FARM FRESH FOODS FOR HEALTHY KIDS

Fruit And Vegetable Preparation Changes During and After Cost-offset Community Supported Agriculture and Nutrition Education

Grace A. Marshall, MHS

Cornell University

Cornell University

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

The UNIVERSITY of VERMONT

the evergreen state college
olympia, washington

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THE PROBLEM

- Fruits and vegetables (FV) are rich with health promoting compounds[1]
  - A diet rich in FV may protect against some chronic diseases
- US adults and children don't consume recommended levels of FV[2]
  - Children 2-12 daily recommended intakes range from 1-3 cups of vegetables and 1-2 cups of fruit[3]
  - Adults 2.5-4 cups of vegetables and 1.5-2.5 cups of fruit[3]
- Individuals in low-income households have lower FV intake[4]

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COMMUNITY SUPPORTED AGRICULTURE (CSA)

- CSA provides a ‘share’ of a farm’s crops, typically paid in full at the beginning of the growing season
  - Consistent access to fresh, local fruits and vegetables for members
  - Economic benefits to farms and rural communities
- Cost-offset (or subsidized) CSA (CO-CSA) provide purchasing support for low-income consumers
- CO-CSA has the potential to improve access to fresh produce and dietary behavior

COMPLEMENTARY INTERVENTION APPROACH: PURCHASING SUPPORT PLUS SKILL-BASED EDUCATION

- Purchasing support (discounts) encourages individuals to consume more fruits and vegetables[1-2]
- Some research indicates purchasing support plus education may enhance dietary behavior change but studies are limited and often lack rigorous design and methods[3-4]
- Aim of the F3HK Trial: changing the economics and food environment of the household through the CO-CSA combined with tailored education to build knowledge, skills, and self-efficacy will help create long-term dietary behavior change

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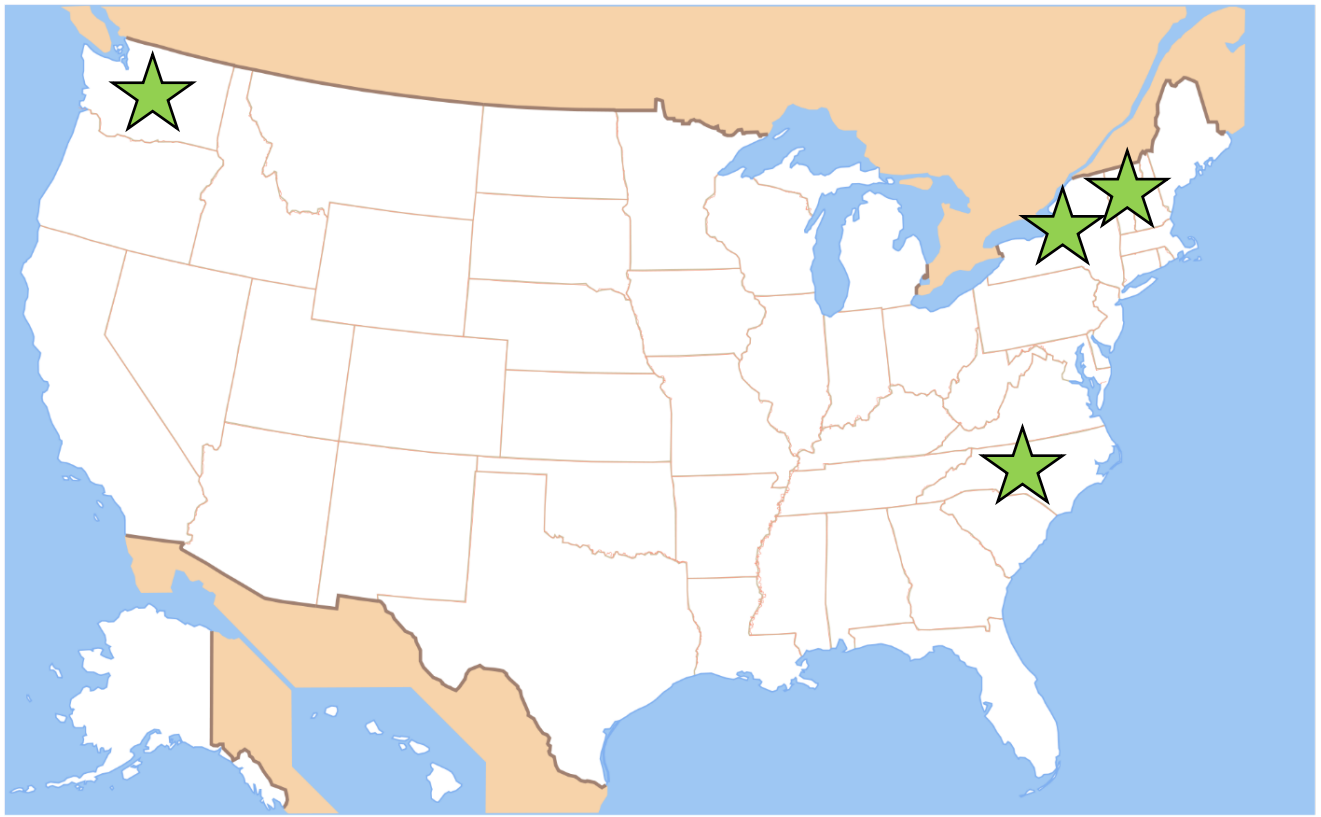
SETTING AND PARTICIPANTS



