

TZEN

- AVOID THE UNAVOIDABLE -



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Sustainable food
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INTRODUCTION

PUCK VERBEEK

Roughly a third of food produced for human consumption is wasted, counting up to approximately 1.3 billion tons of waste each year (FAO, 2013). That is almost 6 million kilograms a minute. Can you imagine the world producing 180 dump trucks of food waste every minute?

Cultivating crops and transporting food requires many, often scarce, resources and by emitting exhaust fumes significantly affects global warming. Globally, more than 70% of one of earth's most precious resources, fresh water, is used for agricultural purposes (The World Bank, 2017). Next to that the FAO estimates that the Carbon Footprint of food produced and not eaten is equivalent to 3.3 billion tons of CO₂ (FAO, 2013)

A lot of unavoidable food waste is thrown away although it is very well edible and nutritious. For example, orange peels actually renders 3 times more nutrients than the flesh itself (McGrane, 2021).

To combat this problem we created a design studio Tzen. Tzen is a design studio that customizes products and services that reduce the amount of unavoidable food waste in households and collaborate with companies to see where and how they can make an impact. Unavoidable food waste is waste that arises from food or drink preparation that is not considered edible under normal circumstances. Unavoidable food waste will now be referred to as UFW.

How we will accomplish this and proof that our solution will make a real difference will be explained in this report. First, the exact goal and vision of this project will be discussed. Afterwards, we will elaborate on the process we went through and show the final outcome of the project. Then, after a description and reflection on the outcome of the project and fulfilment of the project goal, we will discuss our future plans.

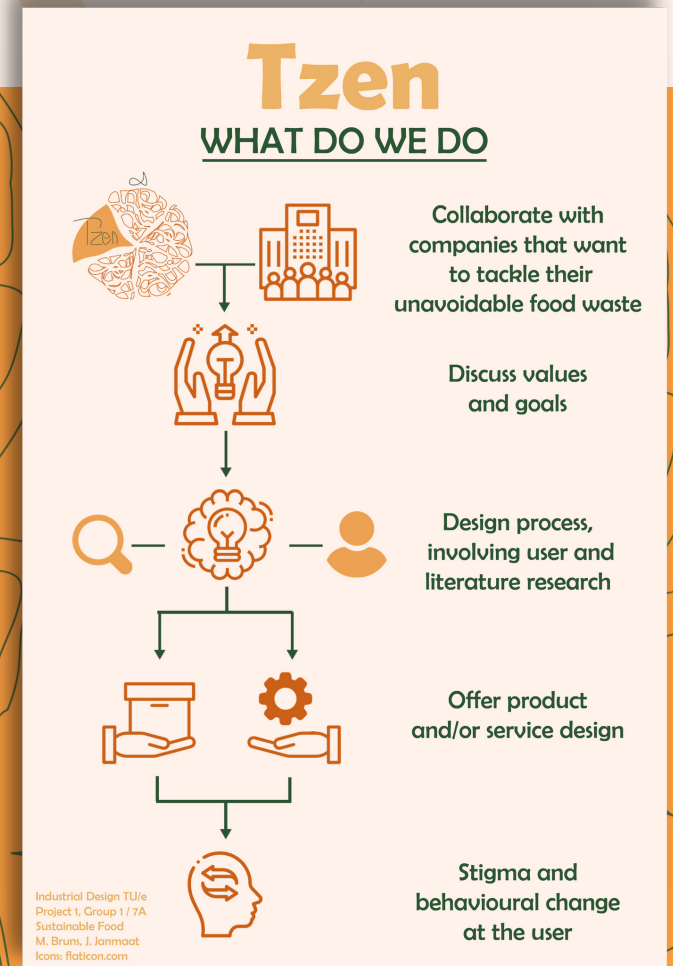
PROJECT GOAL

"Decrease the amount of unavoidable food waste in households by changing the stigma around UFW, while stimulating the user to change their behavior towards UFW."

Tzen is a design studio that customizes products and services that reduce the amount of unavoidable food waste in households. In order to achieve this, we first needed to show people that unavoidable food waste is neither unavoidable nor waste and change the stigma around it. Then stimulate people to avoid their own waste and support them to change their behaviour. We collaborate with companies to see where and how they can make an impact.

In our project we all wanted to focus on developing ourselves within the expertise area of Business & Entrepreneurship. Next to that our other main focuses were the expertise areas Creativity & Aesthetic and User & Society.

FIGURE 1: TZEN STRUCTURE



PROCESS

PUCK VERBEEK

In our project we mainly followed a transformative reflective design process, going through 5 main iterations (fig.2). We also followed a designing for behaviour change process, since our concept is focused on behaviour change.

Our 5 main iterations will briefly be discussed in the upcoming part. Starting with the individual pressure cookers, followed by our concept Deglaze, and concluding with our concept of the design studio Tzen.

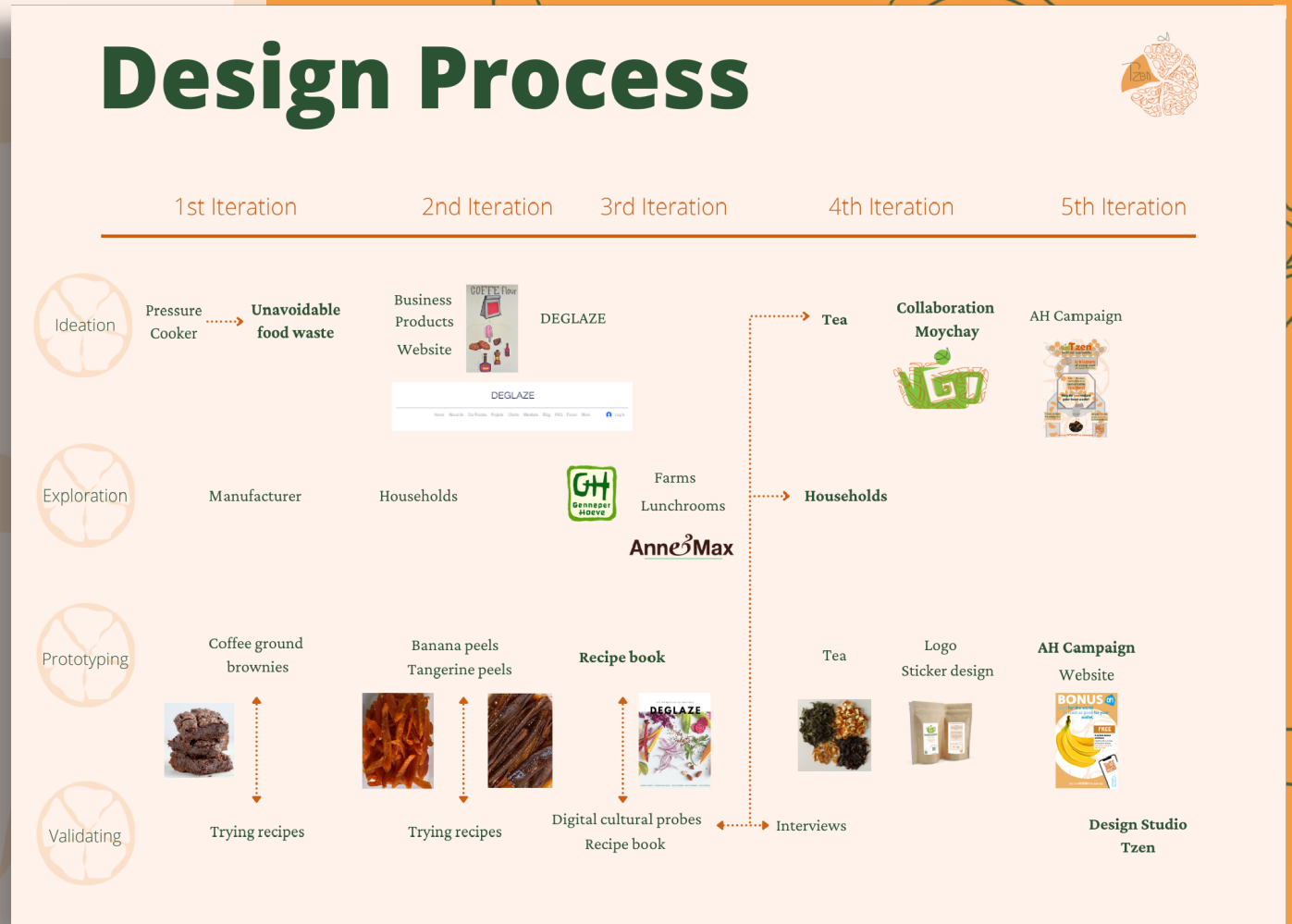


FIGURE 2: DESIGN PROCESS

FIRST

CARMEN VAN GESSEL

ITERATION

In the first week of the project, all team members went through an individual pressure cooker. Even though a new challenge and goal were developed once the team was formed, the insights from the first week were definitely taken into account.

Mart's expiration day checker taught us the dangers of food waste and the importance of reducing the waste in households (fig. 3). Aameena's pressure cooker first introduced us to the concept of unavoidable food waste and how it can be incorporated into new edible products (fig.4). Puck's colour changing plates showed a possible method of applying food psychology to stimulate people to eat differently (fig. 5). Carmen's upcycling of (unavoidable) food waste into fabrics and plastics introduced the wide range of possible applications of food waste, which inspired us to think of sustainable packaging for our product (fig. 6).

