A FOOD RECOVERY PROGRAM

CULLED PRODUCE PROJECT

North Texas Healthy Communities

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Introduction

In response to the Texas Health Resources' commitment to community responsibility and sustainability, the proposed food recovery initiative emerges as a strategic endeavor aimed at addressing environmental impacts, improving public health, and enhancing the overall well-being of the Fort Worth community. Grounded in the findings of the 2018 Community Responsibility and Sustainability Report, the initiative aligns with the organization's five-year collaborative efforts to create programs and policies that positively impact residents' health and quality of life.

The imperative connection between adverse environmental impacts and public health underscores the significance of initiatives like the Blue Zones Project, an influential community-wide well-being improvement program under the Texas Health Resources Healthcare System. The Blue Zones Project focuses on reshaping the physical environment, policies, and social networks to foster healthier lifestyles, recognizing the fundamental role of the physical environment in determining health behaviors and outcomes.

Within this broader framework, the food diversion initiative spearheaded by the Blue Zones Project not only contributes to creating a healthier, resilient, and prosperous habitat but also addresses the critical issue of food waste. Food waste, characterized as the conscious disposal of consumable food, represents a substantial loss of valuable resources. This initiative tackles this problem by diverting still fit-for-consumption foods from landfills, thus mitigating environmental and public health impacts associated with food waste.

The significance of tackling food waste becomes evident when considering its far-reaching consequences. Beyond the loss of resources, recovering wasted food could alleviate food insecurity, a pressing concern associated with various health challenges, especially in vulnerable populations. The initiative acknowledges the interconnection between food waste, climate change, and public health challenges, emphasizing the need for a comprehensive and sustainable solution to address these complex issues.

As the initiative unfolds, it seeks to contribute not only to the immediate challenges of food waste but also to the broader context of climate change and its implications for public health. By aligning with Texas Health Resources' commitment to community responsibility and sustainability, this initiative aims to create a positive impact on the well-being of the Fort Worth community, emphasizing the interconnectedness of environmental stewardship, public health, and community prosperity.

Background

The initiative stems from Texas Health Resources' 2018 Community Responsibility and Sustainability Report, which highlights the organization's efforts to collaborate with stakeholders and enhance health and quality of life for residents, leading to significant improvements in the city's well-being ranking and its certification as the nation's largest Blue Zones Community®.

Internal Process Outline

This section defines the standard operating procedures (SOP) for the food culling process at the designated grocery stores. It covers the purpose, scope, and responsibilities, as well as definitions and acronyms related to the culling process. The SOP focuses on the identification, removal, and responsible disposal or donation of culled items to specific community sites.

The Internal Process Outline serves as the foundational framework for streamlining the food culling process at Elrod's Cost Plus, Foodland Store 52, and Foodland Store 53. This section goes beyond standard operating procedures (SOP) and introduces innovative strategies to optimize the identification, removal, and responsible disposal or donation of culled items. The goal is to not only meet but exceed the defined purpose, scope, and responsibilities of the SOP, ensuring a comprehensive and impactful approach.

The purpose of the food culling process is expanded to transcend the mere elimination of unsellable items. It is now redefined to bridge sustainability goals with community impact. Beyond waste reduction, the purpose emphasizes fostering a positive environmental footprint, contributing to the community's well-being, and aligning with Texas Health Resources' commitment to responsible resource management.

Employee Training and Awareness

This section emphasizes the importance of employee training and awareness in minimizing food waste. It includes questions related to general training, frequency of training, specific training modules, training effectiveness, and employee awareness regarding the impact of food waste. Understanding employee perspectives is crucial for the successful implementation of food waste reduction initiatives.

Communication and Coordination

This section explores the communication channels, coordination effectiveness, and technology integration within the departments involved in the culling and donation process. It addresses questions related to interdepartmental communication, notification procedures, emergency communication, and the overall culture of collaboration.