Farm Fresh Foods for Healthy Kids (F3HK)

- Randomized controlled trial
- Began in 2016

Enrolled individuals who were:

- Caregivers with children 2-12 years old
- Living in rural areas of four states
- Household income < 185% of the federal poverty line

305 enrolled at baseline, 148 assigned to intervention group were included in this analysis

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INTERVENTION COMPONENTS

Cost-offset CSA share	Selection of 2-4 large kitchen tools	9 CSA-tailored education classes to:

• 15-24 week summer share
• Share size and pick-up location selected by participant
• Share price subsidized 50%
• Balance of share price paid weekly ($8-$21 depending on share size)
• SNAP/EBT accepted for payment
	• Slow cooker
	• Food processor
	• Chef's knife
	• Salad spinner
	• Cutting board
	• Stock pot
	• Reusable grocery bag
		• Improve skills and self-efficacy to:
		  • store, prepare, and consume CSA produce;
		  • substitute FV for energy-dense foods;
		  • prepare foods to minimize added (solid) fat and sugar;
		  • be more active in daily life and reduce sedentary time;
		• Promote the value of consuming FV; and
		• Reduce barriers to CSA produce acceptance.

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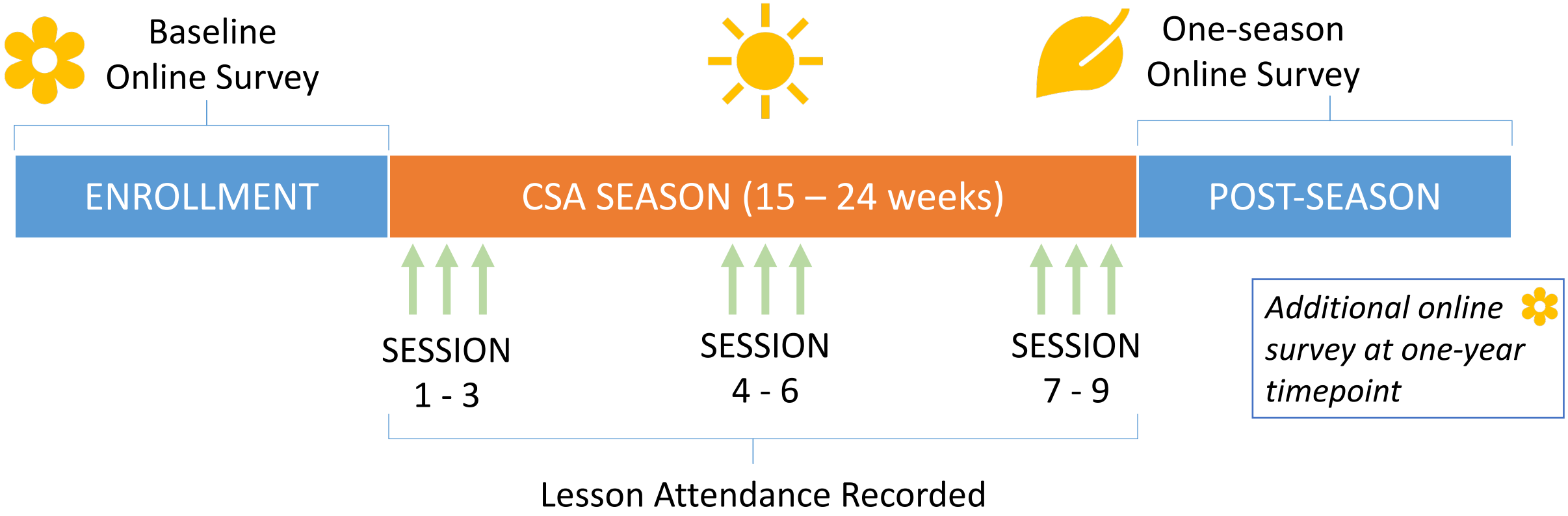
DATA COLLECTION