Overall, this was a very effective method of getting us to think about possible applications of the theme Sustainable Food and to have a broad set of ideas to draw inspiration from.

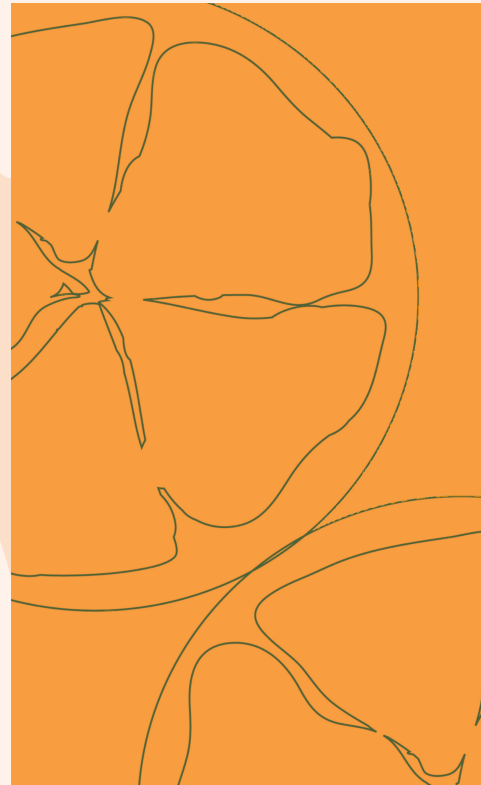


FIGURE 4: PRESSURE COOKER AMEENA

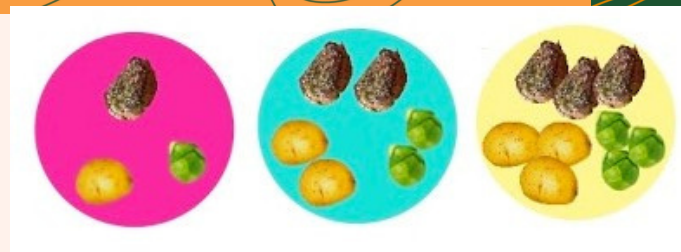


FIGURE 5: PRESSURE COOKER PUCK

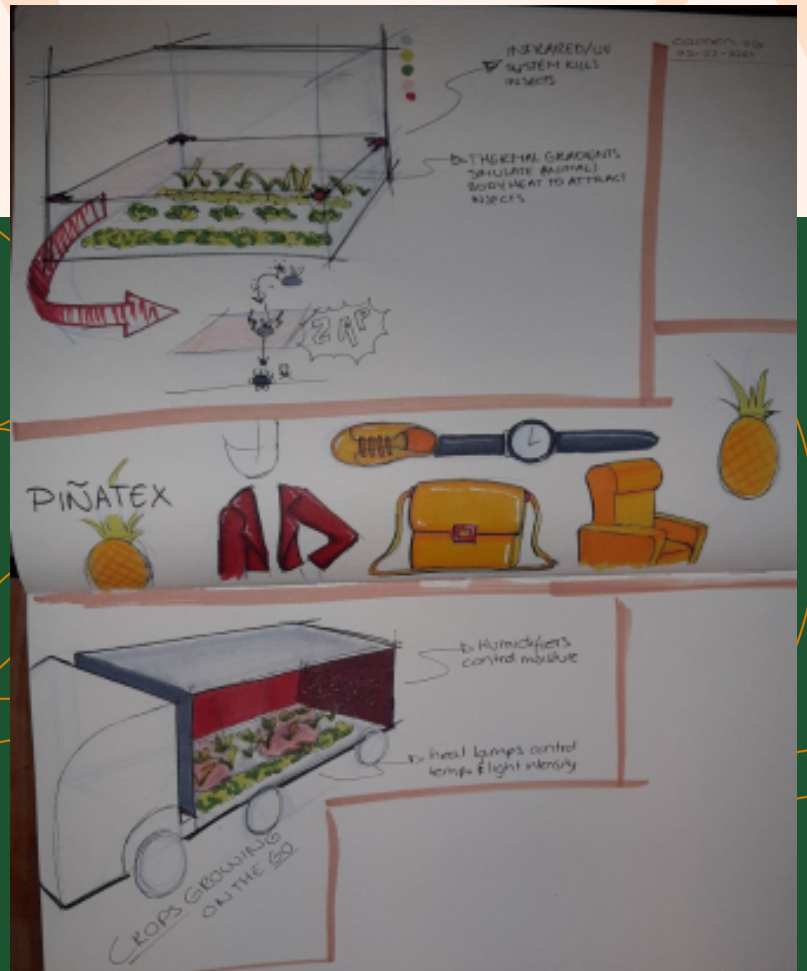


FIGURE 6: PRESSURE COOKER CARMEN

SECOND ITERATION

CARMEN VAN GESSEL

Combining the individual iterations, we used mostly verbal ideation such as brainstorming to decide on the problem that we wanted to address in our design, and how we could make an impact. We unanimously decided that we wanted to work with UFW, as it is a huge problem that many people do not realise can so easily be fixed. To decrease the amount of food waste we first designed a design consultancy that would collaborate with food manufacturers to look at both their product line and the waste arising from production. From there we would design new products that they would be able to make from their waste, using their own factories. The packaging of these products would then inform customers on UFW and what they can do to help from home. We came up with a number of examples of products that could be made by Nestle (fig. 7).

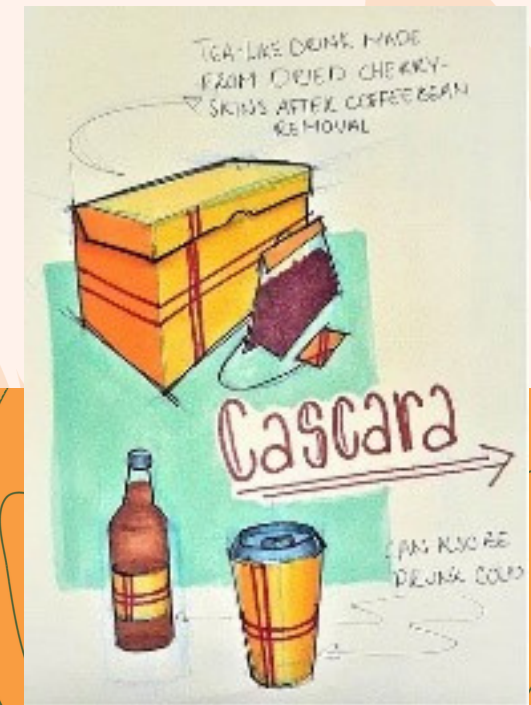


FIGURE 7: IDEAS
COLLAB NESTLE



Looking back, there are a couple of steps that we did not tackle most efficiently. The first 'mistake' was in trying to check all our assumptions and resolve missing information through literary research and verbal validation within our own team only. Especially the validation where all our decisions were based on what we thought would be the case without actually checking it with potential stakeholders or users made our process ineffective, unreliable, and unimaginative. Making decisions based on intuition is not necessarily a bad thing, but it should be balanced with knowledge driven decisions, and our process had become a bit off-center.

Another problem was that our design challenge was too broad and, due to the previously described mistake, focussed on the wrong subject. We interpreted the design challenge as being the vision we wanted the ideal design to fulfill, not the actual impact we intended to make within Project 1. Because of this we set unrealistic goals that left us feeling as if we needed to finetune our idea further before putting it to practice.

Thankfully, the coaches notified us of our misconception and we were able to rewrite our challenge and rethink our design approach to a more hands-on version where we based decisions on data of our own. With this new knowledge in our pockets we started on our third iteration.

THIRD

AMEENA ARAFA

ITERATION

The third iteration was a turning point in our project as all the design decisions were determined after reflecting on what we learned from the generated outcomes. In this iteration we defined our target group, we found the main source of problem and the requirements needed to fulfil our design challenge.



FIGURE 8: UFW RECIPES

FOCUS GROUP

Aim

Get some insights on people's reactions and level of adoption to the idea of eating UFW.

Process

We conducted interviews with 3 focus groups. The groups were made out of 3 to 4 participants. After trying out 2 UFW recipes (fig. 8). We began by giving the interviewees a prompt (Appendix A). Then we tried to give them the space for natural conversations to emerge while we directed the conversations by asking for reasons and explanations behind what they stated. We went through the list of questions, improvising sometimes to get a better insight on why some users reacted in a certain way. At the end we asked the applicants to rate each product on a scale from 1-10 to collect a quantitative measure to compare the 2 options.

Findings

The participants could be mapped up on the innovation adoption life cycle, which is a sociological model that describes the acceptance of a new product. We are focused on a young demographic of the age 18-25 year old.

The first class of participants fell under the early adopters who were excited to try something new and they asked for the recipes. They wanted to see how the concept was applied, they took initiative and were open to try new ways of making it themselves.

The early majority is the class that the mass of participants fell under, they were pragmatic, they were willing to taste the products but were rather curious to the cooking process and the exact ingredients used. They would consider buying the products if they could see a practical application for instance if it was healthier than the alternative product or if it was sustainable and organic.

The late majority were more conservatives. They would not taste the products, instead they waited until the others tasted it first and then they would try it themselves.

