A Supermarket-Research Partnership: Origins, Lessons Learned, and Future Directions

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Overview

Michele:

- Rationale for the work
- Origins of partnership
- 2 RCTs implementation and outcomes

Julie:

- Retailer perspective

Josh:

- Subsequent studies
- Challenges
- Opportunities

Barriers to Healthy Eating

Affordability and availability of fresh produce

Cost and cooking time are major barriers cited by low-income populations

Children living in households that spend less on F&V-eat fewer F&V

WHY the Retail Grocery Environment ?

Has the potential to impact key barriers

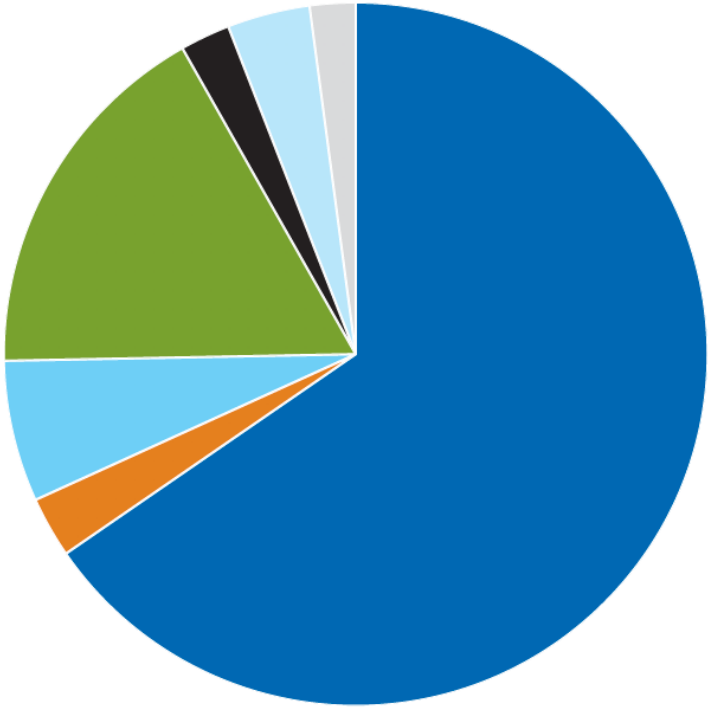
Retail chains can promote products across large population segments

Few studies done to demonstrate effectiveness of approaches in supermarkets (e.g., point of purchase education, choice architecture or financial incentives)

WHY the Retail Grocery Environment ?

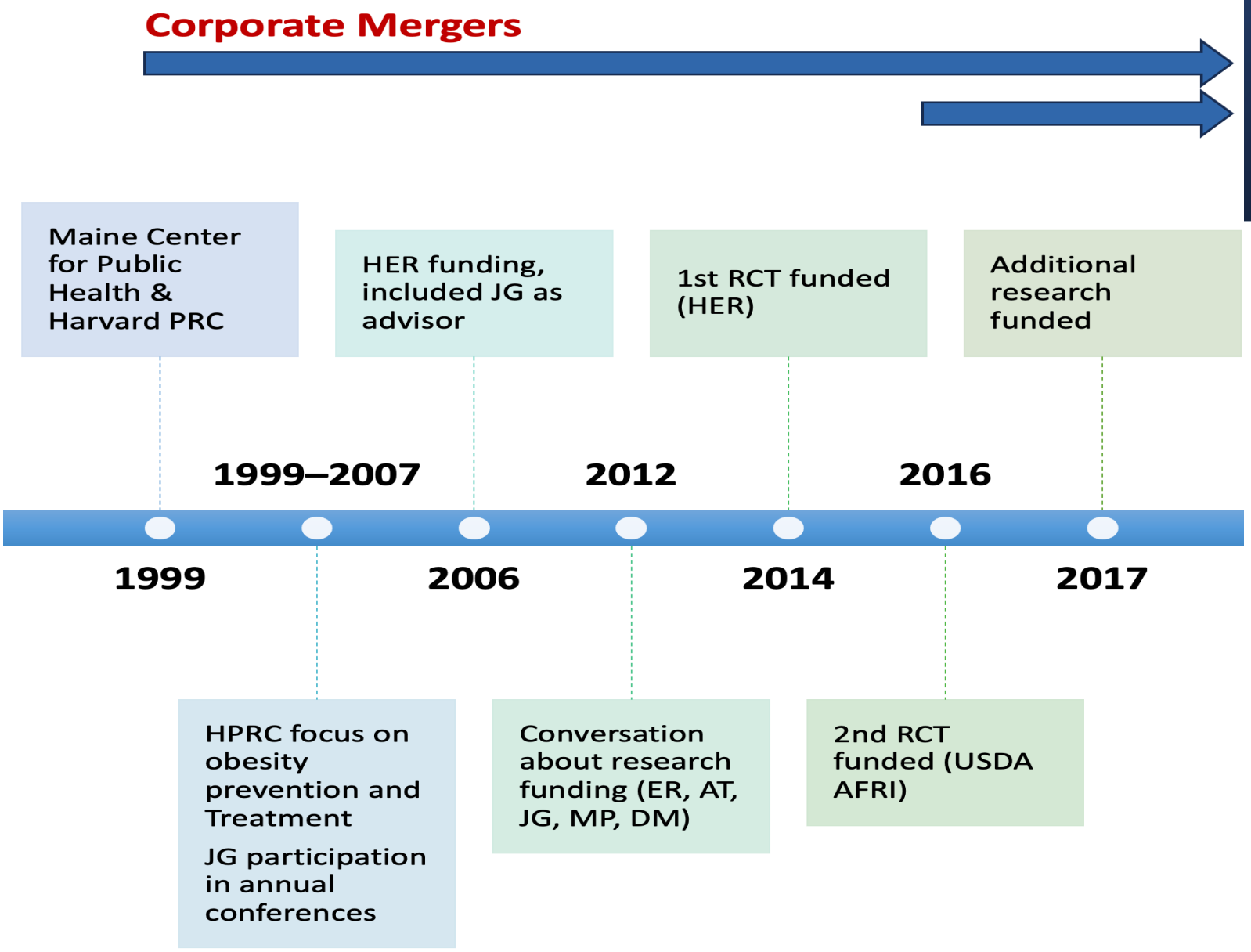
Greene J. *Understanding the Value of Academic Research Partnerships with Food Retailers*. Durham, NC: Healthy Eating Research; 2020. Available at https://healthyeatingresearch.org.

Share of Household Calories by Food Source



- Large grocery stores **65.4%**
- Small and specialty food stores **2.8%**
- Convenience, dollar, and other stores **6.5%**
- Restaurants and eating places **17.1%**
- Schools **2.3%**
- Family, friends, and social gatherings **3.8%**
- Other stores **2.1%**

Origins of the Partnership



Conducted two studies:

Promoting Healthy Purchases at the Supermarket Through Financial Incentives

Polacsek M. A Supermarket Double-Dollar Incentive Program Increases Purchases of Fresh Fruits and Vegetables Among Low-Income Families With Children: The Healthy Double Study. J Nutr Educ Behav. 2018 Mar;50(3): 217-228.

Moran A, Financial Incentives Increase Purchases Of Fruit And Vegetables Among Lower-Income Households With Children. Health Aff (Millwood). 2019 Sep;38(9):1557-1566.

