



# EFNEP

## Connecting the Pieces

2016 National Coordinators' Conference

March 14-17, 2016 - Arlington, VA

# **The Effect of the Expanded Food and Nutrition Education Program on Participants' Diet Quality: Does Supermarket Access Matter?**

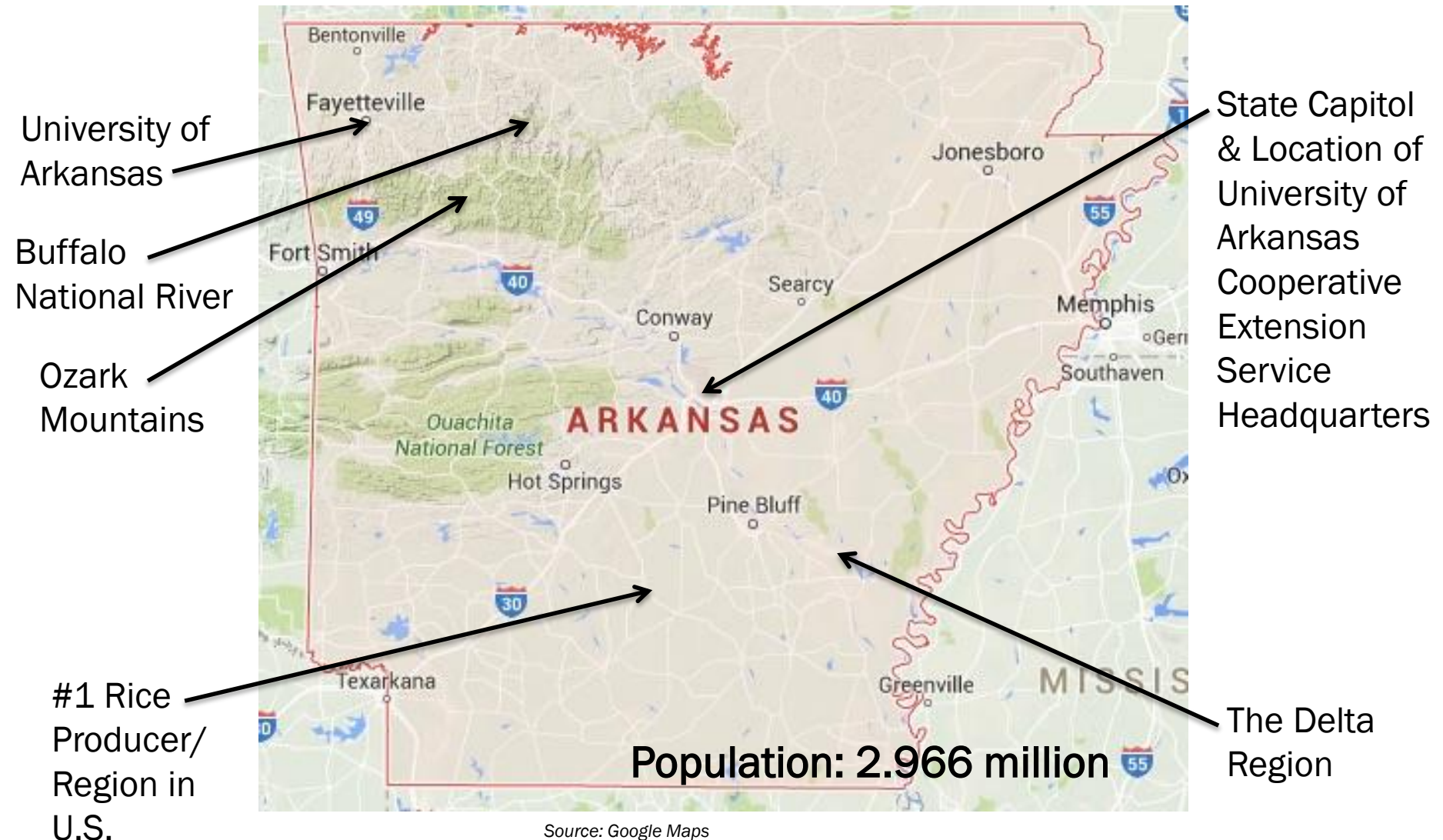
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# State Background

