

Commute times, food retail gaps, and body mass index in North Carolina counties

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2938401/>

Food retail gap per capita: the difference between county-level food demand and sales

- North Carolina Department of Commerce
- Individual-level BMI positively associated with county-level commute times and food retail gaps.

% rural residents positively correlated with:

- commute times,
- food retail gaps, and
- county-level BMI.



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The association between the food environment and weight status among eastern North Carolina youth

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Abstract

Objective: To examine associations between various measures of the food environment and BMI percentile among youth.

Design: Cross-sectional, observational.

Setting: Pitt County, eastern North Carolina.

Subjects: We extracted the electronic medical records for youth receiving well child check-ups from January 2007 to June 2008. We obtained addresses for food venues from two secondary sources and ground-truthing. A geographic information systems database was constructed by geocoding home addresses of 744 youth and food venues. We quantified participants' accessibility to food venues by calculating 'coverage', number of food venues in buffers of 0.25, 0.5, 1 and 5 miles (0.4, 0.8, 1.6 and 8.0 km) and by calculating 'proximity' or distance to the closest food venue. We examined associations between BMI percentile and food venue accessibility using correlation and regression analyses.

Results: There were negative associations between BMI percentile and coverage of farmers' markets/produce markets in 0.25 and 0.5 mile Euclidean and 0.25, 0.5 and 1 mile road network buffers. There were positive associations between BMI percentile and coverage of fast-food and pizza places in the 0.25 mile Euclidean and network buffers. In multivariate analyses adjusted for race, insurance status and rural/urban residence, proximity (network distance) to convenience stores was negatively associated with BMI percentile and proximity to farmers' markets was positively associated with BMI percentile.

Conclusions: Accessibility to various types of food venues is associated with BMI percentile in eastern North Carolina youth. Future longitudinal work should examine correlations between accessibility to and use of traditional and new

Keywords
Food environment
Obesity

Positive association between BMI percentile and access to convenience stores, and inverse association between BMI percentile and access to farmers' markets.

Examining Associations among Obesity and Per Capita Farmers' Markets, Grocery Stores/Supermarkets, and Supercenters in US Counties

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ABSTRACT

Fruit and vegetable consumption is an important component of a healthful diet, yet fruits and vegetables are underconsumed, especially among low-income groups with high prevalence rates of obesity. This study used data from the US Department of Agriculture Economic Research Service Food Environment Atlas to examine county-level associations among obesity prevalence and per capita farmers' markets, grocery stores/supermarkets, and supercenters, adjusted for natural amenities, percent black, percent Hispanic, median age, and median household income, stratified by county metropolitan status. In models that included all three of the food venues, supercenters and grocery stores per capita were inversely associated with obesity in the combined (metro and non-metro) and metro counties. Farmers' markets were not significant in the model for combined (metro and non-

metro) or for metro counties alone, but were significantly inversely related to obesity rates in the model for non-metro counties. In this ecologic study, density of food venues was inversely associated with county-level obesity prevalence. Thus, future research should examine similar associations at the individual-level.

J Am Diet Assoc. 2011;111:567-572.

Higher fruit and vegetable consumption is associated with a reduced risk of chronic disease such as cancer, heart disease, and obesity (1). However, one commonly cited barrier to increasing fruit and vegetable consumption is the higher cost of produce relative to less-healthy foods (2,3). Farmers' markets have been a commonly suggested way to make produce more available in low-income areas with few or no grocery stores or supermarkets (also called food deserts) (4,7) and have

Inverse association between supercenters and grocery stores per capita and obesity, and between farmers' markets per capita and obesity (in non-metro counties).

“...there are people I know in this community that eat three meals a day at one of those restaurants and even possibly an elected official that might do that. There’s definitely an element of the community that’s big into tradition and again it’s still a relatively rural setting so education – educating people about why that might not be the best idea and changing that mindset and culture will be difficult.”

We’re a very rural community, agriculture a lot of our families uh especially my age – the way we were raised a lot of what we ate did come from farms – although it might not be the healthiest choice, but like when we talk about what’s available in restaurants ...some people will advertise like “home cooking” ...

