

# USDA Food Assistance Programs (SNAP, the National School Lunch Program, and the School Breakfast Program) and Healthy Food Choices: Quasi-Experimental Evidence from Geographic Variation in Food Prices

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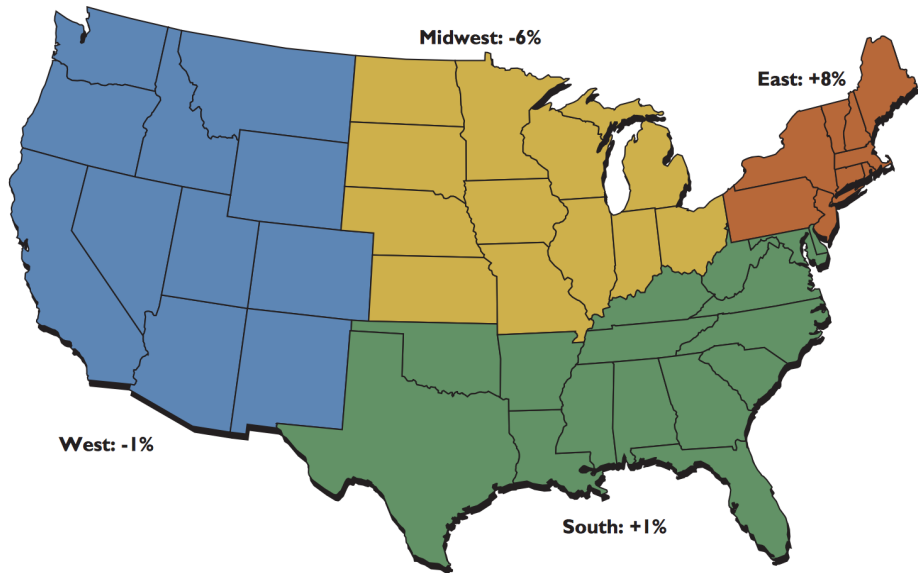
# Our Research I

- ▶ While legislated maximum SNAP benefits are fixed across 48 states, food prices vary significantly across geographic locations.
- ▶ Deductions for costs of housing, medical care, and dependent care help, but are not sufficient sufficient to equalize real value of SNAP benefits across geographic areas (Breen et al., 2011).
- ▶ Food price variation has been studied using BLS data at the census region level, or using QFAHPD for 35 market groups (Gregory & Coleman-Jensen, 2013).

## Our Research II

- ▶ What fraction of recipients can actually afford the TFP locally?
- ▶ What does SNAP relative generosity do to child health?
- ▶ **What does SNAP relative generosity do to nutrition?**

## Variation in food prices from national average, 2004-07



Source: Calculations by USDA, Economic Research Service using Bureau of Labor Statistics' average retail price data.

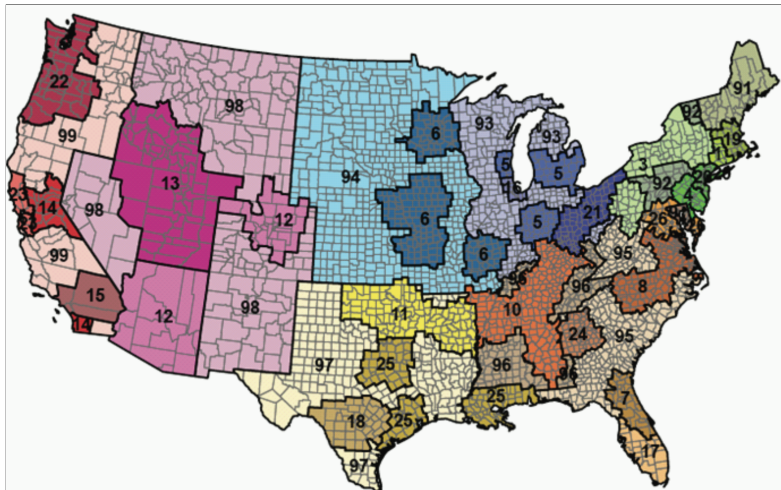


Figure: Quarterly Food-at-Home Price Database market groups, 2002-06  
 (Source: Todd et al 2010)