1. Pilot RCT

Funded by RWJF HER

2. Larger RCT

Funded by USDA/NIFA

The Study Teams

Michele Polacsek, University of New England, PI

Anne Thorndike, Harvard Medical School

Rebecca Boulos, Maine Public Health Association

Rebecca Franckle, Mathematica

Alyssa Moran, Johns Hopkins Bloomberg School of Public Health

Julie C. Greene, Hannaford Supermarkets

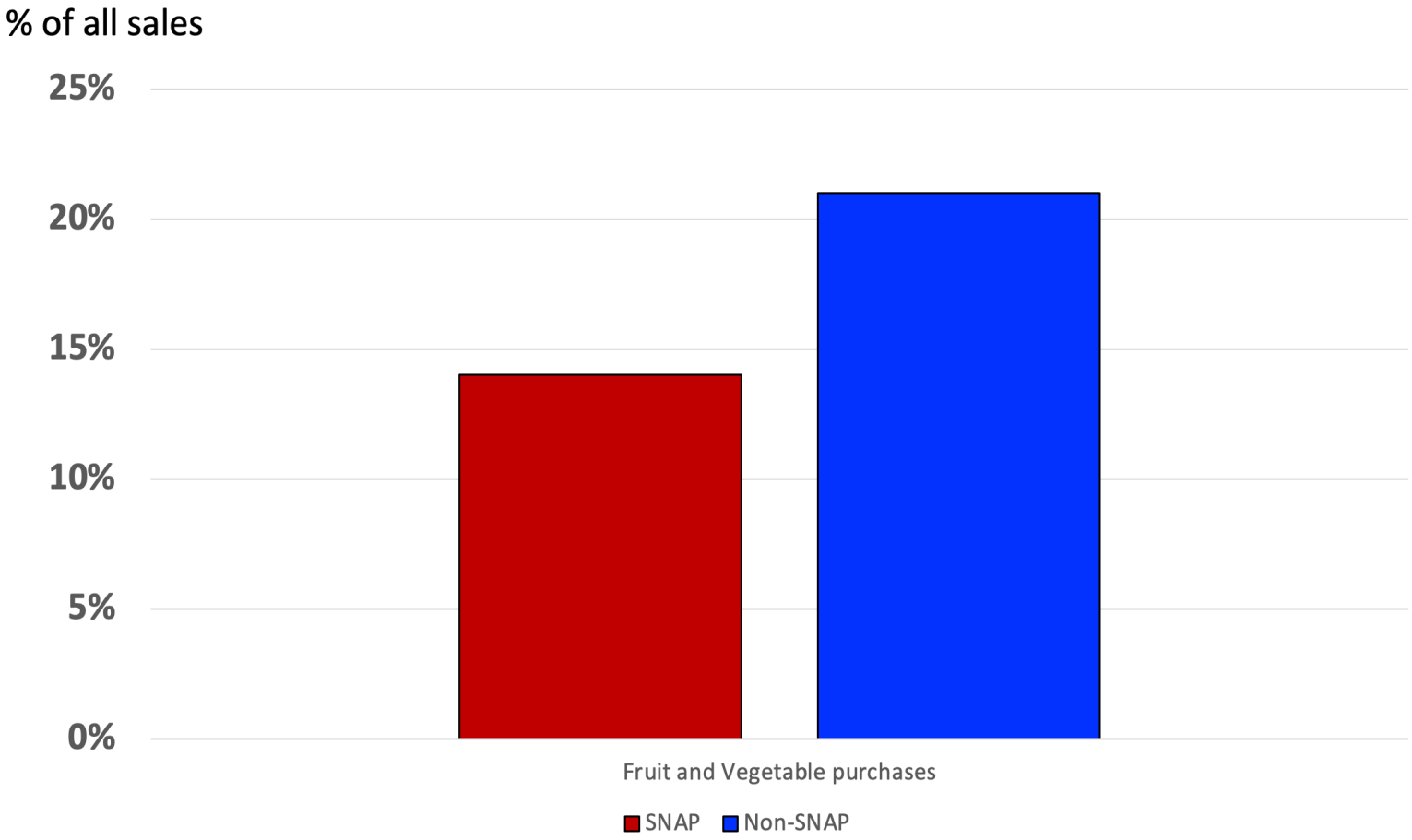
Sue Till, Hannaford Supermarkets

Dan J. Blue, Hannaford Supermarkets

Jason Block, Harvard Medical School

Eric Rimm, Harvard T.H. Chan School of Public Health

F&V Purchases at a Large Northeast Supermarket Chain



2 years of data, 188 stores, >298 M baskets, 4.4% SNAP
non SNAP eligible items removed

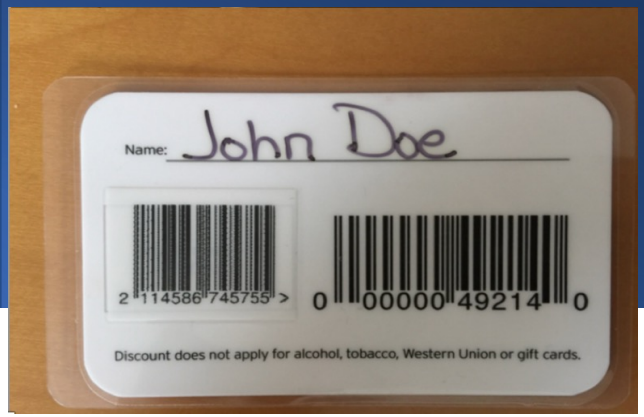
Franckle R., et al., *AJPM* (2017)

Study Aims

First Study: Pilot-test a double-value program (up to $10/shop) that incentivizes the purchase of healthful fresh, frozen or canned F&V and leverage the retailer's "Guiding Stars" nutrition shelf-tag rating system to help consumers make nutritious F&V *purchases*

Second Study: Test the program, adding (station-style) Cooking Matters for impact on *purchases and diet*

Research Strategy- Both Studies



- Randomized controlled trial of 401 and 605 households with children in two Maine supermarkets
- Households were enrolled, followed during baseline and randomized to a control or intervention arm
- 2nd study added required participation in Cooking Matters (12 opportunities over 3 months)
- We measured: (1) household purchases and (2) dietary intake (2nd study only) of the primary shopper and one reference child

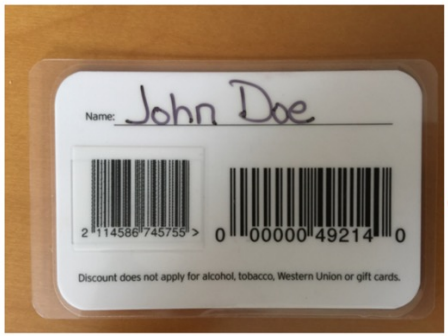

The savings start here.
Real Savings Every Day
2 for 4
Real Savings Every Day
2.19
Real Savings Every Day
3.99
Real Savings Every Day
5.99
3 easy ways to save
store policy


MART CART
Attention Families!
•Do you do most of your shopping here?
•Are you at least 18 years old?
•Do you live with at least one child under 18?
•Do you have a valid picture ID?
If yes, you can get at least 5% off your purchases here!!
We invite you to participate in a research study about promoting healthy food purchases! Ask us how!
UNE UNIVERSITY OF NEW ENGLAND
HARVARD SCHOOL OF PUBLIC HEALTH
Feed your athlete!
Feed your fan!
Feed your family!
BACK TO SPORTS!

