

Assignment A: Taking action to end world hunger (Part 1)

Over the next 3-4 weeks, I will develop a technology-driven solution to address food waste at the “Consumption” stage of the food supply chain: *Fridge Feast*. The primary goal of this app is to reduce food waste through three key strategies:

1. **AI-powered meal suggestions** based on the contents of a user's fridge. Users can choose from a variety of cuisines and preparation times to better suit their palates and preferences. This feature aims to minimize food waste and maximize taste.
2. **Donating excess food** to nearby food banks/shelters. Users and grocery chains will be notified to provide for and give back to their local communities.
3. **Educating users** about better food storage practices and the impacts of food waste on hunger. This will be achieved through a set of curated videos, journals and blog posts.

Annually, about **one-fifth** (approximately 19%) of food that is available to consumers is wasted, amounting to **1.05 billion tonnes** (Division et al., 2024). Food waste occurs at five stages in the supply chain (a.k.a. “farm to fork”): Production, Post-Harvest Handling and Storage, Processing and Packaging, Distribution, and Consumption. At the “Consumption” stage, households waste approximately **631 million tonnes** of food, the food service industry wastes **290 million tonnes**, and grocery stores waste **131 million tonnes** (Division et al., 2024). In groceries, waste is primarily due to overstocking, poor inventory management, and the disposal of goods close to expiry dates. In homes, waste is caused by over-purchasing, improper storage, disposal of leftovers, and a lack of creativity in meal preparation (Aschemann-Witzel et al., 2015). The demand for food is expected to rise by **150-170%** by 2050 (“FAO’s Director-General on How to Feed the World in 2050,” 2009). Astonishingly, food waste generated by households alone could provide **1.3 meals daily** for everyone impacted by hunger today (Division et al., 2024). Moreover, food waste has significant impacts on the environment, accounting for **8-10% of global greenhouse gas emissions**—nearly five times more than the aviation sector (Division et al., 2024).

In 2016, France banned grocery stores from disposing of and intentionally destroying food close to its best-by date, requiring that food be donated to charities. This law aimed to provide an additional **10 million meals per year** (McCarthy, J. 2016). Apps like *Too Good To Go* allow stores to sell “soon-to-expire” products at discounted rates. In 2023, *Too Good To Go* saved over **122 million meals** (Too Good To Go, 2023). Similarly, the impact of *Fridge Feast* could be significant and global if users adopt it and resonate with the problem of food waste. However, the app's success relies on user behavior; if users do not manage their food efficiently, its impact may be minimal.

After the course, I plan to take the app further by implementing a rewards section in the app where users can fill out a short survey about their recent shop in exchange for a discount at their grocery store. This data could be shared with local grocery stores to help them better stock-keeping unit estimates, reducing overstocking. This will lead to lower food waste, reduced costs for groceries and increased rewards for users. In conclusion, my interest and passion for technology and culinary arts inspired the creation of *Fridge Feast*. Based on the success of similar ideas, I believe *Fridge Feast* is a step in the right direction.

References

- Division, I. A. E., Forbes, H., Peacock, E., Abbot, N., & Jones, M. (2024b, March 1). *Food Waste Index Report 2024. Think Eat Save: Tracking Progress to Halve Global Food Waste*. <https://wedocs.unep.org/20.500.11822/45230>
- Aschemann-Witzel, J., De Hooge, I., Amani, P., Bech-Larsen, T., & Oostindjer, M. (2015b). Consumer-Related Food Waste: Causes and Potential for action. *Sustainability*, 7(6), 6457–6477. <https://doi.org/10.3390/su7066457>
- McCarthy, J. (2016b, February 5). *France becomes the first country to ban supermarket food waste*. Global Citizen. <https://www.globalcitizen.org/en/content/big-win-french-supermarkets-can-no-longer-throw-away/>
- Too Good To Go (2024, March 1). *2023 Impact Report*. <https://cdn.sanity.io/files/ngimd3nr/production/fa4075717ba03b510e4f0b29aca8f83dd19fda76.pdf?dl>
- FAO's Director-General on How to Feed the World in 2050. (2009b). *Population and Development Review*, 35(4), 837–839. <https://doi.org/10.1111/j.1728-4457.2009.00312.x>

1) What did you do? Why?