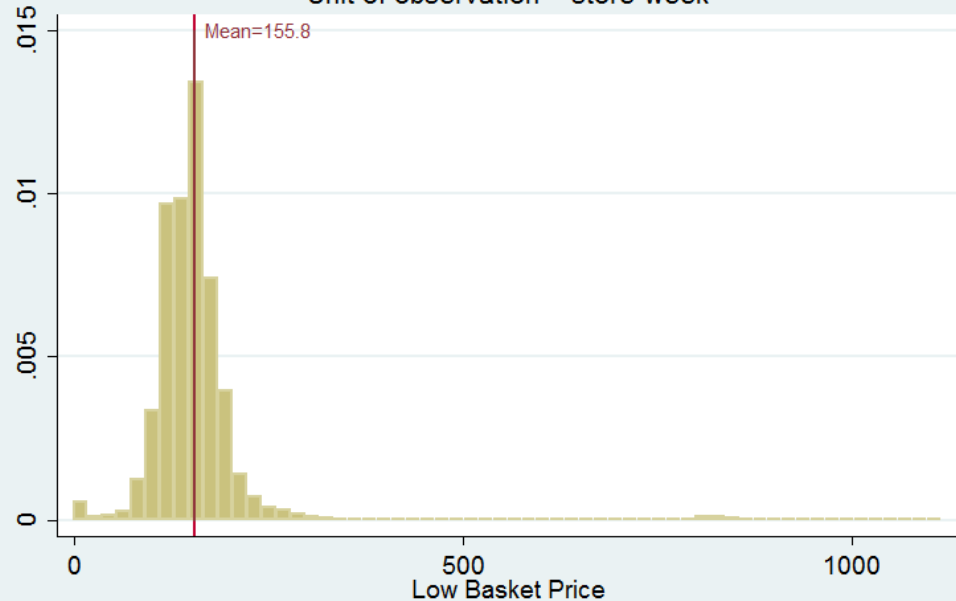
# FoodAPS

“USDA’s National Household Food Acquisition and Purchase Survey (FoodAPS) is the first nationally representative survey of American households to collect unique and comprehensive data about household food purchases and acquisitions.”

- ▶ FoodAPS lets us look at the relationship between food prices and SNAP adequacy at a much finer geographical level.
- ▶ We compare households’ SNAP benefits to the prices these households face for a standardized bundle of foods: The Thrifty Food Plan.

# Cost of the Thrifty Food Plan

Unit of observation = store-week



# Research Questions

1. Are SNAP benefits adequate for SNAP households to purchase the TFP? If not, what is the shortfall?

Compare TFP cost to:

- ▶ SNAP benefit received + 30% of net income
  - ▶ Legislated maximum SNAP benefit
2. What about for SNAP-eligible households?
  3. For which types of households are SNAP benefits inadequate?



## Sufficiency Rates of SNAP for **Recipient** Households by Distance from Stores

	Average	Standard Error	N	Average	Standard Error	N
		Net Income			Max Benefits	
Census Region Median	78%	0.02	1444	83%	0.03	1581
State Median	79%	0.02	1444	76%	0.04	1581
County Median	79%	0.02	1436	74%	0.04	1572
20-mile Median	78%	0.02	1338	73%	0.04	1464
10-mile Median	78%	0.02	1311	73%	0.04	1433
5-mile Median	77%	0.02	1224	72%	0.04	1338
3.4-mile Median	77%	0.02	1174	74%	0.04	1281
2.5mile Median	77%	0.02	1123	72%	0.04	1225
10-nearest Median	79%	0.02	1338	77%	0.03	1464
5-nearest Median	78%	0.02	1332	71%	0.03	1458
Census Region Minimum	100%	0.00	1444	100%	0.00	1581
State Minimum	99%	0.00	1444	100%	0.00	1581
County Minimum	94%	0.01	1436	100%	0.00	1572
20-mile Minimum	95%	0.01	1338	100%	0.00	1464
10-mile Minimum	93%	0.01	1311	100%	0.00	1433
5-mile Minimum	91%	0.01	1224	99%	0.00	1338
3.4-mile Minimum	90%	0.01	1174	100%	0.00	1281
2.5mile Minimum	90%	0.01	1123	99%	0.01	1225
10-nearest Minimum	91%	0.01	1338	100%	0.00	1464
5-nearest Minimum	89%	0.01	1332	98%	0.01	1458
2-nearest Minimum	83%	0.02	1332	85%	0.02	1458