Cooking Matters in the Store

Randomization

Half Were Randomized To Two for One Fresh, Frozen, and Canned Fruits and Vegetables

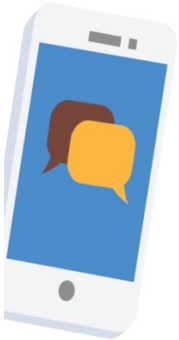


Eligible Items Had 2 or 3 Guiding Stars


Good


Better


Best



Monthly Reminders via Text or Email

Implementation: What we measured

Proctor, E., et al. (2011)

Franckle RL, Boulos RJ, Thorndike AN, Moran AJ, Khandpur N, Blue D, Greene J, Block JP, Rimm EB, Polacsek M. Implementation of a 2-for-1 Price Incentive for Fruits and Vegetables in a Grocery Retail Setting. Health Promot Pract. 2023 Jul;24(4):728-739.

Evaluation Outcome	Definition	Indicator	Data Source
Acceptability *(of the intervention)*	Perception among stakeholders that innovation is agreeable, palatable, or satisfactory	Participant Perceptions	Focus Groups
		Retailer Perceptions	Key Informant Interviews
		Researcher Perceptions	Key Informant Interviews
Adoption *(of F&V discount)*	Intention, initial decision, or action to try or employ an innovation	Use of F&V Discount	Study Loyalty Card; Sales Data
		Redemption Rate	Study Loyalty Card; Sales Data
Appropriateness *(of F&V discount)*	Perceived fit, relevance, or compatibility of innovation for a given setting	Participant Perceptions	Focus Groups; Communication
		Retailer Perceptions	Key Informant Interviews
Feasibility *(of intervention)*	Extent to which an innovation can be successfully used or carried out within a given setting	Integration of Discount into Retailer's System	Key Informant Interviews
		Managing & Analyzing Grocery Sales Data	Key Informant Interviews
Implementation Fidelity *(by retailer)*	Degree to which intervention was implemented as intended	Redemption Rate	Study Loyalty Card; Sales Data; System Outages
		Retailer Perceptions	Key Informant Interviews (Staff Training, Turnover
Implementation Cost	Cost impact of implementation effort	Cost Per Customer	F&V Discount; Program Costs (Staff Time, Training)
Reach *(n/a)*	Integration of practice within a service setting and its subsystems		
Sustainability *(n/a)*	Extent to which innovation is maintained in ongoing operations		

Coupon Use During Intervention

Coupon process not ideal

- Cashiers accustomed to coupon printing after transaction – our study required printing & scanning before end of transaction
- Some coupons were used at a future shopping date (N=169 transactions)
- Periodic “system-outages”

Implementation: What we learned

Human Errors

- Coupon not scanned at correct point in transaction
- Scanned coupon & handed customer cash back instead of applying discount to grocery bill
- "It's on us" flat $10 discount, instead of 50% off
- Customers tried to use it a non-participating store

Solutions

- More frequent store visits, including "Secret shopper," during RCT
- Training & instruction guide for cashiers
- Remind customers about study store location, if partnering with a chain

Technology Problems

- Broken coupon machine
- Store power outages
- Study card barcodes wore down/difficult to read
- Card barcode stopped working

Solutions

- More frequent store visits, including "Secret shopper," during RCT
- More frequent data pulls
- Integration into existing loyalty/rewards program

Transactions-2nd Study

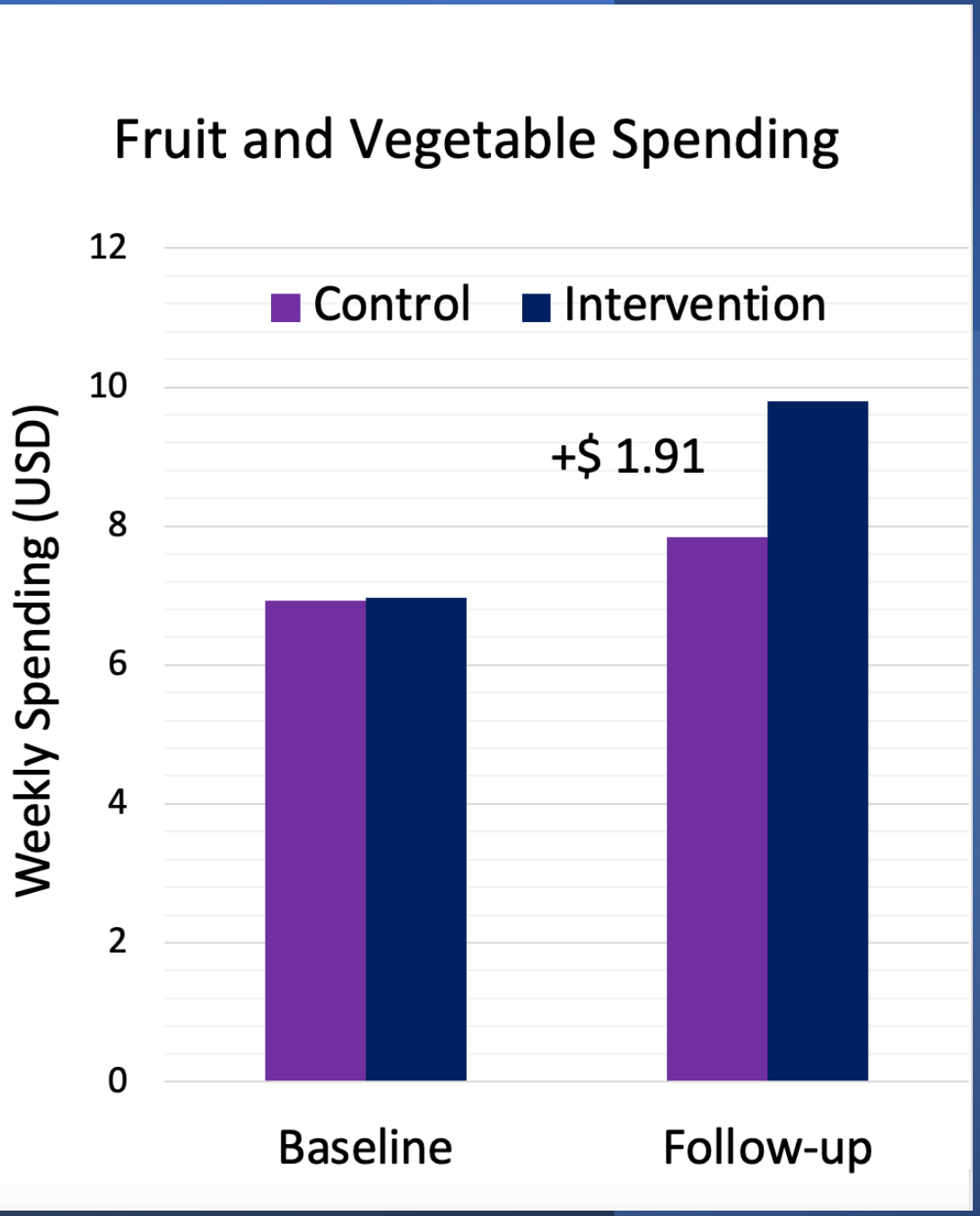
(87%) participants used card at least once	15,353 food transactions over the 35-week study	~282,000 items and 16,000 unique UPC codes
Mean spending per transaction $68	82% (vs.55%) of coupons redeemed	Average weekly shopping trips: ~1 (0.83)