“...maybe I’m doing it wrong We are in the south here, really it’s very hard...down here their mind is set up for fried pork chops, fried chicken...”

Obesity-prevention strategies in rural counties

West S, et al. Stakeholder Perceptions of Obesity-Prevention Strategies: A Comparison of Geographically Diverse Rural Counties. JPHMP. Volume 19(6), 2013, p 511–520.

Interview results suggest that both ENC and WNC stakeholders had similar perceptions of the most and least winnable obesity-prevention strategies in their communities.

- (1) increasing physical activity either through PE or extracurricular activities
- (2) the overall winnability of school-based obesity-prevention strategies;
- (3) lack of funding opportunities to support healthy strategies;
- (4) the importance of community collaborations and partnerships; and
- (5) opposing government policies that interfere with private sector, such as supermarket subsidies or limiting advertisements of less healthy foods.

Environmental and policy-related solutions to prevent obesity among rural children and their caregivers.

- Farmers' Markets
 - Produce Prescriptions, SNAP/EBT, healthy food zoning
- Cost-offset Community Supported Agriculture
- Healthy corner stores
- Online grocery shopping



Solution: Farmers' markets

Among SNAP participants, more farmers' market shopping is associated with more produce consumption.

In our Pitt County sample, about 43% reported shopping at farmers' markets.

- Farmers' market shopping and dietary behaviours among Supplemental Nutrition Assistance Program participants. *Public Health Nutrition*. 2015; 18 (13): 2407-2414.

Solution: Farmers' markets

Jilcott Pitts SB, et al. A possible dose-response association between distance to farmers' markets and roadside produce stands, frequency of shopping, fruit and vegetable consumption, and body mass index among customers in the Southern United States. BMC Public Health. 2017;17(1):65.

Take home #1: Customers who live further from markets shop less frequently.

Take home #2: Customers who shop more frequently consume increasingly more fruits and vegetables.

Take home #3: Not many SNAP participants shop at farmers' markets in ENC

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jedediah.hinkley@arhs-nc.org • (252) 340-0395

Rx

PRESCRIPTION

Date _____

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Expiration Date _____

Provider Name _____

Signature _____

Solution: Farmers' markets

McGuirt, J. T., Ward, R. K., Bullock, S. L., Majette, N., & Jilcott Pitts, S. B. (2014). Factors influencing Local Food Procurement among Women of Reproductive Age in Rural Eastern and Western North Carolina. *Journal of Agriculture, Food Systems, and Community Development* (4(4)), 143-154.

→ Take home: Economic and geographic access to markets, EBT at markets, support for local farmers' and businesses, and fresher produce were facilitators to procuring local produce from farmers' markets and roadside stands.

Solution: Farmers' markets

Farmers' markets can improve dietary behaviors of low-income residents.

- ❑ Evans et al. Introduction of farm stands in low-income communities increases fruit and vegetable among community residents. [Health & Place; Volume 18, Issue 5](#), September 2012, Pages 1137–1143.
- ❑ Freedman et al. A farmers' market at a federally qualified health center improves fruit and vegetable intake among low-income diabetics. [Preventive Medicine. Volume 56, Issue 5](#), May 2013, Pages 288–292.

Solution: Healthy food zoning to promote farmers' markets

Mayo, M. L., Pitts, S. B.J., & Chriqui, J. (2013). Examining associations between county and municipality zoning ordinances and access to fruit and vegetable outlets in rural North Carolina. *Preventing Chronic Disease, 5 (10)*, E203.

→ Take home: Strong positive correlation between healthful food zoning scores and the number of fruit and vegetable outlets in 13 northeastern North Carolina counties.

Solution: Cost-offset Community Supported Agriculture (CO-CSA)

- ❑ Quandt et al. Feasibility of Using a Community-Supported Agriculture Program to Improve Fruit and Vegetable Inventories and Consumption in an Under-resourced Urban Community. Preventing Chronic Disease. 2013;10:130053.
 - ❑ Significant increase in the number of foods in the household inventory of fruits and vegetables in the intervention group compared with the control group.
 - ❑ The intervention group reported greater increases in fruit and vegetable consumption (not statistically significant).