Waste Tracking System

This section delves into the data collection process for a waste tracking system. It includes questions on the frequency of culling, sorting procedures, inventory processes, destination of culled food, comparison of donatable vs compostable items, and the ultimate goals of the initiative. The goal is to establish a robust waste tracking system that informs decision-making and drives continuous improvement.

Documentation and Reporting

The final section outlines a reporting structure to track and analyze key metrics related to produce purchase and restock, daily culling activities, sorting procedures, and calculating culling produce. The goal is to provide valuable insights into the efficiency of the current processes and identify areas for improvement.

Descriptive Analytics and Impact Assessment

Overview

This section presents descriptive analytics and impact assessments based on the food recovery project's initial implementation. The outlined data reflects the success of the project in terms of increased donations, diverted food, and the positive impact on participating stores and farms.

Culled Produce Pickup Schedule

The food recovery project involves three participating stores and several local farms. The stores, namely Elrods Cost Plus, Foodland Store 52, and Foodland Store 53, collaborate with local farms such as Mind Your Garden, Opals Farms, and Funky Town Farm. The outlined pickup schedule ensures efficient collection and redistribution of organic waste and donations.

Store Procedures and Carpool Compost Pickup/Delivery

The store procedures detail the steps involved in the culling and donation process. Carpool Compost plays a pivotal role in the pickup and delivery of organic waste and donations between stores and farms. The outlined procedures establish a structured routine, enhancing the seamless flow of the food recovery initiative.

Elrods Perishables Waste Audit

The waste audit conducted at Elrods Cost Plus provides valuable insights into the quantity and types of perishable waste generated. The audit on September 27, 2021, revealed a total of 515.8 lbs of perishable waste. The audit results showcase the potential for salvaging edible items, contributing to the donation stream.

Learnings and Weekly Waste Estimates

The learnings from the waste audit highlight the effectiveness of bilingual signage and the need for additional training. The weekly waste estimates extrapolate the data to provide a comprehensive view of the potential impact, indicating that approximately 1547 lbs of perishable waste are generated per week across all three stores.

Impact Assessment

The impact assessment indicates a notable increase in donations and diverted food. The project has successfully redirected a significant amount of perishable waste to participating farms, reducing overall food waste. The use of bilingual signage and ongoing training is identified as areas for improvement to enhance the effectiveness of the culling and sorting procedures.

Cost-Benefit Analysis and Stakeholder Motivation

To further expand the project, a cost-benefit analysis is crucial. The project has demonstrated positive outcomes in terms of waste reduction and community impact. Motivating stakeholders can be achieved by showcasing the financial savings from reduced waste disposal costs, tax incentives for donations, and the positive community relations generated by participating in sustainable initiatives.

Conclusion and Future Directions

The food recovery project has proven effective in minimizing food waste and increasing donations. The described analytics provide a foundation for ongoing improvements. Moving forward, the project can explore technology integration for data recording, establish more partnerships with donation sites, and enhance employee training to ensure the sustainability and scalability of the initiative. The cost-benefit analysis will be instrumental in garnering support for further expansion.

Analysis

Descriptive analysis:

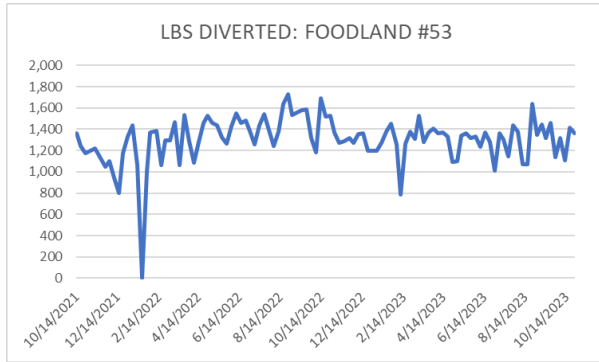Figure 1. Pounds of food diverted by Foodland 53 – Bimonthly.