Cooking Matters participation was low

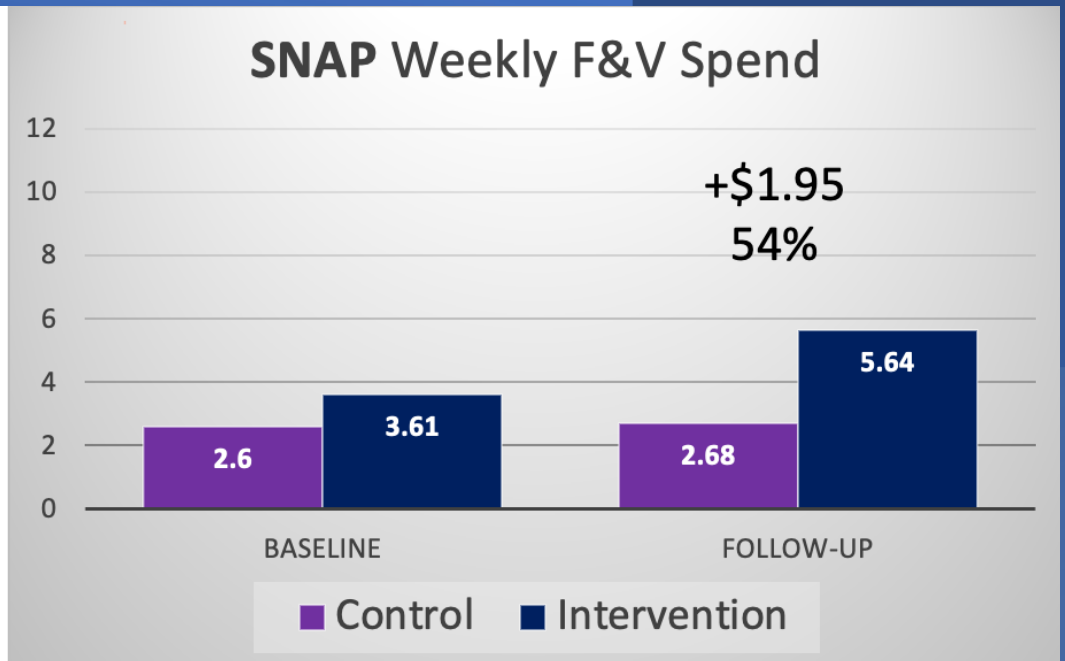
Intervention: 29 (12%)
Control: 9 (4%)

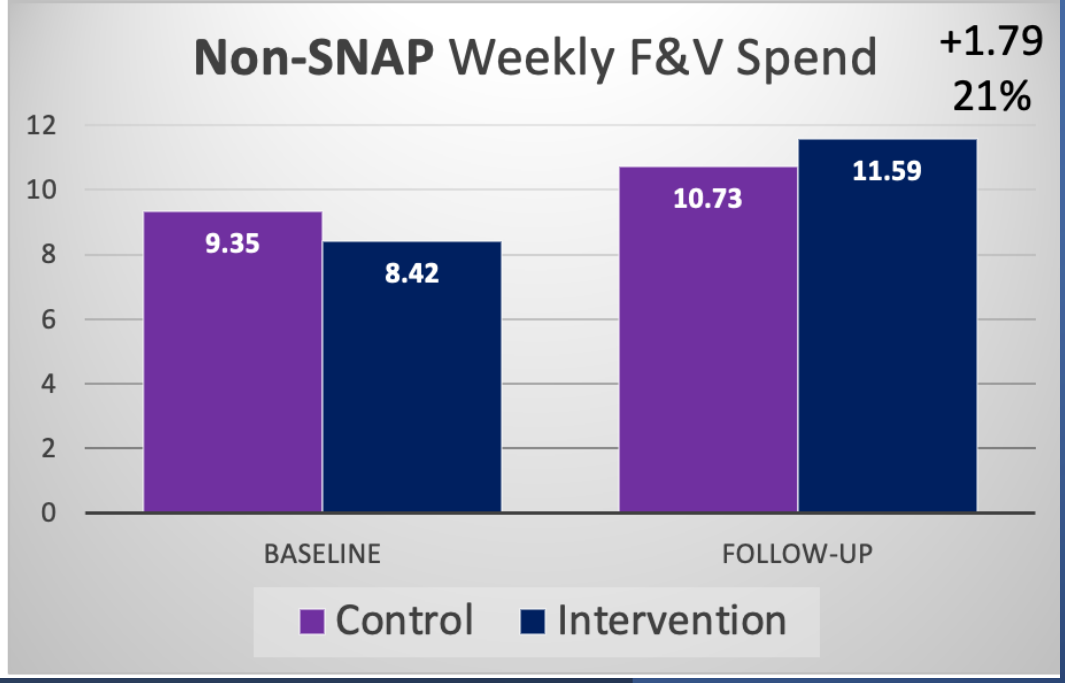
Intervention: 210
Control: 208

Overall, weekly spending on fruits and vegetables increased by 27% in intervention vs. control.

