

Food retailers and disparities in nutritional quality of household food purchases

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Healthy Food Retail Working Group
2/1/2016

*Presented by Global Food Research Program
The University of North Carolina at Chapel Hill*



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Background

- Race-ethnic and socioeconomic (SES) disparities in the nutritional quality of what Americans buy and eat
- Food retailers as a locus for improving diet:
 - Focus on putting grocery stores in food deserts
 - But how much does store type matter?
 - Food retailers implementing “healthy foods initiatives” to improve the nutritional quality of what people buy & eat



Research Questions

1. Compare the nutrient profile of packaged food purchases (PFP) by type of store
2. Characterize food shopping patterns and examine sociodemographic predictors
3. Determine whether food shopping patterns are associated with the nutrient profile total packaged foods purchases and differences by race-ethnicity
4. Examine whether a retailer-based “healthy foods initiative” improved the nutritional quality of household food purchases



Methods

Sample: Nielsen Homescan Panel

- Longitudinal data: mean follow-up of 4 years
- Household PFPs: any food or beverage with a barcode
- Over 33,000 households per year from 2000-2013

Procedure: Participants record all PFPs using a handheld scanner

- Including information on retailer where purchased, price, volume
- Linked to information from the Nutrition Facts Panel

Analyses based in part on data reported by Nielsen Homescan Services. Copyright © 2015, The Nielsen Company



Store type classification

1. Warehouse clubs



Store type classification

1. Warehouse clubs (e.g., Costco, Sam's)
2. Mass merchandisers



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2. Mass merchandisers (e.g., Walmart, Super-Target)
3. Grocery chains



Store type classification

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2. Mass merchandisers (e.g., Walmart, Super-Target)
3. Grocery chains (≥ 10 stores; e.g., Kroger, Safeway)
4. Non-chain grocery (< 10 stores)



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5. Convenience-Drug-Dollar



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6. Ethnic-specialty



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5. Convenience-Drug-Dollar (e.g., Seven Eleven, CVS, Dollar General)
6. Ethnic-specialty (e.g., Compare Foods, Whole Foods Market)
7. Others (e.g., department stores, book stores, etc.)



Where do US households shop for food?



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Statistical Analysis

Trends Analysis, 2000-2012

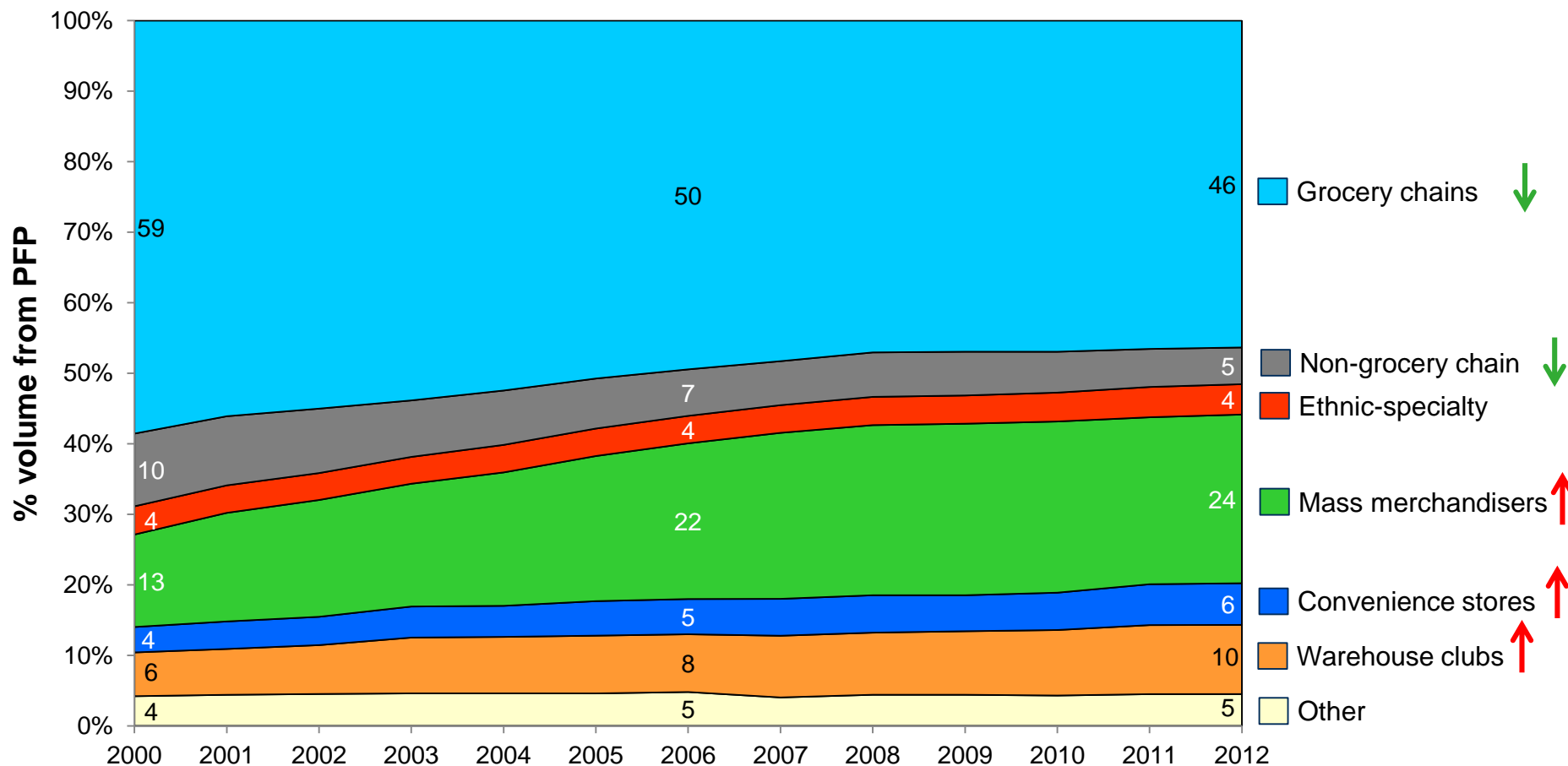
- Pooled cross-sectional approach
- Year-level household purchases
- Contribution of each store type to total volume of packaged food purchases (PFPs)
- Adjusted to be nationally representative
- Clustered by market

Nutrient analysis of household PFPs by store type

- Energy and nutrient densities per 100g
- Top food and beverage groups (% kcal)
- Weighted unadjusted mean purchases



Trends in volume purchases of packaged foods and beverages by store type, 2000-2012



Results were weighted to be nationally representative. A two-sided p-value of 0.001 was set to denote statistical significance to account for multiple comparisons and big sample size.