RESEARCH QUESTIONS AND OUTCOMES

1. Does frequency of FV preparation by caregivers change during and after this intervention?

Three main outcomes:

- Monthly frequency of total <u>fruit</u> prepared for <u>snack</u>
- Monthly frequency of total <u>vegetables</u> prepared for <u>snack</u>

- Monthly frequency of total <u>vegetables</u> prepared for <u>dinner</u>

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RESEARCH QUESTIONS AND OUTCOMES

1. Does frequency of FV preparation by caregivers change during and after this intervention?
2. Do the techniques used to prepare vegetables differ between timepoints?

<u>Healthy preparation techniques</u>

- Raw
- Steamed, boiled, or baked
- Roasted or sautéed in oil

<u>Less healthy prep techniques</u>

- Deep fat fried
- Cooked with meat, butter, or cheese

<u>Other techniques</u>

- Cooked another way

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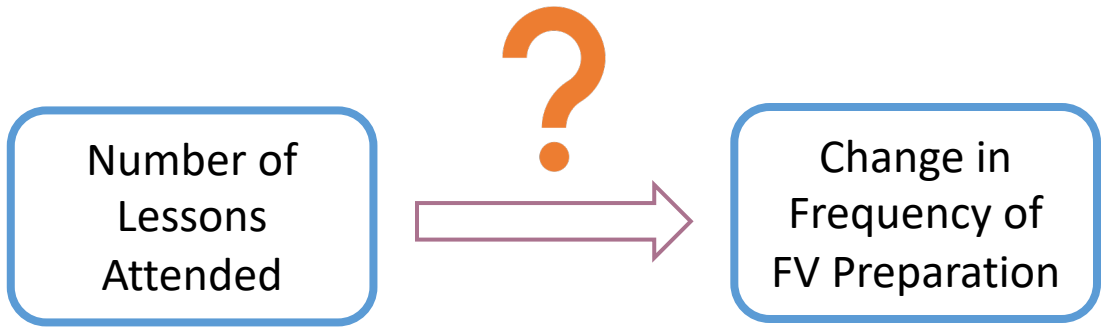
RESEARCH QUESTIONS AND OUTCOMES

1. Does frequency of FV preparation by caregivers change during and after this intervention?
2. Do the techniques used to prepare vegetables differ between timepoints?
3. Is number of lessons attended associated with changes in FV preparation frequency?



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STATISTICAL ANALYSIS

1. Repeated measures ANOVA to examine change in monthly FV prep frequencies over time
2. McNemar's test to examine differences in use of healthy prep techniques between timepoints
3. Multivariate linear regression to assess if education dose is associated with changes in FV prep frequency

In addition to the three main outcomes, we also examined individual produce items using Bonferroni corrections to adjust for multiple comparisons within categories

- Snack fruit: apples, melon, berries, other fruit
- Snack vegetables: carrots, celery, cucumbers, peppers, other vegetables
- Dinner vegetables: lettuce, cabbage, greens, potatoes, other root vegetables, squash

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CHANGE IN MEAN FV PREP FREQUENCY

	n	Baseline Mean	Baseline CI	One-season later Mean	One-season later CI	One-year later Mean	One-year later CI	p value
Prepared for child's snack (times/mo)								
Total snack fruit	107	30.07[a]	25.75, 35.08	36.90[b]	32.34, 42.08	30.56[a]	26.26, 35.55	**0.002**
Total snack vegetables	107	18.52[a]	14.80, 23.12	28.60[b]	23.64, 34.57	24.20[b]	19.61, 29.82	**<0.001**
Prepared for dinner (times/mo)								
Total dinner vegetables	107	29.20[a]	25.40, 33.55	38.70[b]	34.31, 43.64	38.51[b]	34.25, 43.29	**<0.001**

- Change in frequency of preparing **melon, celery, cucumbers, peppers, other vegetables, lettuce, cabbage, and greens** were also significant

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USE OF HEALTHY VEGETABLE PREP TECHNIQUES

- Most participants used healthy preparation techniques at all timepoints (>78%)
- No significant differences between baseline and one-season or baseline and one-year