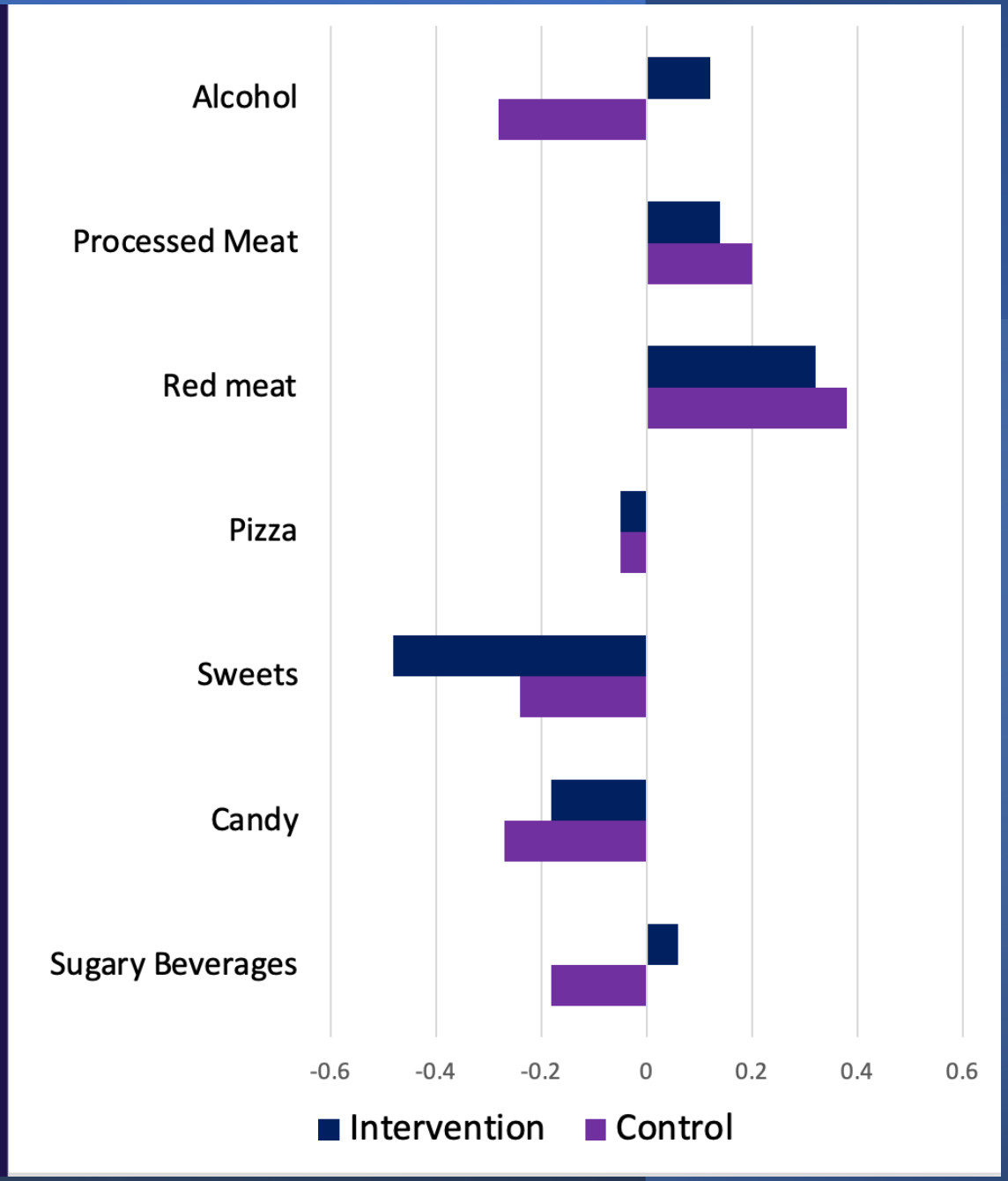


By SNAP Participation

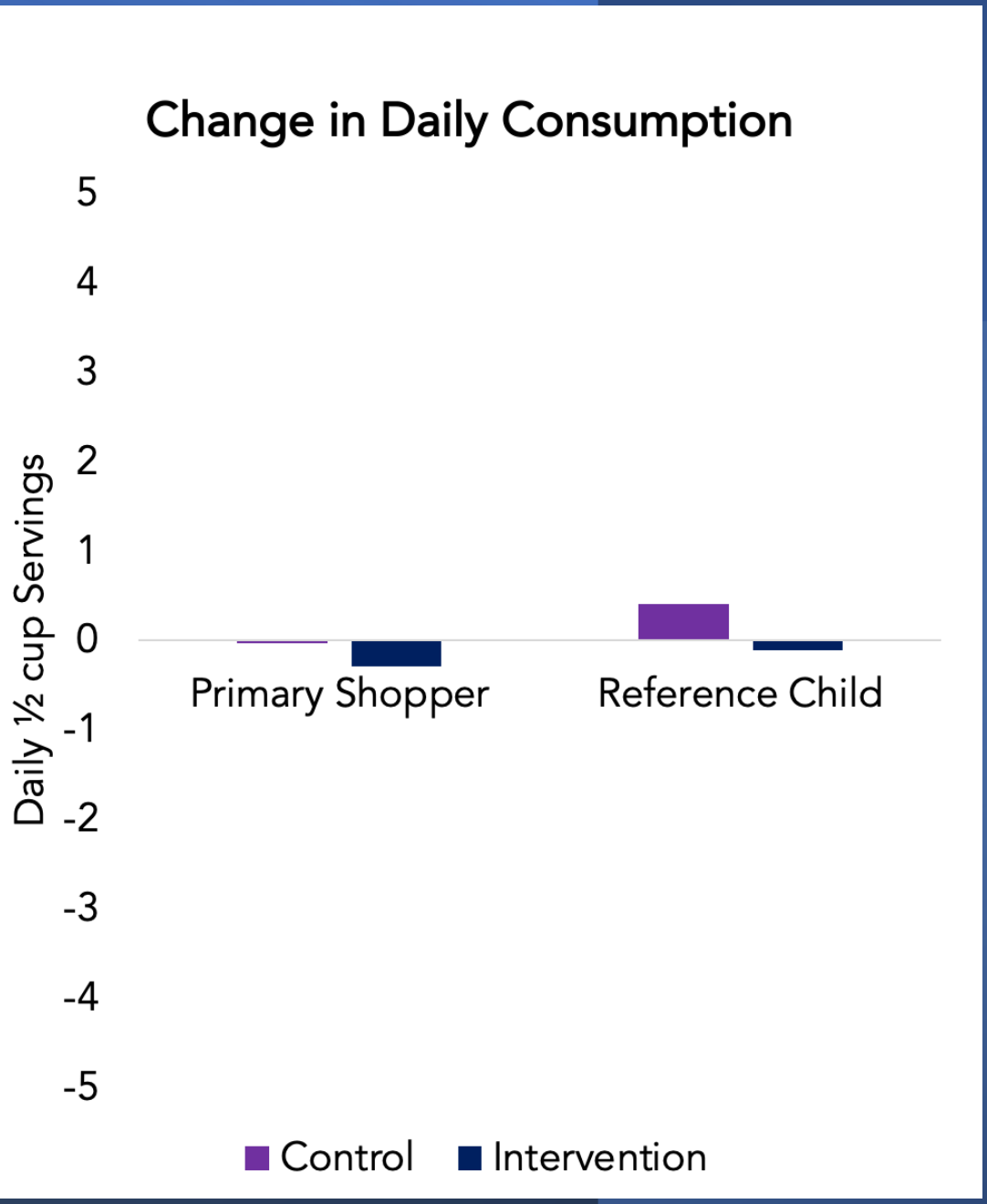




No Changes in Unhealthful Food Purchases



No Changes in Consumption



Key Points: Outcomes

Same day, coupon use likely associated with increases in F&V purchases – “same day” important motivator

SNAP participants not redeeming coupons as often as non-SNAP

When SNAP participants redeem same-day coupon, bigger impact seen than among non-SNAP

Foods Purchased may not be consumed

Financial incentives could be considered to promote healthy purchases among SNAP users, more research needed

Implementation: Key lessons

This can work!

Multi-sector collaboration and frequent communication facilitate success

Successive studies facilitate success and learning

Team capacity for working with sales data is critical

Retailer Perspectives: *Reasons to Partner*

- Mutual interest in understanding consumer behavior
- Promoting health is good business
  - ✓Registered dieticians
  - ✓Product navigation like Guiding Stars
  - ✓Consumers willing to pay more to support business committed to social impact
- Researchers can provide valuable – and credible - insights to help in a competitive landscape
- Help researchers find interventions likely to be adopted by retailers

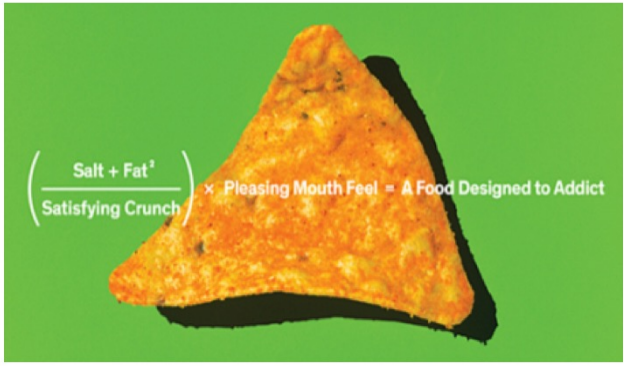
Retailer Context and Outcomes of Interest

- Pressure to meet quarterly earnings and shareholder demands
- Increasing consumer loyalty
- Shift occasional shoppers to to regular shoppers
- Increase basket size
- Increase in number of products people guy
- Increase total value of purchases

Why doesn’t this work with broccoli?