Stern D, et al. The nutrient content of US household food purchases by store types. Am J Prev Med. 2016 Feb;50(2):180-90

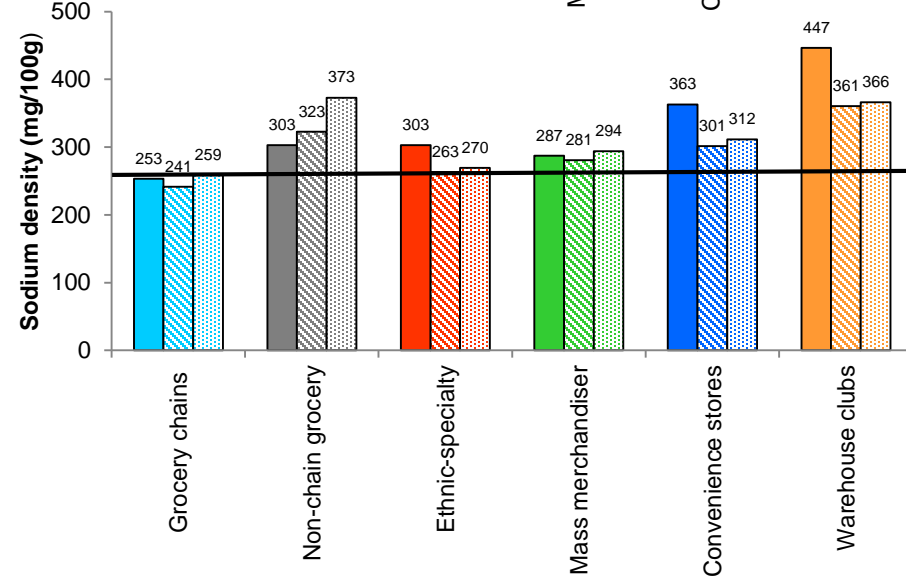
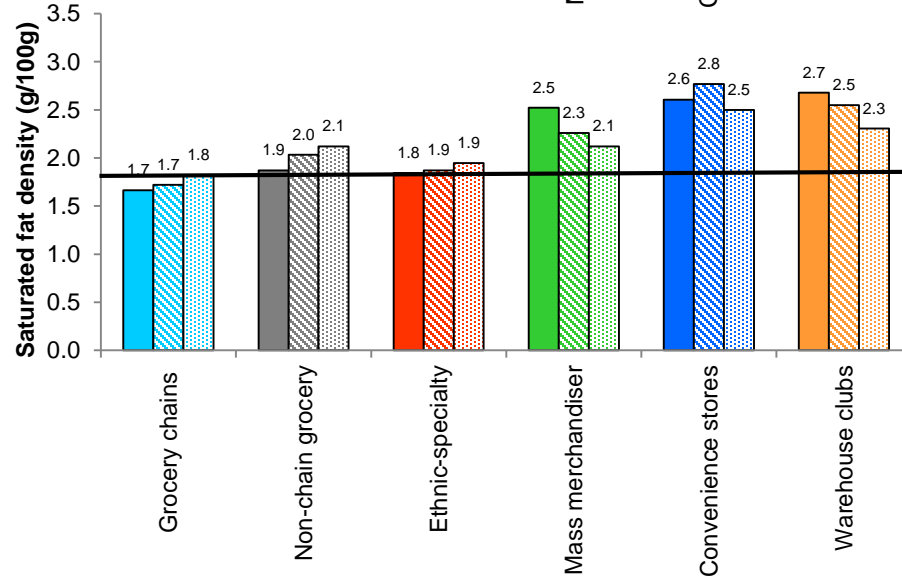
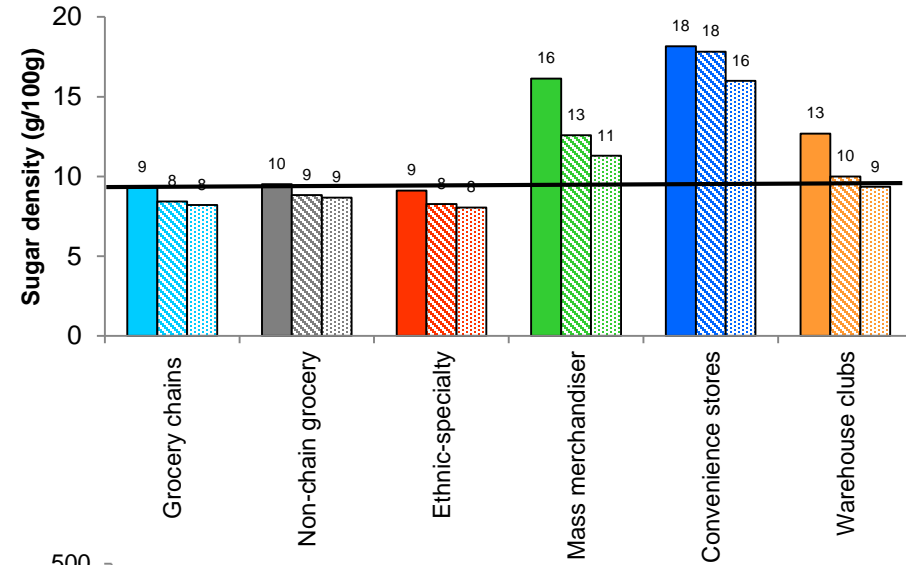
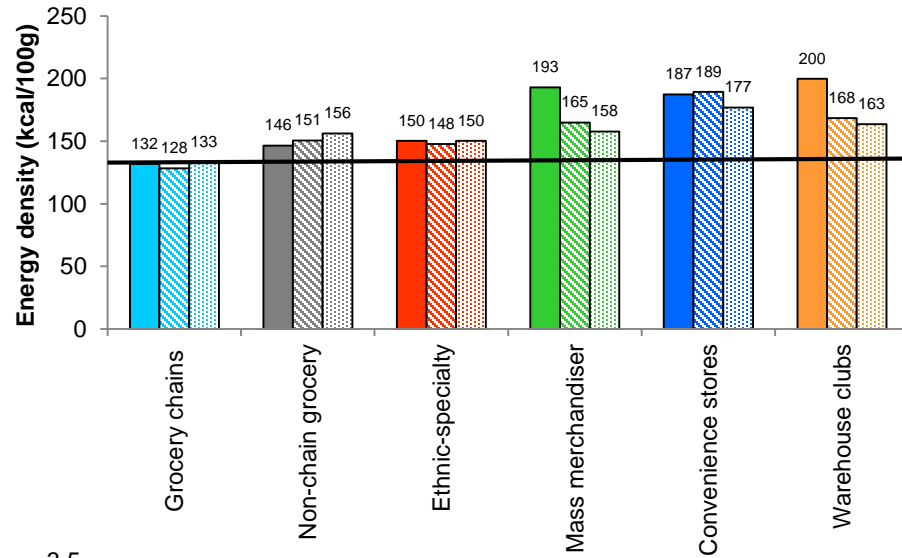


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UNCFRP
UNC Food Research Program
Robert Wood Johnson Foundation
University of North Carolina at Chapel Hill

Nutrient profile of household PFP by store type

2000 2006 2012



Results were weighted to be nationally representative

Top 3 packaged beverage groups purchased by store type (% kcal)

Grocery chains

Non-chain grocery

Ethnic-specialty

Mass merchandisers

Convenience stores

Warehouse clubs



Results were weighted to be nationally representative

Stern D, et al. The nutrient content of US household food purchases by store types. *Am J Prev Med.* 2016 Feb;50(2):180-90

How do food shopping patterns vary by race and SES?



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Statistical Analysis

- Cluster analysis to group households by their food shopping patterns
 - Based on the amount (% volume) of household PFPs by store type



What mix of stores US households use to shop for food in 2012?