## Sufficiency Rates of SNAP for **Eligible** Households by Distance from Stores

	Average	Standard Error	N	Average	Standard Error	N
	Simulated Benefits			Max Benefits		
Region Median	94%	0.01	2405	78%	0.03	2405
State Median	93%	0.01	2405	73%	0.03	2405
County Median	93%	0.01	2395	71%	0.05	2395
20-mile Median	92%	0.01	2242	69%	0.05	2242
10-mile Median	92%	0.01	2189	68%	0.04	2189
5-mile Median	91%	0.01	2043	67%	0.04	2043
3.4-mile Median	91%	0.01	1962	68%	0.04	1962
2.5mile Median	92%	0.01	1879	68%	0.04	1879
10-nearest Median	93%	0.01	2242	72%	0.03	2242
5-nearest Median	92%	0.01	2237	64%	0.03	2237
Region Minimum	100%	0.00	2405	100%	0.00	2405
State Minimum	100%	0.00	2405	100%	0.00	2405
County Minimum	100%	0.00	2395	100%	0.00	2395
20-mile Minimum	100%	0.00	2242	99%	0.01	2242
10-mile Minimum	100%	0.00	2189	100%	0.00	2189
5-mile Minimum	99%	0.00	2043	98%	0.00	2043
3.4-mile Minimum	99%	0.00	1962	98%	0.01	1962
2.5mile Minimum	99%	0.00	1879	97%	0.01	1879
10-nearest Minimum	100%	0.00	2242	99%	0.01	2242
5-nearest Minimum	99%	0.00	2237	97%	0.01	2237
2-nearest Minimum	96%	0.00	2237	82%	0.02	2237

## Characteristics of Households by SNAP Sufficiency

Characteristic	SNAP Recipients			SNAP Eligible		
	No	Yes	P-value	No	Yes	P-value
Family Size	2.78	2.65	0.43	2.52	2.21	0.11
Household Max Age	50.83	49.35	0.30	53.22	53.00	0.89
Household Min Age	27.00	28.14	0.65	34.82	37.21	0.43
Income Per Person	952.04	894.23	0.52	1571.35	1354.35	0.18
Income	2392.80	1950.32	0.05	3059.18	2355.08	0.04
Percent of Poverty Line	141.95	124.20	0.12	209.82	172.74	0.08
HH Has Earned Income	0.50	0.53	0.57	0.60	0.55	0.21
Household Max Education	20.08	19.65	0.10	20.76	20.24	0.09
HH Has Elderly Member	0.30	0.27	0.40	0.38	0.37	0.83
Nonmetro Area	0.03	0.17	0.01	0.03	0.17	0.02
Metro Area	0.97	0.83	0.01	0.97	0.83	0.02
High Food Security	0.34	0.32	0.52	0.45	0.50	0.44
Marginal Food Security	0.25	0.21	0.24	0.23	0.19	0.13
Low Food Security	0.24	0.26	0.57	0.21	0.16	0.08
Very Low Food Security	0.18	0.21	0.40	0.11	0.16	0.02
Troube Paying Bills	0.30	0.27	0.45	0.18	0.17	0.83
High Price Area	0.88	0.00	0.00	0.90	0.00	0.00
Northeast	0.22	0.09	0.25	0.29	0.09	0.13
Midwest	0.24	0.34	0.33	0.16	0.35	0.05
South	0.33	0.43	0.25	0.32	0.42	0.33
West	0.21	0.14	0.49	0.22	0.14	0.39

# Conclusions and Concerns from Variation in Sufficiency

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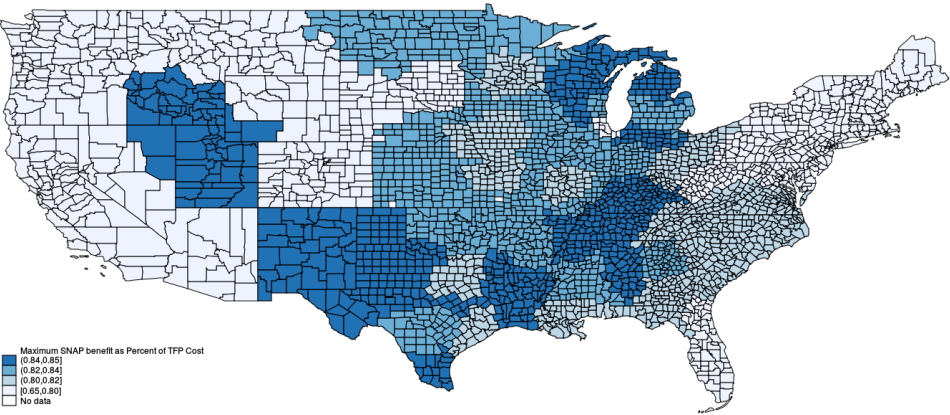
1. Fraction of SNAP households who can afford to purchase the TFP within their county 75% to 80%.
  - ▶ Matters less what shopping radius you use than whether people can find and shop at minimum store.
2. Estimated measures of SNAP adequacy are higher among SNAP-eligible households than SNAP recipients, with results dependent on benefit calculation method.
3. Families in high-price and perhaps metro areas are less able to afford the TFP.
4. Gap measure hard to define in useful relative terms (zero/very low income, benefits).