Only one out of the thirteen participants fell under the laggards group, they were very skeptical and reluctant to the idea of eating unavoidable food waste. Their problem was that they perceived it as trash and inedible, the taste was not the problem.

We noticed that an act of demonstration can serve as a trigger and open a door for a conversation. From there we can educate people and change their perception of unavoidable food waste, thus stimulating behaviour change.

CULTURAL PROBES

Aim

We used a digital approach to conduct a cultural probe research to find out what types of UFW were in people's households and to get some insights about people's level of adoption to the idea of cooking with UFW.

Process

The users were split into two groups A and B (Appendix D). Group A took part in our focus group while group B participants did not. The volunteers were given a UFW recipe book and were sent daily tracking journals. The research lasted for a week, then in depth interviews were conducted with 5 participants (Appendix E).

Findings

The participants could be mapped up on the innovation adoption life cycle depending on their level of acceptance and reluctance to the concept. Fifty percent of the participants tried out at least one of the recipes.

Almost one third of the people who tried the recipes fell under the first class of participants, the early adopters who took the initiative, made more than one recipe and were considering trying out other recipes. The early majority is the class that the mass of participants fell under. Around seventy percent of the participants who tried one of the recipes would consider buying the products but would not consider cooking it themselves again. The majority of partakers fall within the mainstream market. They need a complete and reliable solution, they do not want to cook, however they are open to buying a product that is ready out of the box. Hence the decision to produce a tea blend made from fruit peels was made. As this product had the needed value proposition formulation of being fast, easy and effortless.

The most common types of UFW in households were fruits and vegetables cores and peels (Appendix F).

FIELD RESEARCH

Aim

We performed field research in two different settings to pinpoint where the main source of the problem is. We visited a farm and a lunchroom to analyse the presence of UFW in different sectors through interviews with the owners.

Findings

Farms

The farms have almost zero crop waste as vegetables that do not get sold in the shop; they either eat it themselves or it gets fed to the animals. The cheese making process produces whey that gets fed to the pigs and the chickens (fig. 9). The only source of waste they have at this farm are coffee grounds from the coffee machine, which is around 3 kg per week (Appendix G).

Lunchroom

The lunchroom had two types of food waste UFW arising during food preparation and people's leftovers. We found out that there were a number of initiatives being held and discussed to try to shift the service from linear to circular to tackle the UFW. An example is using the coffee grounds to grow mushrooms. While the latter was temporarily diminished due to their closure during lockdown.

As a result of our findings, we decided to direct our focus to UFW in households. We explored different methods to how this could be done in the next iteration.

FIGURE 9: VISIT FARM



FOURTH

PUCK VERBEEK
TESS GROBBEN

ITERATION

From our findings in the third iteration, we decided to work with the concept of tea made from fruit peels.

Along the fourth iteration, we considered two types of target users; an looking-for-experience user and a quick-and-easy user. As a conclusion from our cultural probe research, we found that the quick-and-easy user was more dominant in the participants that we talked to. To get an insight into the size of our target group, we had a look at the Nationaal Koffie- & Theeonderzoek (De Jongh, Tramper, & Vrijaldenhoven, 2020). We came to the conclusion that our target group would be the 6% of people that drink loose tea and the 2/5 of the people that also focus on sustainability (fig. 10).



FIGURE 10: TARGET GROUP

Tea kit

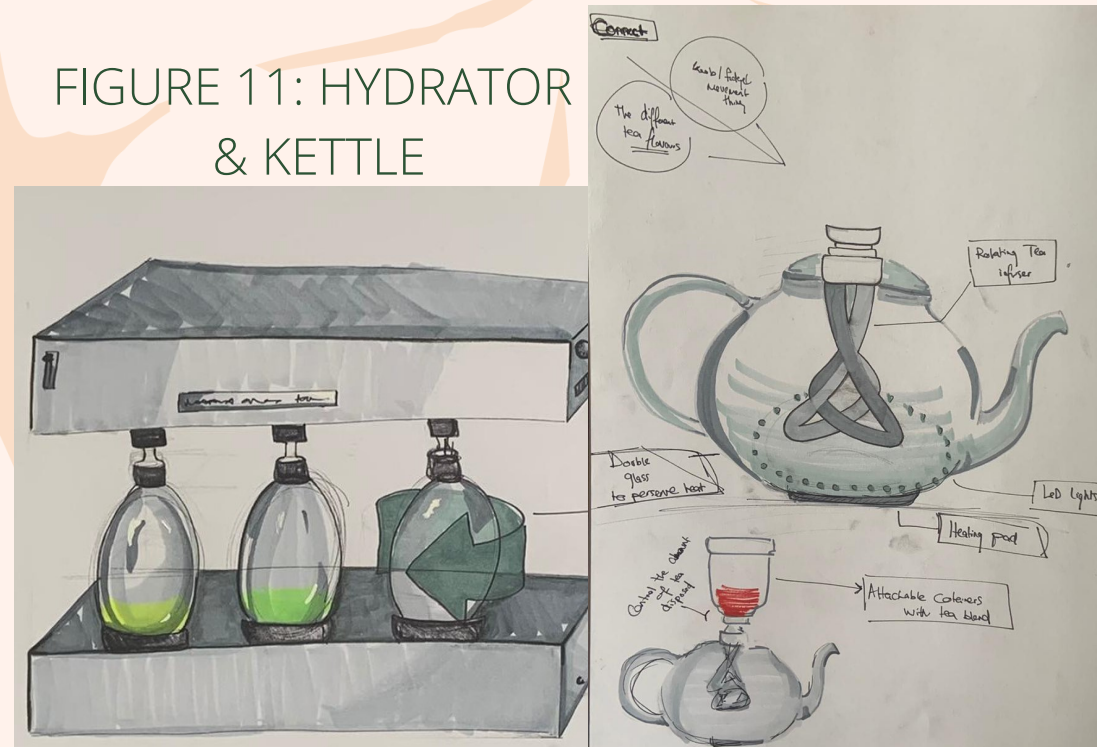
Our initial idea was to create a kit, containing a bag of tea, a reusable tea bag and a recipe book. This kit would be available in the supermarket, but we quickly moved from this idea since we wanted the product to be more engaging for the user, an engaging experience would support their stigma and behaviour change.

Produce at home

To involve the user more in the process of making the tea, we brainstormed on the idea of a machine that would dry the peels and extract the flavours into the tea, much like an old-fashioned coffee pot. We supported this concept with a few sketches, consisting of two parts. One part is the hydrator (fig 11), where the user would have three containers to put in their peels, which would end up in a cup. We decided on having multiple containers, so the user could start and end different peels at different times, to prevent rotting when waiting for the previous blend to hydrate. The cups could be placed on a teapot, this teapot would have a lid with an infuser, to extract the flavour of the dried peels.

Since we focussed on the expertise area of Business & Entrepreneurship in our project, we looked at the costs for an at-home machine like this. We concluded that the costs would be too high for our target group, because they were looking for a quick and easy product. An addition to this, the production of this type of machine would not be carbon neutral. This concept would not meet the desires of our challenge, which is why we discontinued this concept.

FIGURE 11: HYDRATOR & KETTLE



Subscription service

To give the user a more engaging experience in another way than including them in the production of the tea, we created a subscription service (fig. 12). The users would collect their different fruit peels in vacuum boxes throughout the week and at the end of the week the peels are collected at their house and are transported to Moychay. Because we aim for a sustainable product, we did not want to add to the carbon emissions, which is why we planned on using existing pick-up and delivery services, such as Picnic. The peels will be processed at Moychay and mixed with the tea, next the tea would then be transported back to the households, where they are consumed. Next to the subscription the tea would also be sold in the Moychay shop.



One issue that we stumbled upon in this service was hygiene. In a service that involves the peels of the user, we could not guarantee that all the peels were clean and safe to use in an edible product. We decided to look for a different alternative, which led us to our final iteration.

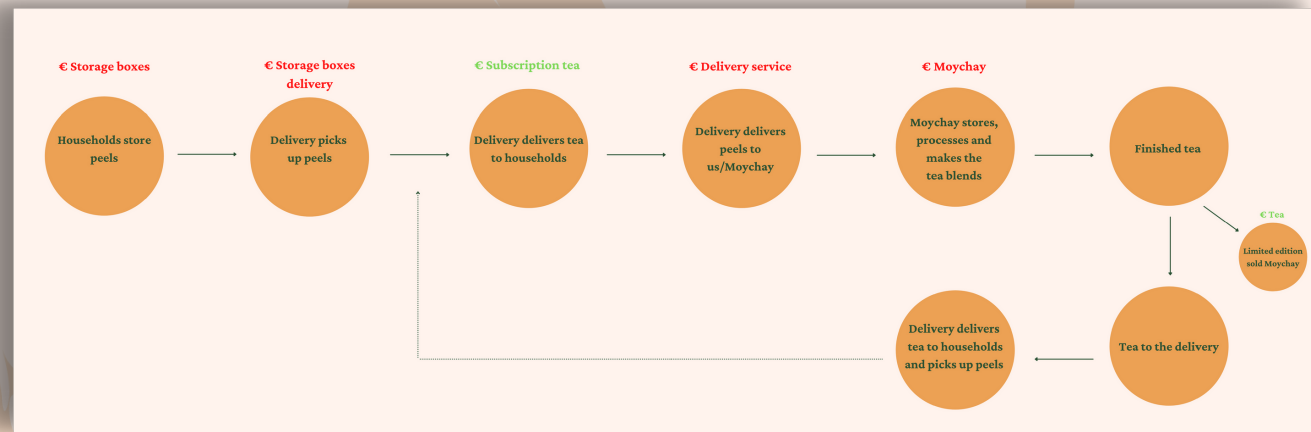


FIGURE 12: SUBSCRIPTION SERVICE

FIFTH

TESS GROBBEN

ITERATION

For our fifth iteration, we sought where the user could be engaged in our service. For this, we went along the lifecycle of fruit and the daily life of our users and found that the two timelines intersect at the supermarket. After a verbal discussion within our group and with a local Albert Heijn we could come in contact with, we decided to include local supermarkets in our process. This is because an average Albert Heijn throws away 10 kilograms of orange peels each day, this batch would be clean enough and big enough to use in a tea blend.