I developed a web app named Fridge Feast (see Appendix for a link) to address food waste at the "consumption" stage of the food supply chain. The primary goal of this app is to reduce food waste through AI-powered meal suggestions, donating excess food to nearby food banks and shelters, and educating users about better food storage practices and the impacts of food waste on hunger. This initiative appealed to me because of my interest in technology and culinary arts. The idea of leveraging technology to create a practical solution for a global issue like food waste and its effects on the environment seemed innovative and impactful.

Additionally, I was appalled that **nearly 20%** (Division et al., 2024) of all food is wasted, which has downstream effects on the environment and results in wasted labour. The average American household wastes **28.4% to 31.9%** (Yu & Jaenicke, 2020) of all the food they purchase. This translates to **\$240 billion per annum** worth of food wasted in U.S. households. Therefore, the social and environmental benefits will be tremendous if change occurs in our households.

2) What was the experience like for you?

The experience was a blend of rewarding, eye-opening, and challenging moments. Before I began developing the app, especially during the research phase for the content to educate users, I often questioned myself: "Would I do this if I were not aware of the impact it has on people?" This introspection led me to include more information on the impact of food waste. Modern, reward-driven minds rarely choose to do anything without a return (Weinstein, 2023). For example, have you ever asked yourself, "Should I cook or eat out?" knowing you have perishables in the fridge? I have, and admittedly, I've also chosen to eat out. I soon understood that, through Fridge Feast, I was trying to cause a shift in mindsets.

It was rewarding to see a concept turn into a potentially impactful tool. However, ensuring that the app was user-friendly and effectively addressed the impacts of food waste was also challenging. I found the process inspiring as I delved deeper into the causes and solutions for food waste, realizing the potential for technology to drive significant social change.

3 & 4) In what way did your action affect world hunger? Do you think you made a difference? Why or why not?

Through Fridge Feast, I was not only trying to prevent food waste but also to highlight the impacts of food waste and hunger. To do this, I included various educational resources ranging from tips for better food storage to the quantitative impacts of hunger, aiming to drive social change and inspire people to waste less food.

To evaluate the impact, I released a beta version of the app to 8 of my friends for 5 days. The Vancouver-based students were from middle- to high-income families, were of Indian heritage, and were also Computer Science or Business students who had not taken FNH 355 or any related course. The sample was small and not diverse because, at the time, I didn't "publish" the app for the public; therefore, I made them run the app "locally" using the code on their

devices. This could be perceived as a cybersecurity risk for those unaware, leading to skewed results. Nonetheless, the feedback survey results (link included in the Appendix) were fascinating.

Income elasticity of demand (IED) is the responsiveness of demand to a change in income. Meat, dairy, and produce are examples of income-elastic foods (i.e., demand decreases when income decreases). Staple foods like rice and wheat are income-inelastic (i.e., demand increases or stays the same when income decreases) (Zhao et al., 2022). Most people also reported that they saved and learned how to store produce and dairy products better (Fig. 3, 5). This statistic is essential to global food waste because most food waste occurs in medium- to high-income households (Yu & Jaenicke, 2020). This implies that they would also have higher demand and food waste for income-elastic foods. This will be prevented through the use of Fridge Feast.

In the current state of the app, I have not made as big of a difference as I wish to make. I will continue to develop the app and soon do a public release and promote the app. I am more optimistic about the app's effectiveness. This confidence boost can be attributed to the survey results. 7/8 people used the AI-powered meal generation feature of the app once or more (Fig. 1). Collectively, they saved soon-to-expire ingredients 4-8 times (Fig. 2). 7/7 (data collection error) People also learned new techniques to store their food more effectively (Fig. 4). 6/8 people even considered donating to one of the charities listed (Fig. 6). 6/8 people also suggested that they are likely or extremely likely to recommend the app to family and friends (Fig. 8). Astonishingly, all eight users said they made conscious efforts to reduce food waste after using the app (Fig. 7)! There may be some bias associated with these results, but even if I caused one person to change their habits, I would be happy, yet not fully satisfied.

5) What was the most important thing you learned by doing this assignment?

Some reasons for global hunger are often overlooked due to the complex nature of the problem. Solving this complex problem requires work at the individual level and understanding the impacts of hunger. The most important thing I learned is the substantial impact that individual actions, supported by technology, can have on global issues like food waste and hunger. This assignment (and the course) highlighted the interconnectedness of food waste, hunger, and environmental sustainability, showing that small changes at the individual level can collectively lead to significant global benefits. It also reinforced the importance of innovative thinking and leveraging technology to create practical solutions for complex problems.