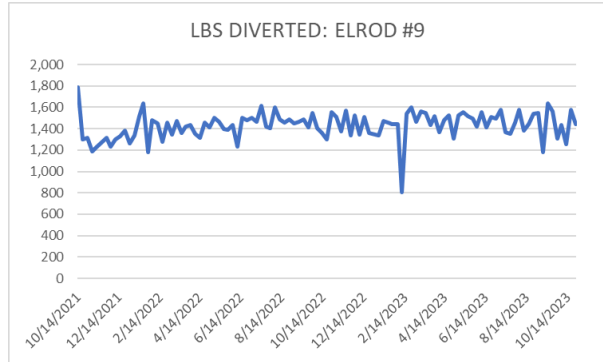Figure 2. Pounds of food diverted by Elrods – Bimonthly.

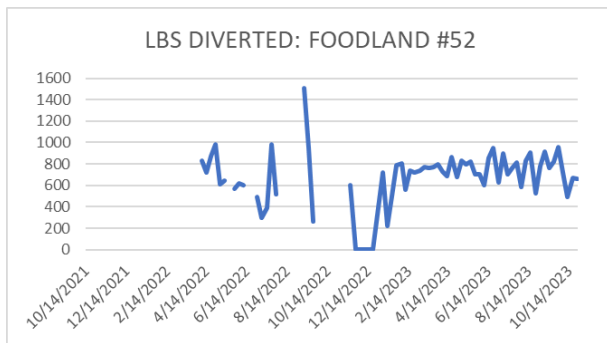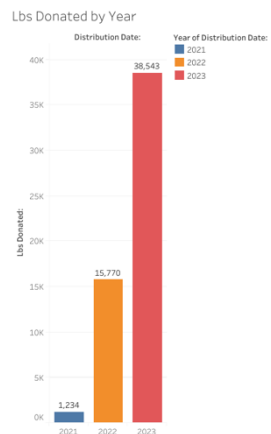Figure 3. Pounds of food diverted by Foodland 52 – Bimonthly.

Figure 4. Pounds donated by year

Comparing 2021- 2023, the total number of pounds composted has increased. However, there is limited information available, which creates an error. Even so, the best fit for comparison is 2022 vs 2023 where we see a slight decrease in compostfed food and an increase in donated food. The bar graph in the middle (red bar graph) in comparison to 2023 shows that 2023 has not yet ended leaving room to outperform 2022 diverted foods for Foodland 53. For Foodland 52, you see how the performance has over doubled the amount of total diverted food without having completed all reporting for 2023. This indicates the program has increased its initial goals of diverting food.
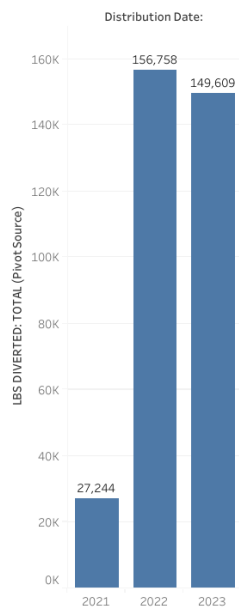
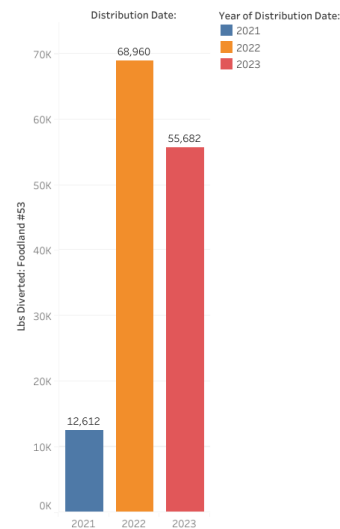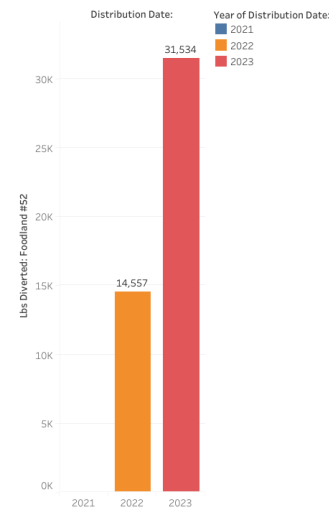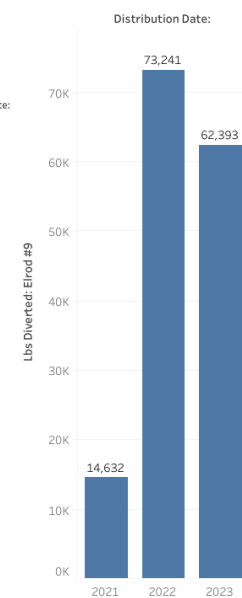| Figure 5. Pounds composted by year	Figure 6. Pounds diverted by Foodland 53 – Annually	Figure 7. Pounds diverted by Foodland 52 – Annually	Figure 8. Pounds diverted by Elrod's – Annually

