH FIT® SUBS

6 GRAMS OF FAT OR LESS*



TURKEY BREAST

280/560 cal



BLACK FOREST HAM

290/570 cal



CARVED TURKEY

330/670 cal



ROAST BEEF

320/630 cal



OVEN ROASTED CHICKEN

320/640 cal



SUBWAY FRESH FIT® is a new diet program. Please visit subway.com for full nutritional information. *Fat content refers to regular 6-inch sub on 9-grain wheat or Italian bread without condiments that contain fat.



Research Question

Does the presence of calorie information on a restaurant's menu affect consumer food choices?



Hypothesis

The inclusion of calorie information on restaurant menus would lead consumers to choose lower-calorie food options.

Treatment & Experimental Design

Within-subject design

- 2 menus shown to each participant
- Compare each participant's food choices before and after treatment

Treatment

- The treatment menu displayed the calorie count for each food item



Data Collection

- Qualtrics Survey
- Demographic, diet & physical activity questions

Sample Size

- 110 respondents

Outcome

- Calories before vs. after

The MSBA Grill
1600 PENNSYLVANIA AVENUE NW,
WASHINGTON, DC 20500

Main Dish

Very, Very Vegan Burger	\$8.00
Farmer's Favorite Burger	\$8.50
Cheese Platter Burger	\$9.00
Meat & Greens Grand Burger	\$9.00

Wraps

Vegan Veggie Wrap	\$7.00
Chicken Caesar Wrap	\$8.00

Sides

Fries	\$5.00
Chicken Fingers	\$5.00

Dessert

Hot Fudge Sundae	\$6.00
Lava Cake	\$6.00





Control

Menu 1 shown first
without Calorie Info.

The MSBA Grill
1600 PENNSYLVANIA AVENUE NW,
WASHINGTON, DC 20500

Main Dish

Very, Very Vegan Burger (750 Cal)	\$8.00
Farmer's Favorite Burger (800 Cal)	\$8.50
Cheese Platter Burger (1020 Cal)	\$9.00
Meat & Greens Grand Burger (970 Cal)	\$9.00

Wraps

Vegan Veggie Wrap (650 Cal)	\$7.00
Chicken Caesar Wrap (750 Cal)	\$8.00

Sides

Fries (350 Cal)	\$5.00
Chicken Fingers (400 Cal)	\$5.00

Dessert

Hot Fudge Sundae (550 Cal)	\$6.00
Lava Cake (580 Cal)	\$6.00






Treatment

Menu 2 shown after
with Calorie info.

Data Analysis



Paired T-Test

- Used to Measure: A.T.E & C.A.T.E of gender, heath conscientiousness, & physical activity levels



FEOLS Regression

- Used to validate our results & provide greater insights

Results

-37
Calories

The Average Treatment Effect

Displaying the Calorie count of food items on a menu led to customers ordering items with fewer Calories

-47
Calories

C.A.T.E for Women

Women tended to switch their order more often than men, and ordered less Calories

-174
Calories

C.A.T.E for Health Conscious Individuals

Health conscious individuals switched their order and ordered less Calories

Business Implications

- Displaying Calorie information can be advantageous for restaurants, as lower Calorie foods are more cost-effective*
- Promoting lower Calorie options through menu labeling, restaurants may increase their profits
- A Win - Win!



*Lower-calorie foods cost more per calorie

Limitations & Future Scope



- Relatively small sample size of a similar demographic
- A survey may not be generalizable to results within the field
- Our menu may not be appeasable to all food preferences
- Future Scope: Examining nutritional information displayed on food choice

Questions?





APPENDIX



```
{r}
```

```
t.test(calorie_unaware$calorie_2, calorie_unaware$calorie_1,  
alternative = "less", paired = TRUE)
```



Paired t-test

```
data: calorie_unaware$calorie_2 and calorie_unaware$calorie_1  
t = 1.35394, df = 75, p-value = 0.91009  
alternative hypothesis: true mean difference is less than 0  
95 percent confidence interval:  
 -Inf 56.338271  
sample estimates:  
mean difference  
 25.263158
```

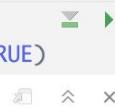
```
{r}
```

```
t.test(men$calorie_2, men$calorie_1, alternative = "less", paired = TRUE)
```



```
{r}
```

```
t.test(women$calorie_2, women$calorie_1, alternative = "less", paired = TRUE)
```



```
{r}  
t.test(exercise$calorie_2, exercise$calorie_1, alternative =  
"less", paired = TRUE)
```



Paired t-test

```
data: exercise$calorie_2 and exercise$calorie_1  
t = -1.57485, df = 105, p-value = 0.05915  
alternative hypothesis: true mean difference is less than 0  
95 percent confidence interval:  
 -Inf 1.9217784  
sample estimates:  
mean difference  
-35.754717
```

```
{r}
```

```
t.test(survey$calorie_2, survey$calorie_1, alternative = "less",
       paired = TRUE)
```

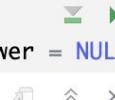


Paired t-test

```
data: survey$calorie_2 and survey$calorie_1
t = -1.6611, df = 109, p-value = 0.049784
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
 -Inf -0.047119604
sample estimates:
mean difference
-36.454545
```

```
{r}
```

```
pwr.t.test(n = length(survey$calorie_1), d = cohen_d, sig.level = .05, power = NULL)
```



Two-sample t test power calculation

```
n = 110
d = 0.047614066
sig.level = 0.05
power = 0.064275521
alternative = two.sided
```

NOTE: n is number in *each* group

```
{r}
```

```
pwr.t.test(n = NULL, d = cohen_d, sig.level = .05, power = 0.7)
```



Two-sample t test power calculation

```
n = 5445.8073
d = 0.047614066
sig.level = 0.05
power = 0.7
alternative = two.sided
```

NOTE: n is number in *each* group

```
{r}  
t.test(calorie_aware$calorie_2, calorie_aware$calorie_1,  
alternative = "less", paired = TRUE)
```



Paired t-test

```
Paired t-test  
  
data: calorie_aware$calorie_2 and calorie_aware$calorie_1  
t = -3.45838, df = 33, p-value = 0.00075902  
alternative hypothesis: true mean difference is less than 0  
95 percent confidence interval:  
      -Inf -89.063271  
sample estimates:  
mean difference  
-174.41176
```