50%

Values below bars indicate the proportion of households classified in each cluster, weighted to be nationally representative

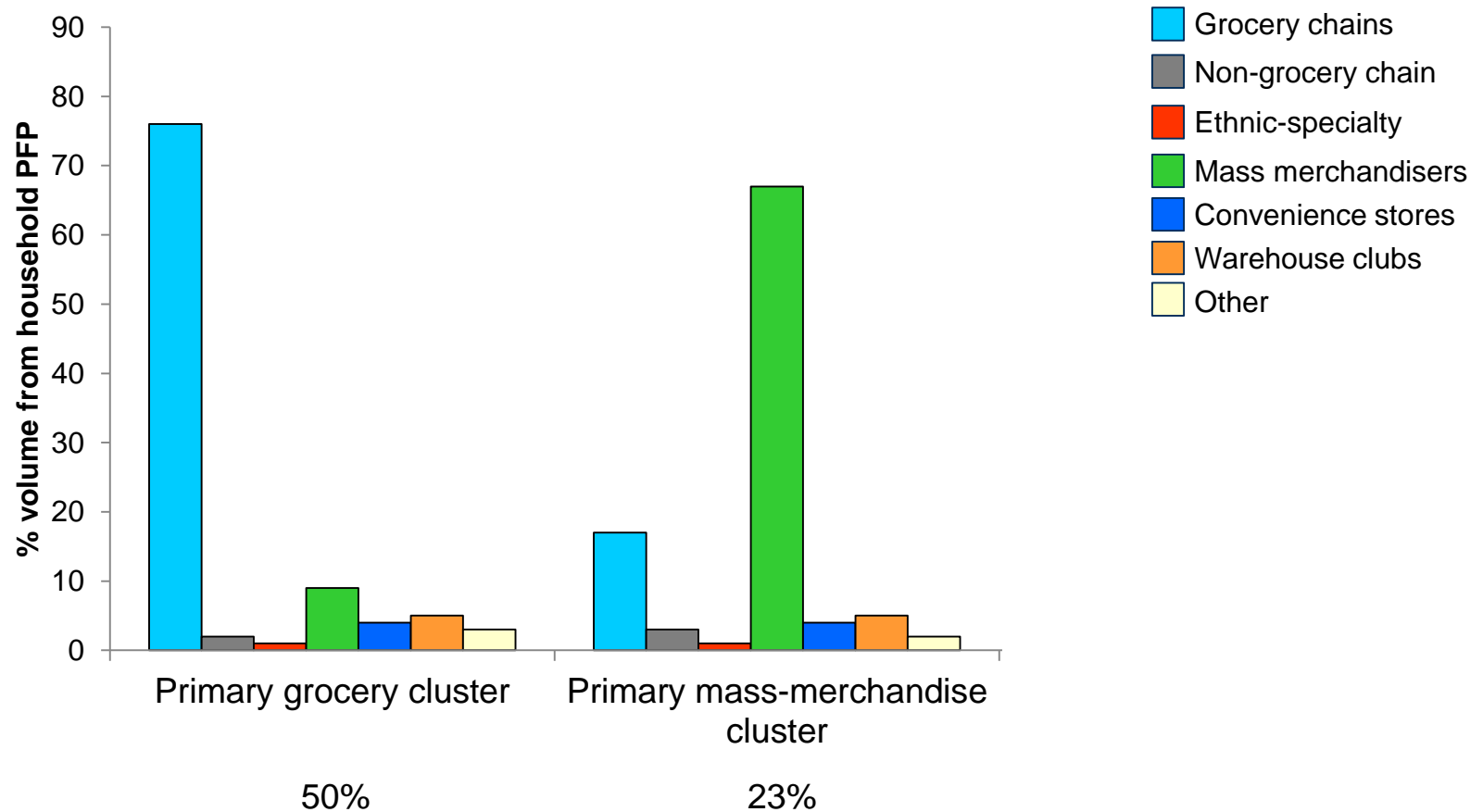
Stern D, et al. US Household Food Shopping Patterns: Dynamic Shifts Since 2000 And Socioeconomic Predictors. *Health Affairs*. 2015 Nov 1;34(11):1840-8