6) What will you do, moving forward?

Moving forward, I plan to continue developing and promoting Fridge Feast, seeking feedback to refine and improve the app. As I mentioned, I will feed the reward-driven mindset by collaborating with grocery stores and providing customers with rewards to maximize the app's effectiveness in reducing food waste. Finally, I will also explore further technological solutions to address other stages of the food supply chain.

References

- Division, I. A. E., Forbes, H., Peacock, E., Abbot, N., & Jones, M. (2024c, March 1). *Food Waste Index Report 2024. Think Eat Save: Tracking Progress to Halve Global Food Waste*. <https://wedocs.unep.org/20.500.11822/45230>
- Weinstein, A. M. (2023). Reward, motivation and brain imaging in human healthy participants – A narrative review. *Frontiers in Behavioral Neuroscience*, 17. <https://doi.org/10.3389/fnbeh.2023.1123733>
- Yu, Y., & Jaenicke, E. C. (2020). Estimating food waste as household production inefficiency. *American Journal of Agricultural Economics*, 102(2), 525–547. <https://doi.org/10.1002/ajae.12036>
- Zhao, J., Huang, J., & Nie, F. (2022). The Income Elasticities of Food, Calories, and Nutrients in China: A Meta-Analysis. *Nutrients*, 14(22), 4711. <https://doi.org/10.3390/nu14224711>

Appendix

Link to Fridge Feast: <https://github.com/bhmohit/fnh-355>

Link to Survey: <https://forms.gle/UHxCsKPjBuGznn3D9>

Survey results:

Figure 1.

Question 1: How many times did you use the AI-powered meal suggestion feature of Fridge Feast?

How many times did you use the AI-powered meal suggestion feature of Fridge Feast?

8 responses

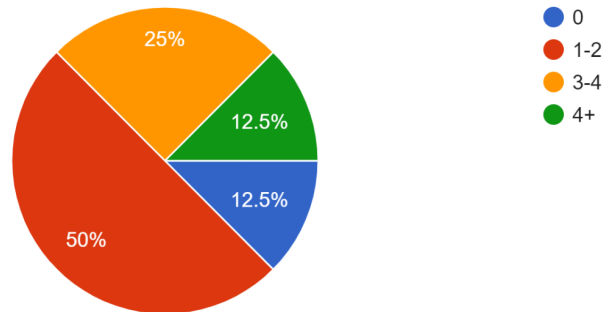


Figure 2.

Question 2: How many times did you find yourself using ingredients that were originally intended to be discarded before using Fridge Feast?

How many times did you find yourself using ingredients that were originally intended to be discarded before using Fridge Feast?

8 responses

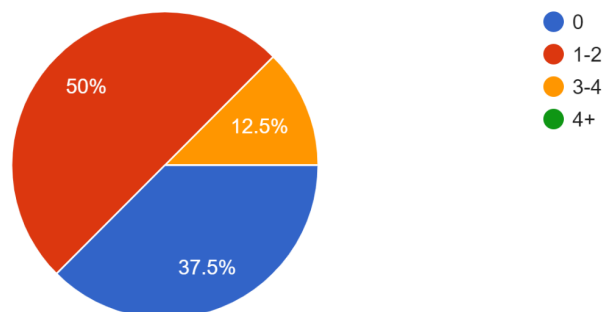


Figure 3.

Question 3: What types of food items did Fridge Feast help you save?