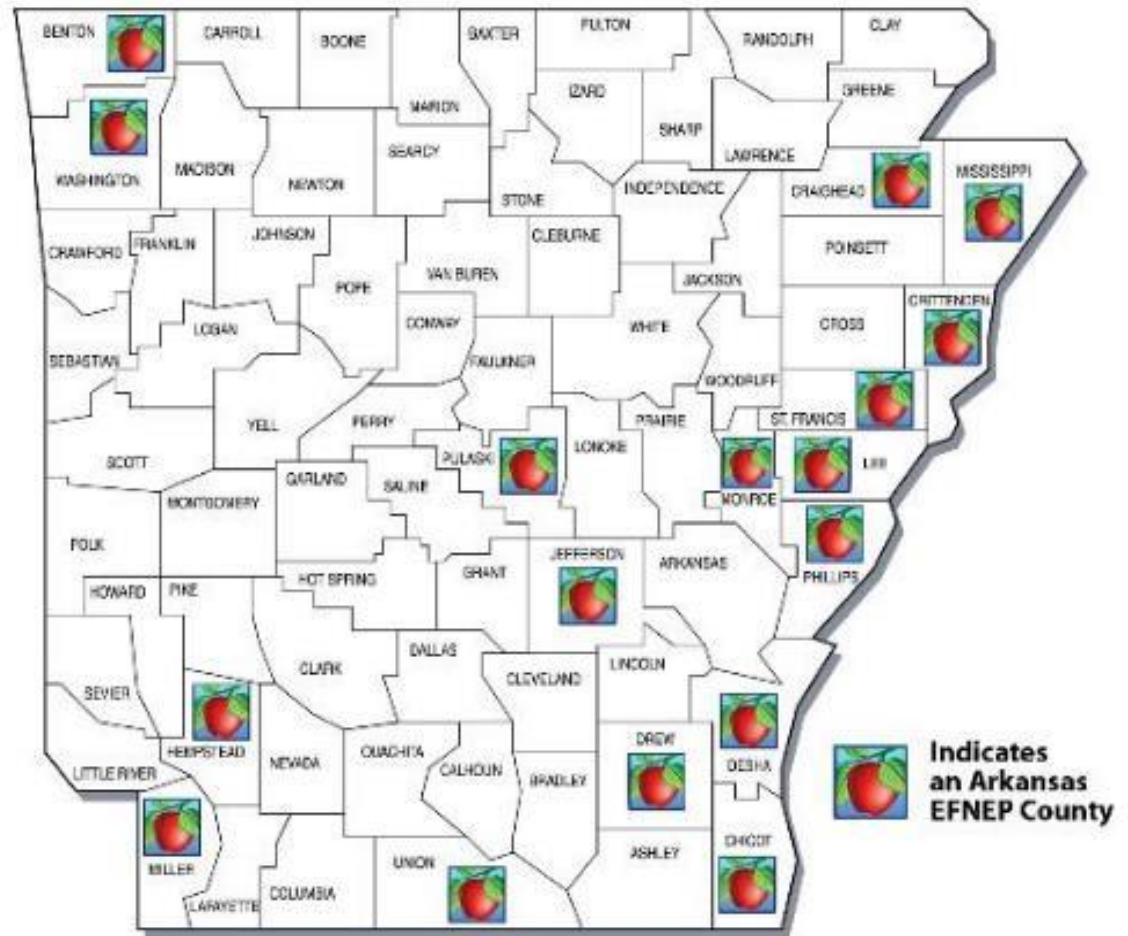




# Study Objectives

To assess program effectiveness within the context of the commercial food environment, we ask:

*Does supermarket  
access impact  
EFNEP  
effectiveness?*



Source: [uaex.edu](http://uaex.edu)

# What do we mean when we say food environment?

- Connecting the pieces between:
  - Where we choose to shop
  - Where we *can* shop
  - The decisions we make about the foods we buy
  - The way we eat
  - Health
- How EFNEP fits into these pieces for Arkansas in 2013 and 2014

# Guiding Questions for Discussion

- Does access to healthy food impact the education you deliver in your EFNEP program?
- What types of retail food outlets are most prolific in your EFNEP communities?
- How can we adapt EFNEP programming to address food access constraints?
- What additional questions should we be examining?