To repay Albert Heijn for using their peels and putting a trigger for the user at the intersection of the timelines, we created a campaign of BONUS posters (fig. 13). These posters would activate the user to scan the QR-code and get in touch with more recipes using UFW,

by making the user think they receive an extra free item with their purchase, while they already have it in their hands. This campaign motivates the user to consider how the UFW is not actually waste, leading to stigma and behaviour change.



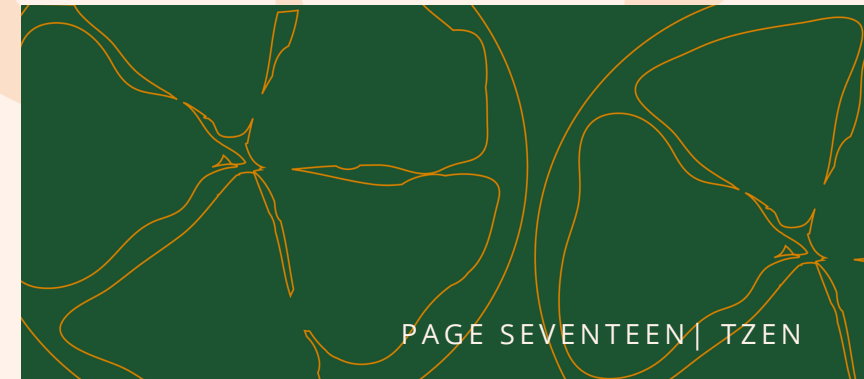
FIGURE 13: AH BONUS POSTERS

Simultaneously, we reached out to a potential stakeholder, an Amsterdam-based tea culture club called Moychay. To convince them to work with us, we needed to understand their values and goals and understand their position in the market. After our first conversation, they were very much interested in a collaboration with us to develop our concept (fig. 14). This collaboration required us to set up a contract as well, regarding the intellectual property of our concept, its reward, and the accountability towards possible risks. The process of our collaboration contributed greatly to our development of Business & Entrepreneurship.

One issue that we stumbled upon in this service was hygiene. In a service that involves the peels of the user, we could not guarantee that all the peels were clean and safe to use in an edible product. We decided to look for a different alternative, which led us to our final iteration.



FIGURE 14: TEA BAG



OVERALL

MART JONKMAN

RESULTS

As the final outcome of this project, we created a project from the perspective of a design studio. This design studio is focused on collaborating with companies to find a solution that reduces the amount of unavoidable food waste right at the user's home (fig. 15).

As we start collaborating with a company we discuss our values and goals to see how we can help each other. After this we start with the design process and create a product and/or service. In this product and/or service we implement techniques that change the stigma around unavoidable food waste. The goal of this is to show the user that UFW is edible, healthy, useful or whatever the product and/or service needs. Secondly, we want the user to change their behavior so that they start using UFW, and thus reduce the amount of food waste at the user's home.

In the case of Moychay, we contacted them to see if they were interested in a collaboration. We discussed our values and goals and said that we wanted to create a tea made from orange peels that were collected from local supermarkets and restaurants. After this we collected those peels and prepared and delivered them to Moychay, who started to experiment with different flavors of tea that they could make. At that time we started with the service around it that makes sure that we achieve stigma and behavioral change (fig. 16).

FIGURE 15: BUSINESS MODEL CANVAS

The Business Model Canvas

Key Partners <ul style="list-style-type: none"> • <i>Moychay</i> • <i>Albert Heijn</i> (Local Supermarkets) • Companies that want to become more sustainable • Companies that want to do something with unavoidable food waste • Entrepreneurial Networks & Events • Coworking & Similar spaces • Investors 	Key Activities <ul style="list-style-type: none"> • Designing products or services for companies • Marketing & Branding of the product or service • Communication • User research • Test product (User test) • Finding new companies to work with Key Resources <ul style="list-style-type: none"> • Entrepreneurs / Design team • Website • Trademarks & Patents • Working place (office) • <i>Poster materials</i> • <i>Packaging materials</i> • <i>Sticker</i> • <i>Orange peels</i> 	Value Propositions <ul style="list-style-type: none"> • Helping companies become more sustainable • Personalized service • End-to-end design solutions for customers • User research • Positive and good branding & marketing • High quality design • Easy sustainability • Minimizing unavoidable food waste • Original design 	Customer Relationships <ul style="list-style-type: none"> • Personal in nature (differs per customer) • Semi-Private • In-person connection + online engagement Channels <ul style="list-style-type: none"> • Networking • Social Professional Sites • Our Website • Social Media • Through our previous projects • In-person • Email and Phone 	Customer Segments <ul style="list-style-type: none"> • <i>Moychay</i> • <i>Albert Heijn</i> (Local Supermarkets) • Brands/Companies that want to become more sustainable • Companies that want to do something with unavoidable food waste • Entrepreneurs • People who want to become more sustainable • Funders/Investors
Cost Structure <ul style="list-style-type: none"> • Design team salaries • Sales & Processing • Press & Marketing • Validation & Testing • Equipment • Office • Startup Launch Costs 		Revenue Streams <ul style="list-style-type: none"> • <i>Profit tea in the physical and online Moychay shop</i> • Our service or product development for the company • Our marketing & branding for the company • Sponsorship (from investors) 		

FIGURE 16: SERVICE BLUEPRINT MOYCHAY

Project TZEN x MOYCHAY



Physical Evidence	TZEN	Local Supermarket	MOYCHAY Kitchen	MOYCHAY Website	MOYCHAY Shop	Tzen Website	Customer's Household
Customer Actions				Buys tea blend	Buys tea blend		Brews Tea & Scans QR Code
Front of Stage Interactions	Educates customer about unavoidable food waste			Welcomes customer and introduces the blend		Access to free Unavoidable food waste recipe book	
Back of Stage Interactions	Branding & Packaging Design			Tea bags are packed			
Support Processes	Design the service and come up with a product that aligns with our mission and MOYCHAY	Peels are collected from juicer machines twice a month	Peels are dried and blended with the tea				



It became clear that we would be able to change the stigma of this product and UFW in several ways. First, we create a product that is premium quality and since it is in collaboration with Moychay, the first tea experience club in the Netherlands, we are assured that we will get a premium quality tea. Collaborating with Moychay also binds their name to this product, and since they only sell other premium quality teas, this will change the stigma of this product and UFW. From the cultural probe we also learned that if it looks good, user's are more reluctant to try it out.

Behavioral change is achieved by providing recipes that the user can access through the QR-code on the packaging that lead to the Tzen website (Appendix H). On this website they can find all sorts of information on UFW and give a recipe book with easy recipes that you can make using UFW. In our cultural probe it became clear that if you gave user's the recipe book and information on UFW the threshold to try using becomes very low. In the cultural probe 50% of the participants tried out one of the recipes and 14.3% of the participants tried out more than one recipe.

Since providing users with information on UFW and adding a recipe book already activates the user. We wanted to show another project from the perspective of a design studio. For this speculative design we created posters that the Albert Heijn can use to reduce the amount of UFW at their user's house (fig. 17). The user can scan the QR-code of the poster or the QR-code on the sticker of the product that will send the user to our recipe book, where the user can try the recipes that are promoted on the posters.

FIGURE 17: AH POSTERS



CONCLUSIONS

MART JONKMAN

Design vision throughout the project

The design challenge we started with is:

“Decrease the amount of unavoidable food waste at the manufacturing sector by offering products made out of UFW by changing the stigma around it. By also changing how people perceive it, and influence people to eat it by creating an experience.”

But during the project our design challenge changed toward this design challenge:

“Decrease the amount of unavoidable food waste in households by changing the stigma of the user, while stimulating the user to change their behavior toward UFW.”

There are some subtle changes here that are important for the development of our project. It became clear during the project that we wanted to focus on changing the stigma and behavioral change and we had to adapt our design challenge to that. First we shifted from the manufacturing sector toward the user's home. Our product with Moychay still reduces the amount of UFW, but the real difference should be made at the user's home by stigma and behavioral change as discussed in the overall results. Next to that, we stepped away from creating an experience, since that is intertwined into changing the stigma and behavioral change, if needed. If it is necessary for Tzen to create a product that needs the experience it would be to change to stigma or to change behavioral change, so we left it out.