# Health Effects

Bronchetti, Christensen, Hoynes

## The Real Value of SNAP Benefits and Health Outcomes

- ▶ Use QFAHPD and restricted access geo-located NHIS to look at how food price variation affects health outcomes among SNAP recipients and SNAP eligibles (UKCPR).
- ▶ 10 percent increase in SNAP purchasing power increases the likelihood a child had a check-up in the past year by 5.4 percent and may reduce the likelihood that children delay or go without care due to cost.
- ▶ We do not find much evidence that these higher prices cause detrimental impacts on health status, the likelihood of a hospitalization, or other measures of physical (e.g., obesity) and mental health (e.g., child has emotional problems). School days is exception.



## Health Care Utilization

	(1)	(2)	(3)
	Had a checkup past 12m	Doctor's visit past 12m	Delay or forgo care past 12m
log(SNAPMAX/TFP)	0.435** (0.205)	0.221 (0.141)	-0.148** (0.068)
Mean of dep. var.	0.766	0.895	0.0563
Effect of 10% increase in SNAP purchasing power	0.041	0.021	-0.014
As a % of mean of dep. var.	<b>5.4%</b>	2.3%	<b>-24.9%</b>
N	18,746	18,884	18,884
R2	0.083	0.043	0.020

## Health Outcomes

	(1)	(2)	(3)
	Health status excellent or very good	Hospitalized overnight past 12m	School days missed due to illness
log(SNAPMAX/TFP)	-0.106 (0.185)	0.080 (0.079)	-10.340** (3.873)
Mean of dep. var.	0.701	0.078	4.956
Effect of 10% increase in SNAP purchasing power	-0.010	0.000	-0.986
As a % of mean of dep. var.	-1.4%	0.0%	<b>-19.9%</b>
N	18,880	18,872	11,942
R2	0.034	0.150	0.038



# Nutrition

Bronchetti, Christensen, Hansen

- ▶ Use local relative generosity of SNAP to measure nutrition impacts.
- ▶ Outcomes:
  - ▶ HEI (total, fruit, veg)
  - ▶ sugar, fat, alcohol (sofa\_perc)
  - ▶ self-reported nutrition status
- ▶ Cross-sectional data: plan to use Altonji, Elder, Taber method to compare with and without observable controls.
- ▶ National School Lunch Program and the School Breakfast Program as mediators.

# Nutrition

$$\text{Nutrition}_{ij} = \alpha + \beta \cdot f(\text{TFP}_{ij}, \text{MAXSNAP}_{ij}) + X_{ij} \cdot \theta + \delta_j + \epsilon_{ij}$$

- ▶ Function could be  $\log(\text{TFP}_{ij})$ ,  $\log(\text{SNAPMAX}_{ij} / \text{TFP}_{ij})$ , sufficiency[0/1], or gap[cont.].
- ▶  $X$  is rural, nonmetro, troublebills, largeexp, highpricearea, inchhavg, famsize, nocar, anytobacco, snapdays\_final, WIC eligibility.
- ▶ County fixed effects for now.

# Nutrition

## Nutrition and Measures of SNAP Purchasing Power

Outcome: HEI Total Score	(1)	(2)	(5)	(6)	(7)	(8)
log(SNAP/TFP)	4.966*	6.007*				
	(2.998)	(3.158)				
SNAP + 30% income sufficient to purchase TFP			1.469*	1.740**		
			(0.838)	(0.841)		
Gap between SNAP+30% of income and TFP cost					0.001	0.003
					(0.002)	(0.002)
County FE	No	Yes	No	Yes	No	Yes
Observations	1,378	1,378	1268	1268	1268	1268
R-squared	0.058	0.102	0.055	0.098	0.054	0.097
Mean	47.66	47.66	47.69	47.69	47.69	47.69
Effect of a 10% increase in indep. var.	0.473	0.573				

