



A Model for Implementing a Food Recovery Program at the University Level

Lexi Endicott, Jada Stevenson, PhD, RDN, LD; Lyn Dart, PhD, RD, LD; Gina Hill, PhD, RD, LD

Department of Nutritional Sciences, Texas Christian University

Abstract

Background: Over 42 million Americans face food insecurity (FI). Simultaneously, approximately 40% of food produced in the U.S. is wasted. Where FI and food waste (FW) coexist, it is necessary to develop and implement programs to decrease the negative consequences caused by these issues.

Objective: The objective of this study was to create a standardized model for implementing a student-led food recovery program (FRP) for other universities to access and utilize. The secondary objective was to measure the effectiveness of the FRP at TCU. Researchers hypothesized that by incorporating the FRP into the dietetics program, the FRP would achieve program sustainability and enhance dietetic students' knowledge of FI and FW.

Design: This study utilized a mixed methods study design.

Methods: Over three academic semesters, researchers observed the overall operations of the FRP at TCU. Researchers collected quantitative data on food types (i.e. vegetables, grains, proteins, mixed), quantities (pounds), and raw food costs (\$). Researchers conducted semi-structured interviews with nutrition and dietetics students, foodservice personnel, and faculty and analyzed interview transcripts for prevalent theme codes. A codebook was created based on frequently identified phrases, and themes were extracted. Participants provided written consent. This project received IRB approval.

Results: Over 12,500 pounds of food were recovered during the study period. By weight, protein-containing foods were the most recovered type of food (~4900 lbs.), followed by mixed foods (~3000 lbs.), grains (~2600 lbs.), and vegetables (~2000 lbs.). Five major themes were extracted from interviews; all respondents identified the FRP as a meaningful and practical program.

Conclusions: FRP offers a sustainable solution for benefitting the environment, combating FI, and providing dietetics students with experience working with FI and FW. Efforts should be made to incorporate a FRP at the university level, and a dietetics program may offer an effective means to achieve this integration.

Funding Source: This project was partially funded by the TCU SERC Grant #170328.



Methods

- Study period: Fall 2017, Spring 2018, Fall 2018
- Qualitatively-driven descriptive mixed methods study
 - Types, pounds, raw costs of foods
 - Sodexo: Market Square, Training Table, Champion's Club
 - Einstein Bros Bagels
 - Semi-structured interviews
 - Coordinated Program in Dietetics focus groups (n=2)
 - Key informants (n=5)
 - Sodexo foodservice manager, Market Square head chef, Union Gospel Mission foodservice manager, TCU food recovery program advisor, TCU food recovery program president
 - Field observations

Implementation Phase



Serving a meal at Union Gospel Mission



Delivering bagels to NICA

Qualitative Results: Interview Analysis

THEMES

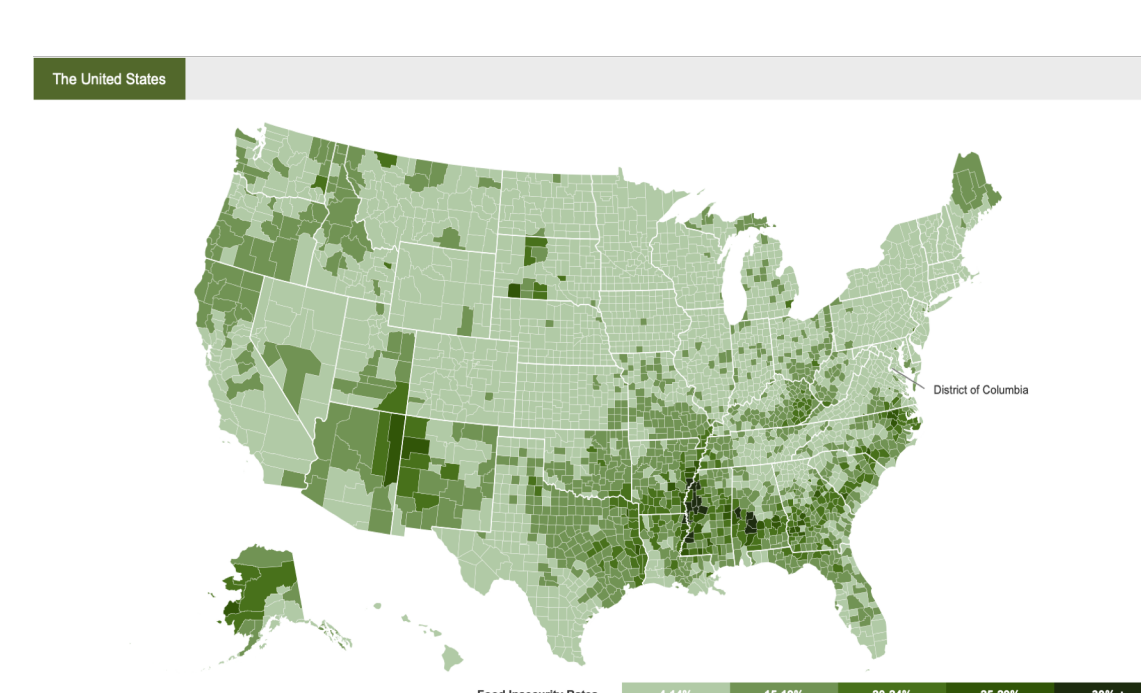
- Challenges and opportunities
- Wide community impact
- Meaningful and practical
- Increased awareness of food waste and food insecurity
- Dietetics curriculum may contribute to program sustainability