# Previous Research

- We know that graduation from the EFNEP positively impacts HEI.
- Research from public health, geography, and agricultural economics illustrates the growing connection between food environments, access to healthy food, and the decisions we make about what we eat.
- We examine the effect of access to supermarkets on the effectiveness of EFNEP in Arkansas.

# ***Does supermarket access impact EFNEP effectiveness?***





# Getting Started & Finding Data

- We needed to find out:
  - Where do the EFNEP participants in Arkansas live?
  - How far are they from supermarkets?
- To do this we used:
  - WebNEERS
  - USDA SNAP Retail Locator
  - GIS software
- We define supermarkets as grocery stores with fresh produce departments

# Data and Methods: Food Environment

Used data from the 2014 USDA SNAP Retailer Locator to capture the food environment in EFNEP counties

- Commercial food environment classified retail outlets as: supermarkets, convenience stores, dollar stores, specialty stores, farmer's markets



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## SNAP Retailer Locator

Print

To find a retailer near you that welcomes SNAP EBT customers, click the "Select Location" button and enter a starting location. Click a map point to get details and directions. Click "En Espanol" above to view this page in Spanish. Researchers: for data download options see below the map.

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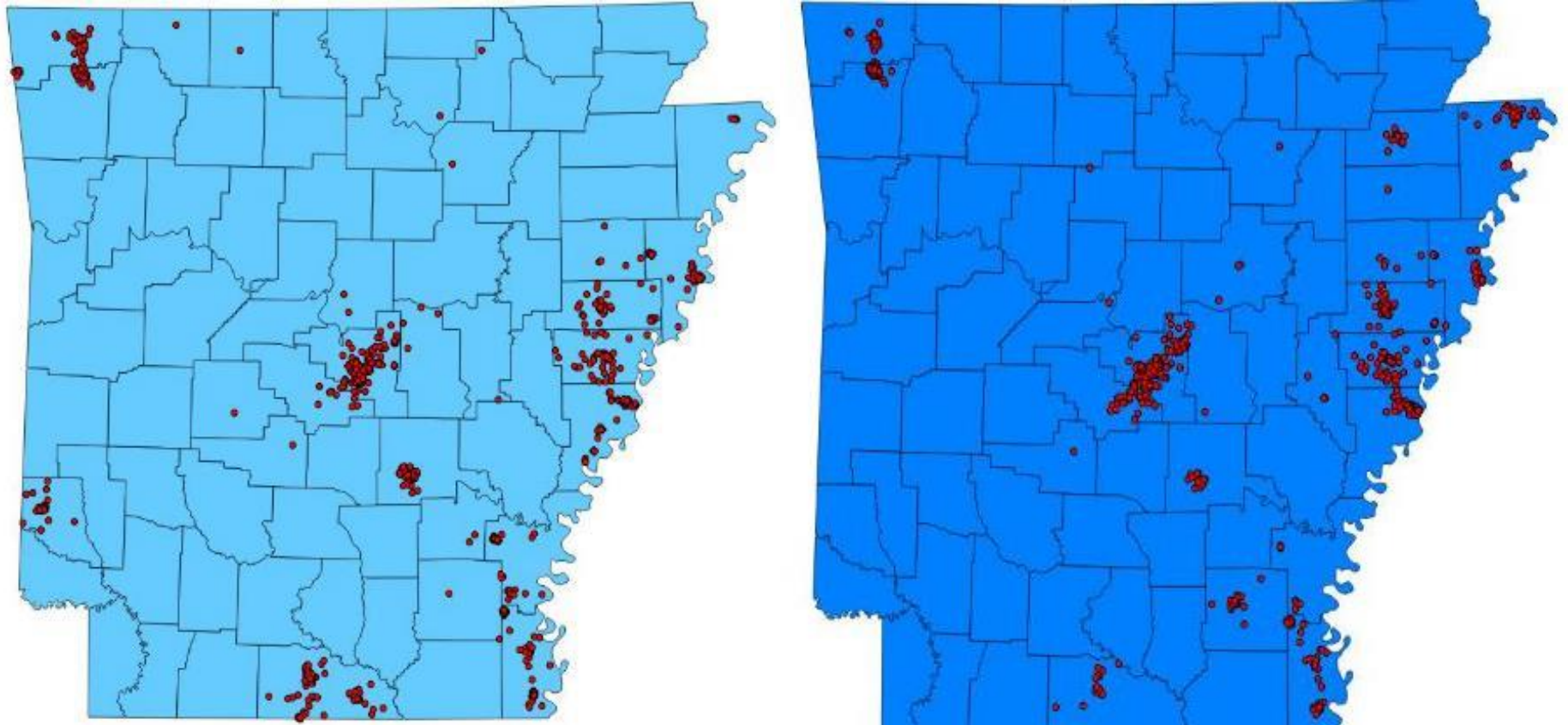


