

# The Growing Concern of Poverty in the United States



## An exploration of food prices and poverty on obesity rates for low-income citizens

Ethan Bailey, Catherine Gillespie, Kathy Gray, JP. Zivalich

**ABSTRACT** As obesity rates have increased in the United States, the amount of scholarly research on the epidemic has correspondingly increased. Past studies have found a myriad of indicators affecting obesity, however this study focuses on which commonly studied indicator, poverty or food prices, has a greater influence on obesity rates.

### DATA

Dependent Variable – Obesity	
Percent obese	
Independent Variable - Food Price	
Sugar/sweets price index	
Fruits/vegetables price index	
Caloric sweetener consumption	
Refined sugar consumption	
Oil prices	
Gas prices	
High fructose corn syrup price	
Refined sugar price	
Agricultural subsidies	
Independent Variable – Poverty	
Percent on food stamps	
Percent in poverty	
Unemployment rate	

**RESULTS** Which action, reducing poverty or reducing food price, would be more successful in eliminating obesity in the United States? Analysis suggests that lowering food prices would be the stronger driver.

The trend analysis confirmed rising obesity rates. Additionally, trends revealed that food prices are rising and that poverty rates are generally cyclical.

The correlation analysis that followed revealed that both food price indicators and poverty indicators showed positive correlations with obesity. However, a stronger relationship existed between food price and obesity than between poverty level and obesity.

Finally, the regression analysis revealed that fruits and vegetables price index is a significant measure of obesity levels, and the data was a close fit. Also, it was determined that the percentage of people on food stamps had a statistically significant effect on obesity as well, but the model had a worse fit.

### ACKNOWLEDGMENTS

Professor Suzanne Coshow, for her guidance throughout the entire project  
 Stephen Hayes & Pete Pietraszewski for their help in the data collection process

### CONTACT INFORMATION

Ethan Bailey: ebailey@nd.edu  
 Catherine Gillespie: cgillesp@nd.edu  
 Kathy Gray: kgray@nd.edu  
 JP. Zivalich: jzivalic@nd.edu

### METHODS

**TREND ANALYSIS** The research group first analyzed historical trends in the obesity, food price, and poverty data sets. Graphs were made through Excel and trend lines were calculated where applicable. This analysis created a foundation for the research group as it further analyzed the data sets.

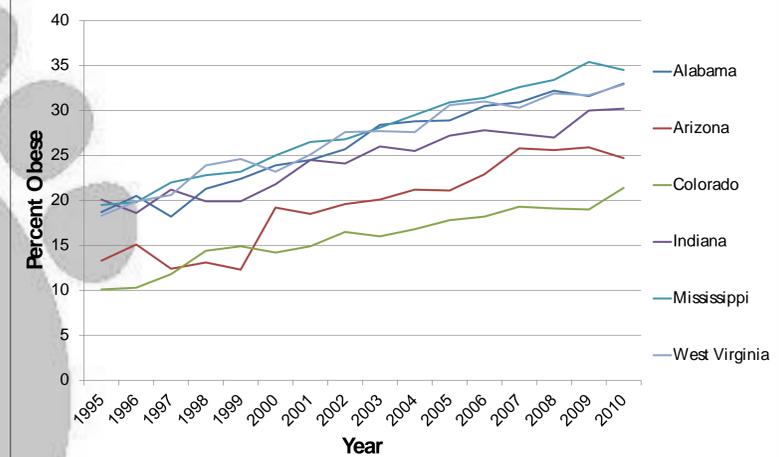
**CORRELATION ANALYSIS** After analyzing data trends, the research group conducted a correlation analysis of each indicator group—food prices and poverty—against obesity rates. This analysis was performed through Stata. This analysis gave input on which indicator group is more closely correlated with obesity rates.

**REGRESSION ANALYSIS** The third and final step of the research analysis was a regression analysis between indicators and obesity. All indicators were regressed before removing insignificant indicators. This analysis also gave input on which indicator group is more closely correlated with obesity rates.

**LIT REVIEW** Obesity has become an epidemic in the United States. Approximately one-third of American adolescents are at risk of becoming obese or are already obese and direct health care costs of obesity are estimated at over \$100 billion.

