**Turning ReFresh Consumer Behaviour Study into Effective Food Waste Technological Intervention**

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Food waste is no longer a niche concern in the developed countries.  Although not everybody has actively joined the food waste reduction movement yet, there is an increasingly growing consensus in Western societies, that food waste is an issue not to be taken lightly. Both the EU and the US have passed prescriptions aimed at reducing food waste by 50% by 2030. It is yet not clear what exact measures will be implemented.  We can expect to see more and more countries introducing public policy interventions following the example of France, circled out as the official leader in food waste reduction.

Yet public policy intervention has a stronger focus on food loss prevention from farm-to-shop, while it is a widely known fact that currently, 53% of all food waste in Europe and North American is happening in the shop-to-fork stage. Therefore, while public policy intervention is a vital next step, there is a need to address the issue on an individual, household level.

One of the possible solutions for curbing food waste on consumer level is technological intervention. Such is the idea behind the CozZo app, that aims to reduce food waste by providing smart assistance to consumers during all the various stages of food management from planning, provisioning, storage, to preparation and consumption, so as to help households use the food they provision before it expires.

### **Tech Scepticism**

Before analysing the ways in which technological interventions can assist consumers to a more national food management process, it is important to address the not so uncommon scepticism among food waste warriors, that technology, in fact, can help curb the issue of food waste.  Much of the doubt is based on the fact that that earlier technological attempts in the direction of food waste reduction have failed. Yet most of the earlier prototypes have one thing in common. They were not based on real consumer behaviour research that provides insight as to the actual pain points that people experience in their daily kitchen routines and customer journeys.

The major breakthrough in this field of consumer food waste research happened in 2016 with the publishing of the “Causes & Determinants of Consumers Food Waste A theoretical framework,” a report that was constructed by the Wageningen University in the Netherlands and funded by the EU project REFRESH (Resource Efficient Food and Drink for the Entire Supply Chain). This report presents a comprehensive theoretical framework on consumer food waste behaviors and focuses on the specific habits that increase the likelihood to waste, as well as the drivers behind these habits.

It is not the inability of technology to provide meaningful intervention for food waste reduction per se that should be in question, but the construction of technology that is not centred on tweaking behaviours that lead to food waste and the drivers behind them. A design solution, be it technological or from the realm of public policy, is useless unless it is able to capture the heart of the problem it is trying to solve. Technology has already successfully intervened in many parts of people’s lives, to the extent that they can no longer imagine a day without it. There is no reason that is should not work when it comes to tweaking food management habits given the design of the technology is accurately anticipating actual consumer behaviours and drivers.

CozZo is designed specifically with such behaviour and drivers in mind and is based on the findings of the abovementioned REFRESH report and extensive user feedback. Its purpose is to provide relief and assist on all the pain points outlined in the study through an accurate user experience delivered through smart, self-learning and intuitive technology.

More than that, CozZo closely monitors how users interact with the app and try to identify pain points that they encounter with the technology itself and in its relation to their customer journey. CozZo team actively listens to feedback on social media, joins into pilot projects. Based on these finding, the development team is constantly iterating to improve the design of the user experience, as part of the overall journey for its users.

### **Planning**

The REFRESH report outlines planning as the first vital stage in the household food management process that relates both to “the planning before food enters the household and when the food is in stock,” (p.17). The report suggests that incorrect or lack of planning can indirectly result in food waste, as it can lead to purchasing too many products, which increases the likelihood that not all products can be eaten before becoming spoiled. (Quested et al. 2013; Schmidt 2016). To avoid this from happening, consumers can plan their next shopping trip by checking storage spaces first, “to update their knowledge on which products are already in stock and what their shelf-life is.” This advice applies to both already prepared meals, and to raw ingredients and separate food items. Based on the updated knowledge, consumers can now make lists with “food products that should be bought and in which quantities”.

One of the key challenges to planning is that consumers do not always have the chance to physically go through their pantry and fridge, as they are not at home when making their shopping plans. With its **super-precise tracking and reporting** the status of groceries functionality, CozZo allows the users to have a digital snapshot of the food they already have at home always with them in their pockets or handbags.