Solution: Cost-offset Community Supported Agriculture (CO-CSA)

- ❑ Can CSA Cost-Offset Programs Improve Diet Quality for Limited Resource Families?

http://ageconsearch.umn.edu/bitstream/253381/2/cmsarticle_566.pdf

- ❑ Our project will examine whether subsidizing the cost of CSAs, integrated with tailored education: 1) increases fruit and vegetable consumption, 2) promotes substitution of fruits and vegetables for more energy-dense foods, and 3) improves overall diet quality and energy balance, thus helping children maintain healthy body weights.

Solution: Healthy Corner Stores

Communities Putting Prevention to Work,
Pitt County, 2010-2012.

- *Pitts et al. Formative Evaluation for a Healthy Corner Store Initiative in Pitt County, North Carolina: Assessing the Rural Food Environment, Parts 1& 2, 2013, Preventing Chronic Disease.*

Food environment in small stores improved over time as more produce was stocked.

Healthier choices at the corner store



RHETT BUTLER/THE DAILY REFLECTOR

DAVID RIZEK, owner of Mark's Food Market on Pactolus Highway, talks about the healthy food choices he offers at his convenience store.

Pitt County campaign aims to curb obesity

BY K. J. WILLIAMS
The Daily Reflector

The makings of a fresh garden salad just became available at a corner store popular with people living near the Pitt County Fairgrounds.

Mark's Food Market at 2205 Pactolus Highway already stocks rows of convenience foods, paper goods and cleaning supplies. The convenience store also sells everything from bandanas and birthday candles to handbags and screwdrivers, more in line with an old-time five-and-dime.

David Rizek, the store's owner,

See HEALTHY, A9



STOP-N-GO TO HEALTHY CHOICES

■ The program, which is part of a federal \$1.6 million grant called Communities Putting Prevention to Work, aims to change the everyday environment of people, making it easier to eat healthy and exercise.

■ Pitt County's health department was one of two in the state to receive the grant. There are 50 grants nationwide.

■ The goal in the next year is to sign on five to 10 corner stores in neighborhoods located away from grocery stores.

Solution: Healthy Corner Stores

HOUSE BILL 1030 (ratified)

HEALTHY FOOD SMALL RETAILER PROGRAM SECTION

SECTION 13.4.(a) Of the funds appropriated to the Department of Agriculture and Consumer Services, the sum of two hundred fifty thousand dollars (\$250,000) for the 2016-2017 fiscal year shall be used to create a program to reimburse small food retailers for expenditures related to enhancing access to healthy foods in areas that qualify as food desert zones according to the Economic Research Service of the United States Department of Agriculture...Funds may be used to reimburse small food retailers for the purchase and installation of refrigeration equipment, display shelving, and other equipment necessary for stocking nutrient-dense foods, including fresh vegetables and fruits, whole grains, nuts, seeds, beans and legumes, low-fat dairy products, lean meats, and seafood.

Solution: Healthy Corner Stores



https://www.youtube.com/watch?v=ZsTUBIX_Jo

Solution: Healthy Corner Stores

North Carolina Healthy Food RETAIL DESIGNATION PROGRAM

The North Carolina Healthy Food Retail Designation Program aims to support and recognize small food stores that improve healthier food access. The program consists of two components: the North Carolina Healthy Food Retail Designation and technical support.

The designation identifies small food stores that maintain a minimum stock of products from the following categories:

- Fruits
- Vegetables
- Dairy/dairy substitutes
- Whole grains
- Protein
- Water

Designation materials (door cling and certificate) will be provided to recognize stores that meet the minimum criteria.

