

# Effects of 'Fat Tax' and Calorie Information on Restaurant Food Choices



Jayson L. Lusk

Professor and Willard Sparks Endowed Chair

Oklahoma State University

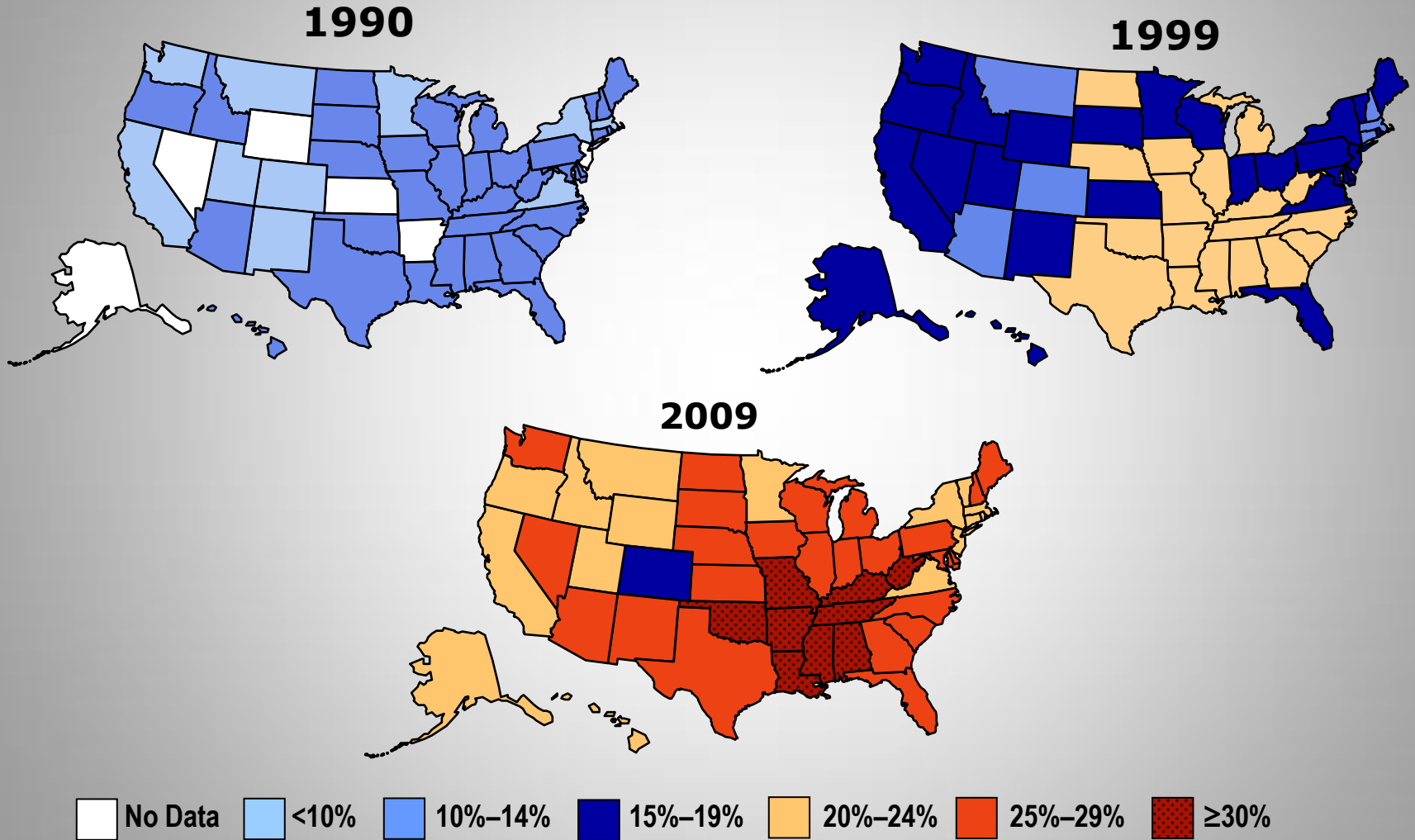
[jayson.lusk@okstate.edu](mailto:jayson.lusk@okstate.edu)