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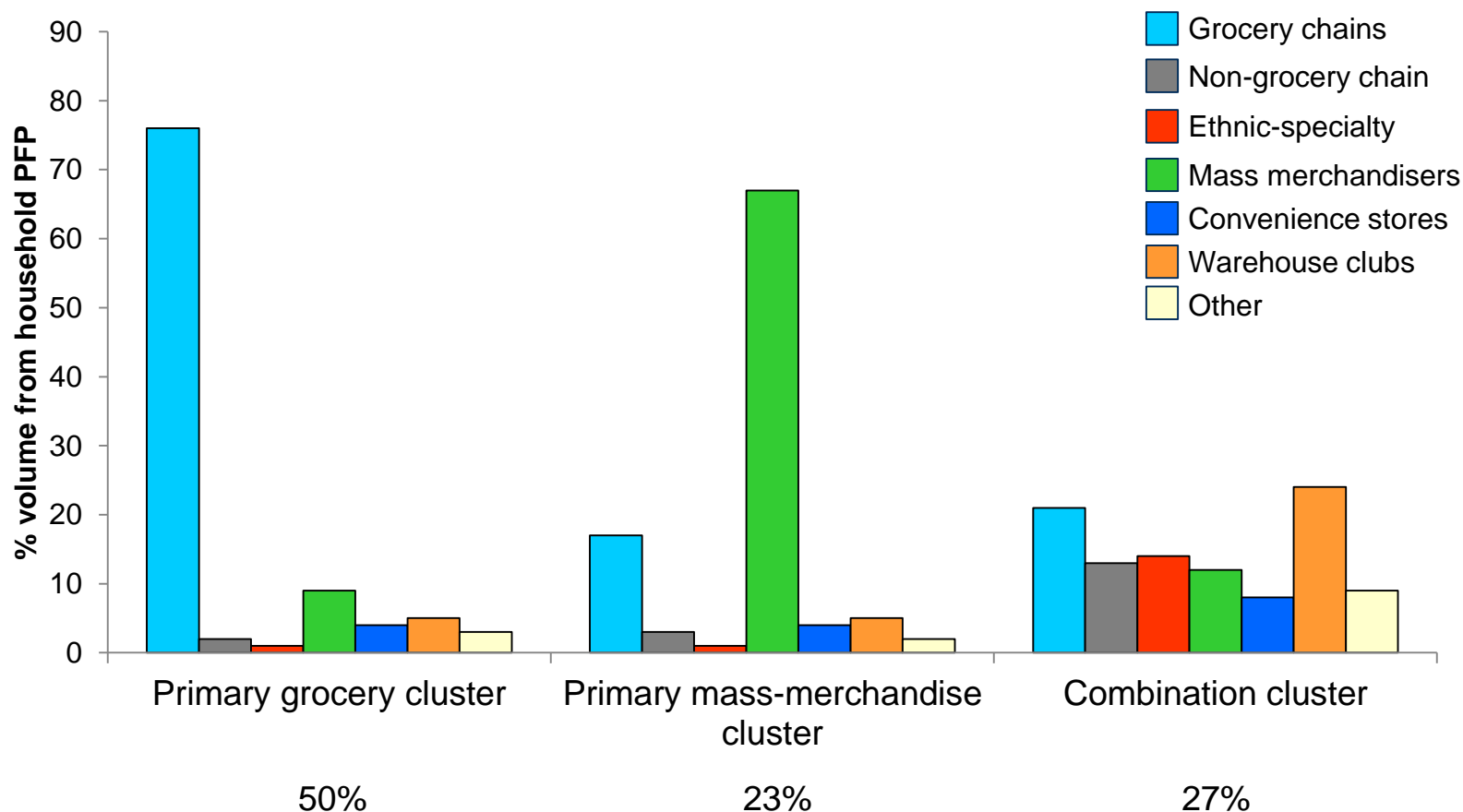
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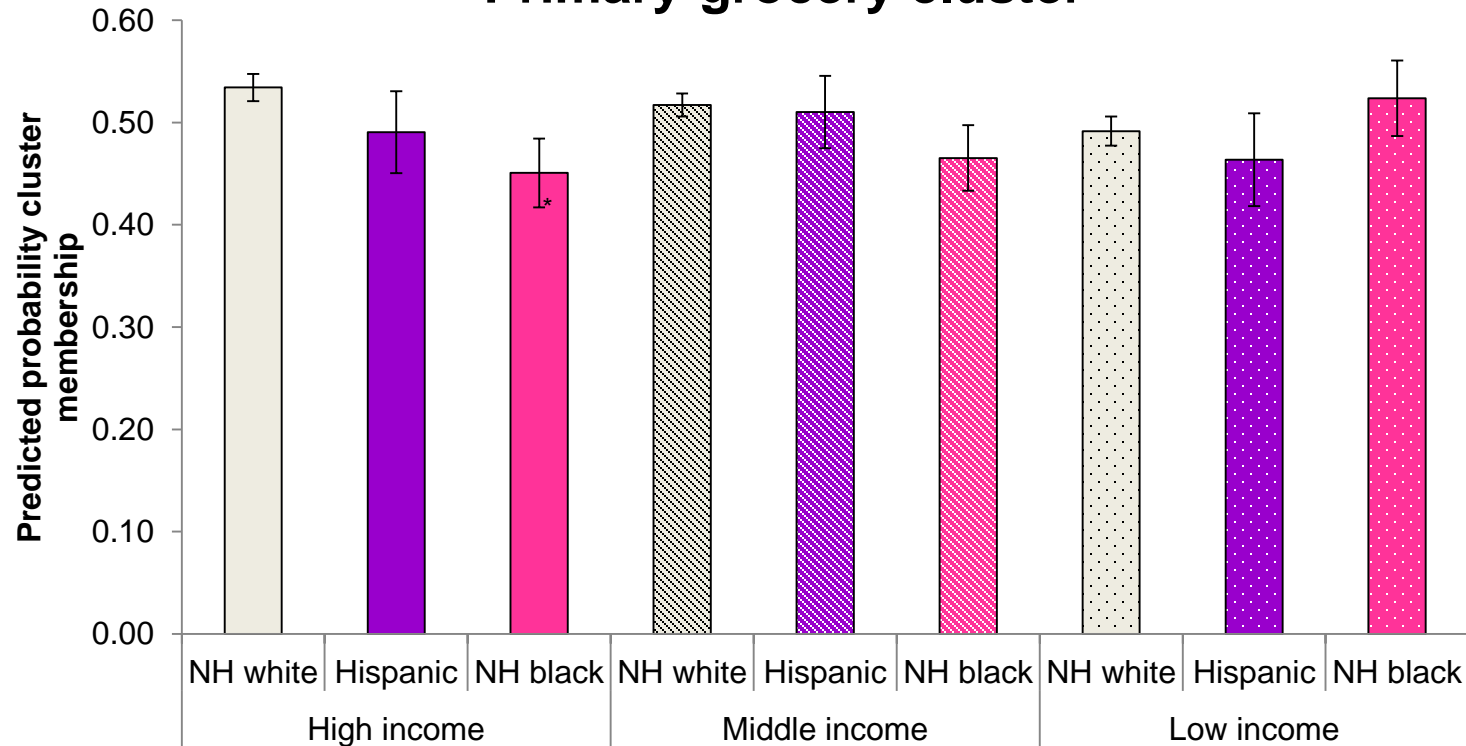


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Sociodemographic predictors of food shopping patterns in 2012

Primary-grocery cluster



Predicted probabilities from multinomial logistic regression models, adjusted for household composition and education

Results were weighted to be nationally representative

A two-sided P value of 0.05 was set to denote statistical significance

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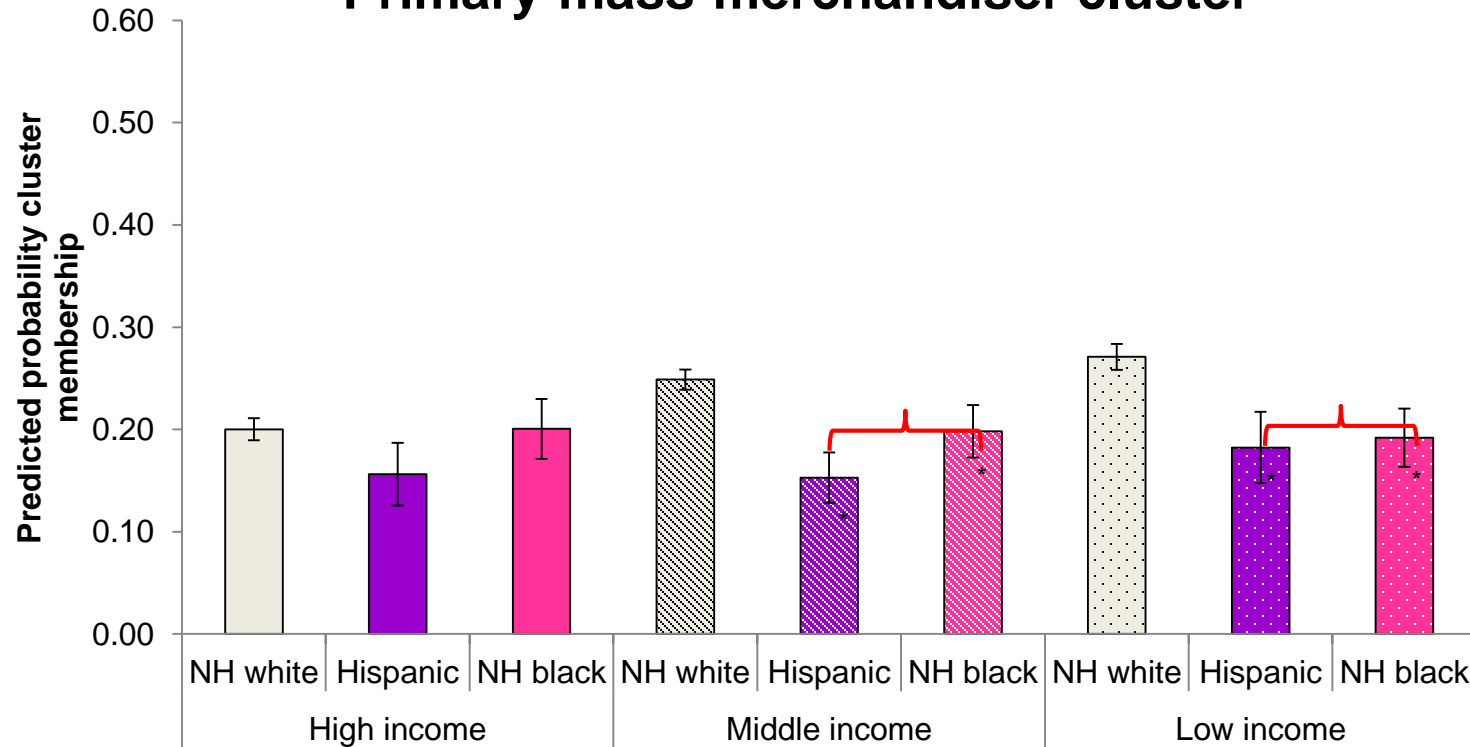