Below in Figure 9. you can see another form representing the trends of maximum pounds vs lowest pounds throughout each week reported in 2021-2023.This is good for future management of composting as you can see there is a trend towards the beginning or end of certain months were you have a maximum number of diverted food and then it slows down until the next monthly cycle occurs, this is good for future indication of carpool compost pick up scheduling. Another pattern that is more subtle is towards the beginning and the end of each year, we have a lower totals for diverted food which can indicate the lack of food being thrown away or possible inventory transition.

Figure 9. Pounds donated weekly 2021-2023
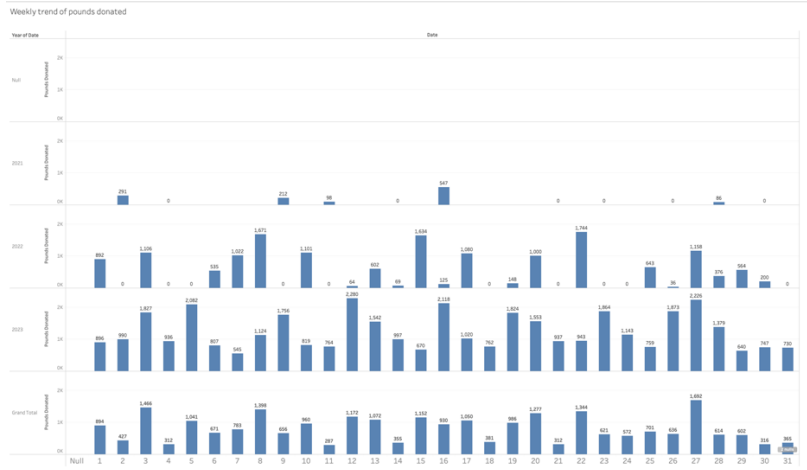
In Figure 11 and Figure 12., there are total net calculations of the difference between the total diverted food and the Donated food, which can indicate the total amount (lbs) of food composted. In 2022, presents an increasing trend of composted food towards the end of the year.
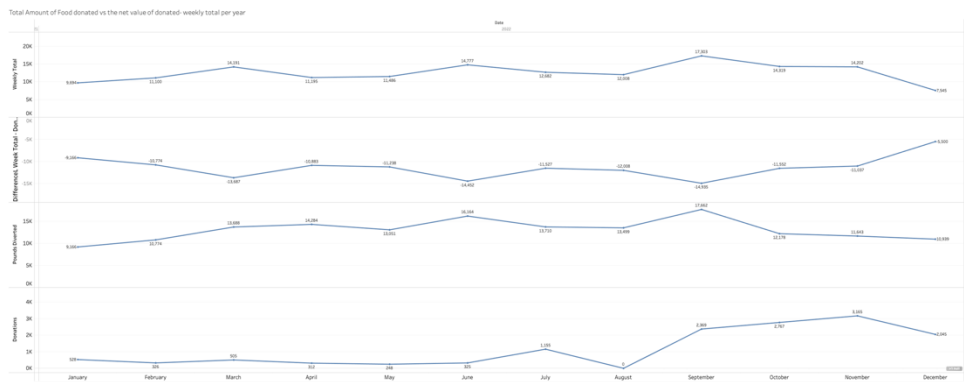