Support for the program includes a guide for those interested in partnering with small store owners to help them make progress toward the designation. In-store promotional materials will



Obesity, Diabetes, Heart Disease and Stroke Prevention (ODHDSP) Project North Carolina Healthy Food Retail Designation Program

APPROACH | The North Carolina Division of Public Health supports work to strengthen healthier food access and sales in small food stores across the state with ODHDSP funding received from the Centers for Disease Control and Prevention.

- Efforts are focused in five regions in the state (see gray area on the map on the reverse side).
- At least 10 small food stores in the regions of focus will begin working to provide healthier foods each year from 2016–2018.
- Technical assistance will be provided to regional coordinators to assist small store owners in increasing availability of healthier food items and using promotion, placement and pricing to sell their healthy foods and beverages.

STAFFING | The ODHDSP grant provides funding for the following staff positions to implement healthy food retail:

- A Healthy Eating and Communications Coordinator, Jen Sohl-Marion, housed at the NC Division of Public Health, Community and Clinical Connections for Prevention and Health Branch.
- ODHDSP Regional Coordinators housed in a local health department in each of the five targeted regions (see map on reverse side).

Solution: Online shopping

This is why I shop for groceries online!



Solution: Online shopping

SNAP participants will be able to shop online in a pilot program.

A potential way to alleviate rural healthy food access challenges?

https://www.washingtonpost.com/news/food/wp/2017/01/10/food-stamp-recipients-will-soon-be-able-to-order-groceries-online/?utm_term=.915ed83e2dfb

By Maura Judkis January 10, 2017



Customers leave a Safeway store in 2014 in San Francisco. (Justin Sullivan/Getty Images)

Beginning this summer, some Americans who receive food assistance will have a new way to feed their families. The Agriculture Department said that it will test a program that allows people on the

Solution: Online shopping

Could online shopping increase healthy habits? Or help form less healthy habits?

Your Weekly Harris Teeter Express Lane Grocery List

Harris Teeter <HarrisTeeter@harristeeter-email.com>
To: Stephanie P...>

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My Order Express is the fastest and easiest way to shop every week.

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Shop From My Last Order



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Objectives

1. Describe key features of community and consumer food environments, the types of methods used to measure food environments, and their strengths and limitations.
2. Discuss the roles of geography and rurality in producing food environments that promote obesity.
3. Identify potential environmental and policy-related solutions to prevent obesity among rural children and their caregivers.

Questions for discussion:

Related to food environment measures, which is better?: RFEI, proximity to or coverage of a single venue?

Which is more important? Consumer versus community food environment?

What are other major barriers that rural caregivers face in trying to obtain healthy food for their children?

How can we leverage the benefits of farmers' markets, CSAs, healthy corner stores and online shopping to improve health in rural caregivers and their children?

Questions?

Stephanie Jilcott Pitts

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Extra slides

Pester power, habit strength, ego depletion

We created two separate, but similar Qualtrics surveys to assess self-reported levels of pester power, ego depletion, and habit strength (using validated scales).

Amazon Mechanical Turk workers took the survey and each participant was compensated \$0.50 after completion and validation of the survey.

T-tests were used to examine differences between pester power, ego depletion, and habit strength among the online versus brick-and-mortar shoppers.

- Propensity score matching

Pester power

Measured using an 11-item scale ($\alpha=0.86$)

- Ogba I, Johnson R. How packaging affects the product preferences of children and the buyer behaviour of their parents in the food industry. *Young Consumers* 2010;11(1):77-89.

Response options were on a five-point Likert scale.

Sample items include the following:

- “My child tries to influence my purchases by making verbal requests;”
- “My child’s product preferences are influenced by the bright colors used in packaging;”

The sum on this 11-item scale was the measure of pester power, with potential scores ranging from 11 to 55, with a higher score indicating more pester power.

Habit strength

Measured using the Verplanken and Orbell Self-report index of habit strength.

- Verplanken B, Orbell S. Reflections on past behavior: A Self-Report index of habit strength J Appl Soc Psychol 2003;33(6):1313-30.

Example items include the following: “Purchasing fruits and vegetables is something ...