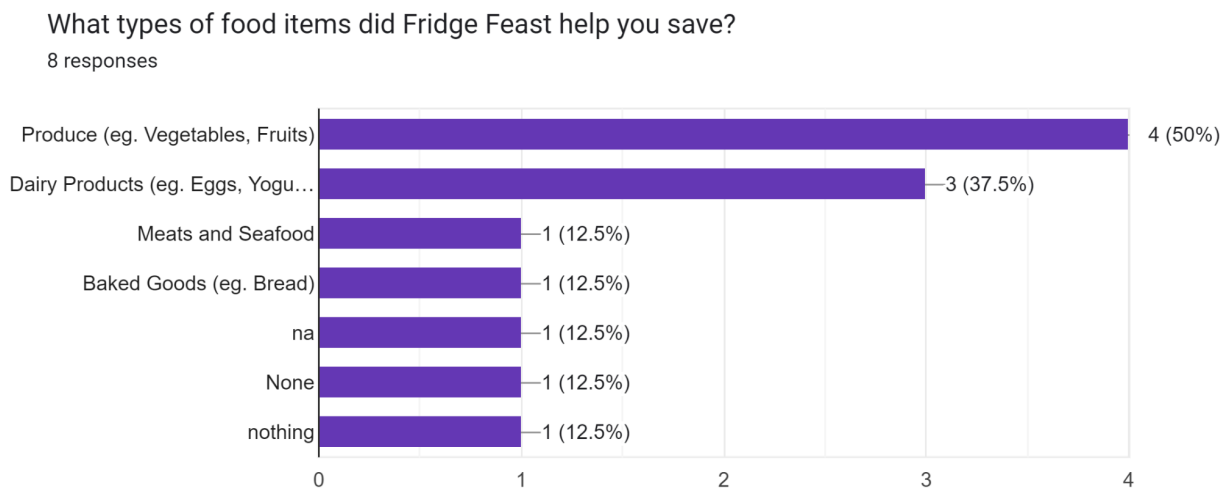


Figure 4.

Question 4: Did you learn new ways to store food for better freshness?

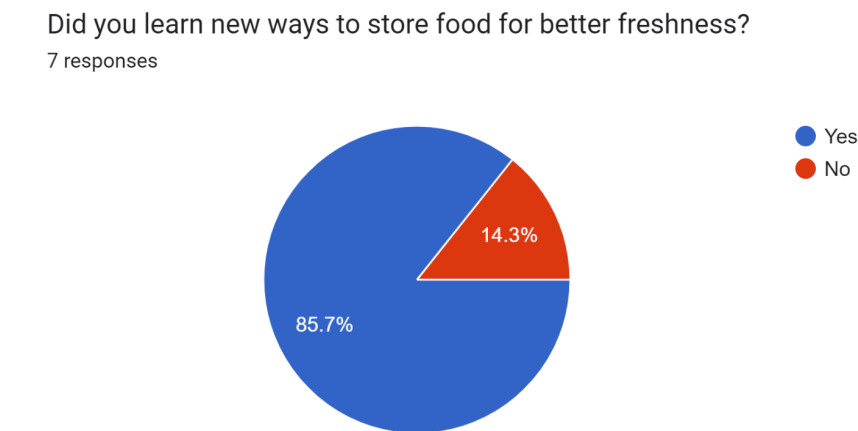


Figure 5.

Question 5: What types of food items did Fridge Feast help you store better?

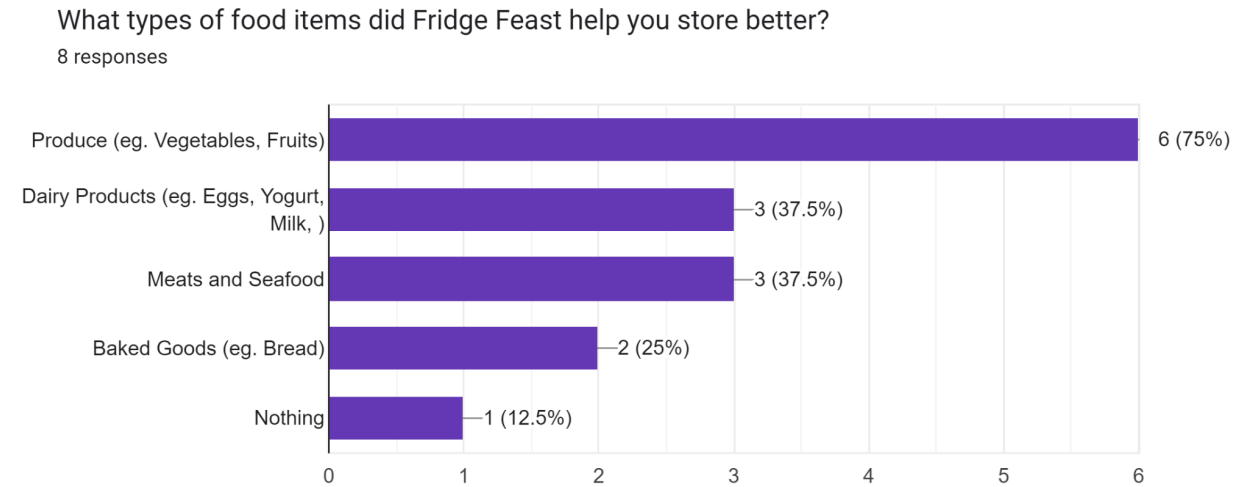


Figure 6.

