Reducing Food Waste in the Household Through Behaviour Change

Master Thesis by Pauline Spengemann
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Design for Interaction
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by Pauline Spengemann

Faculty of Industrial Design Engineering
Delft University of Technology
Design Research Unit Interactive Institute

Supervisory Team
Chair: Annelise de Jong (TUDelft)
Mentor: Conny Bakker (TUDelft)
External Coach: Ramia Maze (Interactive Institute)
Abstract

“Reducing food waste in the household through behaviour change” is a thesis project for the Design for Interaction Master Programme at the faculty of Industrial Design Engineering at the Delft University of Technology. The project was carried out at the Interactive Institute in Stockholm.

In Sweden 25% of purchased food is thrown away. If people only bought the food they needed and ate the food they bought the amount of food waste would undoubtedly sink. This thesis looks at what role design can play in changing people’s consumption behaviour. The focus of this thesis were skills and knowledge on how to treat food. Skills and knowledge around food were seen as having the potential to contribute to the effort of reducing food waste. Three skill domains were defined as food management, storage knowledge, and the art of cooking, that were used as a means to structure the large and diverse group of skills present when dealing with food. In the course of the project “food skills” was defined more narrow as insights into one’s own routine behaviour. It was believed that this insight would lead to a more skillful way of dealing with food as people would understand what they had to improve.

A practice oriented approach was used in order to gain an understanding of current practices and the underlying elements that determined their form and about what could cause changes in practices. Instead of pre-defining how people should behave, people were viewed as co-creators of practices giving them an active role in which they were asked to find solutions for the food waste problem. This was done because it was believed that the best practice could vary greatly between different people and that new practices had to be developed to fit a modern sustainable life style. These new practices were yet to be discovered. This was done because it was believed that the best practice could vary greatly between different people and because it was believed that new practices had to be developed to fit a modern sustainable life style. These new practices were yet to be discovered.

The product was to stimulate and trigger people to reflect on their current routines and experiment with new ones. In order to facilitate reflecting and experimenting it was decided to develop a group activity and to include a game aspects. A participatory design approach was used during the product development. Participatory design includes consumers in the design process in order to collect qualitative consumer data at an early stage in the product development. Due to this approach insights could be gained on how consumers react and deal with the idea to experiment with new practices and what kind of insights they gain by that. How group dynamics work in this setting and what kind of a group people feel comfortable sharing the experience.
of reflecting on their routines and exploring new ways of behaving is another phenomenon that was could be explored thanks to the participatory design approach.

The final concept is the service “The Food Challenge” that is a collection of tasks that are meant to engage people in doing things differently. When taking on a challenge people have to break with some of their routines and through that get the chance to reflect on the current situation and find out how they could do things differently. Reading the challenges often makes people reflect on their food practices. By offering different ideas on how to deal with food “The Food Challenge“ aims to inspire people to become active in finding solutions for the food waste problem.
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>5</td>
</tr>
<tr>
<td>Introduction</td>
<td>8</td>
</tr>
<tr>
<td>Sustainable Behaviour Design</td>
<td>13</td>
</tr>
<tr>
<td>Practice Oriented Product Design</td>
<td>17</td>
</tr>
<tr>
<td>Food Skills</td>
<td>22</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>Existing Products</td>
<td>27</td>
</tr>
<tr>
<td>Methods</td>
<td>28</td>
</tr>
<tr>
<td>Discussion Online Research</td>
<td>37</td>
</tr>
<tr>
<td>Discussion Observational Research</td>
<td>41</td>
</tr>
<tr>
<td>Conclusion</td>
<td>42</td>
</tr>
<tr>
<td>Exploration through Sketching</td>
<td>54</td>
</tr>
<tr>
<td><strong>Design &amp; Testing</strong></td>
<td>57</td>
</tr>
<tr>
<td>Design Brief</td>
<td>63</td>
</tr>
<tr>
<td>Introduction to Ideas</td>
<td>64</td>
</tr>
<tr>
<td>The Workshop</td>
<td>67</td>
</tr>
<tr>
<td>The Dinner Game</td>
<td>75</td>
</tr>
<tr>
<td>The Blog</td>
<td>79</td>
</tr>
<tr>
<td>Arguments for the Choice of Activity and Setting</td>
<td>85</td>
</tr>
<tr>
<td>Testing and Developing The Food Challenge - 1st Group</td>
<td>88</td>
</tr>
<tr>
<td>1st Group - Results and Conclusions</td>
<td>92</td>
</tr>
<tr>
<td>Testing and Developing The Food Challenge - The Food Freaks</td>
<td>99</td>
</tr>
<tr>
<td>The Food Freaks - Results and Conclusions</td>
<td>95</td>
</tr>
<tr>
<td>Recommendations for The Food Challenge</td>
<td>111</td>
</tr>
<tr>
<td><strong>Final Concept</strong></td>
<td>112</td>
</tr>
<tr>
<td>Service Blueprint of The Food Challenge</td>
<td>113</td>
</tr>
<tr>
<td>Choosing a Challenge</td>
<td>120</td>
</tr>
<tr>
<td>Creating a Group</td>
<td>121</td>
</tr>
<tr>
<td>Business Model Canvas</td>
<td>122</td>
</tr>
<tr>
<td>Promotion of The Food Challenge</td>
<td>126</td>
</tr>
<tr>
<td>Reflection</td>
<td>128</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>132</td>
</tr>
<tr>
<td>References</td>
<td>133</td>
</tr>
<tr>
<td><strong>Appendix</strong></td>
<td>136</td>
</tr>
</tbody>
</table>
Introduction

The average Swedish household throws away 25% of the food they buy. All the energy and resources that go into the production of the food are wasted.