Objectives

- Design a model for implementing a food recovery program at the university level
- Assess efficacy of food recovery program at TCU
- Justify incorporation of food recovery program into university dietetics curriculum

Background

- 40% of US food produced is wasted¹
 - 2010: 133 bill. pounds; \$161 bill. value
 - ~300 pounds/person/year
 - 1200 uneaten calories/person/day
 - Majority at retail and consumer levels
 - Universities contribute ~1 billion pounds/year
- Negatively impacts environment and economy^{2,3}

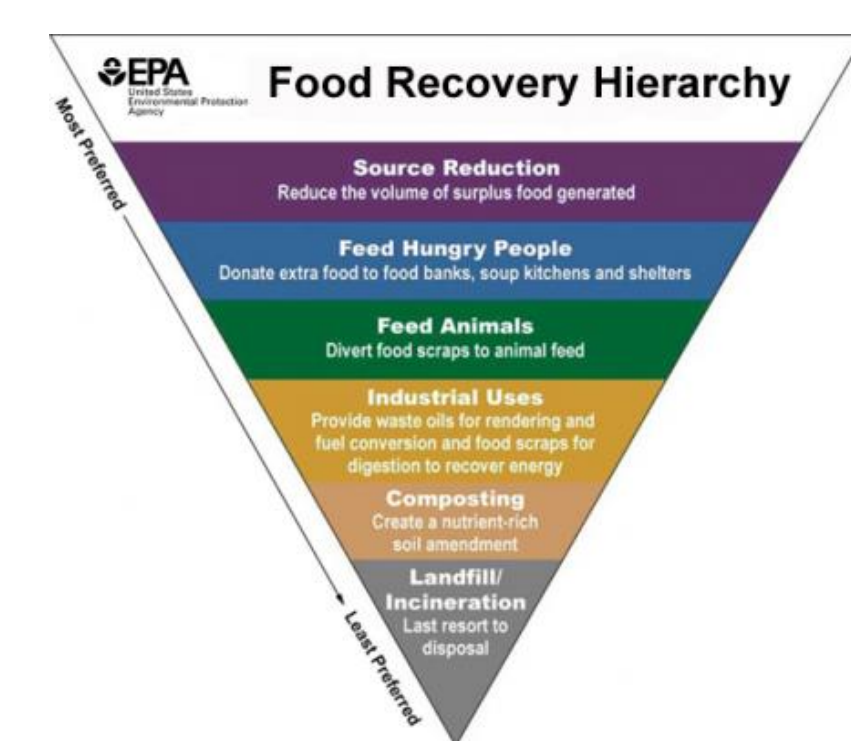


Feeding America Map The Meal Gap*

- 1 in 8 (42 million) Americans face food insecurity⁵
 - Food Insecurity: uncertainty of meal acquisition in a safe or socially acceptable manner
 - 1 in 6 people in Tarrant County⁴
 - 1 in 4 children in Tarrant County
 - Negatively impacts individual's health, employee productivity, US economy⁶⁻¹⁰