405-744-7465

Joint work with Brenna Ellison and David Davis



# The Problem



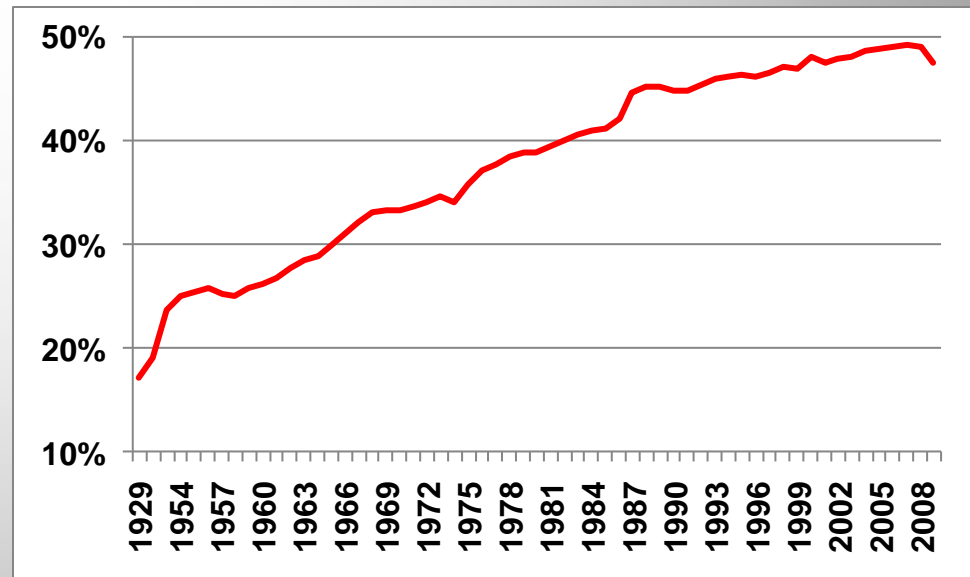
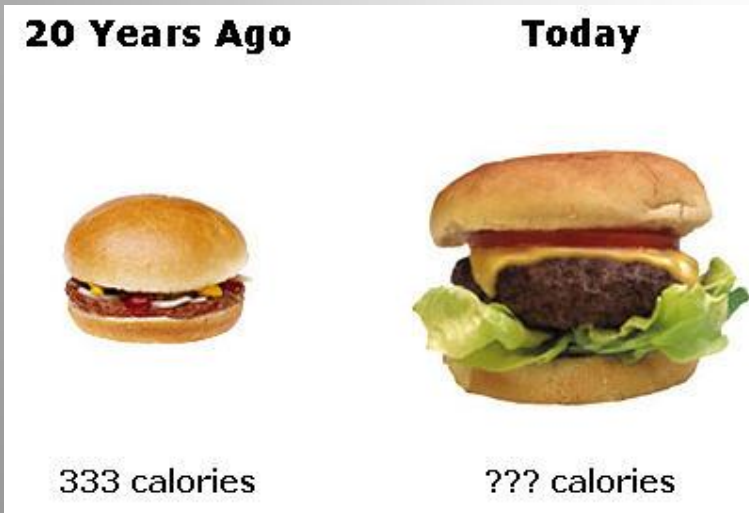
(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)

# Policy

- Obesity imposes significant costs on over-weight people and potentially the health care system
  - whether there is an “externality” is hotly debated
- Proposed policy solutions
  - fat taxes
  - more strategic use of farm subsidies
  - school lunch programs
  - educational programs
  - variety of “information” policies
    - restaurants (particularly fast food outlets) have been a target in recent years

# Restaurants

- More people are eating away from home
  - Food away from home tends to be less healthy than food at home
  - Restaurant portion sizes have increased dramatically over the past 20 years



Expenditures on Food Away from Home as Percentage of Total Food Expenditures (Source: USDA, ERS)

# Menu Labeling

- In 2006, New York City began enforcing menu labeling regulations at chain restaurants
- 2010 health care bill will mandate a standardized menu labeling system for chain restaurants
  - FDA must develop specific guidelines
  - Law was to go into effect by end of March, 2011
  - Postponed until June, 2011

# What Will the Legislation Mandate?

- Restaurants with 20 or more outlets must:
  - Provide calorie information for all menu items
  - Provide additional nutrition information on request
  - Recommend daily caloric intake



# Menu Labeling

- Will the legislation be effective?
  - Research is surprisingly sparse and inconclusive
  - Do consumers really understand caloric intake?
  - What is the economic value of menu labels?
- Is there a better way to label?
  - Symbolic vs. numeric nutritional information
- Is labeling more or less effective than “fat taxes?”