Figure 11. Amount Donated/Diverted/Net in 2022

In 2023, you can see there is a drastic decrease in composted food but an increasing trend in donated food totals, which indicates the relationship of maintaining food quality to a consumable status than just compostable.
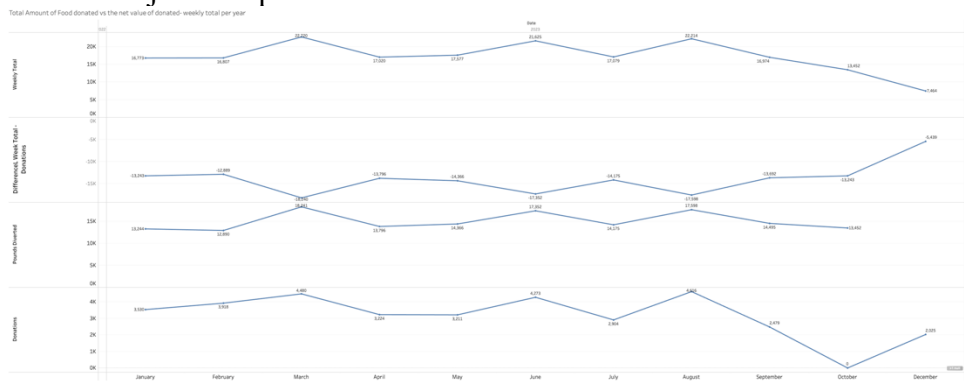

Figure 12. Amount Donated/Diverted/Net in 2023

To show the total numbers of food donated per store you can see that Elrod 9 and Foodland 53 have greater numbers of donation which indicates more food is being thrown out. To look further into their protocols or ordering inventory management to find ways to see cost benefit analysis are possible avenues to increase the effectiveness of the program.
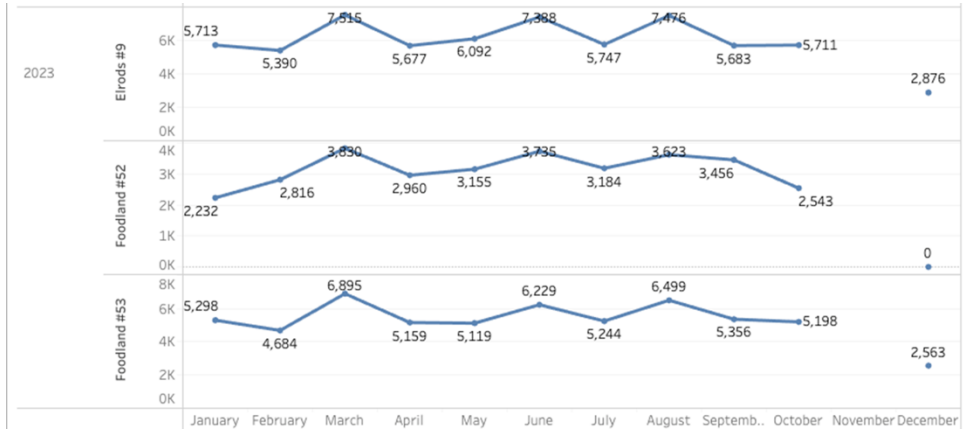