Diet quality is notably affected by socioeconomic status, with more disadvantaged groups suffering from higher rates of obesity than those with higher income. While studies have found that a multitude of influences affect consumption, two of the most commonly cited variables correlated with low-income obesity are poverty factors and food prices. The research outlined here not only focused on the ways in which poverty and food prices relate to obesity but also assessed the magnitude of the relationship in order to determine which of the two indicators has a statistically stronger relationship to the disease at hand.

Maximum/Minimum Obesity Percentages for U.S. States from 1995-2010



**IMPLICATIONS** This research suggests that lowering food prices, rather than reducing poverty levels, would be a stronger driver in alleviating obesity rates in the United States.

A suggested action to alleviate obesity would be for government and corporations to work together to fight rising food prices. Governments specifically should focus on reforming the Food Stamp Program and should discover ways to influence those in the Program, potentially through consumer and supplier incentives for healthy food. Businesses should aim to market their products as both healthy and tasty, and should work toward passing industry nutrition and health standards.

Overall, lowering food prices can potentially reduce the obesity levels in the United States, especially concerning those in poverty. As many factors influence obesity, government, businesses, and consumers should collaborate to develop changes in societal behaviors and improve dietary choices.

### Indicator & Obesity Correlations

Indicator Category	Indicator	Correlation Against Obesity	N
<b>Food Price Indicators</b>			
	FV Price Index	0.947	16
	SS Price Index	0.934	16
	Gas/gallon Price	0.906	15
	Oil/barrel Price	0.879	16
	Annual Sweets Consumption Per Capital	-0.819	16
	Price of Sugar (lb)	0.794	16
	Price of Corn Syrup (lb)	0.74	16
<b>Poverty Indicators</b>			
	Percent on Food Stamps	0.597	549
	Percent Unemployed	0.437	547

### Indicator & Obesity Regressions

Indicator	Coefficient	P-value
% Food Stamp	0.8045101	0*
% Poverty	-0.0918434	0.153
% Unemployment	-0.0692683	0.592
Constant	18.00541	0
Observation	397	
Adj R-Squared	0.4246	
Indicator	Coefficient	P-value
FVPI	0.2301216	0.028*
Sugar Sweets PI	0.0811668	0.133
Constant	-10.94367	2.867438
Observations	16	
Adj R-Squared	0.9004	

### REFERENCES

Burke, Jessica G., Keane, Christopher R., & Walker, Renee E. "Disparities and access to healthy food in the United States: A review of food deserts literature." *Health & Place* 16.5 (2010): 876-884.  
 Cassidy, Diana L., & Jetter, Karen M. "The Availability and Cost of Healthier Food Alternatives." *American Journal of Preventive Medicine*. 30.1 (2006): 38-44.  
 Darmon, Nicolas, & Drewnowski, Adam. "Does social class predict diet quality?" *American Journal of Clinical Nutrition*. Vol. 87 (2008): 5, 1107-1117.  
 Just, David R., Mancino, Lisa, & Wansink, Brian. "Could Behavioral Economics Help Improve Diet Quality for Nutrition Assistance Program Participants?" *Economics, Management and Financial Markets* 5.2 (2010): 174-200.  
 Goldberg, Marvin, and Kunter Gussard. "Creating an Environment in Which Youths Are Encouraged to Eat a Healthier Diet." *Journal of Public Policy & Marketing*. 26.2 (2007): 162.  
 Martin, Seth. "From Poverty to Obesity: Exploration of the Food Choice Constraint Model and the Impact of an Energy-Dense Food Tax." *The American Economist*. 49.2 (2005): 78-86.  
 Natarajan, Vivek S., and Kabir C. Sen. "Antecedents of Population Health Across US States: An Empirical Investigation." *Journal of Management Policy and Practice* 12.2 (2011): 97-97.  
 102.  
 Petty, Ross D., & Siders, Kathleen. "Obesity and the Role of Food Marketing: A Policy Analysis of Issues and Remedies." *Journal of Public Policy & Marketing*. Vol. 32 (2004): 2, 153-169.  
 Wang, May C., Sponson Kim, Alma A. Gonzalez, Kara E. MacLeod, and Marilyn A. Winkley. "Evidence based public health policy and practice: Socioeconomic and Food-related Physical Characteristics of the Neighbourhood Environment Are Associated with Body Mass Index." *Journal of Epidemiology and Community Health* (1979-), 61.6 (2007): 491-498.