# Objectives

- This research will determine:
  1. Whether caloric labels in a full-service restaurant influences
    - a. food choice
    - b. caloric intake
  2. Whether symbolic calorie labels are more/less influential than numeric calorie labels
  3. The economic value of menu labels
  4. How effective menu labels are relative to “fat” taxes at reducing caloric intake

# Experiment

- Diners at The Rancher's Club in Fall, 2010
  - lunch only
  - 1,500 observations
  - mean expenditure: \$14
- 3 menu treatments
  - Control menu with no nutritional information
  - Calorie-only menu
  - Calorie + traffic light symbol menu
- Pricing
  - 12 weeks of regular menu prices
  - 7 weeks of altered prices (on select items)



## Soup and Salad

- STOCK POT seasonal preparation cup 3 bowl 5
- Ranchers house with SEASONAL GREENS and preparation half 5 full 6
- CAESAR with romaine, grana padano, creamy Caesar, olive oil croutons half 5 full 7
- WEDGE with crisp iceberg, bacon, shaved red onion, Roquefort, butter milk ranch half 5.5 full 7.5
- Add chicken 4, shrimp 6, 6 oz sirloin 8

## Burgers and Sandwiches

- SIGNATURE CHEESE BURGER with cheddar, lettuce, shaved red onion 8.5
- BACON CHEESE BURGER with apple smoked bacon, shaved red onion, cheddar cheese 8.5
- MUSHROOM SWISS BURGER with gruyere cheese, crimini mushrooms 8.5
- BLEU CHEESE BACON BURGER with apple smoked bacon, shaved red onions, lettuce 8.5
- WEST COAST CHEESE BURGER with colby jack, avocado, apple smoked bacon, lettuce, chipotle mayo 8.5
- WEST COAST RANCHER with chicken, colby jack, avocado, apple smoked bacon, lettuce chipotle mayo 9.5
- RANCHERS CLUB with sliced Berkshire ham, prime rib, avocado, apple smoked bacon, lettuce and chipotle mayo 9
- PRESSED CUBAN with sliced Berkshire ham, chipotle mayo, pickles, bacon, gruyere, cowboy toast 9
- PRIME RIB sandwich with caramelized onion, white cheddar, roasted garlic mayo, butter toasted roll 14
- CRAB CAKE sandwich with fresh Maine crab, lemon aioli, lettuce, butter toasted roll 10

## Combo Meals

- PONY EXPRESS with 1/2 sandwich (chicken salad or ham n cheese), soup or salad, drink 7
- COWBOY COMBO with petit house salad, sandwich or burger, dessert, drink 13
- Prime rib is an additional 5

## Homemade Pasta and Rice

- Shaved garlic, extra virgin olive oil, SPAGHETTI cherry tomatoes half 6 full 10
- Fennel sausage, RIGATONI, greens half 8 full 12
- Black pepper, LINGUINI FINI, grana padano, pecorino half 7 full 11
- Curried LENTILS with jasmine rice 8
- PINCHITOS of farmers market vegetables, mozzarella, and cous cous 8

We proudly serve locally grown produce, meats, and cheeses.

## Soup and Salad

- STOCK POT seasonal preparation cup (50 calories) 3 bowl (80 calories) 5
- Ranchers house with SEASONAL GREENS and preparation half (70 calories) 5 full (90 calories) 6
- CAESAR with romaine, grana padano, creamy Caesar, olive oil croutons half (330 calories) 5 full (550 calories) 6
- WEDGE with crisp iceberg, bacon, shaved red onion, Roquefort, butter milk ranch half (420 calories) 5.5 full (620 calories) 7.5
- Add chicken (250 calories) 4, shrimp (60 calories) 6, 6 oz sirloin (290 calories) 8

## Burgers and Sandwiches

- SIGNATURE CHEESE BURGER with cheddar, lettuce, shaved red onion (820 calories) 8.5
- BACON CHEESE BURGER with apple smoked bacon, shaved red onion, cheddar cheese (920 calories) 8.5
- MUSHROOM SWISS BURGER with gruyere cheese, crimini mushrooms (820 calories) 8.5
- BLEU CHEESE BACON BURGER with apple smoked bacon, shaved red onions, lettuce (920 calories) 8.5
- WEST COAST CHEESE BURGER with colby jack, avocado, apple smoked bacon, lettuce, chipotle mayo (970 calories) 8.5
- WEST COAST RANCHER with chicken, colby jack, avocado, apple smoked bacon, lettuce chipotle mayo (590 calories) 9.5
- RANCHERS CLUB with sliced Berkshire ham, prime rib, avocado, apple smoked bacon, lettuce and chipotle mayo (920 calories) 9
- PRESSED CUBAN with sliced Berkshire ham, chipotle mayo, pickles, bacon, gruyere, cowboy toast (660 calories) 9
- PRIME RIB sandwich with caramelized onion, white cheddar, roasted garlic mayo, butter toasted roll (890 calories) 14
- CRAB CAKE sandwich with fresh Maine crab, lemon aioli, lettuce, butter toasted roll (350 calories) 10