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Sociodemographic predictors of food shopping patterns in 2012

Primary-mass-merchandise cluster



Predicted probabilities from multinomial logistic regression models, adjusted for household composition and education

Results were weighted to be nationally representative

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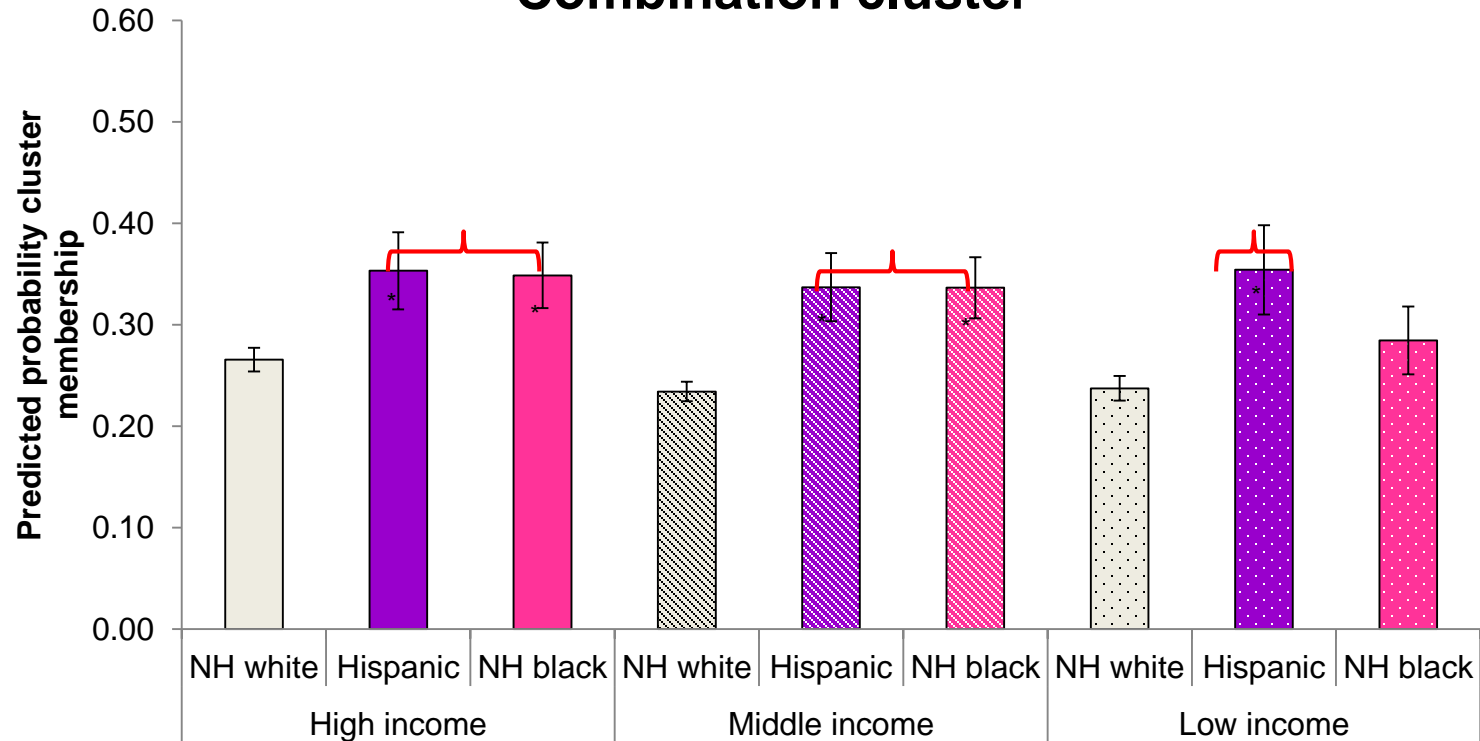


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Sociodemographic predictors of food shopping patterns in 2012

Combination cluster



Predicted probabilities from multinomial logistic regression models, adjusted for household composition and education

Results were weighted to be nationally representative

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How does nutrient profile of food purchases vary by shopping cluster and race-ethnic subpopulations??