		Baseline		**One-season later**		**One-year later**	
	n	Count	%	Count	%	Count	%
Used healthy preparation technique (count)							
Cabbage	53	43	81.1	45	84.9	44	83.0
Greens	82	70	85.4	74	90.2	71	86.6
Potatoes	101	82	81.2	90	89.1	90	89.1
Other root vegetables	79	70	88.6	74	93.7	76	96.2
Squash	32	25	78.1	29	90.6	31	96.9

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ROLE OF EDUCATION DOSE

- Most caregivers attended at least one lesson, but few attended all lessons[1]
- The number of lessons attended was not found to be associated with changes in frequency of FV preparation

		One-season change			**One-year later**		
	n	β	SE	p value	β	SE	p value
Prepared for child's snack (times/mo)							
Total snack fruit	107	-0.43	0.60	0.473	+0.65	0.57	0.256
Total snack vegetables	107	-0.73	0.86	0.393	-1.23	0.82	0.137
Prepared for dinner (times/mo)							
Total dinner vegetables	107	-0.61	0.74	0.413	-0.27	0.74	0.712

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CONCLUSIONS AND IMPLICATIONS

1. CO-CSA plus education was associated with increases in the frequency of preparing fruits and vegetables, including increases in many different vegetables for dinner and for children's snacks

2. Healthy preparation techniques were used by the majority of caregivers before, during, and after the intervention

3. Changes in FV preparation frequency did not depend on how many lessons were attended

CO-CSA is associated with greater frequency of FV preparation, but there is no evidence that the education component of the intervention drives the observed differences

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CO-AUTHORS

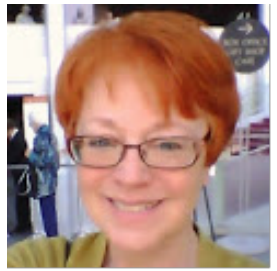
Rebecca Seguin
Principal Investigator
Texas A&M AgriLife Research

Karla Hanson
Co-Principal Investigator
Cornell University

Alice Ammerman
Co-Investigator
University of North Carolina

Stephanie Jilcott Pitts
Co-Investigator
East Carolina University

Jane Kolodinsky
Co-Investigator
University of Vermont



Marilyn Sitaker
Co-Investigator
The Evergreen State College

Jennifer Garner
Co-Author
The Ohio State University

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School of Environmental and Biological Sciences

How Seafood Says “Sustainable”: A Content Analysis of Retail Package Labels

Lauren Errickson, M.S.
Ph.D. Candidate, Nutritional Sciences
Senior Program Administrator, Rutgers Cooperative Extension
lauren.errickson@rutgers.edu

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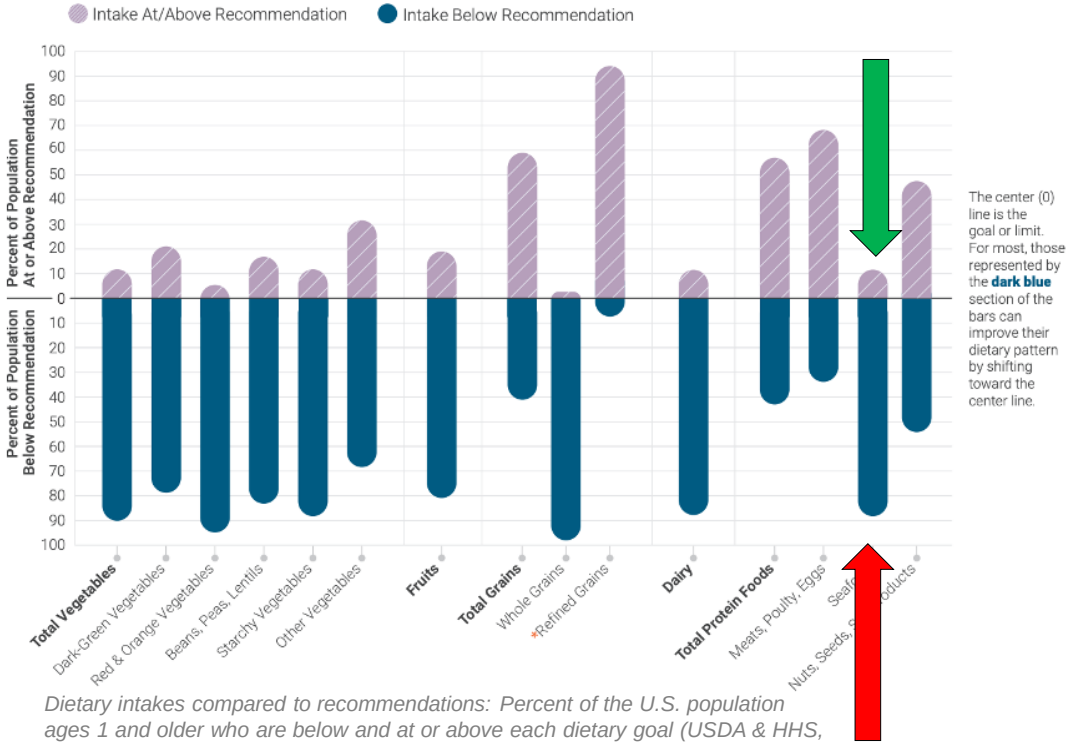
Introduction

Americans do not meet seafood intake recommendations.