Outcome of the project

As a group we are pretty happy with what we created. We created a product that will be sold. We learned a lot in the directions of Business & Entrepreneurship, Creativity & Aesthetics and User & Society. We created the idea of a design studio that has proven to succeed if it was a real studio. As we managed to work with a real business and our product will be sold in stores next month. Unfortunately we were unable to conduct a user test on the tea and how well it will perform in the market because of some setbacks that have to do with intellectual property and contracts.



Future endeavors

To further develop the service we provide, we have made a short list of things that we can do. At first we want to usertest the final product that will be sold by Moychay. We would ask the people that buy our product if they want to participate in a usertest. The usertest starts immediately after they buy the product. We will interview them about the product: what do they think of it? Do they like how it looks? Are they interested in sustainability? Do they understand what UFW is? Next, we will interview them weekly for 10 weeks (the time it takes to form a habit) and see if it becomes part of the user's pattern (Clear, 2020).

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APPENDIX A

Focus Group Notes

Prompt: "Would you buy the products that you just tasted if they were sold at your local supermarket?".

GROUP 1

How did you like the product on a scale from 1-10?

Banana Peels: 4 - 4 - 5.5

Tangerine Peels: 8 - 8 - 6.5

Would you change anything?

Banana Peels: more crunchy, less salty, preferred sweet.

Tangerine Peels: more sweet if they are labelled as a candy.

Would you buy something like this?

Person A: Tangerine Peels and Brownies.

Person B: Banana chips if improved.

Person C: Doesn't like the idea of eating unavoidable food.

Would you buy it?

Brownies if they tasted good

Orange and banana peels if they are marketed as healthy snacks.

Would you make this (or something similar) yourself?

NO

Observation:

One person was reluctant to the idea of eating non-avoidable food waste. Her problem was that she perceives it as trash, not that the taste was the problem.

The other 2 were excited to try something new.

GROUP 2

How did you like the product on a scale from 1-10?

Banana Peels: 6 - 8.5 - 7 - 4

Tangerine Peels: 6 - 7.5 - 7.5 - 8

Would you change anything?

Banana Peels: Shape.

Tangerine Peels: texture and shape.

Would you buy something like this?

Yes, but after I tried it first.

No, I would go for what I already know and like.

Would you buy it?

More likely to cook it than buy it

Would you make this (or something similar) yourself?

Yes

Observation:

One person liked the tangerine peels a lot but thought the banana peels weren't really digestible or edible. When asked why he said that he saw a documentary a few years ago about people eating the tangerine peels.

A lot of people were also curious about how the banana peels were made and how they were cooked, but weren't really interested in how the orange peels were made.

GROUP 3

How did you like the product on a scale from 1-10?

Banana Peels: 5.5 - 6 - 6.5

Tangerine Peels: 8 - 8 - 7.5 (liked the organic shape)

Would you change anything?

Banana Peels: Less soy and the after taste.

Tangerine Peels: They would like to eat it as sour candy.

Would you buy something like this?

Yes, if it was organic sustainable etc...

Would you buy it?

Buy especially the orange peels as they made her feel like she was eating something that's sustainable and organic.

Would you make this (or something similar) yourself?

No

APPENDIX B

Cultural Probes Recipe Book

The QR-code of the Recipe Book used in the Cultural Probes



APPENDIX C

Cultural Probes Tracking Journal

The QR-code of the Tracking Journal used in the Cultural Probes.



APPENDIX D

Cultural Probes Consent Form

The QR-code of the Consent Form used in the Cultural Probes.



APPENDIX E

Cultural Probes Interviews

Disclaimer: You can be brutally honest, if you did not like something, tell us, because this is also valuable information.

Questions:

- How many tracking journals did you fill in?
- Could you elaborate on the amount of DJT you filled in? Regarding motivation etc.
- What were your expectations before the research week? Did you think you were going to try out recipes? Why?
- Did you try out one of the recipes?
- Which ones?
- Do you try out new recipes more often?
- What made you want to start with the recipes? As in what attracted you to start the research?
- What attracted you to this specific recipe?
- Did you already try to make something with food waste before? Maybe without noticing?
- What were your feelings regarding the recipe before you started? Did you think you were going to like it?
- What did you think about your end result? Would you try it again? Why?
- How did your view/attitude on non-avoidable food waste change? Did it even?
- Is there anything else you would like to tell us, any of your experiences?

PARTICIPANT B3

How many tracking journals did you fill in?

Elke dag

Could you elaborate on the amount of DJT you filled in? Regarding motivation etc.

Helemaal niet erg, soms lastig nadenken als het te laat kwam.

What were your expectations before the research week? Did you think you were going to try out recipes? Why?

Tentamen week dus was moeilijk om dingen uit te testen.

Did you try out one of the recipes? Which ones?

Orange peel tea, ze had nog sinaasappels en ze houdt van thee.

In het weekend was ze bij haar ouders en ze had de coffee ground weggegooid, ze had graag de brownies willen maken en dat vond ze stom dat ze het niet geprobeerd had.

What made you want to start with the recipes? As in what attracted you to start the research?

Zag er goed uit, de bananenschil wilde ze echt niet proberen want dat leek heel vies en wilde ze echt nooit proberen. Bananendraadjes zijn vies. Koffie en sinaasappel klinkt meer voor de hand liggend.

Did you already try to make something with food waste before? Maybe without noticing?

Had ze nog nooit gedaan, bang voor rotten.

What did you think about your end result? Would you try it again? Why?

Koffie brownies wilde ze sowieso maken, ze had graag veel meer dingen willen maken. Als het aantrekkelijk er uit ziet (bananenschil valt niet te overtuigen), bouillon bijvoorbeeld wel.

How did your view/attitude on non-avoidable food waste change? Did it even?

Ze had veel groenten die nog overbleven en dat vond ze zonde.

Is there anything else you would like to tell us, any of your experiences?

Boekje was heel mooi, leuke en verschillende recepten, was leuk en goed en maakte haar ook bewust. Soms kwam de link laat, dus was vervelend.

PARTICIPANT B5

How many tracking journals did you fill in?

Allemaal

Could you elaborate on the amount of DJT you filled in? Regarding motivation etc.

Prima, was heel kort en duidelijk, dezelfde vragen, dus even onthouden.

What were your expectations before the research week? Did you think you were going to try out recipes? Why?

Vragenlijst krijgen met wat je weggooit, minder moeite dan verwacht.

Did you try out one of the recipes? Which ones?

Candied orange peel, want de combo vond ze lekker met chocola, vond ze niet per se vies, banaan wel. Viel mee, prima, was wel heel lekker

Do you try out new recipes more often?

Nee, afval geven ze aan konijnen.

What made you want to start with the recipes? As in what attracted you to start the research?

Receptenboekje was professioneel, zag er lekker uit, behalve banaan.

How did your view/attitude on non-avoidable food waste change? Did it even?

Niet veranderd, dacht er altijd al wel over na. Ze gebruikte ze het voor soep.

Is there anything else you would like to tell us, any of your experiences?

Niks verder te melden.
Communicatie ging even mis.

PARTICIPANT B6

How many tracking journals did you fill in?

All of them

Could you elaborate on the amount of DJT you filled in? Regarding motivation etc.

Sowieso moeite met je ertoe zetten, stelde uit omdat ze er geen zin in hadden maar het was snel dus het was niet moeilijk.

What were your expectations before the research week? Did you think you were going to try out recipes? Why?

Ze dachten dat het heel vies zou zijn, ze hadden wel zin om het uit te proberen. Sustainable leven is interesse en het boekje was ook aantrekkelijk. Het zag er mooi en lekker uit, dus sprak aan om mee bezig te gaan. Package moet accessible zijn voor iedereen en gewoon standaard, dat spreekt het meest aan.

Did you try out one of the recipes? Which ones?

Candied orange peel

Was makkelijk en ze hadden het al in huis. Ze dachten dat het heel vies zou zijn, bittere smaak. Het duurde wel lang, maar standaard in de supermarkt kopen is niet per se wat ze zouden willen, want neemt experience weg. Snoepjes met suiker en nutella was lekker, zou wel opnieuw doen.

Orange peel tea

Zou beetje bitter smaken, maar sprak wel aan omdat gekruide thee wel in hun smaak viel. het was accurate verwachting en best cool en lekker.

Do you try out new recipes more often?

Ze zouden het vaker proberen en ook met andere producten, maar hebben wel duwtje in de rug nodig. Wel een keer groentebouillon gemaakt.

How did your view/attitude on non-avoidable food waste change? Did it even?

Attitude is veranderd, ze denken vaker hmmm misschien kan ik hier iets mee maken of wanneer ze het al hebben weggegooid meer spijt dat ze er niks mee hebben gedaan.

Is there anything else you would like to tell us, any of your experiences?

Leuk om te doen, nog nooit eerder gedaan. Het candy recept duurde lang, niet chill.

PARTICIPANT B8

How many tracking journals did you fill in?

Allemaal

Could you elaborate on the amount of DJT you filled in? Regarding motivation etc.

Het was kort dus het maakte niks uit.

What were your expectations before the research week? Did you think you were going to try out recipes? Why?

Geen verwachtingen, stond open voor alles, één ding moest ze van zichzelf proberen.

Did you try out one of the recipes? Which ones?

Banana bacon, was duidelijk en mooi maar was niet goed gelukt. Kwam dat ze het er niet genoeg had afgeschraapt (recept niet duidelijk genoeg).