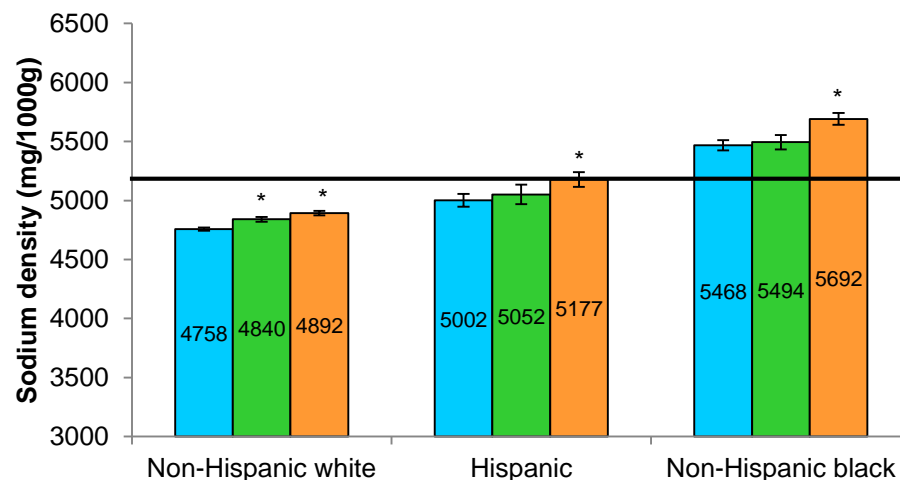
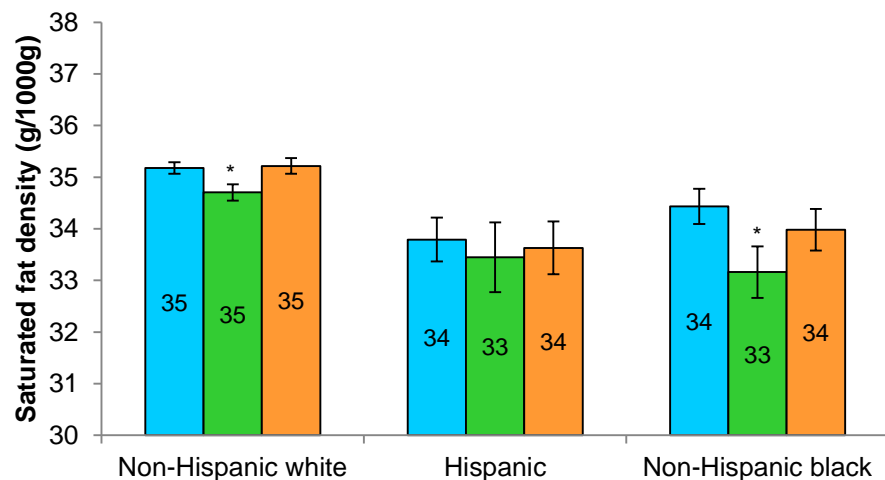
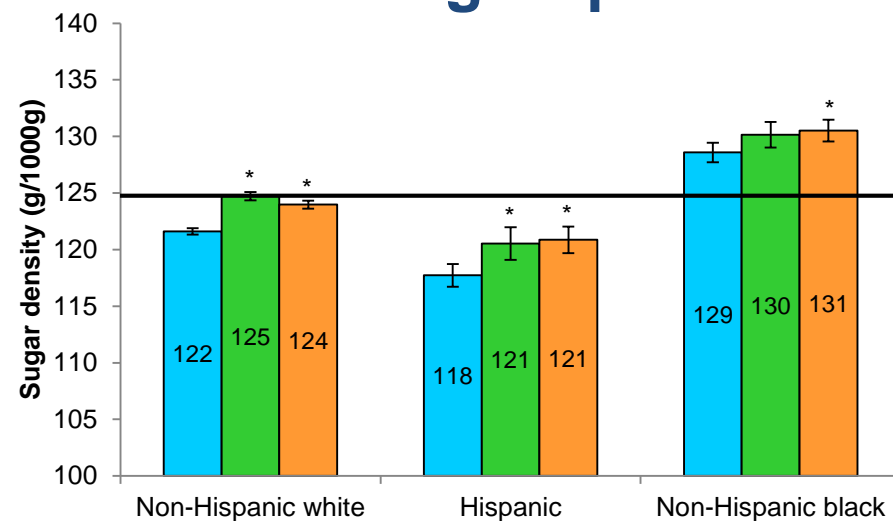
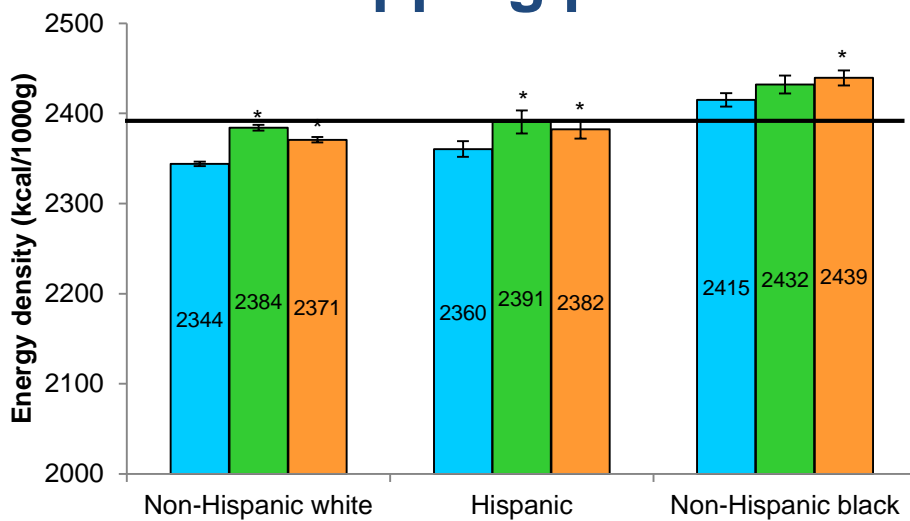


Statistical Analysis

- Longitudinal random-effects models
 - Outcomes: Nutrient profile of total PFP
 - Caloric and nutrient densities per 1000g
 - Foods
 - Beverages
 - Food and beverage groups (% kcal)
 - Exposure: Food shopping patterns*race-ethnicity



Nutrient profile of packaged foods by shopping patterns across race-ethnic groups

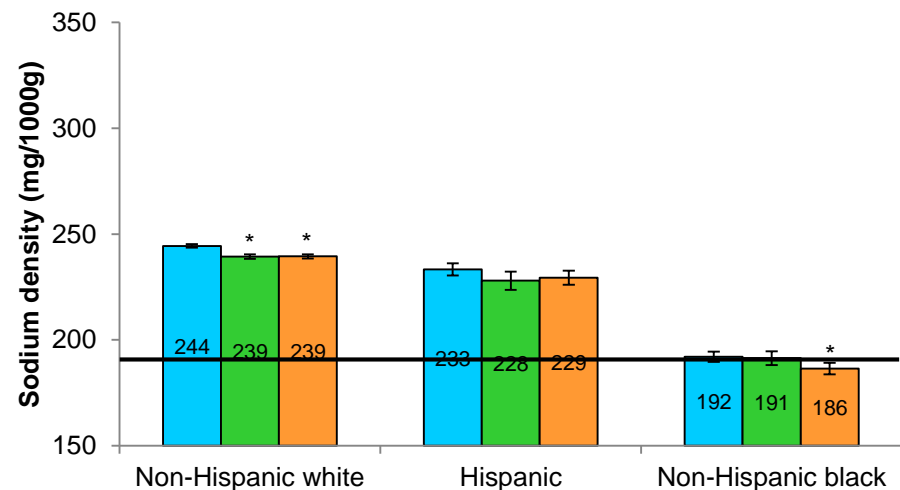
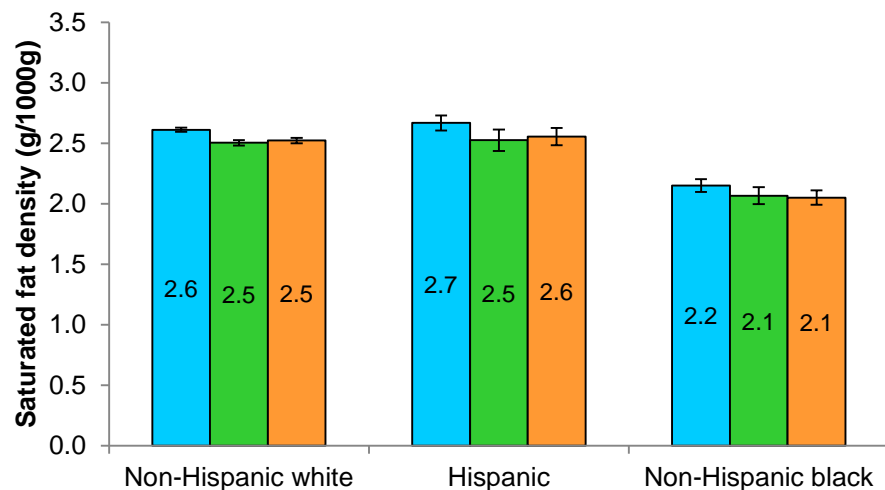
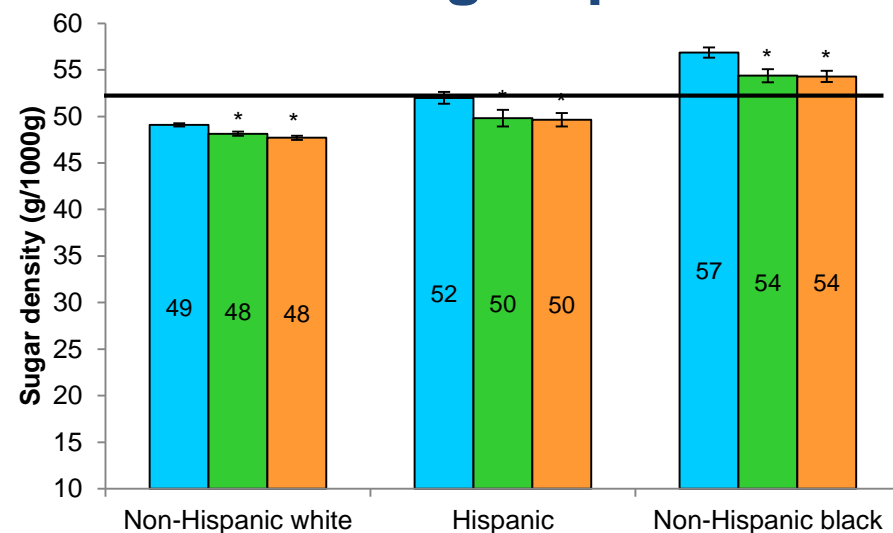
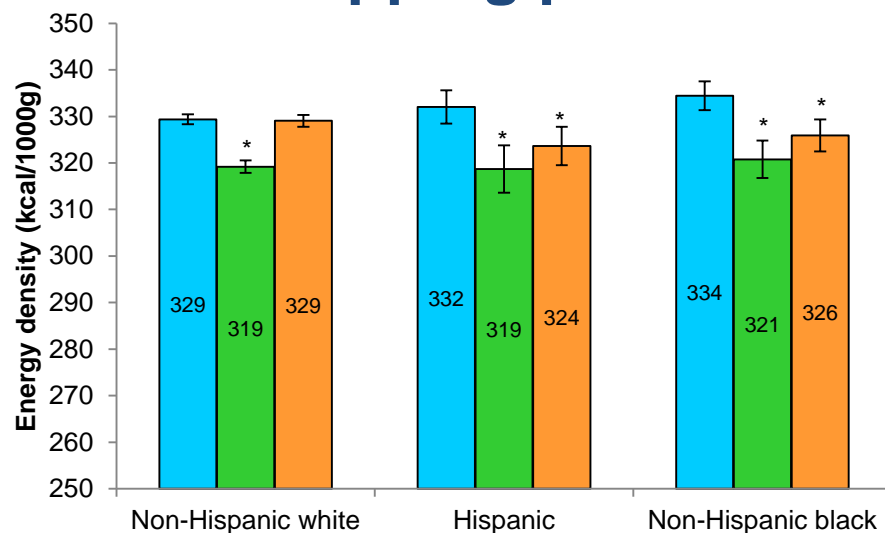