Dietary intakes compared to recommendations: Percent of the U.S. population ages 1 and older who are below and at or above each dietary goal (USDA & HHS, 2020, p. 30).

Perceived unsustainability is one potential barrier to seafood intake.

Introduction

- U.S. fisheries and aquaculture yield healthy and sustainable seafood choices
- Consumers need to be able to recognize which are the most sustainable choices

NOAA www.FishWatch.gov FISHWATCH U.S. SEAFOOD FACTS

Objective:

To characterize label attributes indicative of sustainability on seafood packages.

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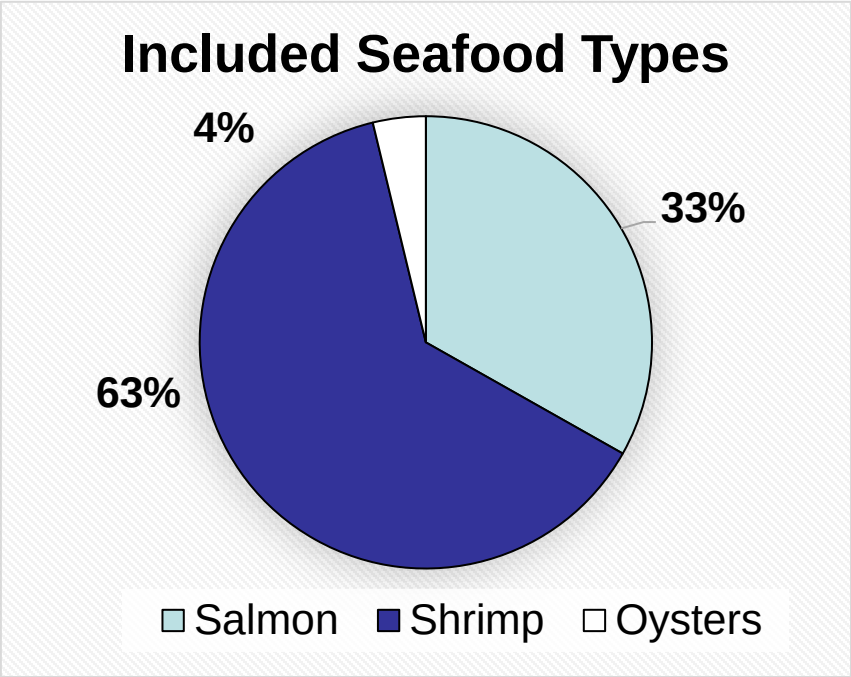
Methods: Product Selection

LABELINSIGHT®

Of 400,000 food products, we included 2,200 seafood products:

- ✓ Salmon, n = 730
- ✓ Shrimp, n = 1387
- ✓ Oysters, n = 83

- ✓ Both farmed and wild-caught products were included.
- ✗ Mixed dishes were excluded.



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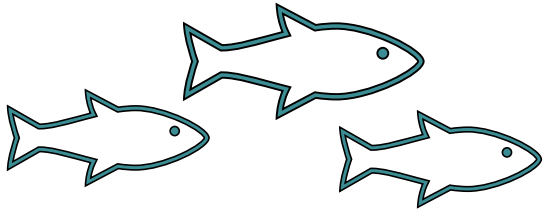
Methods: Label Attribute Characterization

- Label Insight indicates 320 label attribute terms appear on seafood packages
- Four trained coders identified which terms reference sustainability and other a priori themes
- Inter-rater reliability (Cohen's Kappa)
- Revised codebook, identified a posteriori themes, and recoded attribute term list



A Priori
Label Attribute Themes

1. **Sustainability**
2. Health
3. Nutrition
4. Quality
5. Convenience
6. Place of Origin
7. Sociocultural Values
8. Other