- Need to address imbalance between overproduction and scarcity

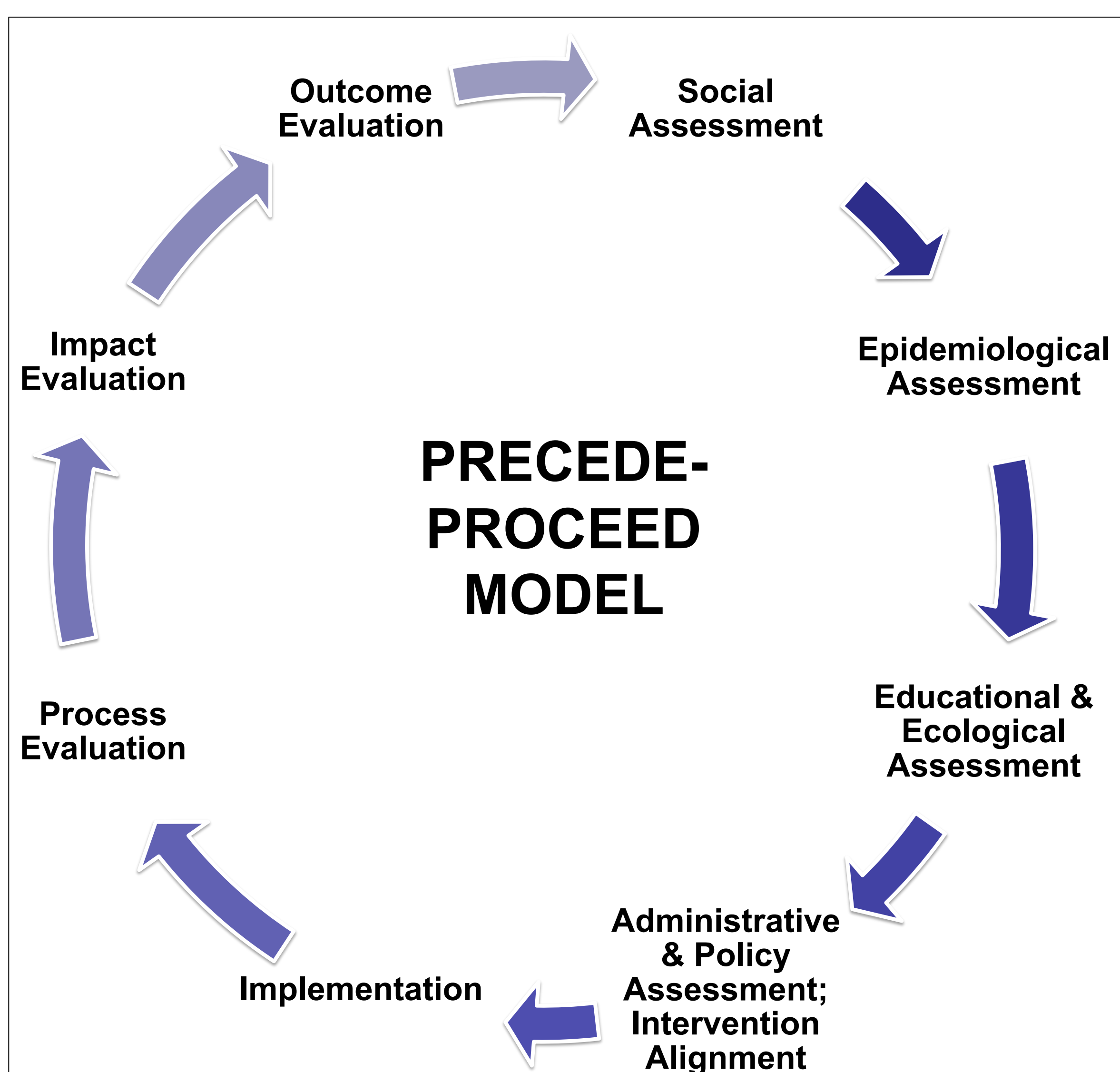


USDA Food Recovery Hierarchy:
Goal of reducing food waste 50% by 2030¹¹



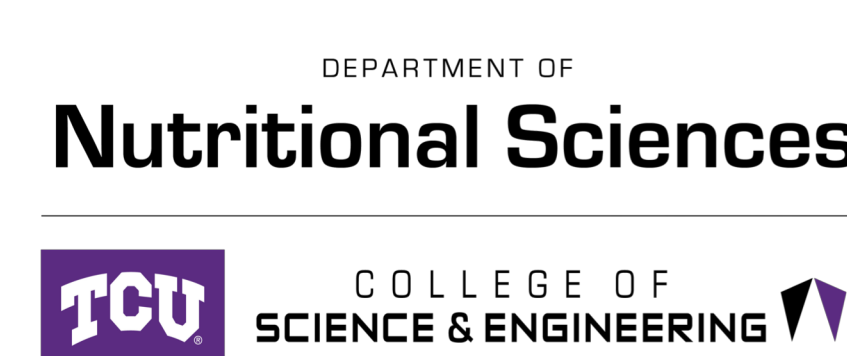
Existing Food Recovery Programs

Proposed Food Recovery Model¹²

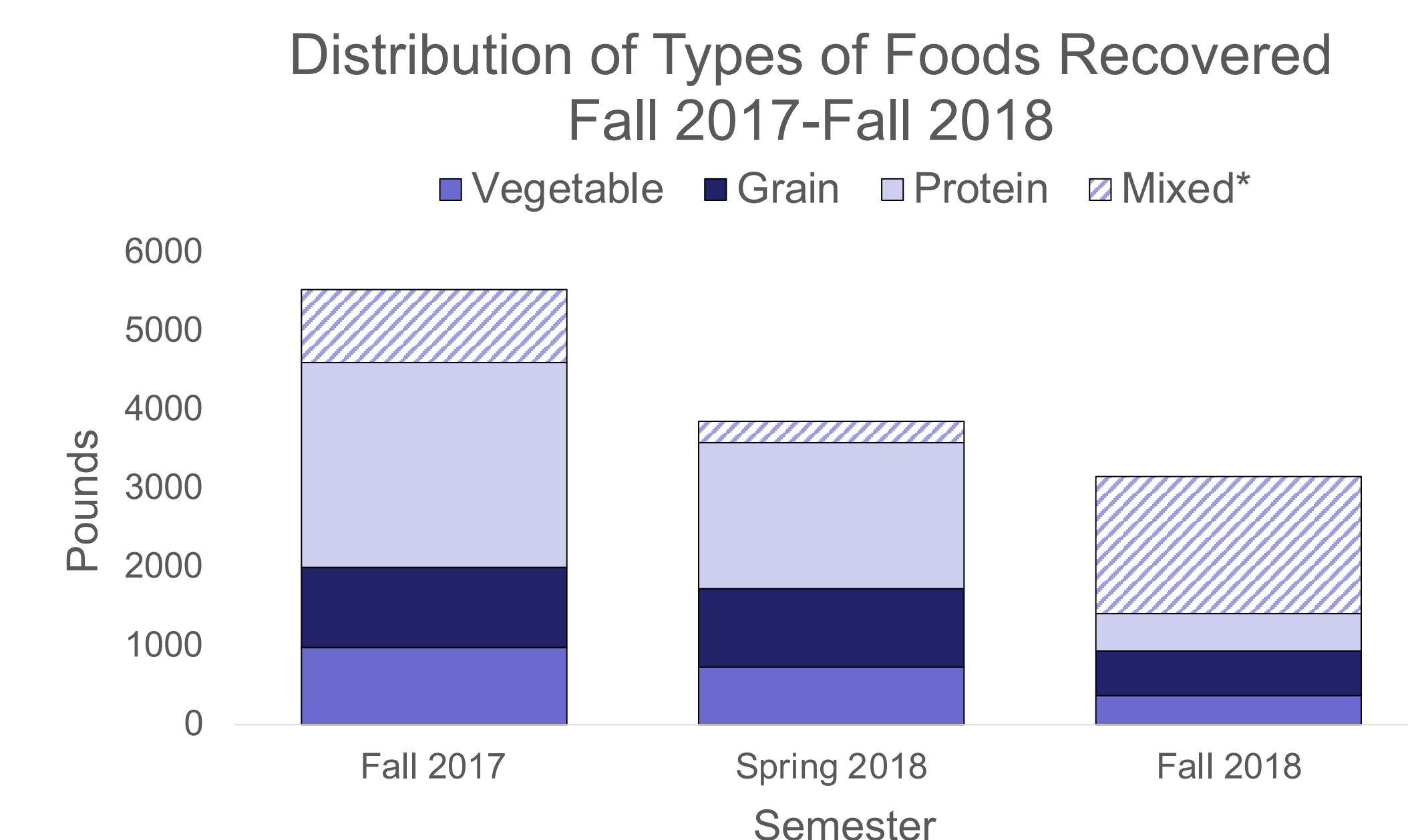
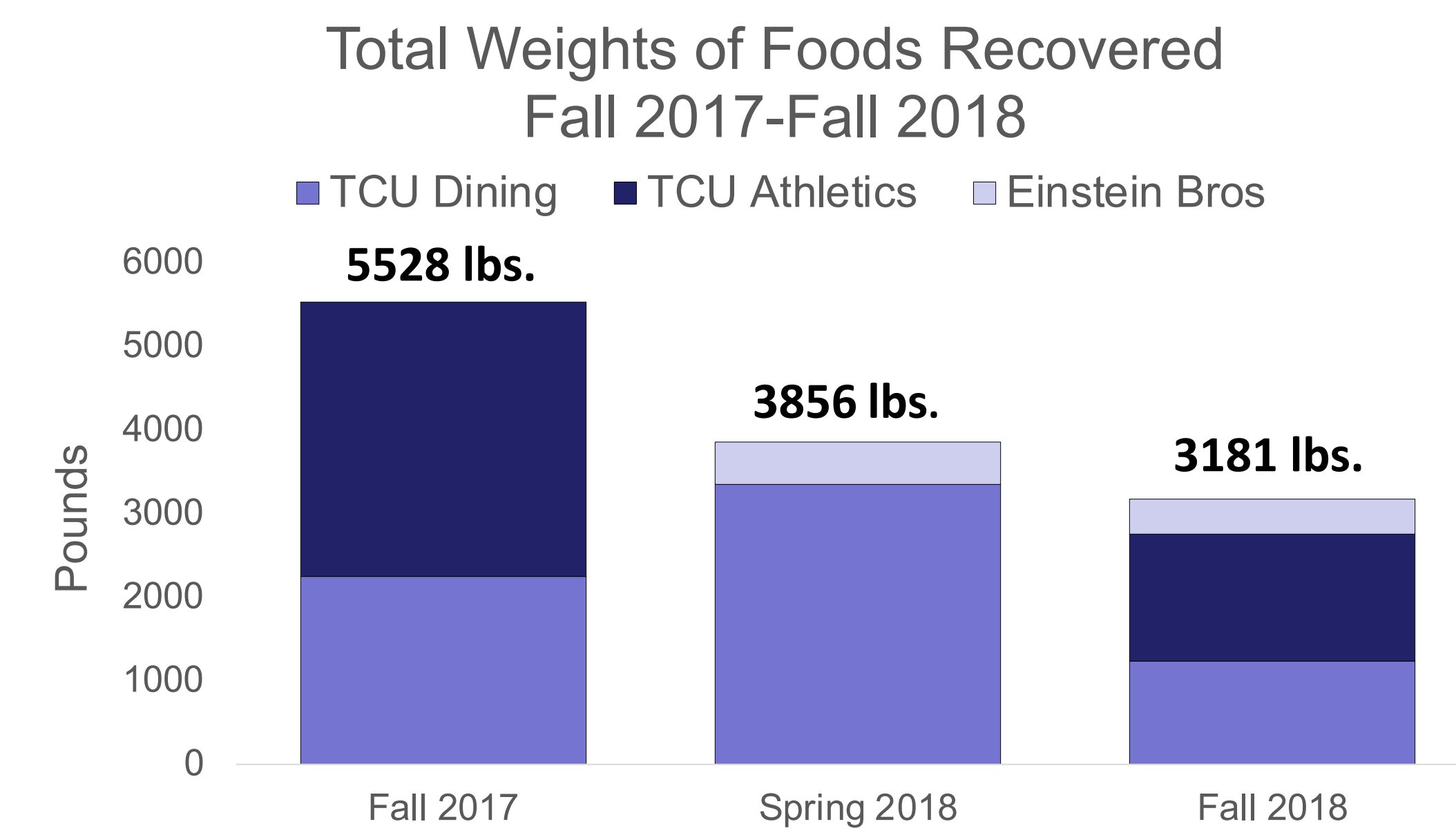