Question 6: Have you considered donating to the sources mentioned mentioned in Fridge Feast?

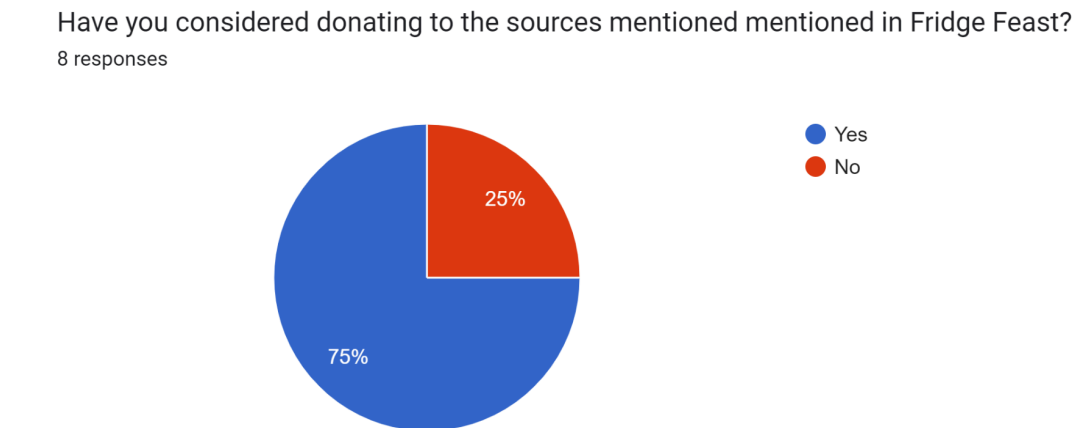


Figure 7.

Question 7: Have you made any conscious efforts to reduce food waste after using Fridge Feast?

Have you made any conscious efforts to reduce food waste after using Fridge Feast?

8 responses

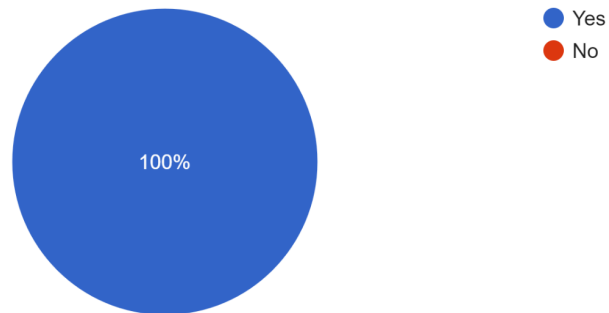


Figure 8.

Question 8: Have you made any conscious efforts to reduce food waste after using Fridge Feast

How likely are you to recommend Fridge Feast to a friend or family member?

8 responses

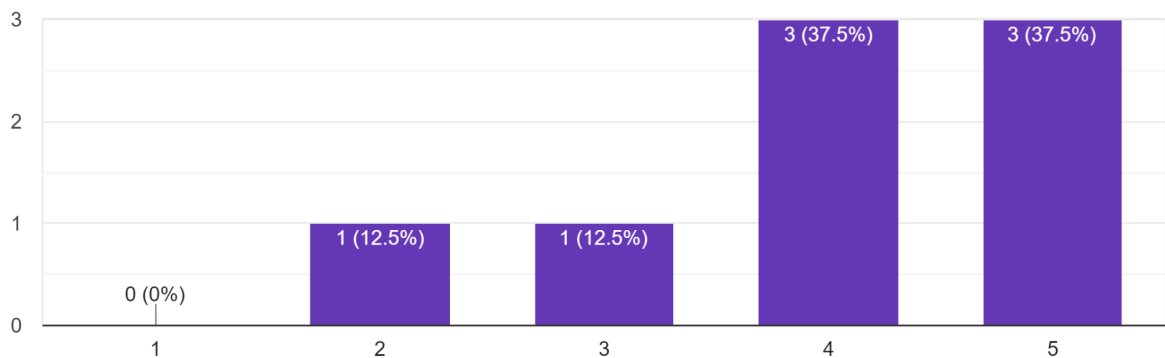


Figure 9.

Question 9: This question is unrelated to Fridge Feast. How many days (per week) choose to dine out knowing you have perishables in the fridge?

This question is unrelated to Fridge Feast. How many days (per week) choose to dine out knowing you have perishables in the fridge?

8 responses