■ Primary grocery cluster
 ■ Primary mass merchandiser cluster
 ■ Combination cluster

Predicted means from longitudinal random-effects models adjusted for income, maximum level of education, household composition, store-type specific food and beverage price indices, year and market. A two-sided p-value of 0.001 was set to denote statistical significance to account for multiple comparisons and big sample size.

Stern D, et al. Where people shopped was not associated with the nutrient quality of packaged foods for any racial-ethnic group in the US. Am J Clin Nut, In press.

Nutrient profile of packaged beverages by shopping patterns across race-ethnic groups



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Do food-retailer based healthier foods initiatives improve the nutrient profile of purchases?



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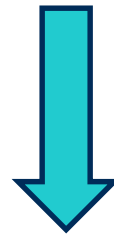
Walmart's 2011 Healthy Foods Initiative

Produce

- Increased local & organic
- Price cuts on fruits & veg

Packaged Food and Beverage

- front-of-package logo
- product formulation:
 - 10% added sugar
 - 25% sodium
 - elimination *trans* fat



WE'VE LOST A FEW
(MILLION)
POUNDS

And this is how:

Between 2008 and 2011

— We eliminated —

6.9 MILLION
POUNDS OF SUGAR

— in our —
YOGURT PRODUCTS
— a decrease of over —

12%

— We removed —

1.5 MILLION
POUNDS OF SALT

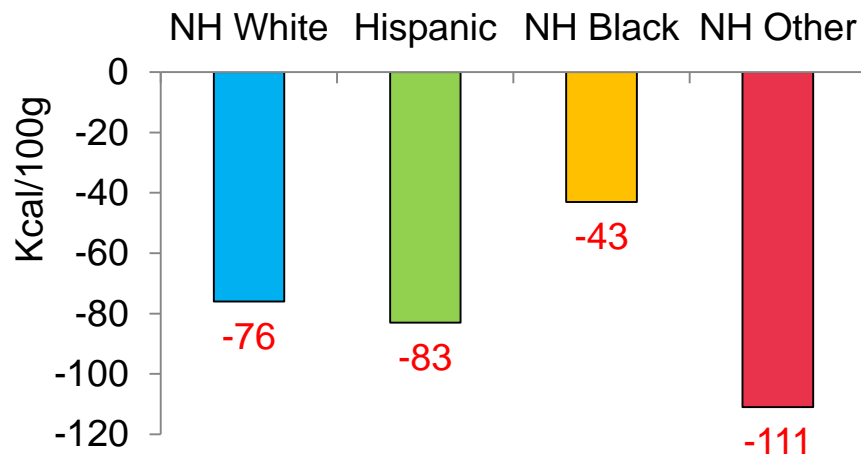
— across the —
COMMERCIAL BREAD CATEGORY
— a decrease of over —

13%

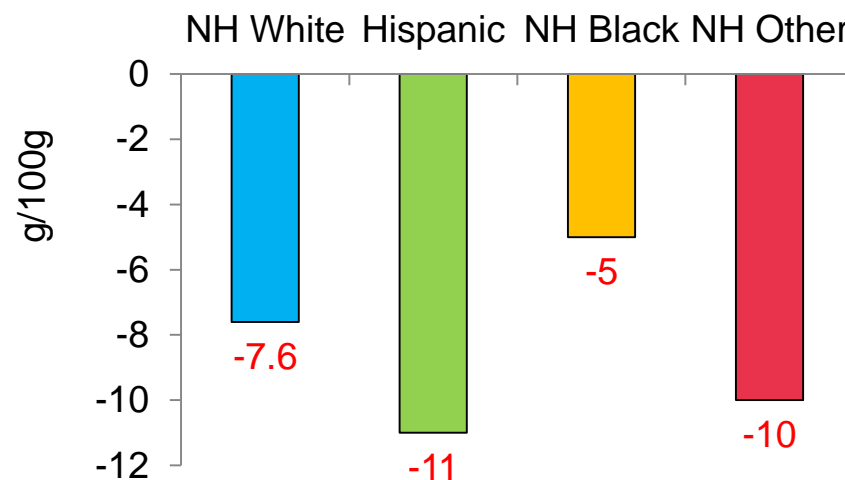


Changes in Walmart PFP profiles by race-ethnicity (2013 vs 2010)