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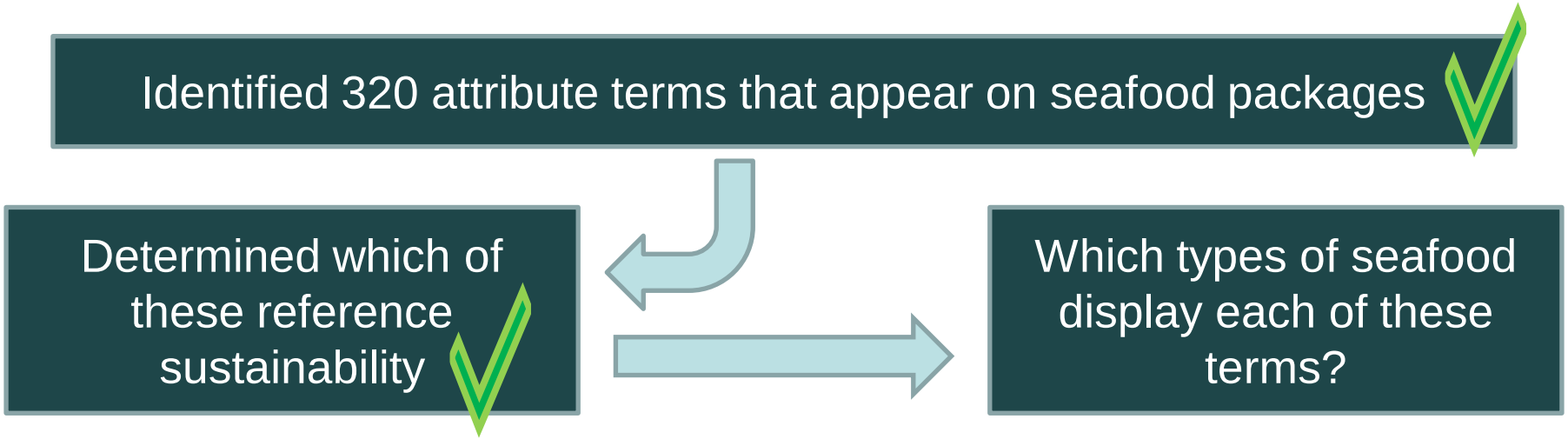
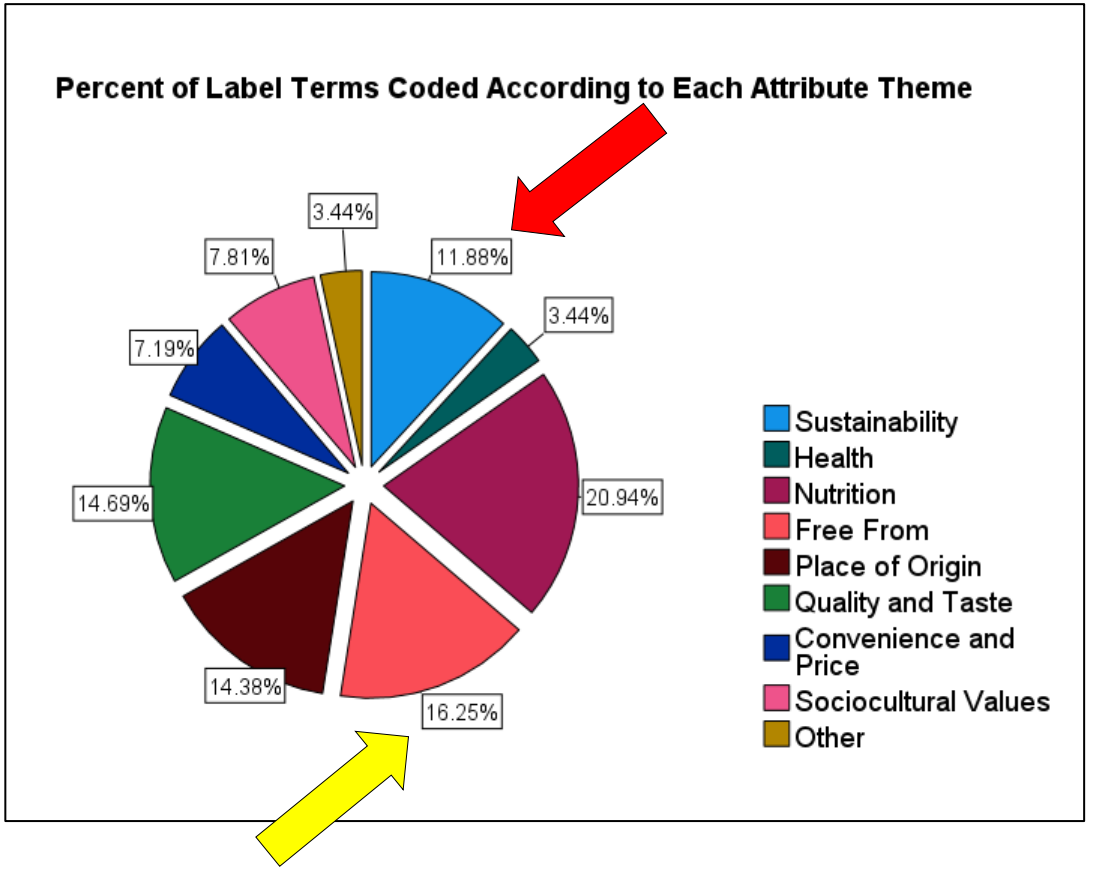
Methods: Label Attribute Frequencies