## Combo Meals

- PONY EXPRESS with 1/2 sandwich (chicken salad or ham n cheese), soup or salad, drink (370 calories) 7
- COWBOY COMBO with petit house salad, sandwich or burger, dessert, drink (sandwich + 370 calories) 13
- Prime rib is an additional 5

## Homemade Pasta and Rice

- Shaved garlic, extra virgin olive oil, SPAGHETTI cherry tomatoes half (340 calories) 6 full (550 calories) 10
- Fennel sausage, RIGATONI, greens half (260 calories) 8 full (490 calories) 12
- Black pepper, LINGUINI FINI, grana padano, pecorino half (370 calories) 7 full (660 calories) 11
- Curried LENTILS with jasmine rice (210 calories) 8
- PINCHITOS of farmers market vegetables, mozzarella, and cous cous (280 calories) 8

We proudly serve locally grown produce, meats, and cheeses.

\*Caloric values are estimates - actual values may vary due to individual meal preparation.

● Items with 400 calories or less ● items with 401-800 calories ● items with over 800 calories

# Control Menu (No information)

## *Burgers and Sandwiches*

SIGNATURE CHEESE BURGER with cheddar, lettuce, shaved red onion 8.5

BACON CHEESE BURGER with apple smoked bacon, shaved red onion, cheddar cheese 8.5

MUSHROOM SWISS BURGER with gruyere cheese, crimini mushrooms 8.5

BLEU CHEESE BACON BURGER with apple smoked bacon, shaved red onions, lettuce 8.5

WEST COAST CHEESE BURGER with colby jack, avocado, apple smoked bacon, lettuce, chipotle mayo 8.5

WEST COAST RANCHER with chicken, colby jack, avocado, apple smoked bacon, lettuce chipotle mayo 9.5

RANCHERS CLUB with sliced Berkshire ham, prime rib, avocado, apple smoked bacon, lettuce and chipotle mayo 9

PRESSED CUBAN with sliced Berkshire ham, chipotle mayo, pickles, bacon, gruyere, cowboy toast 9

PRIME RIB sandwich with caramelized onion, white cheddar, roasted garlic mayo, butter toasted roll 14

CRAB CAKE sandwich with fresh Maine crab, lemon aioli, lettuce, butter toasted roll 10

# Calorie Only Menu

## *Burgers and Sandwiches*

SIGNATURE CHEESE BURGER with cheddar, lettuce, shaved red onion (820 calories) 8.5

BACON CHEESE BURGER with apple smoked bacon, shaved red onion, cheddar cheese (920 calories) 8.5

MUSHROOM SWISS BURGER with gruyere cheese, crimini mushrooms (820 calories) 8.5

BLEU CHEESE BACON BURGER with apple smoked bacon, shaved red onions, lettuce (920 calories) 8.5

WEST COAST CHEESE BURGER with colby jack, avocado, apple smoked bacon, lettuce, chipotle mayo (970 calories) 8.5

WEST COAST RANCHER with chicken, colby jack, avocado, apple smoked bacon, lettuce chipotle mayo (590 calories) 9.5

RANCHERS CLUB with sliced Berkshire ham, prime rib, avocado, apple smoked bacon, lettuce and chipotle mayo (760 calories) 9

PRESSED CUBAN with sliced Berkshire ham, chipotle mayo, pickles, bacon, gruyere, cowboy toast (660 calories) 9

PRIME RIB sandwich with caramelized onion, white cheddar, roasted garlic mayo, butter toasted roll (890 calories) 14

CRAB CAKE sandwich with fresh Maine crab, lemon aioli, lettuce, butter toasted roll (350 calories) 10

# Calorie + Traffic Light Menu

## *Burgers and Sandwiches*

 SIGNATURE CHEESE BURGER with cheddar, lettuce, shaved red onion (820 calories) 8.5

 BACON CHEESE BURGER with apple smoked bacon, shaved red onion, cheddar cheese (920 calories) 8.5

 MUSHROOM SWISS BURGER with gruyere cheese, crimini mushrooms (820 calories) 8.5

 BLEU CHEESE BACON BURGER with apple smoked bacon, shaved red onions, lettuce (920 calories) 8.5

 WEST COAST CHEESE BURGER with colby jack, avocado, apple smoked bacon, lettuce, chipotle mayo (970 calories) 8.5

 WEST COAST RANCHER with chicken, colby jack, avocado, apple smoked bacon, lettuce chipotle mayo (590 calories) 9.5

 RANCHERS CLUB with sliced Berkshire ham, prime rib, avocado, apple smoked bacon, lettuce and chipotle mayo (760 calories) 9