## Nutrition and SNAP Purchasing Power

Regression of nutrition outcomes on purchasing power of snap benefits at 5-nearest store median

	(1)	(2)	(3)	(4)	(5)	(6)
	HEI total	HEI total	HEI Veg	HEI Veg	HEI Fruit	HEI Fruit
log (SNAP/TFP)	4.966* (2.998)	6.007* (3.158)	0.300 (0.341)	0.474 (0.358)	0.279 (0.326)	0.494 (0.354)
State FE	No	Yes	No	Yes	No	Yes
Observations	1,378	1,378	1,378	1,378	1,378	1,378
R-squared	0.058	0.102	0.027	0.055	0.083	0.106
Mean	47.66	47.66	2.592	2.592	1.734	1.734
Effect10	0.473	0.573	0.0286	0.0452	0.0266	0.0471
	(7)	(8)	(9)	(10)	(11)	(12)
	SOFA	SOFA	Diet Person	Diet Person	Diet HH	Diet HH
log (SNAP/TFP)	-6.433*** (2.392)	-8.678*** (2.624)	0.139 (0.195)	0.157 (0.218)	0.0935 (0.211)	0.0456 (0.224)
State FE	No	Yes	No	Yes	No	Yes
Observations	1,378	1,378	1,434	1,434	1,187	1,187
R-squared	0.031	0.065	0.025	0.048	0.010	0.040
Mean	33.59	33.59	3.299	3.299	3.094	3.094
Effect10	-0.613	-0.827	0.0132	0.0150	0.00891	0.00434

# Nutrition

## Nutrition and SNAP TFP Sufficiency [0/1]

Regression of nutrition outcomes on purchasing power of snap benefits at 5-nearest store median

	(1) HEI total	(2) HEI total	(3) HEI Veg	(4) HEI Veg	(5) HEI Fruit	(6) HEI Fruit
SNAP sufficient for TFP	1.469* (0.838)	1.740** (0.841)	-0.116 (0.103)	-0.0969 (0.104)	0.128 (0.110)	0.142 (0.113)
Observations	1,268	1,268	1,268	1,268	1,268	1,268
R-squared	0.055	0.098	0.025	0.052	0.081	0.104
Mean	47.69	47.69	2.572	2.572	1.744	1.744
	(7) SOFA	(8) SOFA	(9) Diet Person	(10) Diet Person	(11) Diet HH	(12) Diet HH
SNAP sufficient for TFP	-0.297 (0.820)	-0.667 (0.827)	-0.00510 (0.0689)	0.000139 (0.0700)	-0.154** (0.0671)	-0.139** (0.0691)
Observations	1,268	1,268	1,322	1,322	1,092	1,092
R-squared	0.026	0.057	0.019	0.044	0.015	0.041
Mean	33.63	33.63	3.305	3.305	3.081	3.081

# Nutrition

## Nutrition and TFP Shortfall

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Regression of nutrition outcomes on TFP-(SNAP+30% net income) at 5-nearest store median

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	(1)	(2)	(3)	(4)	(5)	(6)
	HEI total	HEI total	HEI Veg	HEI Veg	HEI Fruit	HEI Fruit
TFP Shortfall	-0.00147 (0.00176)	-0.00255 (0.00176)	0.000354* (0.000215)	0.000290 (0.000220)	-0.000562** (0.000229)	-0.000662*** (0.000232)
Observations	1,268	1,268	1,268	1,268	1,268	1,268
R-squared	0.054	0.097	0.026	0.053	0.084	0.109
Mean	47.69	47.69	2.572	2.572	1.744	1.744

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TFP Shortfall	-0.00103 (0.00165)	-7.04e-05 (0.00169)	0.000192 (0.000146)	0.000206 (0.000152)	0.000252* (0.000138)	0.000248* (0.000141)
Observations	1,268	1,268	1,322	1,322	1,092	1,092
R-squared	0.026	0.057	0.020	0.046	0.014	0.040
Mean	33.63	33.63	3.305	3.305	3.081	3.081

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# Nutrition

## Very tentative conclusions

- ▶ Higher real value of SNAP associated with higher HEI score, evenly across sub-categories.
- ▶ Drop in sugar, fat, and alcohol.
- ▶ Less strong when filtered through exact TFP cost.

## Concerns

- ▶ School breakfast availability missing for high fraction of sample.

Thank You