Figure 16. Pounds donated by month - 2023

Predictive analysis

Given all the descriptive analysis, we have ran forecast to see what are the possible results of donations from each store and in total with all the stores combined. This can help decide how to allocate resources according to the time and or cycles where some stores may need more attention certain periods of the year, and what to expect.
With the combination of predicting all stores expecting to donate there is an increasing forecasting trend for 2024.
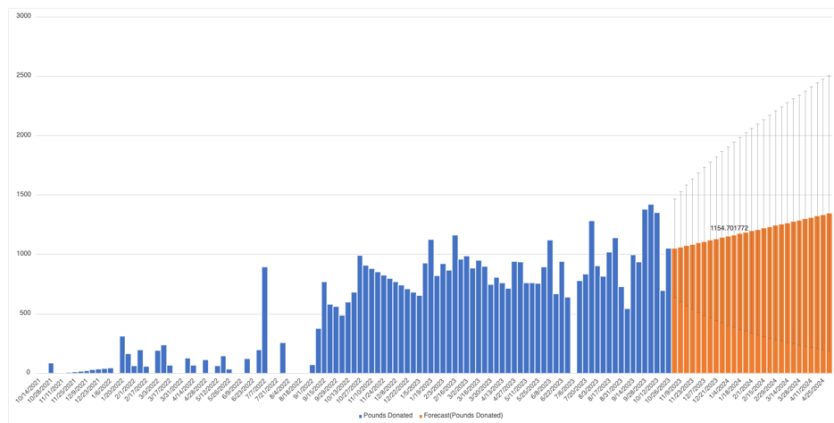
To break down the overall prediction/forecast of 2024, using forecasting models such as Arima model, there is a seasonal forecast per week towards 2024 in Elrod #9 store. We can see that there is not going to be a drastic change unless there are unforeseen changes in the upcoming.
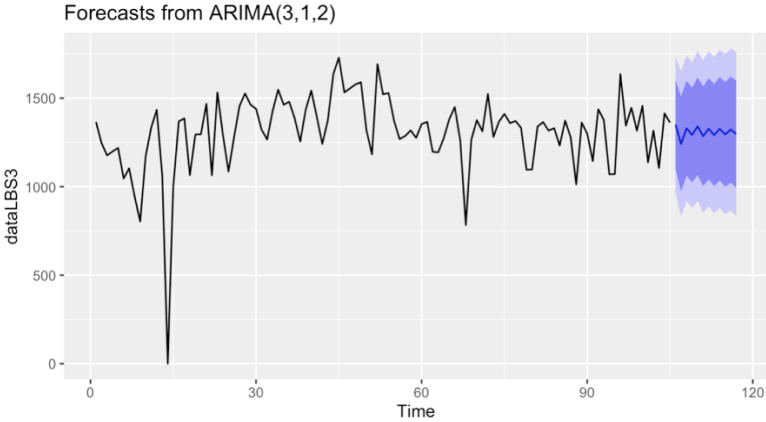
Figure 13. Foodland 53 Forecast shows forecast also stable and not much differentiation throughout the year.
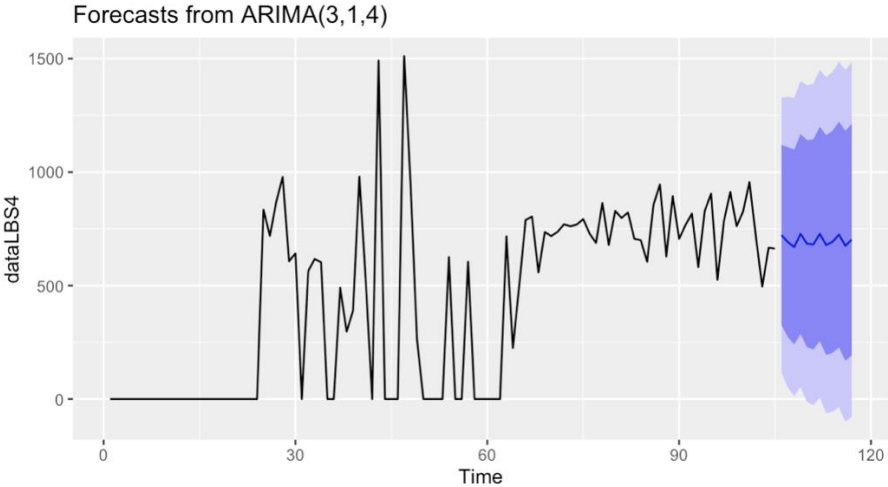
The last forecast that we see is not the best forecast but still shows a consistency of mid-range donation of 14-1500 lbs of food expected to be diverted throughout on a monthly basis. There might be seasonality due to some weeks having spikes in the total number of food diverted as well as there are some low minimum amounts of doo diverted ~1200 lbs of food diverted.