| PRECEDE | TCU Timeline |
|------------|---|
| Phases 1-3 | 2 semesters prior to program implementation |
| Phase 4 | 1 semester prior to program implementation |
| Phase 5 | Pilot run: 1 semester prior to program implementation |
| Phase 6 | Monthly |
| Phases 7-8 | Ongoing |

TCU Food Recovery Program



Quantitative Results: Food Recovery Data



TCU FOOD RECOVERY PROGRAM SUMMARY (FALL 2017-FALL 2018)

| | |
|----------------------------------|-------------|
| Total weight of foods recovered* | 12,565 lbs. |
| Estimated cost savings* | \$27,220 |
| Deliveries completed** | 113 |
| Active volunteers | 78 |
| Number of collection sites | 4 |
| Number of partner agencies | 2 |
| Number of meal services | 15 |

*inaccurate figures due to lack of data reporting
**does not include summer deliveries

Discussion and Conclusions

- Adjust model to suit university organization needs
- Potential impact on university, students, community
- Measuring Success
 - Continuation of recoveries, full delivery schedule, source reduction, support from stakeholders, effective leadership transitions



Food recovery programs provide...

- Sustainable solution for environment
- Feasible means to decrease food insecurity
- Nutrition and dietetics students with practical experience
- Positive impact on community

Limitations and Future Implications

Limitations

- High turnover in foodservice industry
- Lack of systems to measure data accuracy

Future Implications for Research

- Improved methods to collect recovery data
- Program effectiveness in other settings
- Effectiveness of source reduction
- Effectiveness of reducing community food insecurity

References

- Vogliano C, Brown K. The State of America's Wasted Food and Opportunities to Make a Difference. *J Acad Nutr Diet*. 2016;116(7):1199-1207.
- Spiker ML, Hiza HAB, Siddiqi SM, Neff RA. Wasted Food, Wasted Nutrients: Nutrient Loss from Wasted Food in the United States and Comparison to Gaps in Dietary Intake. *J Acad Nutr Diet*. 2017;117(7):1031-1040 e1022.
- Conrad Z, Niles MT, Neher DA, Roy ED, Tichenor NE, Jahns L. Relationship between food waste, diet quality, and environmental sustainability. *PLoS One*. 2018;13(4):e0195405.
- Map the Meal Gap. Feeding America. <http://map.feedingamerica.org/county/2016/child/texas/county/tarrant>. Published 2016.
- NIA. Poverty and Hunger Fact Sheet. 2017;1-4.
- Kara Dean-Assael L. What's Food Got To Do With It? Food Insecurity and Mental Health. In: Diana Arias M, ed. *Zero Degrees of Separation: The Role of Social Determinants*. clancy.org: The Community Technical Assistance Center of New York.
- Dinour LM, Bergen D, Yeh MC. The food insecurity-obesity paradox: a review of the literature and the role food stamps may play. *J Am Diet Assoc*. 2007;107(11):1952-1961.
- Pan L, Sherry B, Ngai R, Blanck HM. Food insecurity is associated with obesity among US adults in 12 states. *J Acad Nutr Diet*. 2012;112(9):1403-1409.
- John Cook PKU AB. Child Food Insecurity: The Economic Impact on our Nation. 2009;1-36. <https://www.nokidhungry.org/sites/default/files/child-economy-study.pdf>.
- Maureen Black P. Household food insecurities: Threats to children's well-being. *American Psychological Association*. 2012.
- Food Recovery Hierarchy. Sustainable Management of Food. <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>. Published 2016.
- Chapter 2: Other Models for Promoting Community Health and Development | Section 2. PRECEDE/PROCEED Community Tool Box. <https://cib.ku.edu/en/table-contents/overview/other-models-promoting-community-health-and-development/precede-proceed/main>.