I do frequently;

I do automatically;

I do without having to consciously remember;

Scores ranged from 12 to 60 and a higher score indicated higher habit strength.

Ego Depletion

Measured using an adapted version of the State Ego Depletion Scale. ($\alpha = .90$)

- Ciarocco N, Twenge J, Muraven M, Tice D. Measuring state self-control: Reliability, validity, and correlations with physical and psychological stress. Unpublished Manuscript 2007.

“Please think about your state of mind on your most recent online grocery shopping experience.” Responses are on a seven-point scale where 1 = not true and 7 = very true.

Sample items include:

- “Right now, it would take a lot of effort for me to concentrate on something;“
- “I can't absorb any more information;“
- “I feel sharp and focused.”

Possible scores ranged from 25 to 175, and a higher score indicated less ego depletion.

Pester power, habit strength, ego depletion

Our results may indicate that brick-and-mortar shopping is driven by automaticity and habitual behavior to a greater degree than online shopping.

More work is needed to understand the factors within the online grocery shopping environment that drive purchasing decisions.

Our next steps: Examine habit strength, ego depletion, and pester power in a group of online shoppers, in greater depth.

Limitations: Ego depletion is state dependent (though we tried to address this); self-reported measures; difficult to assess how children influence shopping—both online and brick-and-mortar

Assessment of the
Efficacy and Impact of the

The Virtual Supermarket Program



Executive Summary



For 25% of Baltimoreans—especially African Americans living in low-income neighborhoods—finding fresh fruits and vegetables is not an easy task. Neighborhoods with a great abundance of food outlets that sell mainly cheap, unhealthy, and highly processed foods, but relatively barren when it comes to full-service grocery stores or other outlets that sell produce and healthier options, are considered “food deserts”. Furthermore, limited access to healthy food disproportionately affects low-income African-Americans in Baltimore City than any other demographic. Access to healthy food is essential to leading a productive life and this disparity in food access has caused a balanced diet and good health to be out of reach for many city residents.

In response to this complex food issue, the Baltimore City Health Department (BCHD) developed an innovative program design based on the Social Ecological framework to reduce food deserts. The Virtual Supermarket Program (VSP) uses existing infrastructure—community centers and ShopRite’s grocery delivery service to:

1. improve access and affordability of fresh produce to predominantly low-income, African-American neighborhoods;
2. provide customers with the knowledge and tools needed to encourage health-related diet behavior change;
3. stimulate leadership development and community building within food desert neighborhoods

The program offers free grocery delivery, nutrition programming, healthy food incentives, Neighborhood Food Advocate (NFA) training, and accepts debit, credit, cash, and SNAP for payment, which provides a multifaceted program design to counter this intricate food issue. This evaluation report for the Virtual Supermarket Program, is meant to determine the current state of the efficacy and impact of the program in reducing barriers to food access and changing behaviors in these communities. The primary objectives of the evaluation are to:

1. To assess participants’ self-reported perceptions of the Virtual Supermarket Program.
2. To assess participants’ self-reported perceptions of how the Virtual Supermarket Program has affected their food choices (i.e., their diet-related health behaviors).
3. To understand self-reported perceptions of how the Virtual Supermarket Program has changed its customers’ access to healthy food.
4. To understand how the Virtual Supermarket Program affects its customers’ sense of community.

The BCHD collected this evaluation data by taking cross-sectional surveys of customers to ascertain respondents' satisfaction with the program, usage of incentives and programming, changes in purchasing habits, changes in their perception of their barriers to healthy food access, and development of community and social networks.

Key Findings

- ❖ 96.8% of participants would refer a family member or a friend to the Virtual Supermarket program.
- ❖ 92.5% of participants believe that the program improves their food access and makes it easier for them to eat healthy.
- ❖ 47.3% of participants are self-report that they are buying more fruits and 49.7% are buying more vegetables.
- ❖ 41.9% are self-reporting buying less snacks and deserts, but 44.1% are also buying more caloric beverages.
- ❖ 79.6% of participants believes that the program enhances a sense of community at its host sites.