Do you try out new recipes more often?

Brownies wilde ze wel proberen.

What made you want to start with the recipes? As in what attracted you to start the research?

Sinaasappelschil en koffie wist ze dat die eetbaar waren dus die wilde ze wel proberen, maar bananenschil was ze beetje sceptisch over, daarom wilde ze het juist proberen. Het leek haar gewoon interessant en had ook wel interesse in sustainability.

What attracted you to this specific recipe?

Het was het eerste recept wat er makkelijk uit zag.

Did you already try to make something with food waste before? Maybe without noticing?

Citroenrasp heeft ze wel eens gebruikt.

What were your feelings regarding the recipe before you started? Did you think you were going to like it?

Ze verwachtte dat het niet naar banaan ging smaken en dat het hartig zou smaken, niet per se naar bacon.

What did you think about your end result? Would you try it again? Why?

Teleurstellend, kwam door eigen fout met recept, ze zou het wel weer willen proberen want het leek haar oprecht lekker.

How did your view/attitude on non-avoidable food waste change? Did it even?

Door het invullen van die tracking journal ging ze nadenken wat heb ik vandaag weggegooid wat eigenlijk helemaal niet nodig was, ze was bewuster, waarvoor zou ik dit nog voor kunnen gebruiken.

Is there anything else you would like to tell us, any of your experiences?

Receptenboek was mooi, zag er legit uit en aantrekkelijk, zou ze willen kopen.

Niet de links op whatsapp sturen, dus via mail is beter (moeten wij duidelijker over zijn).

PARTICIPANT B10

How many tracking journals did you fill in?

All of them

Could you elaborate on the amount of DJT you filled in? Regarding motivation etc.

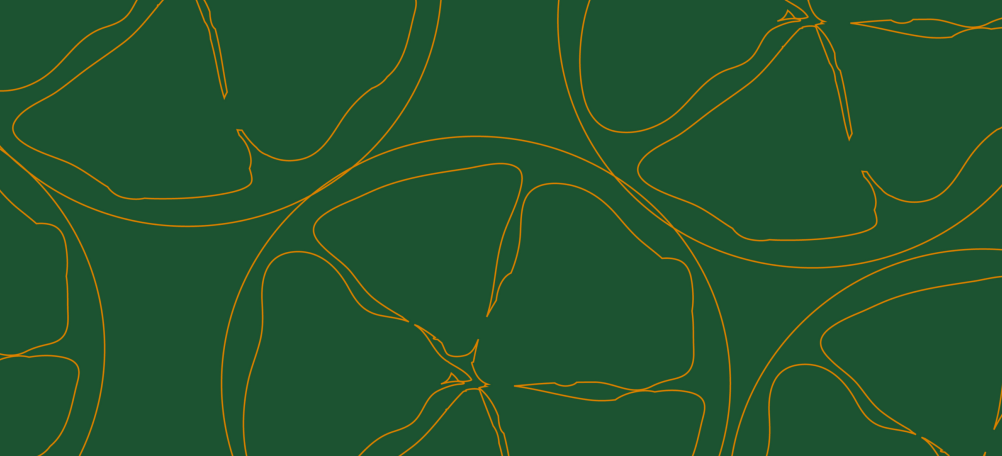
Het leek haar heel leuk om te doen, dus had veel motivatie, maar door school was het veel te druk en echt een vervelende periode maar anders had ze meer willen doen.

Recepten gaan ervan uit dat je het afval al hebt, vaak had ze dit niet dus dan was je een soort van verplicht om andere boodschappen te halen.

Did you try out one of the recipes? Which ones?

Thee, alleen dan met appel.

Leek heel leuk en ook lekker, heel mooie vormgeving, maakte het aantrekkelijker dan normaal. Alleen bananenschil leek haar heel vies.



Do you try out new recipes more often?

Ze had alles wel willen proberen, ze klonken allemaal oké.

Did you already try to make something with food waste before? Maybe without noticing?

No

What did you think about your end result? Would you try it again? Why?

Het was niet heel makkelijk want je moest steeds dingen opwarmen en afkoelen en erbij gooien. In haar hoofd wil ze wel het afval gebruiken, maar het kost veel tijd en moeite en kan zich daar ook niet toe zetten, ook omdat het vaak niet meer vers blijft.

How did your view/attitude on non-avoidable food waste change? Did it even?

Meer bewust van wat je op een dag weggooide

Is there anything else you would like to tell us, any of your experiences?

Sommige dingen gingen mis met dingen uitsturen of sommige forms konden niet ingevuld te worden, dat motiveert niet om er zelf ook bezig mee te gaan want de onderzoekers maken zelf fouten. Aan het begin van de dag een motiverend bericht zou fijn zijn.



APPENDIX F

Cultural Probes Results

Tracking journals:

- 7 out of 14 participants tried a recipe
- 2 out of those 7 participants tried more than one recipe
- 1 out of 4 participants of group A tried a recipe
- 6 out of 10 participants of group B tried a recipe

TABLE 1: REVIEW RECIPES

Banana peel bacon	strongly agree	agree	neutral	disagree	strongly disagree
I enjoyed trying out this recipe		2			
I enjoyed tasting this recipe		1	1		
Candied orange peel					
I enjoyed trying out this recipe		2			
I enjoyed tasting this recipe		1	1		
Orange peel tea					
I enjoyed trying out this recipe		4			
I enjoyed tasting this recipe		4			

TABLE 2: TRYING RECIPES

Would you try this recipe again?	yes	no	I would try another recipe
Banana peel bacon		2	
Candied orange peel	1		1
Orange peel tea	4		

TABLE 3: UNAVOIDABLE FOOD WASTE IN THE HOUSEHOLDS

What kind of unavoidable food waste did you throw away today?	(one is added per person, per day)
Fruit/vegetable cores	43
Fruit/vegetable peels	42
Egg shells	22
Rotten food	16
Coffee grounds	8
Meat/fish bones	7
Tea	5
Cheese crusts	3
Dinner leftovers	3
Other	3

APPENDIX G

Farm Interview

GENNEPER HOEVE

We had a meeting with Mirjam Matze one of the owners of the farm.

What kind of products do you harvest at this farm?

Fruits, flour, vegetables, cheese, meat, milk

Which products do you make at your farm, that you sell in the shop?

Cheese

What is the process of the product making?

Use a 1000 kg of milk → it will give 100kg of cheese.
The whey gets to the pigs and the chicken. If they have left over it will go to the cellar.

What products in the shop are from other farms/retailers?

The vegetables and packaged food are from a food retailer Odin.

The bread they get from BROODT, which uses their flour to make bread. They also get bread from Verbeek from Brummen.

The chicken meat is from a chicken meat seller from Uden.

The ice cream is from an organic farm

The goat cheese is from a farm from Heeze.

What kind of waste do you have?

Not a lot. Most waste goes to the pigs or they eat the vegetables they can't sell in the shop themselves. The waste they have are mostly coffee grounds (coffee grounds can be used to grow mushrooms, she said).

Some orange peels and banana peels, brought by people themselves for their lunch (not really useful).



PHILIPS FRUITTUIN

We had a meeting with Carlos Faes one of the owners of the Philips fruittuin.

What kind of products do you harvest at this farm?

Apples, pears and plums.

Which products do you make at your farm, that you sell in the shop?

Apple juice, apple sauce, chutney

What is the process of the product making?

All the apples that have fallen off the tree or aren't looking good enough to sell in the shop are collected. Once in a while all the collected apples go to a juice maker, who makes juice of the apples. The juices are then sold in the shop of the Philips fruittuin. They get around 20.000-30.000 bottles of juice at once from the juice maker, so they also store the bottles at the farm. The leftover pulp from the juices will go to another farm as food for animals, so it is not wasted.

How much food waste do you have?

3 kg of coffee grounds a week.

What unavoidable food waste do you have? So for example egg shells, banana peels, orange peels etc.

See previous question

What do you do with your food waste?

Goes to the animals or eat themselves.

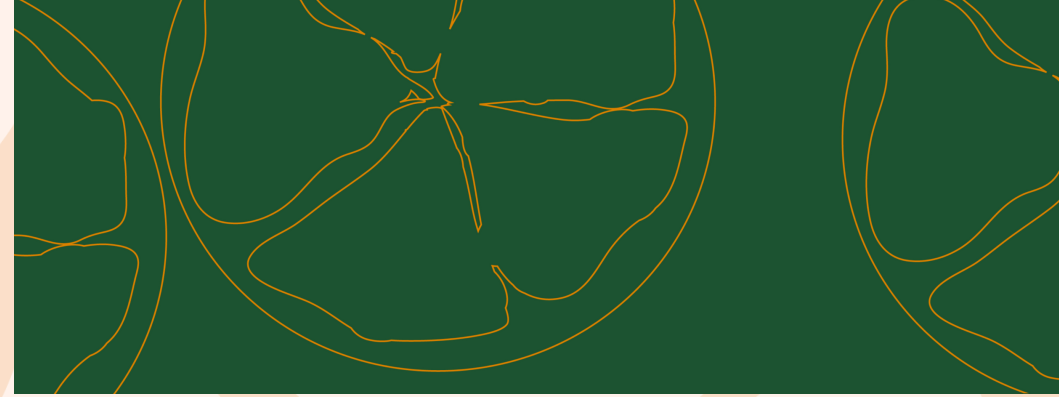
What do you do with the unavoidable food waste?