If a highly perishable food is approaching its expiry date, the user will get a strict reminder and the product will be red-flagged.  This way consumers are informed that they ought to include these particular items into their next meal, or they will be spoiled. A gentle reminder is sent for the foods that are starting to lose their flavour but are still safe to eat, together with a green flag, reminding the user that these items need priority attention.

CozZo app checks the home inventory several times a day and sends reminders for products that need attention to the phone home screen, which allows for a quick product update even without opening the app. Based on these updates, it is much easier to come up with a meal concept for this night’s dinner. If the user feels stuck, just entering the priority ingredients into the Google search bar will render hundreds of ideas. It is straightforward from here on, the user just needs to add to the “to buy” list the several missing ingredients that will complete the meal they have in mind for tonight. This helps users shop with intention by entering the grocery store with a plan and a list.

Shopping with intention is a food habit that has a direct link to less food wasting at home. The less random food enters the house, the less random food will need to be consumed or alternatively discarded.

### **Provisioning**

The REFRESH report refers to provisioning as all the ways in which food enters the household, usually through purchases in retail outlets such as supermarkets, greengrocers or butchers, or through purchases at farmers’ markets. However, there are also other ways of provisioning, which include online shopping and home-delivery, home growing, foraging, receiving as gifts, take-away from restaurants or leftover food from out-of-home consumption.

REFRESH reports impulse buying as a behaviour significantly contributing to food waste, described as “spontaneous and without much reflection” and defined as experiencing “a sudden and strong urge to buy”. The findings of the report suggest that people who have a greater tendency to make impulsive purchases, waste more food (Stefan et al. 2013; Parizeau, von Massow, and Martin 2015).

The CozZo team says there are several main reasons for this consequence. First, when people buy on impulse, they do not take into account how much they really need or can eat, which results in overstocking. Secondly, not having a specific dish in mind when choosing the ingredients, and doing so on the spur of the moment, leads to buying random stuff that may not work together as a meal well or not at all.

If the items one has purchased do not add up to a concrete meal, it is very likely they will be partially left lying around in the fridge until they perish. The third main reason is that impulse often happens when shopping hungry, for e.g., after work before getting home. Hunger is a bad advisor, so one is tempted to buy food that one is normally not prone to eat or at least not in excess quantities, once the hunger spurs have been curbed. The only way to avoid all these pitfalls it to shop with intention by sticking to a strict shopping list of what has been deliberately marked as needed items in the CozZo app.

Additionally, a behaviour that has been shown to increase the likelihood to waste is buying packaged food that contains too much of a certain product. Consumers report a relationship between large package sizes and food waste (Williams et al. 2012; Koivupuro et al. 2012; Evans 2011). Yet consumers report continuing to buy them because the larger package size is often cheaper than the smaller packages of the same product. Not having a plan and a list to match makes peoples vulnerable to [merchandise techniques, which count on precisely that](https://cogzum.com/blog/13-supermarket-tactics-trick-buy-spend/) – tempting consumers who shop without a clear intention in mind, into buying in excess.

Buying more than one can eat, as already discussed, has an impact on food waste. The built-in **Journal** in the CozZo app allows the consumer to track for every product, how much of it was used in time, and how much was left to perish uneaten**.** In that way, the consumers receive a precise feedback plan of the consumption quantities in their household, so that they can adopt the purchasing levels accordingly. This way the consumer can empirically establish that buying the more expensive per gram option may eventually turn out to be the cheaper option for their household, as they will waste less money on food that was paid but not eaten.

### **Storing**

Food storing is another important phase, where a specific set of behaviour was established to lead to food waste. It refers to the food, both single items and a combination of food, such as meals and leftovers being stocked in “fridge, freezer, cupboards or other forms of storage”. The REFRESH report concludes that “a large majority of people seem to store products sub optimally due to a lack of correct knowledge on how to prolong products shelf-life.” To overcome this particular skill deficit, for each item that is entered into the “at home” catalogue, the CozZo app suggests the optimum storage place.

The report suggests that “how the storage is organized also has an influence on how much food is wasted since a cluttered or chaotic storage space increases the risk of forgetting products.” The CozZo team believes that this type of behaviour creates a vicious circle: the more food consumers pile up in the fridge, the more food they forget that they already have at home, the more food they purchase on top of what they have, the more clutter piles up in the fridge. The result is that a lot of food is not consumed in time and is binned instead.