- Created master dataset of salmon, shrimp, and oyster products
- Coded products for the presence/absence of each attribute term
- Determined frequencies of term appearance on labels
- Conducted Pearson Chi Square analysis to determine associates between seafood type and labeling practices

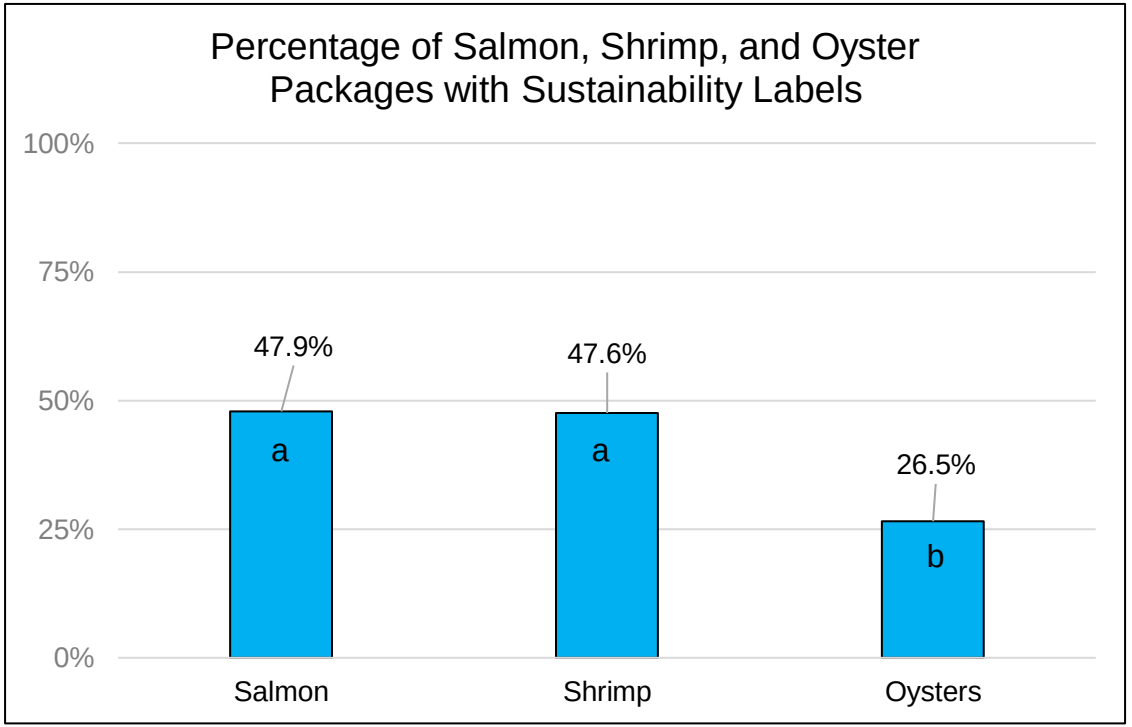
Results: Label Attribute Characterization

- Of 320 terms, 38 (11.88%) referenced sustainability.
- Terms ranged from broad statements to specific references. Examples include:
  - "Sustainable"
  - "Environmental"
  - "Fishing with Hooks and Lines"
  - "Dolphin Safe"
- Both claims and certifications were included