Forecasts from ARIMA(1,1,1)
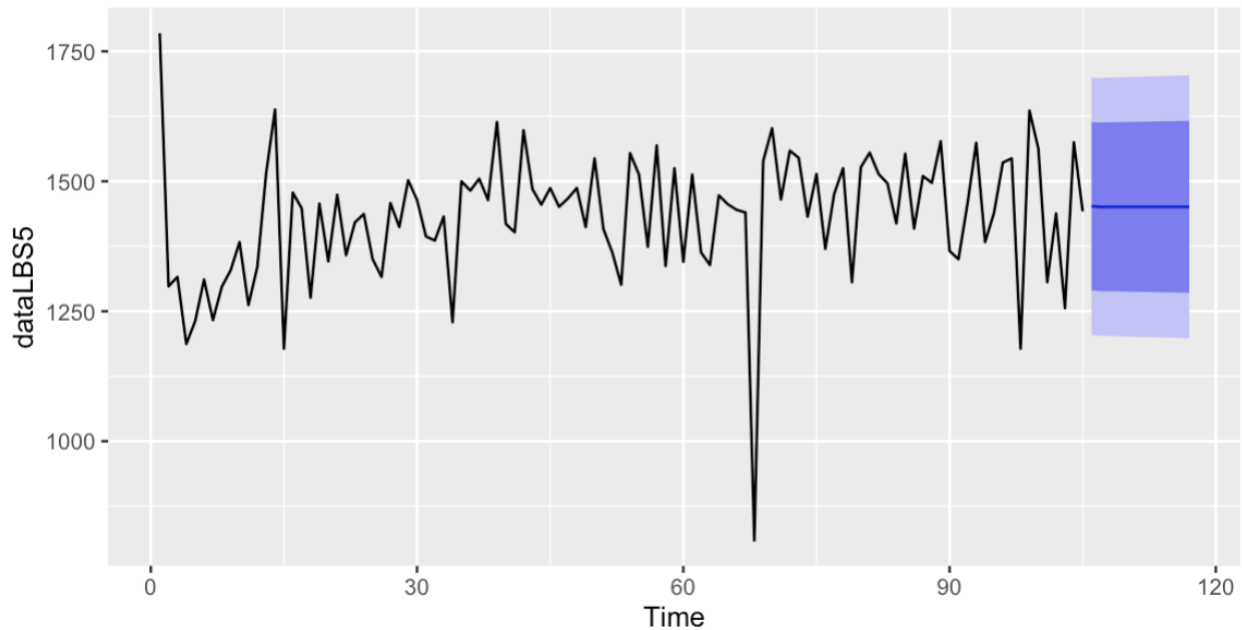
Important Notices

Effects contributing to the outcomes:

I. How often are the employees culling per day at the grocery stores?

II. How are the employee's sorting foods for compost vs donations being reported/ accounted for?

III. How often is fresh food being purchased for grocery stores?

IV. Where does the food fore culling go when the bins get filled?

V. How to compare amount per LBS donatable vs compostable

VI. What is the actual goal? (This affects the process put into place using different metrics/ methods from the data/ collecting data for both questions/ ultimate goals).