Shelf Space at a Premium

- As manufacturers extended their lines, retailers needed to **mitigate their risks** against new products that didn't sell.
- In the 1980's, retailers started charging fees ("allowance" or "slotting") were charged as **"insurance" against duds**.
- With shelf space becoming increasingly scarce, CPGs did everything possible to **drive consumption**.
- Quarterly reporting cycles create pressure to stick with **reliable sales-drivers.**



Other fees have emerged to cover costs for advertising in weekly circular, co-marketing around a seasonal theme, promotional activity and display.

Assortment Decisions

Hey Grocery Stores, There's no matzah in Hanukkah!

- **Fees & Category budgets** impact assortment
  - Income targets can influence buyers to prefer one brand over another.
  - Mergers can enable buying power, also influencing assortment
- **Direct Store Delivery** (soda, snacks, candy, beer)
  - Saves labor and warehouse costs for retailer
  - Allows vendors to have more influence over in-store assortment and display.
- **Demographics** can also influence assortment
  - Striking the right balance is crucial to avoid shrink
  - Getting it wrong can be costly and embarrassing
  - Do your research! Buyers at corporate HQ don't always know much about the markets they serve.

Key Challenges

- Who to work with—team skills and knowledge and can stay involved over time
- Corporate support
- Timelines and expectations
- Pushback from legal
  - ✓Data use
  - ✓Loyalty programs and data security
- Recruitment and non-solicitation policies
- Publishing and Acknowledgement
  - ✓Publication rights
  - ✓Unflattering findings

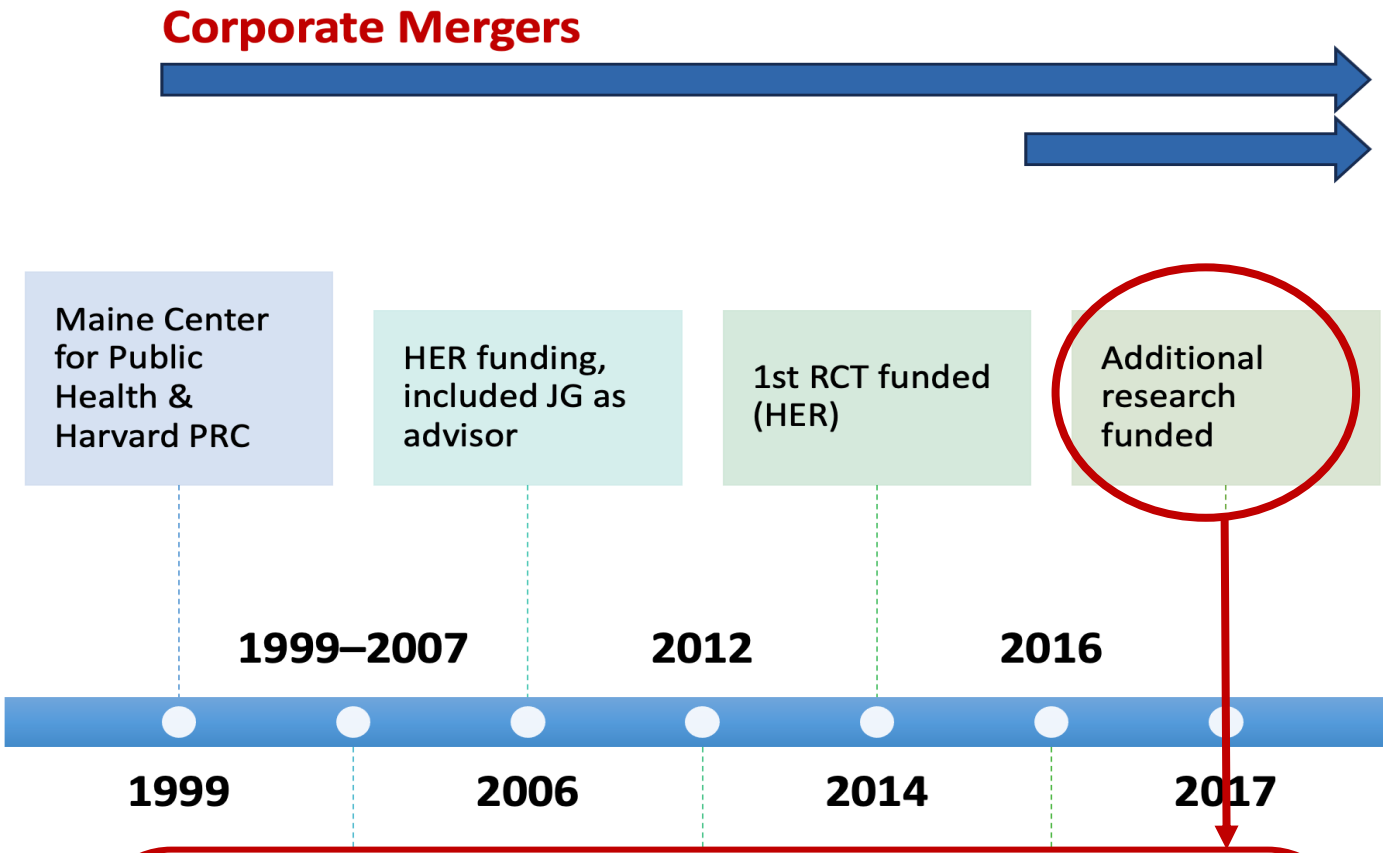
Key Challenges

- Tracking purchases
  - ✓High turnover front of store
  - ✓Routines disrupted
- Understanding purchase data and tracking purchases
  - ✓Classification of food products
  - ✓Price variability & “loss leaders”

Recommendations

- Engage with retailers early
- Make it participatory and collaborative
- Adapt interventions

Origins Of Partnership



Policy research

- Nutrition labeling policies
- Food and beverage marketing
- Pandemic-related changes to SNAP & WIC benefits

Benefits of sales data for policy research

- Get **rich, detailed data on food behaviors** to evaluate in response to policy changes
  - Did calorie labeling lead to improved purchases of prepared foods?
  - How did SNAP participants' purchases change when benefits increased?
- Data are **objective** – you can collect retrospectively without as much concern over measurement error
- **Repeated measures** if you have access to loyalty card programs
- **Large sample sizes** make it easier to detect associations overall and in key subgroups of interest (SNAP, WIC participants)

Benefits of sales data for policy research

- Example: evaluating the effects of menu calorie labeling
  - Use comprehensive sales data from April 2015 – December 2017 (labels added in April 2017)
  - ~375 million transactions across 173 stores in 5 states
  - Can stratify easily by neighborhood characteristics
  - No sampling – you get the entire population!