# Data and Methods: Mapping Participants

Using the WebNEERS database and R, matched participant address with identifying information

- To protect identity of participants translated data points into census block centroids to use as a proxy for participant location

## Census Block Centroids: Program Years 2013 & 2014



# Census Blocks Reflect the Residential Neighborhood:

- They are the smallest unit of measurement defined by the Census Bureau in terms of geography and population.
- Arkansas has
  - 75 counties
  - 686 census tracts
  - 2,147 census block groups
  - ***186,211 blocks***



# Data and Methods

- Used Healthy Eating Index to assess changes in participant's diet quality from pre to post
  - Healthy Eating Index = HEI
- HEI is calculated from data collected through diary surveys
  - Entering and exiting survey comparison to determine change
- HEI is calculated as a value between 0 and 100
  - With lesser number representing poor diet quality, the higher the value the healthier the diet
  - Categories include: grains, fruits, vegetables, proteins, oils, SoFAS (solid fats, alcoholic beverages, added sugars)

# Data and Methods

- Defining Food Access:
  - Having a supermarket within 1 mile of the census block center point for URBAN participants
  - Having a supermarket within 10 miles of the census block center point for RURAL participants
- These cutoffs are based on existing food desert research
- Measured as a radial distance

# Empirical Model

- Outcome variable:
  - Change in Healthy Eating Index
- Explanatory Variables:
  - Complete (completed 8 lessons)
  - Income (dollars, monthly)
  - Education Level (highest grade less than 12<sup>th</sup>)
  - SNAP (receives SNAP benefits)
  - WIC (receives WIC)
  - Race (white, African American, other)
  - Hispanic (yes/no)
  - Gender (male/female)
  - Age (years)
  - Staff (fixed effects for county educators )

# Analysis: Using the Model

- We wanted to examine how all those factors played into our outcome measure, the change in HEI
- The question of interest is whether the effect is different for sample with and without supermarket access
- We included county-level, educator fixed-effects to control for differences between EFNEP staff
- We estimated models for three different subsamples:

Full  
Sample

No Access to  
Supermarkets

Access to  
Supermarkets



# Who are our EFNEP participants?

## *Descriptive Statistics*

Mean	
HEI at Entry	51.24
HEI at Exit	56.76
Change in HEI	5.524
SNAP recipients	58%
WIC recipients	34%
Classified as Urban	83%
Classified as No Access	48%

Mean	
Race	
White	36%
African American	62%
Other	2%
Hispanic	26%
Female	85%
Male	15%
Income (\$/mo.)	1,007
Age (yrs.)	37.79

# Thinking through our sample:

## *Descriptive Statistics*

- Our sample is:
  - Largely African American
  - Largely urban
  - More than half receive SNAP, almost half receive WIC
  - They begin EFNEP with HEI's around 51, and after graduating their HEI increases an average of 5 points
- Recall that we pooled program years 2013 and 2014
- “Urban” is a census-defined categorization