Goes to the animals.

What products in the shop are from other farms/retailers?

Local retailers/other farms:

- 'Echte Boederijzuivel' van de Ambachtshoeve www.ambachtshoevezuivel.nl uit Raamsdonk. (Dairy)
- Biologisch ijs van Boerderijs www.boerderijs.nl uit Huissen. (Ice cream)
- Jams van Zorgboerderij De Laarhoeve www.delaarhoeve.nl uit Diessen. (Jam)
- Ambachtelijk brood van Bakker Bekkers www.bakkerijbekkers.nl uit Veghel. (Bread)
- Kaas van kaasboerderij De Ruurhoeve www.ruurhoeve.nl uit Hoogeloon. (cheese)
- Tapenades, dressings en kaasdips van Smaakgeheimen www.smaakgeheimen.nl uit Eersel. (Tapenades, dressings and cheese dips)
- Schone sla van Duurzame Kost www.duurzamekost.nl uit Eindhoven. (Lettuce)
- Boerenscharreleieren van Lekker n'ei www.lekkernei.eu en de Fladderfarm www.fladderfarm.nl uit Oirschot. (Eggs)
- Vers vlees van de Polsdonk www.polsdonk.nl uit Oirschot. (Meat)
- Honing van onze eigen imker. (Honey)

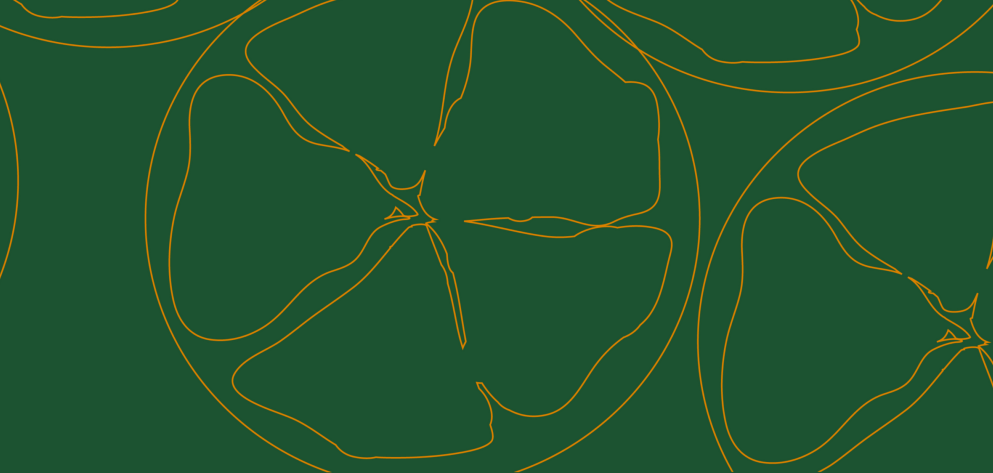


What kind of waste do you have?

They have some waste from the restaurant, like packing etc. This waste is sorted in different tons. They try to keep their waste as minimal as possible.

How much food waste do you have?

They don't have a lot of food waste. Only some waste from the restaurant and some rotten fruits, which will go to the compost heap. The compost heap is a new initiative of the farm, which is not yet done, but they are working on this at the moment. The farm wants to make a "verspillingscircuit", which is a compost heap of different stages. They want the compost heap to be visible for people, so they get motivated/engaged to maybe start a compost heap at their own home. They want it to also be interactive, with videos that explain what happens at/in a compost heap.



What unavoidable food waste do you have? So for example egg shells, banana peels, orange peels etc.

They don't really have unavoidable food waste. The fruit peels are used in the juice making. The used coffee grounds will go to the compost heap, when realised. They are also planning on picking up the used coffee grounds around the area to use for the compost heap. So they want to pick these up at the international school, PSV and the brainport offices.

What do you do with your food waste?

Goes to the compost.

What do you do with the unavoidable food waste?

Go to compost or other farms as food for the animals.

Extra information:

- Contact the guy from brainport from article in paper about unavoidable foodwaste.
- The moto of the farm: People need fair and real products.
- 30 years ago Carlos had a feeling that "real", pure, raw food would be a hype again in the future.
- Have a look at "volhoudbaarheid".
- Keep the food chain as short as possible. This they do by the shop and the restaurant. They also do this by buying locally from other farmers. Kind of fair trade for the region.
- The farm has picnic tables made from fleece around rice. This fleece is squeezed together so it looks a bit like wood.
- They want to place Olifantengras (Miscanthus giganteus) around the airport in Eindhoven, since this absorbs CO2, is sound isolating. Around February/March it gets mowed. This is lignified (verhout) / dry and is used to make fireproof doors (brandwerende deuren).
- The packaging materials used in the shop are mostly glass, paper or biodegradable plastic. The biodegradable plastics can go on the compost heap.

APPENDIX H

Recipe Book & Website

QR-code Tzen Recipe Book



QR-code Tzen Website



APPENDIX I

Business Model Canvas

The Business Model Canvas

Key Partners <ul style="list-style-type: none"> • <i>Moychay</i> • <i>Albert Heijn</i> (Local Supermarkets) • Companies that want to become more sustainable • Companies that want to do something with unavoidable food waste • Entrepreneurial Networks & Events • Coworking & Similar spaces • Investors 	Key Activities <ul style="list-style-type: none"> • Designing products or services for companies • Marketing & Branding of the product or service • Communication • User research • Test product (User test) • Finding new companies to work with Key Resources <ul style="list-style-type: none"> • Entrepreneurs / Design team • Website • Trademarks & Patents • Working place (office) • <i>Poster materials</i> • <i>Packaging materials</i> • <i>Sticker</i> • <i>Orange peels</i> 	Value Propositions <ul style="list-style-type: none"> • Helping companies become more sustainable • Personalized service • End-to-end design solutions for customers • User research • Positive and good branding & marketing • High quality design • Easy sustainability • Minimizing unavoidable food waste • Original design 	Customer Relationships <ul style="list-style-type: none"> • Personal in nature (differs per customer) • Semi-Private • In-person connection + online engagement Channels <ul style="list-style-type: none"> • Networking • Social Professional Sites • Our Website • Social Media • Through our previous projects • In-person • Email and Phone 	Customer Segments <ul style="list-style-type: none"> • <i>Moychay</i> • <i>Albert Heijn</i> (Local Supermarkets) • Brands/Companies that want to become more sustainable • Companies that want to do something with unavoidable food waste • Entrepreneurs • People who want to become more sustainable • Funders/Investors
Cost Structure <ul style="list-style-type: none"> • Design team salaries • Sales & Processing • Press & Marketing • Validation & Testing • Equipment • Office • Startup Launch Costs 		Revenue Streams <ul style="list-style-type: none"> • <i>Profit tea in the physical and online Moychay shop</i> • Our service or product development for the company • Our marketing & branding for the company • Sponsorship (from investors) 		