Challenges of sales data for policy research

- Sales datasets are **large**

Challenges of sales data for policy research

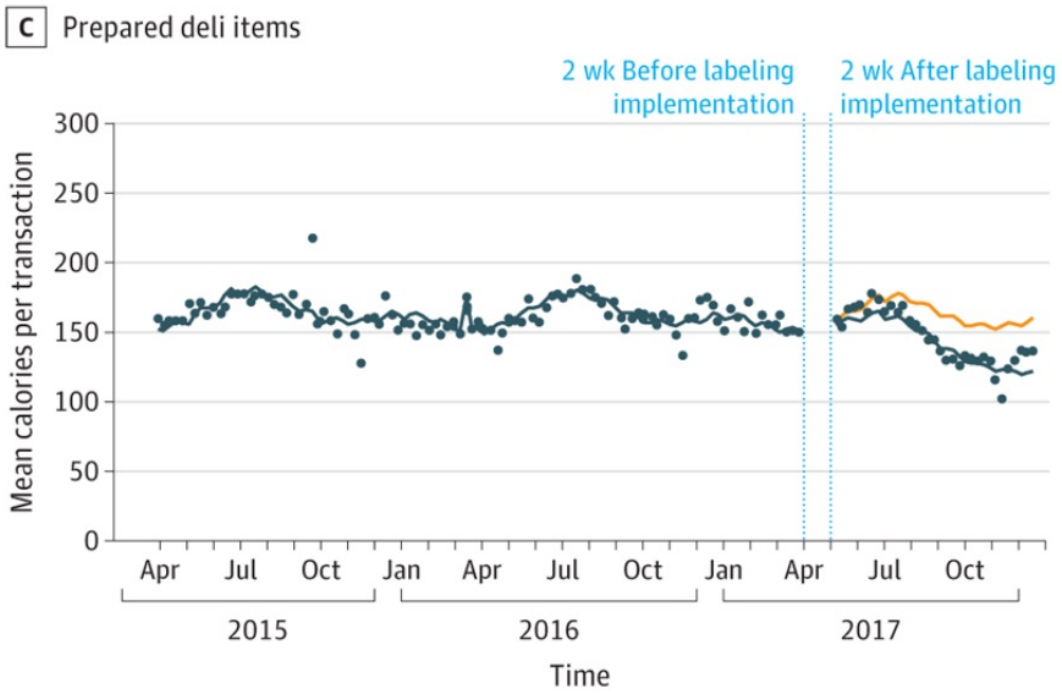
- Sales datasets are **large**
  - Our sales datasets are transaction-level and contain >1 billion rows (>5 terabytes of storage)
  - Need an experienced data manager who can devote a significant amount of time to processing the data
  - Require lots of storage on academic servers → could be costly
  - Could incur slow processing times – up to weeks to analyze!

Challenges of sales data for policy research

- Sales datasets are **messy**
  - Some of this messiness is intrinsic to the nature of the data
  - The food supply is constantly shifting

Challenges of sales data for policy research

- Sales datasets are **<u>messy</u>**



-11.0% (-11.9, -10.1)

Mean percent change in calories/transaction

*But more items discontinued in post period than pre period

-6.3% (-7.3, -5.3)

Percent change among <u>continuously offered</u> deli items

Challenges of sales data for policy research

- Sales datasets are **messy**
  - Some of this messiness is due to company "errors"
  - Example 1: changed the way that quantity and cost were recorded
    - Old way: price was per unit purchased. To get cost, you had to multiply by the number of items purchased (e.g., 2 avocados had price recorded as $1.99, multiply by 2 to get $3.98 total cost)
    - New way: price included # of units purchased, so multiplying by quantity led to incorrectly higher cost (e.g., 2 avocados had price recorded as $3.98, multiplying by 2 gave $7.96, which is wrong)

Challenges of sales data for policy research

- Sales datasets are **messy**
  - Some of this messiness is due to company "errors"
  - Example 2: incorrect coding of "calorie label" variable
    - Provided us with a flag for whether the item was in-scope for calorie labeling (i.e., was a prepared food)
    - Problem: this was miscoded. Had to dig into the data and even visit stores to confirm that certain UPCs were labeled with calories

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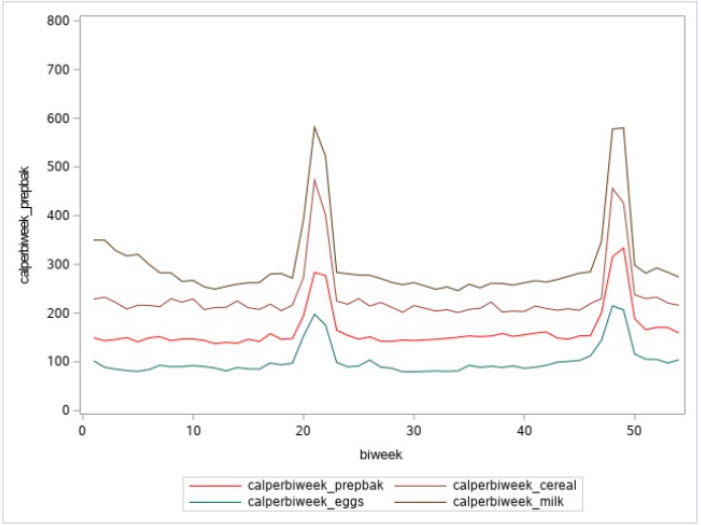
    - Solution: recode by hand (painful)

Challenges of sales data for policy research

- Sales datasets are **messy**
  - Some of this messiness is due to research team errors
  - Example: weird pattern in food purchases for a few weeks, around Jan-Feb in 2 years
  - Retailer theory: NFL playoffs? People buy more food for parties
  - But would this double purchases?



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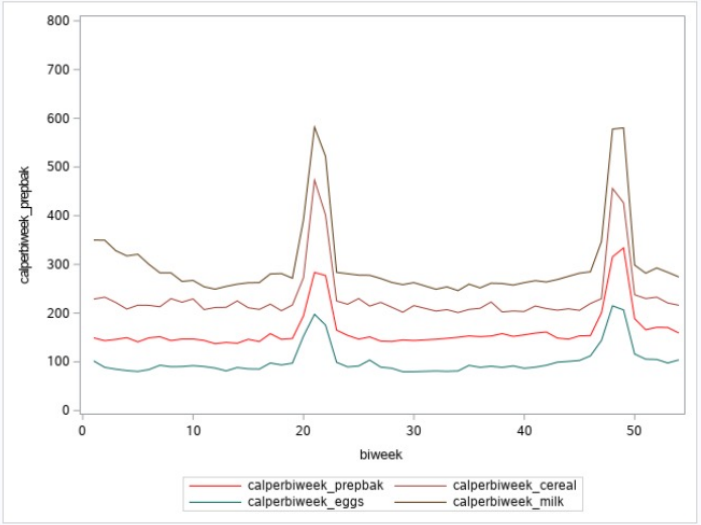
  - Example: weird pattern in food purchases for a few weeks, around Jan-Feb in 2 years
  - Retailer theory: NFL playoffs? People buy more food for parties
  - But would this double purchases?
  - **Explanation:** data manager appended the sales data for some months twice!



Challenges of sales data for policy research

- Sales datasets are **messy**
  - Need to be a data detective!
  - Helpful to be a skeptic and question everything
  - But need balance – if you overcurate the data, you can mess things up even more

Challenges of sales data for policy research

- Sales datasets often **lack information about consumers**
  - Usually no data on customer demographics (age, gender, race/ethnicity, etc.)
  - May be able to infer SNAP/WIC status if you have payment information
  - Can use neighborhood-level demographics (e.g., store census tracts' median income) in lieu of customer demographics

Challenges of sales data for policy research

- Sales datasets **<u>may not include nutrition information</u>**
  - May need to contract with another organization (e.g., Guiding Stars, Label Insight, etc.)
  - Can also scrape data from supermarket websites

Challenges of sales data for policy research

- Sales datasets **require good relationships with the retailer**

- We have worked with our retail partner to:
  - Help answer questions about confusing patterns in the data
  - Confirm and help correct errors in nutrition information
  - Get permission to recruit for studies in stores
  - Help think of new ideas!