Contributes to effectiveness and approach to procedure. Points to think about when answering towards ultimate goal, and how effective is the process and if its working. Because if the process does not cover every necessary task then the procedure will be deeply affected resulting in the continuation of food wastage.

Procedures

- Produce Purchase & Restock
  - Shipment/ Order Date
- Restock
- Delivery

- Culling Produce Daily
  - Compost
  - Donated
  - Food Wasted

- Sorting
  - Binning
  - Sorting compost
  - Sorting Donation

- Calculations
  - Food Wasted
  - Donated
  - Compost
  - Food Wasted- (donated + Compost

Optimization Through Scheduling and Inventory Management

Introduction

To further enhance the efficiency of the food recovery project, it is essential to explore scheduling optimization and implement robust inventory management practices. This section outlines strategies to reduce the time between culled food and donatable food, improving the overall process from waste reduction to fresh produce restocking.

Scheduling Optimization

Dynamic Pickup Scheduling:
Instead of a fixed weekly pickup schedule, consider implementing a dynamic schedule based on real-time data. Analyze the culled food patterns and adjust pickup times accordingly. This dynamic approach ensures timely removal of organic waste and donations, reducing the time it spends in storage.

Real-time Notifications:
Implement a notification system to alert stores and farms about the readiness of culled food. This proactive communication allows for better coordination and reduces delays in the pickup and delivery process.

Fresh Produce Ordering Schedule:
Coordinate the fresh produce ordering schedule with the pickup schedule. By aligning the arrival of fresh produce with the day of culled food pickup, you can minimize the time between restocking and waste generation.

Inventory Management

Real-time Inventory Tracking:
Utilize technology to implement real-time inventory tracking systems. This allows stores to monitor the availability of fresh produce, enabling more accurate ordering based on demand and reducing the risk of overstocking.

Demand Forecasting:
Implement data analytics to forecast the demand for fresh produce. By analyzing historical data and current trends, stores can optimize their inventory, ensuring that they have enough stock to meet demand without generating excessive waste.

Collaboration with Suppliers:
Establish a collaborative relationship with fresh produce suppliers. Share data on culling patterns and donation quantities to enhance coordination. This collaboration can lead to more accurate delivery schedules and reduced waste.

Benefits and Considerations

Reduced Time in Storage:
Implementing dynamic scheduling and real-time tracking reduces the time culled food spends in storage, enhancing its freshness and quality for donation or composting.

Cost Savings:
Optimizing scheduling and inventory management can lead to cost savings by minimizing waste and ensuring efficient use of resources.

Enhanced Community Impact:
By reducing the time between culling and restocking, the project can increase the availability of fresh produce for sale, benefiting both the community and participating stores.

The incorporation of scheduling optimization and inventory management stands as a valuable enhancement to the food recovery initiative. These strategies are geared towards establishing a more efficient and streamlined process, ensuring synchronization between the delivery of fresh produce and the pickup of culled food. As the project advances, continuous monitoring and fine-tuning become imperative for sustained success and optimal impact. The pivotal role of technology integration and collaboration with stakeholders cannot be overstated in achieving these objectives.

Limitations

Limitations of the analysis conducted for this project include limited data due to the recent implementation of the project as well as missing data points that allow for further analysis. To overcome these limitations, it is imperative to continue staying up to date with compost and diversion data, ensuring that the data obtained is accurate, along with adding key data points that will allow for a more comprehensive analysis as the project progresses. Examples of key data points include but are not limited to how much each donation recipient receives, how often the grocery bins fill up, how often Carpool Compost picks up produce, and more.

Conclusion

This comprehensive approach seeks to harmonize internal processes with Texas Health Resources' dedication to community responsibility and sustainability. Through the cultivation of employee awareness, improvements in communication and coordination, the implementation of a waste tracking system, and the establishment of robust documentation and reporting practices, grocery stores can make substantial contributions to diminishing food waste and elevating community well-being.