# Results: entire population

	All	No Access	Access
Intercept	-5.322	-5.157	-10.851
Complete	<b>4.022***</b>	3.407	<b>4.882**</b>
Income	<0.000	<b>-0.002*</b>	0.002
Highest Grade Less than 12 <sup>th</sup>	-1.285	0.247	-2.439
SNAP recipient	1.110	0.568	<b>2.461*</b>
WIC recipient	-0.678	-1.217	-0.343
Gender	0.630	0.038	0.068
Age	<b>-0.092**</b>	-0.088	-0.079
Number of observations	1209	583	626
*** = $p < 0.001$ , ** = $p < 0.01$ , * = $p < 0.05$			

# Interpreting Results: entire population

- We see a significant improvement in HEI for students that graduate from EFNEP among the full sample.
- **The graduation effect is even larger among the sample with access to supermarkets.**
- However, there is no significant graduation effect among the sample without access to supermarkets.
- **Conclusion:** *There is evidence that benefits of EFNEP graduation depend on the food environment.*





# Results: African American subsample

	All	No Access	Access
Intercept	-8.491	-9.327	-10.038
Complete	2.812	-0.056	<b>4.884**</b>
Income	0.001	-0.001	0.001
Highest Grade Less than 12 <sup>th</sup>	-0.212	0.522	-1.322
SNAP recipient	<b>2.441*</b>	2.442	<b>4.065**</b>
WIC recipient	-0.826	-2.550	0.564
Gender	<b>4.426**</b>	5.095	3.097
Age	-0.067	-0.088	-0.031
Number of observations	747	339	408
*** = $p < 0.001$ , ** = $p < 0.01$ , * = $p < 0.05$			

# Diving Deeper: African American Subsample

- Among the African American subsample, there is no significant graduation effect **except in the sample with access to supermarkets.**
- Graduation had no measurable effect among the sample with no access to supermarkets.
- **Conclusion:** *Again, there is evidence that benefits of EFNEP graduation depend on the food environment.*

# Results: Urban Subsample

	All	No Access	Access
Intercept	-4.742	-4.679	-14.86
Complete	<b>3.946**</b>	3.471	<b>5.169**</b>
Income	0	-0.001	0.001
Highest Grade Less than 12 <sup>th</sup>	-0.592	0.747	-1.601
SNAP recipient	0.442	0.621	1.252
WIC recipient	-0.747	-1.548	0.134
Gender	0.73	0.412	-0.281
Age	<b>-0.117***</b>	<b>-0.112*</b>	-0.083
Number of observations	1000	522	478
	*** = $p < 0.001$ , ** = $p < 0.01$ , * = $p < 0.05$		

# Diving Deeper: Urban subsample

- Again, we see a significant improvement in HEI for students that graduate from EFNEP among the urban sample.
- **Once again, the graduation effect is even larger among the sample with access to supermarkets.**
- **Conclusion:** *Once again, there is evidence that benefits of EFNEP graduation depend on the food environment.*





# Conclusions

- *Graduation from EFNEP should be encouraged.*
- *But, there is evidence that access to supermarkets matters.*
  - We see this in our entire sample, as well as in our African American and urban subsamples.
  - We reached this main conclusion controlling for age, gender, race, ethnicity, educational attainment, income, and access to additional food resources conferred by SNAP and WIC.
  - Interestingly, the control for SNAP was positive across all models and was larger and more significant in models estimated from samples with supermarket access

# Discussion & Areas for Future Research

- How does access to other types of retail food outlets (dollar stores, convenience stores, farmers markets) influence EFNEP effectiveness?
- Are there marketing opportunities to highlight healthy food specials in underserved areas?
- Is there potential to pair EFNEP with outreach programs to increase access to healthy foods?
  - Through supermarkets, co-op models, community supported agriculture, farmers markets
- How would food environment impact EFNEP effectiveness more generally, outside of the context of Arkansas?

# Think, pair, share: guiding questions:

- Does access to healthy food impact the education you deliver in your EFNEP program?
- What types of retail food outlets are most prolific in your EFNEP communities?
- How can we adapt EFNEP programming to address food access constraints?
- What additional questions should we be examining?

# Questions? Comments?







# Thanks for listening!