Breaking the vicious circle requires a “restart”. Ideally, this is an hour or two set aside for some tidying up, decluttering. and going through the kitchen staples and basic food supplies.  If a household has not sorted its pantry in a while, it is likely that they have a very vague idea of what they already have. Being aware, that most people find making a full inventory of one’s food supplies a daunting job, that is above all time consuming and requires some free time allocation, the CozZo team has broken down the process into more manageable steps and has succeeded into making it actually fun.

Once the [CozZo](https://itunes.apple.com/gb/app/cogzum-shopping-pantry-list-food-waste-helper/id1162606257?mt=8) app is installed the onboarding process begins with a superfast pantry session, where different cards with basic products, that one is likely to maintain at home, are flashed at the user. She can then swipe left on the image if the item is already in her pantry, so it is entered into the “at home” catalogue or swipes right if it is something that she needs to be purchased, so it goes into the “to buy” list. So, this initial onboarding step has a dual purpose of preparing both a home catalogue and a shopping list. The best part of it, that it can be done out of home and further updated and fine-tuned during a more relaxed setting.

The other major area of waste during the storage phase, confirmed by the REFRESH report, is in the estimation of food edibility. While elderly persons often still have the skills to judge by making use of their senses, younger individuals tend to only to the use of date labels or the number of days it has been stored for (Terpstra et al. 2005), which has been proven to be the more unreliable and confusing method. To overcome this knowledge gap, for every item in its product catalogue, CozZo has assigned a precise food expiry time frame based on storage preferences, from its database developed by food experts and professional chefs.

### **Preparation and Consumption**

Preparation is the process of handling food products by cooking or other methods to enhance their taste and edibility. Consuming refers to the moments when the food products or meals are being consumed and leftovers are being handled. One important aspect of food waste during the preparation phase that REFRESH reports, but one that is often overlooked, occurs when products are used only partially (e.g., when half an onion is used in a recipe). The team behind CozZo believe that people should be more relaxed about recipes in general and should not feel obliged to follow them blindly. They urge people to consult several recipes to grasp the general principle of the dish and then go on to create their own version by integrating the larger part of existing ingredients and playing with proportions instead of fixed measurements.

Another behaviour during the preparation and consumption stage that regularly results in food waste, as described by the REFRESH study, is the amount of food that is prepared. Consumers tend to overestimate the number of dishes each family member will have over the next few days and hence prepare too much food. This happens because many consumers lead hectic lifestyles where changes in plans occur constantly. The result is that part of the food that was planned to be eaten within a time frame, remains unconsumed after that period.

When this occurs, it is important to analyse if the food is still edible and does it still taste good and can it be turned into a new dish from leftovers? Consumers often do not store the leftovers for later use or do not do it optimally, or they do store the leftovers but end up not eating them, because they forgot or due to an aversion to leftover food. REFRESH reports that as consumers often find it difficult to estimate the edibility of cooked food and want to avoid foodborne diseases, they decide to discard the leftovers.

CozZo helps users maintain a clear overview of the food that is already available in the house in the form of cooked meals or leftovers, and precisely know its status on the expiry timeline. Hence, they can make informed decisions on whether to keep that food and how to turn it around to minimize the amount that will end up in the bin.

### **Disposal**

At that point, food becomes waste, and consumers make decisions about how to dispose of the food. The CozZo Journal provides a feedback loop of how much of each food was thrown away in the household**.** Based on this report, consumers can have a more realistic assessment of their behaviour during the various stages of food management, (planning, provisioning, storing, preparation and consumption) and make the necessary adjustments in terms of the excess quantity of food that flows through the household and is eventually discarded.

### Conclusion

CozZo is on its way to prove that technology can provide meaningful and impactful intervention in the battle with food waste, particular on the consumer level. The people on the CozZo team are well aware that superior SaaS alone cannot solve food waste unless it is underlined with a solid understanding of consumer behaviour and drivers that lead cause it. CozZo provides assistance to consumers so that they can adjust their food habits, especially at those various pain points outlined in the REFRESH report, where they meet the most difficulties.