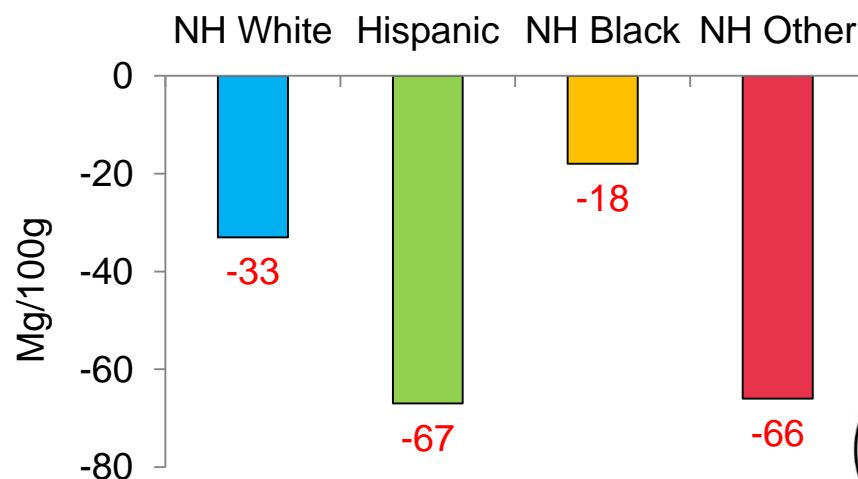
Energy Density



Sugar Density



Sodium Density



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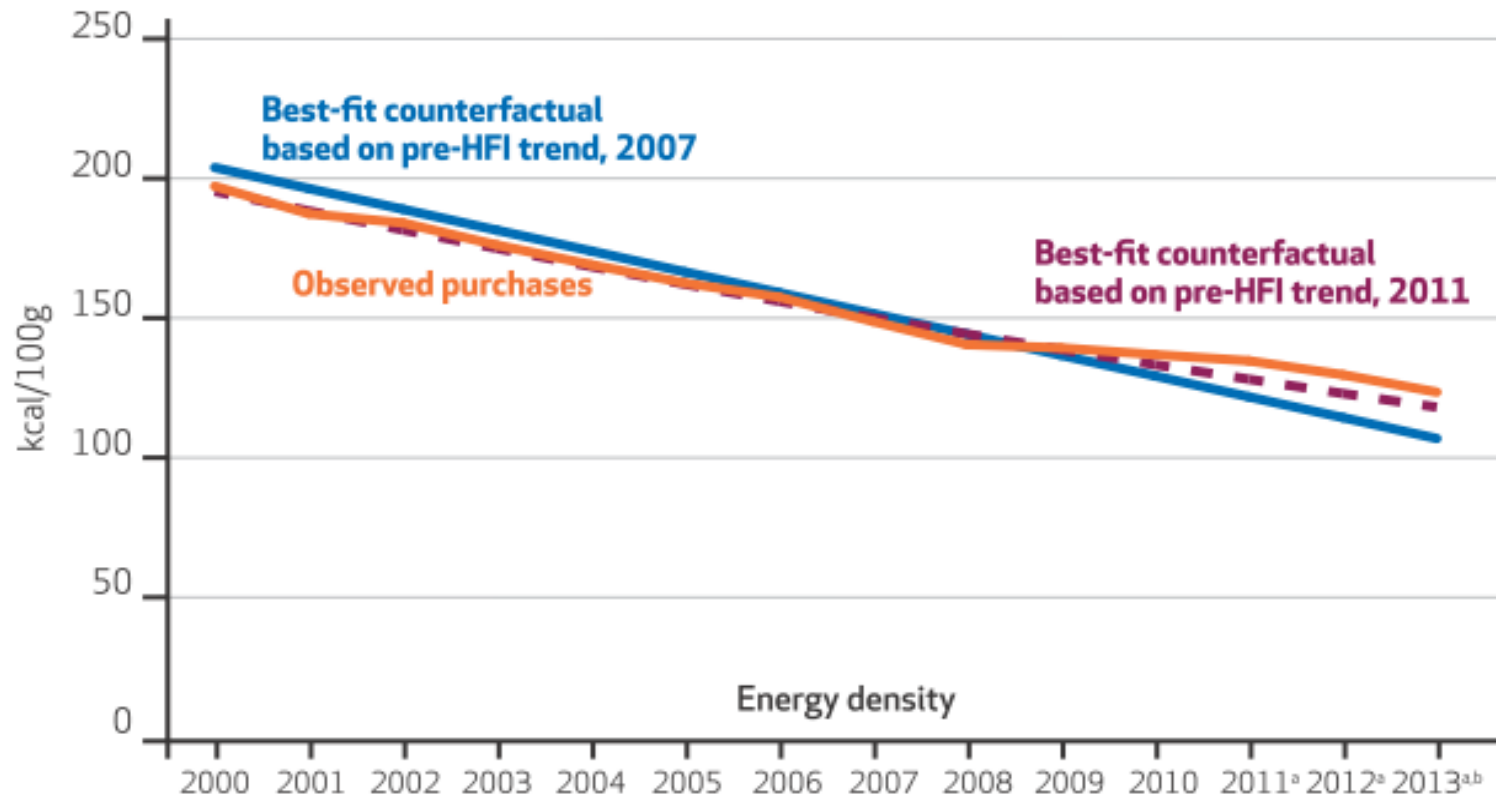


Evaluating the HFI: Statistical Analysis

- Fixed effects models with inverse probability weights to control for the selectivity of shopping at Walmart
- We compared the observed nutrient profile of purchases after the initiative to the counterfactual (what we would have expected to occur based on pre-initiative trends)



Post-Initiative Changes in Nutrient Profile Decline Less than Expected



The observed nutritional profile of post-initiative purchases differs from the ^a2007 or ^b2011 counterfactual based on the pre-HFI trend ($p < 0.01$).



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- Similar results for sodium, total sugar, and saturated fat densities
- For food groups, post-initiative we see:
 - Increases in fruits and vegetables; declines in grain-based desserts, candy, and savory snacks
 - All no different than we would expect based on pre-existing trends
- We did see declines in sugary beverages beyond what would be expected
 - But small (1%) and due to pre-initiative increases
- No differential effects by race/ethnicity or income



Summary

- “Less healthy” food and beverage groups were top calorie contributors to household PFP ***across all types of stores***
- Majority of households follow a ***primary grocery shopping pattern***, however for some households, purchases were made primarily at mass merchandisers or at a mixture of large and small stores
- ***No meaningful differences*** in the nutrient profile of PFP across food shopping patterns. Findings were consistent across race-ethnic groups.
- Healthy foods initiative at US’ largest retailer ***did not contribute to improvements*** in the nutrient profile of purchases, nor reduce race/ethnic or socio-economic disparities



Public Health Significance

- People shop for food at a mix of stores
 - These varied shopping patterns and race-ethnic/income differences must be considered in future studies and policy initiatives
- Ubiquity of unhealthy packaged foods and beverages
 - High in sugars, sodium and fat may impair efforts to improve eating habits
- Better access to certain types of stores, such as supermarket or grocery stores, may not guarantee improved nutritional quality of household purchases
 - While access to healthy foods is a necessary condition for healthier diets, it may not be sufficient to change dietary behaviors
 - Efforts negated by people choosing to purchase foods that are in line with their culture, socioeconomic characteristics and dietary preferences



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Questions?



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Non-packaged food purchases