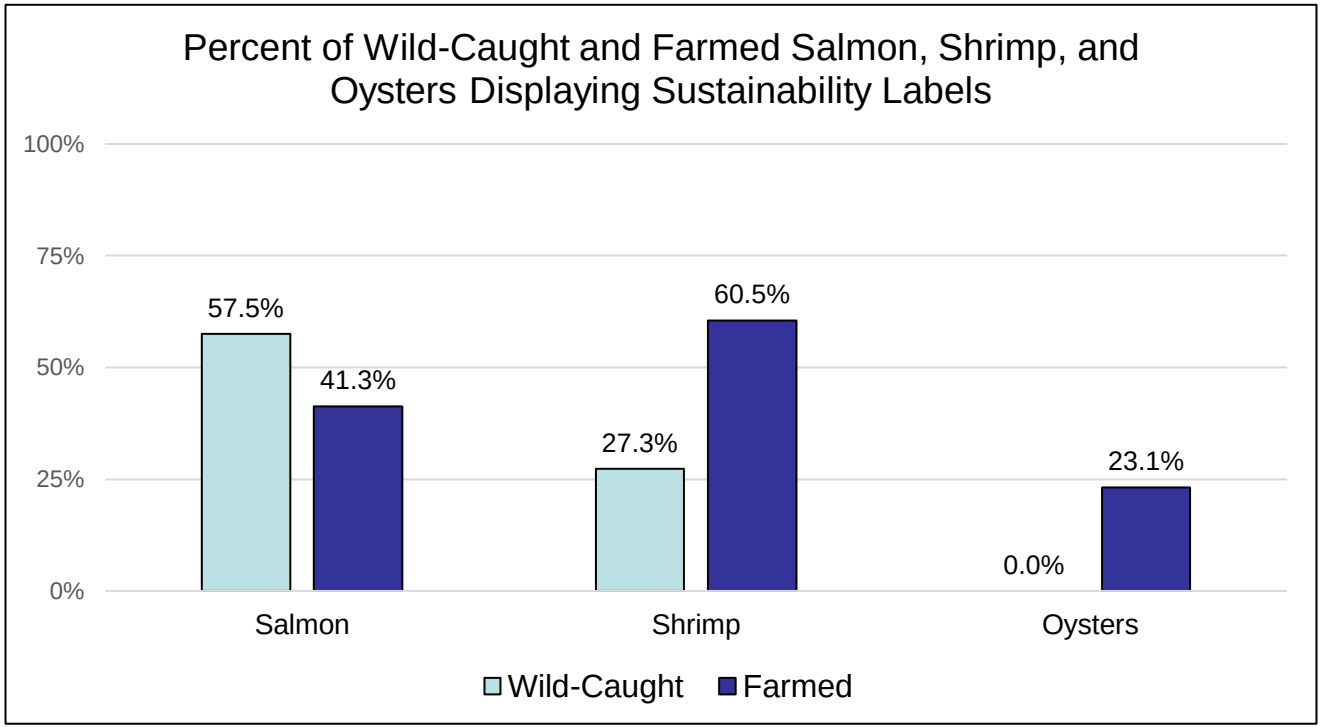
Results: Label Attribute Frequencies

- Overall, more salmon and shrimp packages displayed sustainability labels than did oysters
- Use of sustainability labels is significantly correlated with seafood type according to Pearson Chi Square analysis



X^2 (2, N = 2,200) = 14.443, p = .001

Results: Label Attribute Frequencies



Use of sustainability labels also differed by harvest method among the various seafood types.

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Results: Label Attribute Frequencies

Among the salmon, shrimp, and oyster products that do display sustainability labels, the type of label used most frequently also varies by seafood type.

SALMON	SHRIMP	OYSTERS
42% use environmental claims	36% use third-party certifications	27% use environmental claims
examples include: Environmental Choice Environmentally Friendly Environmental Practices	*examples include:* Certified Sustainable Best Aquaculture Practices	*examples include:* Environmental Choice Environmentally Friendly Environmental Practices

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Conclusions

- On salmon, shrimp, and oyster packages, 38 different label terms were used to reference sustainability
- Many labels used broad terms that are relatively vague
- Salmon and shrimp more often referenced sustainability than did oysters, but frequencies also varied among wild-caught and farmed products

Implications for Nutrition Education & Behavior

Next steps and future studies to improve seafood intake might include:

- Increasing sustainability labeling practices to cue consumers toward sustainable seafood choices
- Developing industry consensus regarding which sustainability terms to use on seafood packages
- Conducting consumer education relative to sustainable seafood labels
- Measuring consumer understanding of and responsiveness to sustainability labels

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THANK YOU

Lauren B. Errickson, M.S.

Ph.D. Candidate, Nutritional Sciences
Senior Program Administrator,
Rutgers Cooperative Extension
Rutgers, the State University of NJ

lauren.errickson@rutgers.edu

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Co-Authors

Helena Horikawa, B.S.

Mark Hanna, B.S.

William K. Hallman, Ph.D.

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