Retail sales data are extremely valuable

- Sales datasets are **large**
- Sales datasets are **messy**
- Sales datasets **lack information about consumers**
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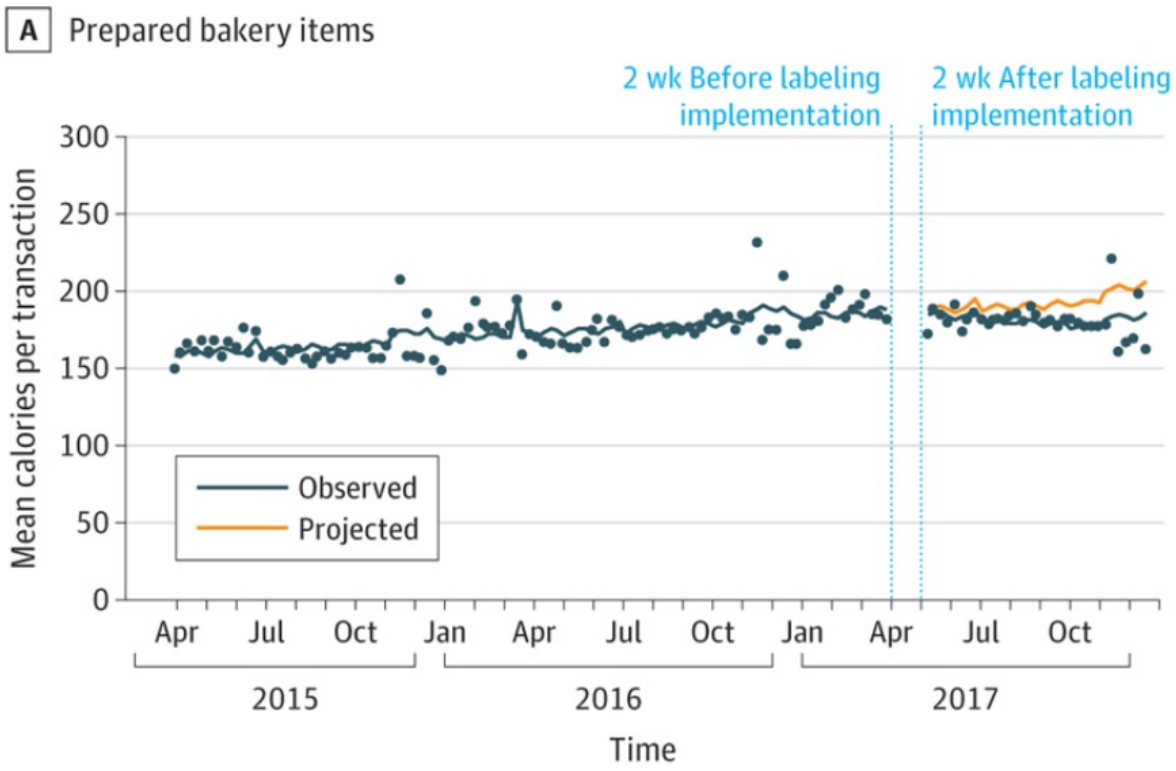
Why use them?

Retail sales data are extremely valuable

Calorie labeling work



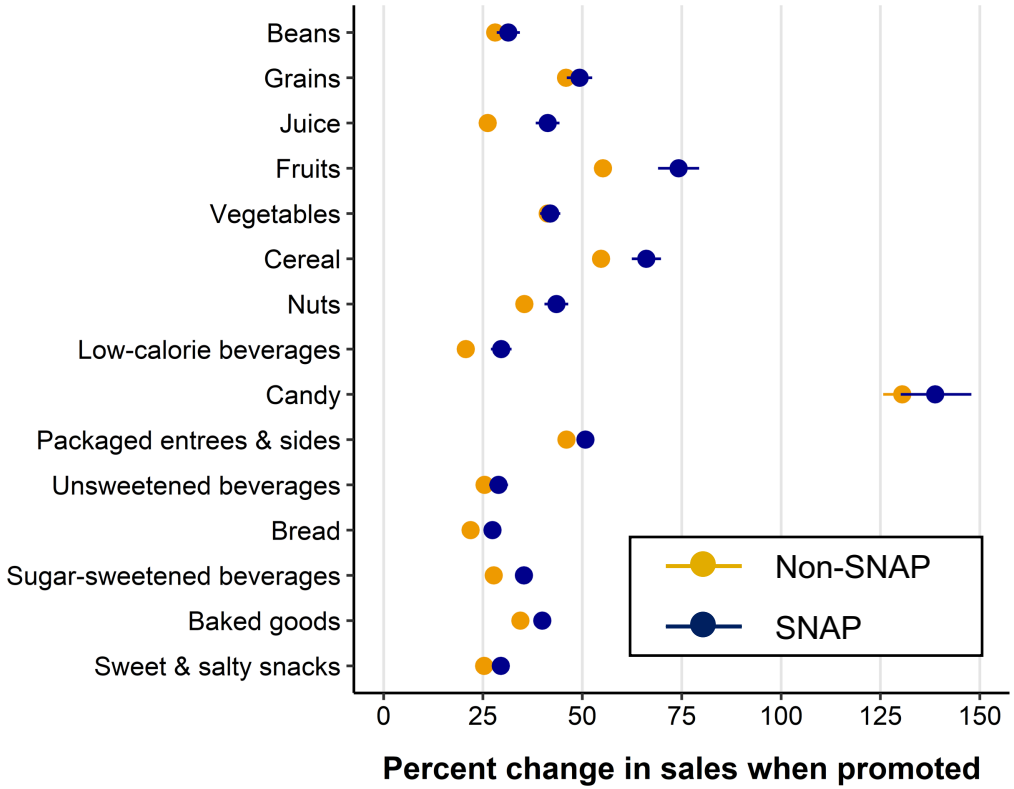
-5.1% (-5.8, -4.4)

Mean percent change in calories/transaction

Petimar et al., *JAMA Intern Med* (2022)

Retail sales data are extremely valuable

Food marketing work



- Across most food groups, product sales increase **25–50%** when an item receives a placement promotion vs. when not receiving a promotion
- Effects are almost all stronger for SNAP vs. non-SNAP transactions

Petimar et al., *Am J Prev Med* (2023)

Retail sales data are extremely valuable

Pandemic-related changes to SNAP and WIC benefits

- Analyze changes in nutritional quality of purchases among SNAP shoppers after benefits increased and after they decreased due to pandemic policies
- Examine similar changes to WIC CVB benefits
- Currently enrolling a cohort of shoppers to share their loyalty ID so that we can identify their purchases and have household-level information about them

Retail sales data are extremely valuable

Many other uses of retail sales data

- Evaluating Food Is Medicine programs
- Other labeling policies (e.g., FOP labels)
- Beverage taxes
- Etc.

Thank you!

Collaborators

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