 PRESSED CUBAN with sliced Berkshire ham, chipotle mayo, pickles, bacon, gruyere, cowboy toast (660 calories) 9

 PRIME RIB sandwich with caramelized onion, white cheddar, roasted garlic mayo, butter toasted roll (890 calories) 14

 CRAB CAKE sandwich with fresh Maine crab, lemon aioli, lettuce, butter toasted roll (350 calories) 10



Items with 400 calories or less



items with 401-800 calories



items with over 800 calories

# Price Intervention

<b>Menu Item</b>	<b>Calories</b>	<b>Original Price</b>	<b>New Price</b>	<b>Percent Change</b>
Bacon Cheese Burger	920	8.5	9.5	+11.76%
Bleu Cheese Bacon Burger	920	8.5	9.5	+11.76%
West Coast Cheese Burger	970	8.5	10	+17.65%
West Coast Rancher Sandwich	590	9.5	8.5	-10.53%
Cowboy Combo	1185	13	16	+23.08%
Lentils	210	8	7	-12.50%
Pinchitos	280	8	7	-12.50%

# Methods

- Statistical model of consumer demand
  - Receipt data used to create model of the choice of main entrée
- Model Predictions
  - What menu item people will choose?
  - What are diners willing to pay (WTP)?
  - How many calories consumed?
  - How much will diners spend?