APPENDIX J

Service blueprint Moychay

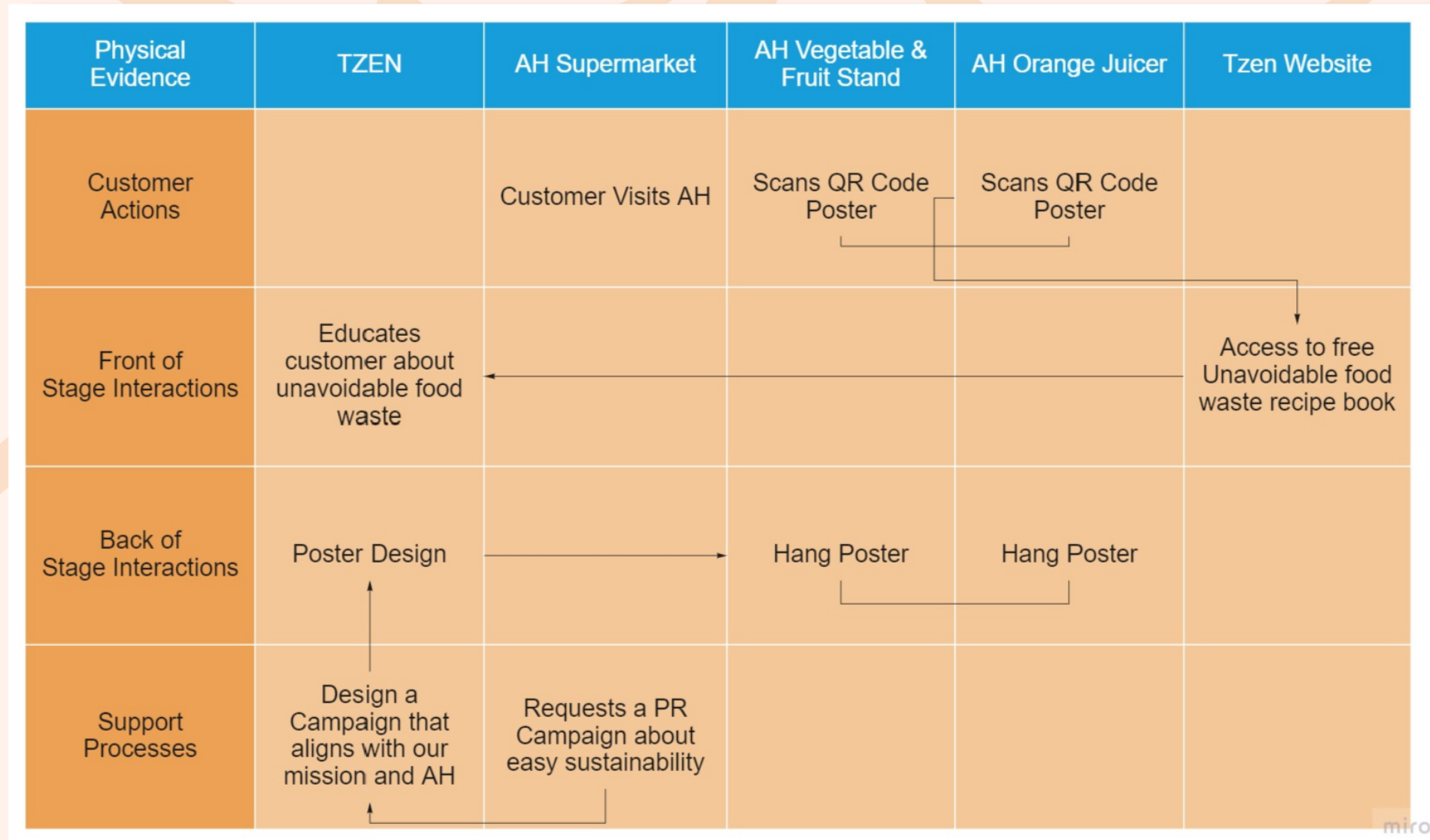
Project TZEN x MOYCHAY

Physical Evidence	TZEN	Local Supermarket	MOYCHAY Kitchen	MOYCHAY Website	MOYCHAY Shop	Tzen Website	Customer's Household
Customer Actions				Buys tea blend	Buys tea blend		Brews Tea & Scans QR Code
Front of Stage Interactions	Educates customer about unavoidable food waste			Welcomes customer and introduces the blend		Access to free Unavoidable food waste recipe book	
Back of Stage Interactions	Branding & Packaging Design			Tea bags are packed			
Support Processes	Design the service and come up with a product that aligns with our mission and MOYCHAY	Peels are collected from juicer machines twice a month	Peels are dried and blended with the tea				



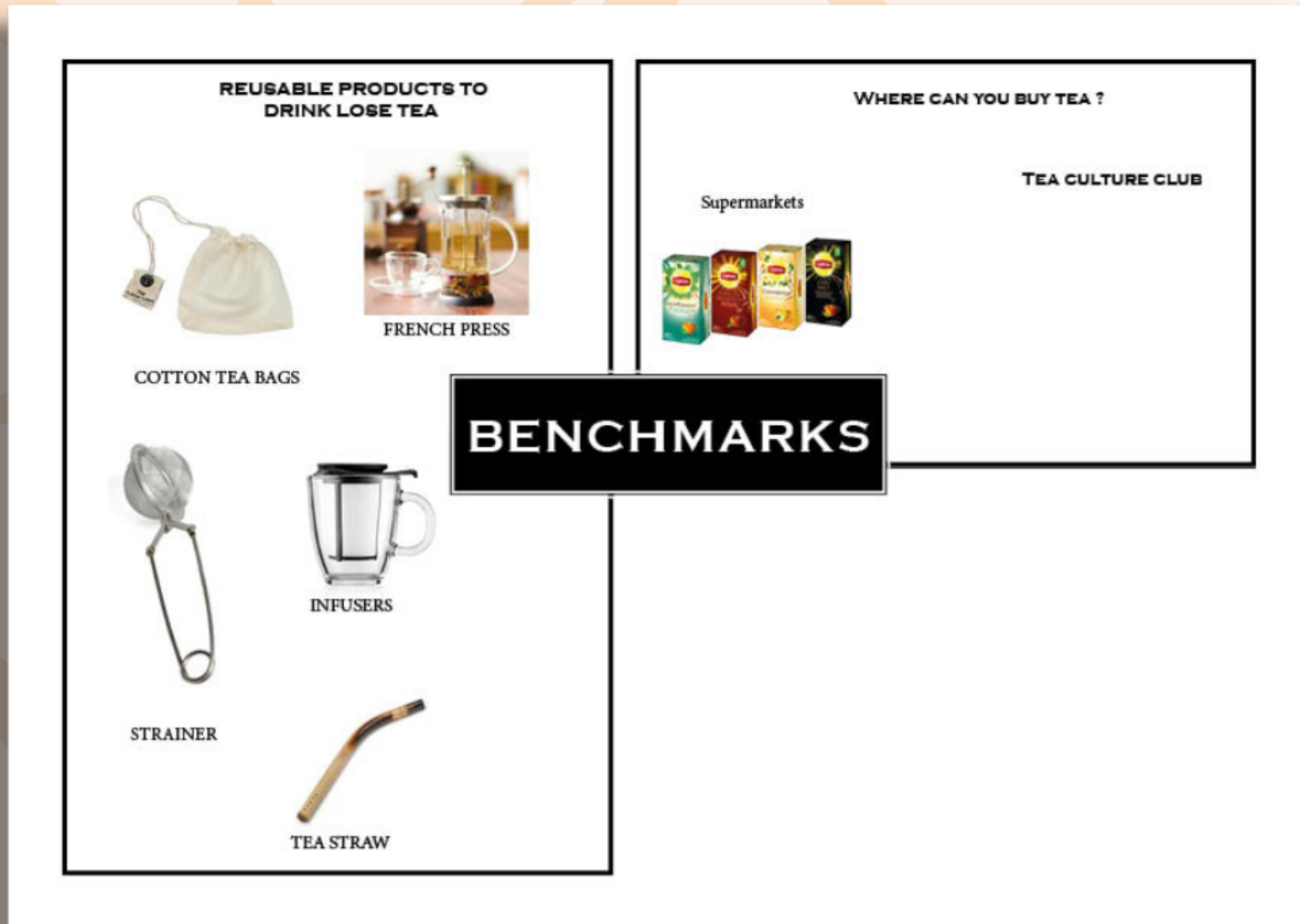
APPENDIX K

Service blueprint Albert Heijn



APPENDIX L

Benchmarking Diagram



APPENDIX M

Midterm Demoday Poster



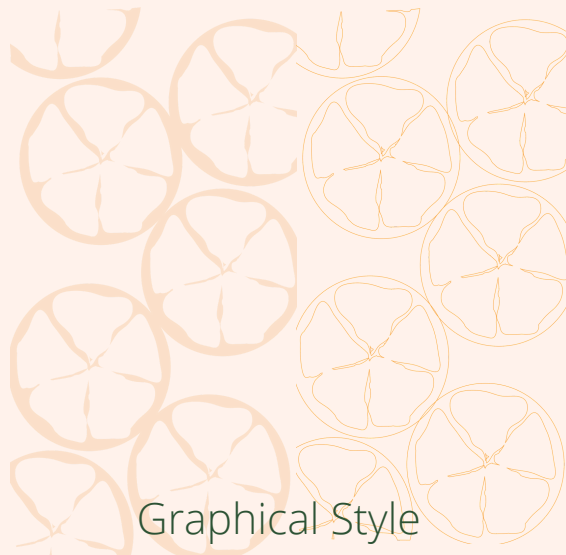
APPENDIX N

Tzen Brand Identity

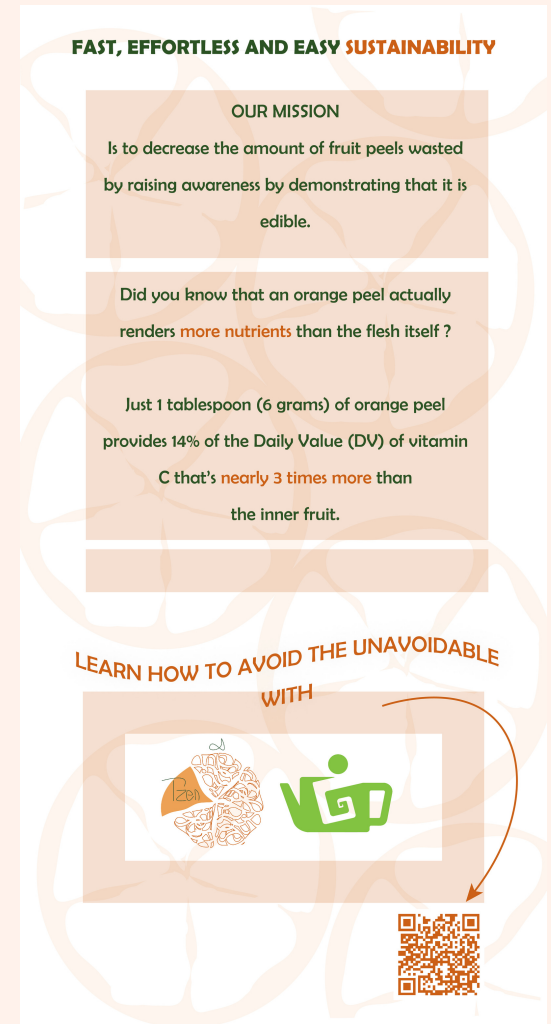
Colour swatches



Logo



Graphical Style



Packaging