# Discrete Choice Model



\$7  
550 cal



\$8  
850 cal



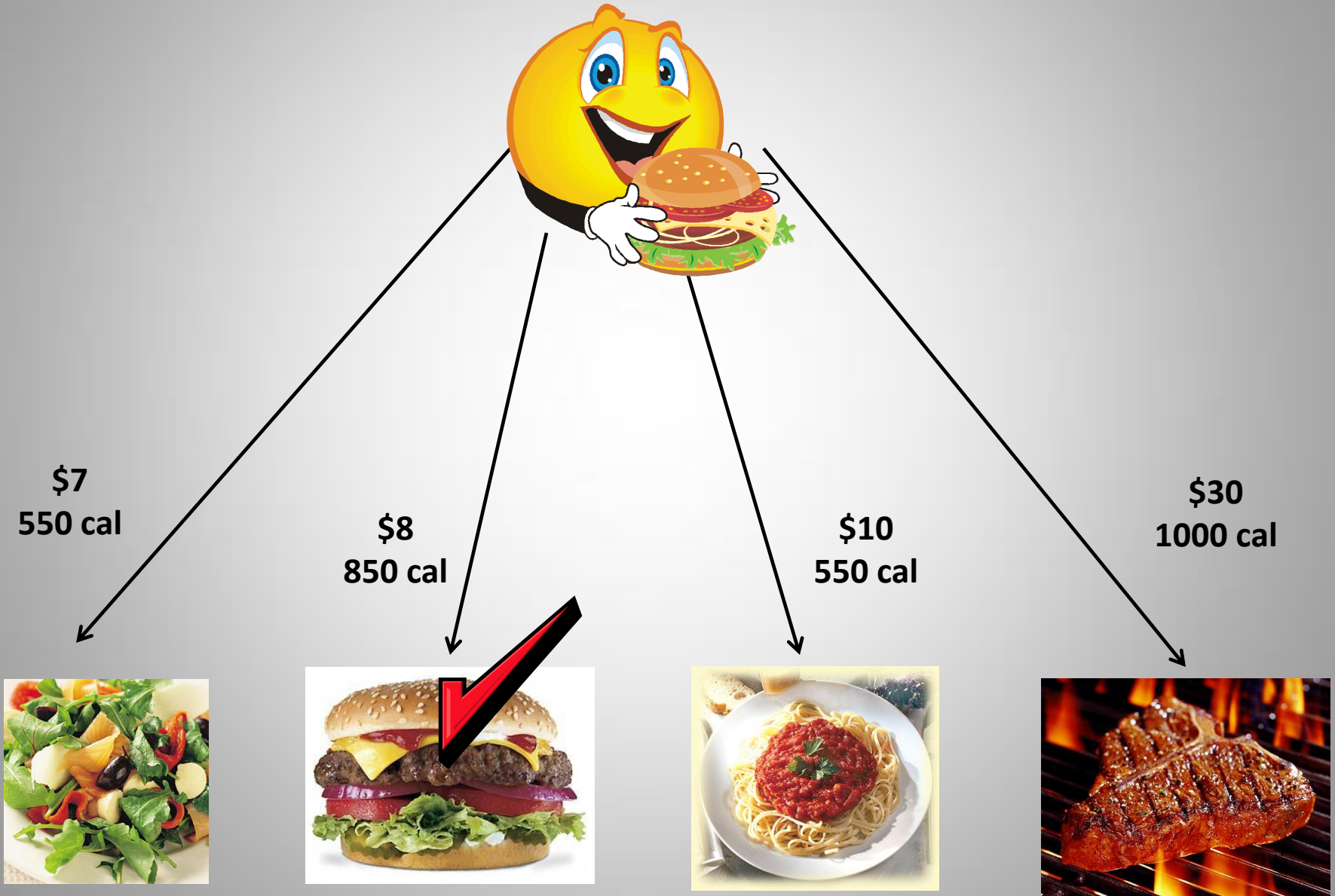
\$10  
550 cal



\$30  
1000 cal

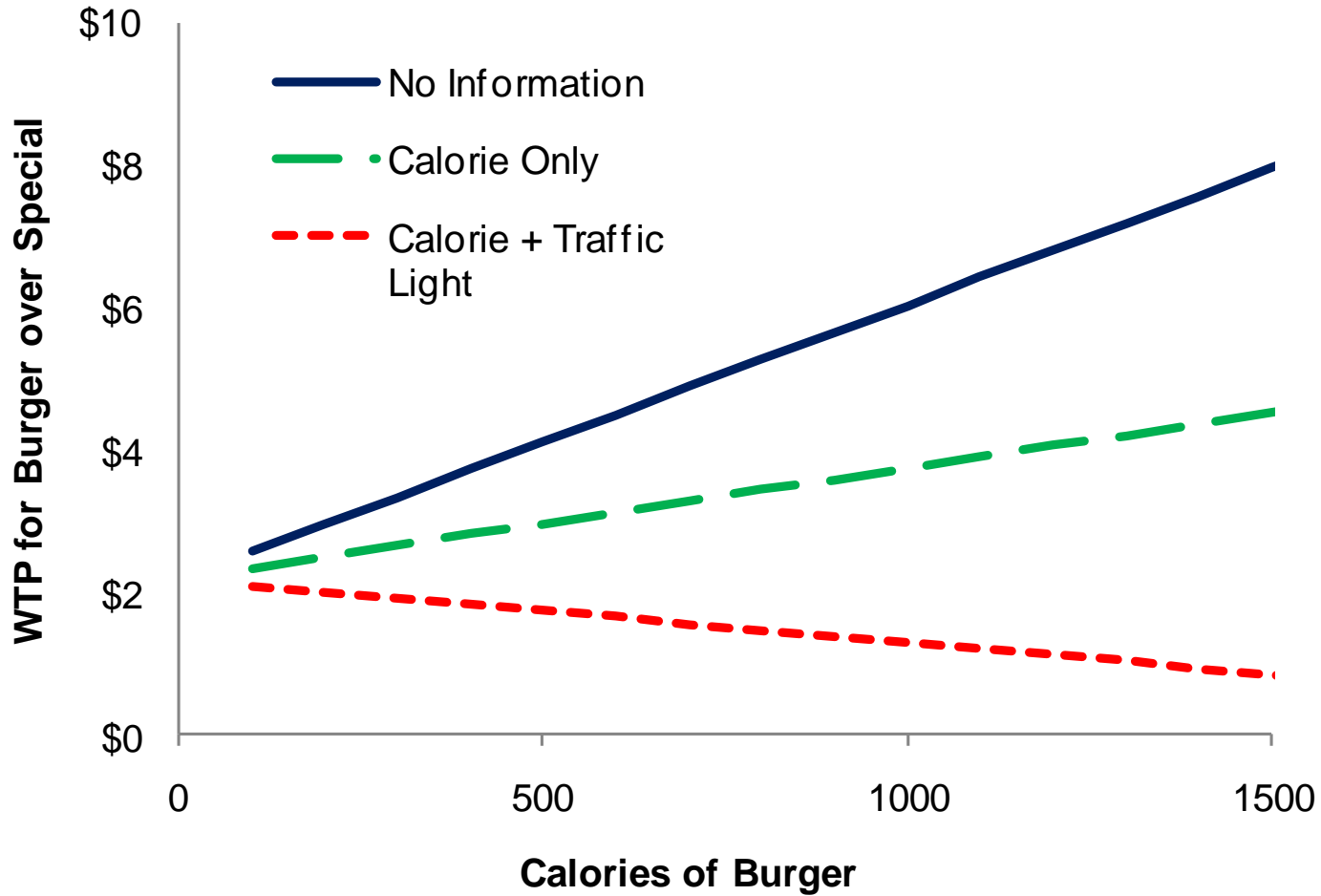


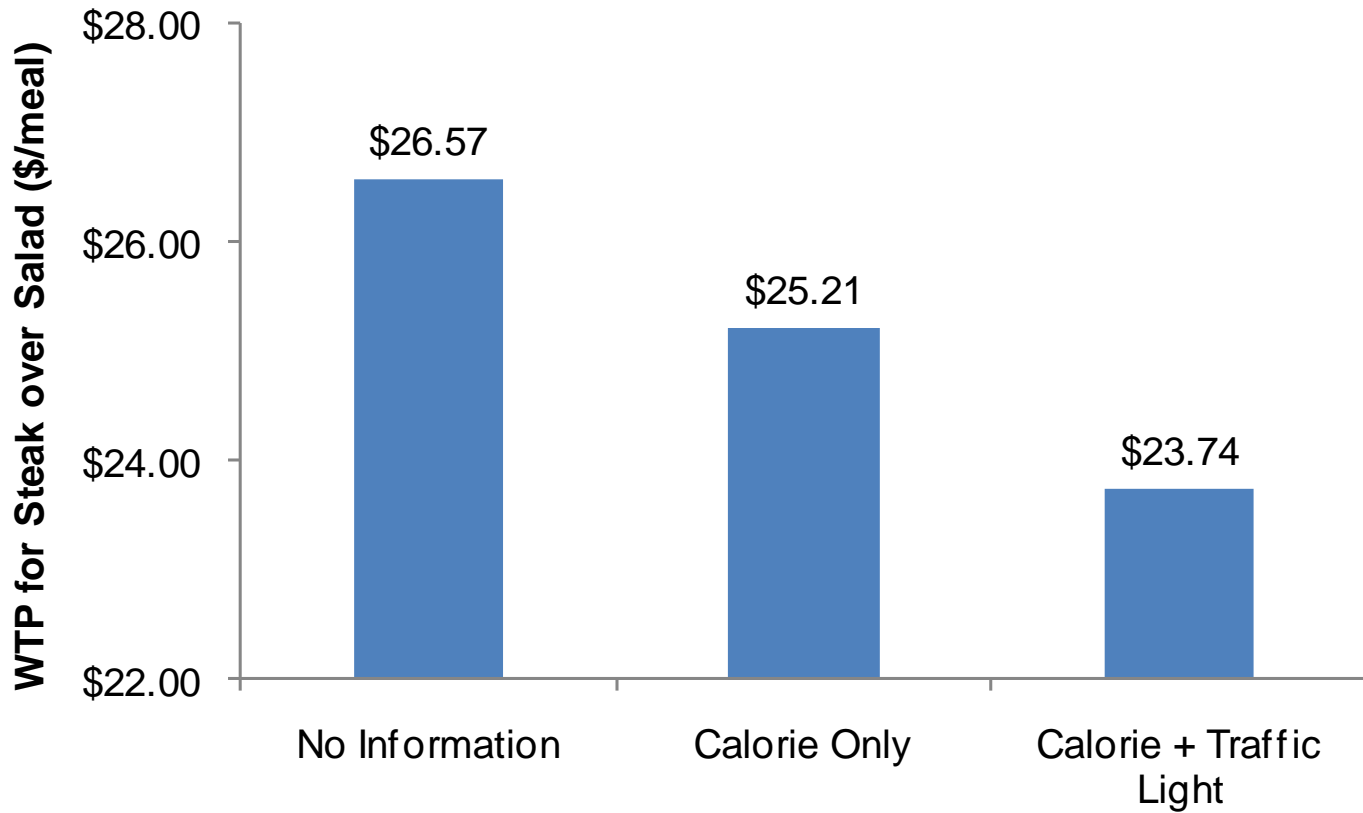
# Discrete Choice Model



# Results







# Value of Information

- Willingness-to-pay to have calorie only information vs. no information
  - \$0.03/meal
- Willingness-to-pay to have calorie + traffic light information vs. no information
  - \$0.1335/meal
  - If you eat out 100 times a year, the value of the new menu is \$13.35/year

# Simulated Calorie Impacts

---

Policy Option	Expected Calories Consumed (kcal/person/entrée)	Change from Status Quo
Status-quo	641.0	
Thin Subsidy	629.5	-11.5
Fat tax	619.0	-22.0
Calorie Label	613.6	-27.4
Calorie + Traffic Light Symbol	585.4	-55.6

---

For a reduction of 56 cal/meal, one would have to eat at this restaurant 63 times to lose 1 lb

One 12oz can of Coke = 155 calories

One 12oz can of Budweiser = 146 calories

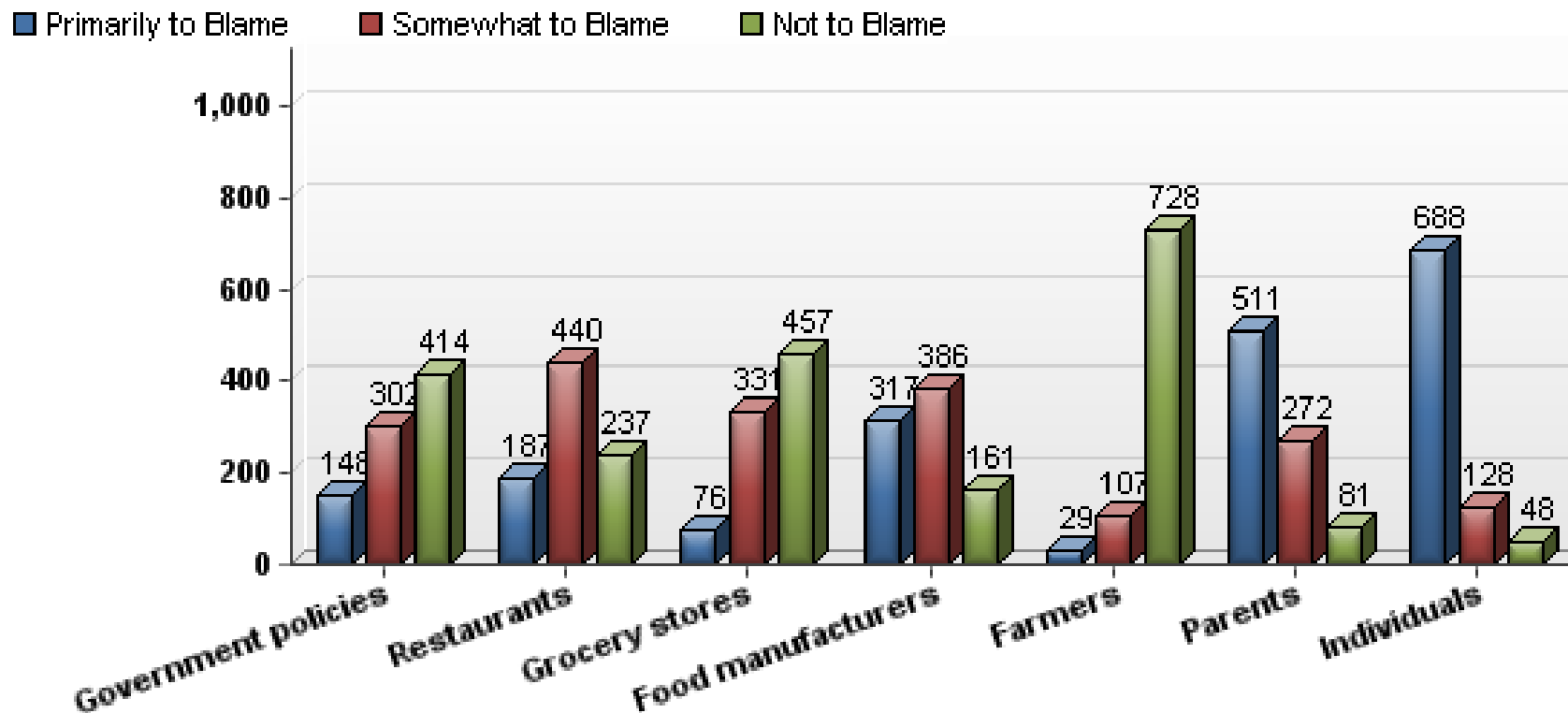
# Simulated Revenue Impacts

<b>Policy Option</b>	<b>Expected Revenue (\$/person/entree)</b>	<b>Change from Status Quo</b>
Status-quo	\$11.19	
Thin Subsidy	\$10.82	-\$0.37
Fat tax	\$11.21	\$0.02
Calorie Label	\$10.97	-\$0.22
Calorie + Traffic Light Symbol	\$10.75	-\$0.44

# Conclusions

- Simple numeric caloric information only has very modest (if any) effect on choice and calorie intake
- Symbolic nutritional information (traffic light menu) has more pronounced effect on choice and caloric intake
- Menu labels leads to lower caloric intake than “fat taxes” or “thin subsidies”
- Overall, the changes are small
  - traffic light menu lowers caloric intake by 55 kcal per meal
  - value of calorie information is \$0.03 to \$0.13 per meal

# Who is to Blame for Obesity? (N=864)



# Funding Acknowledgements

- USDA-NIFA, National Needs Graduate Fellowship
- USDA-NIFA, Hatch Funding
- Willard Sparks Endowed Chair

# Questions?