The focus of this project is on how to prevent food from becoming waste. While recycling and composting can make food waste less harmful for the environment, these methods are not seen as possible solutions. The goal is to have people only buy as much food as they eat and to have them eat all the food they buy.

This project focuses on the food waste production in the household. The food waste production of super markets, restaurants etcetera., while interesting, is not explored in this project. The behaviour of the consumer when buying the groceries, storing products at home and preparing and eating the food is of central interest.

Skills were seen as necessary to enable people to deal with food in a way that generates as little waste as possible. That is why this thesis focuses on skills concerning the treatment of food. Three skill domains were defined, food management, storage knowledge and the art of cooking, and were used throughout the project to structure the research and the product development. In the course of the project the understanding of what building up “food skills“ meant changed.

While in the beginning it was believed that people had to learn specific skills this perception changed. It was understood that at the core of dealing with food skilfully lies the understanding of one’s food routines. During testing it was witnessed that this understanding led people to come up with skilful solutions to their individual problems.

Practice theory was used to better understand the complexities of consumer behaviour. Practice theory stems from the social sciences and looks at practices or routine behaviour as the basic unit of analysis. Practice theory looks at how practices change over time and how they establish themselves as being normal. In this thesis the focus was on understanding why current practices were developed in the way they were and how changes in behaviour could be induced.

Pre-defining good ways of behaviour and trying to induce that way of behaving through design was seen as unsuited for the problem of food waste. This was grounded in the belief that new practices, practices that were not yet known, had to be developed in order to lead to sustainable consumption in a modern context. It is not enough to look to traditional knowledge because modern ideas on how to live, modern facilities and infrastructure lead to a different way of life and require a different set of skills. Besides, people were seen as co-creators of practices and it was chosen to give them in an active role throughout
the process of behaviour change.

The idea to put the task of developing insights and ideas for new practices with the consumers lead to the need to focus on people who were willing to take action to reduce their food waste. Additionally, means in which the activity of some could inspire less active people who are not as willing to change was also investigated.

A product was designed that stimulated people to gain deeper insight into their current routines and experiment with new ways of doing. The product was to have game characteristics and facilitate a group activity. These two factors were seen as facilitating the process of reflection on routines and experimenting with new ways of doing. A game offers a safe space where people can look at their routines from a distance and are more open minded to new and different ideas. A group feeling can have a motivating effect on people and the tips and knowledge from others can be beneficiary to people’s process of adopting new ways of doing.

The product was designed using a participatory design approach. A participatory design approach involves consumers in the development of the products. The aim is not to turn users into designers but rather to collect qualitative data in an early stage of the product development. The input of consumers during the product development was essential as the way in which a group were to participate in reflection on and experimenting with daily routines was hard to predict. By engaging users valuable insights could be gained.

A product concept was developed, “The Food Challenge”. The product is a website that introduces tasks that people can carry out together with their friends. The tasks question the current food practices and offer new ideas in a fun engaging way. When doing a challenge people have to break with some of their routines and consequently other routines are affected by that. This brings about a reflection and experimenting with new ways of doing.

The people who will take on challenges are those who are active and willing to try out new and different things. Their experiences are presented on the website in order to inspire others who are less active.

In order to better integrate the challenges in people’s everyday lives the website “The Food Challenge” will be available for Iphones and smart phone. Lowering the threshold of posting text and pictures is important as the challenges as such already ask a lot of effort from people.
The Food Challenge can be experienced in different ways and leaves the freedom for that. People who acknowledge the food waste problem, are willing to change their behaviour and are active are likely to take on a challenge and by that gain deep insight into their practices. Less active people can get aware of the food waste problem and start to reflect on their food practices and think about what they could do different simply by reading the challenges and about the experiences of others on the website.
Project Approach

Figure 1 shows the structure that was followed throughout the thesis project. It shows what research and design activities were taking place in what stage of the project. The colors indicate the chapter in which the different parts can be found.

Beginning with research questions, methods were determined and data was collected. In order to facilitate the research, a sketch book was kept as a means to reflect upon the data found and the insights gained throughout the project. It was used to analyse data and further realize which of the aspects found were relevant from a designer’s point of view. By reflecting on the data through sketching possible product solutions, various phenomena that could be relevant for design were detected. The qualitative data, which are named stories in the project model, was reviewed and used as inspiration for the design sketches but also to determine further narrowing of the scope of the project.

The outcome of both, the research and the sketch book, led to a more specific research question, constantly narrowing the focus of the project. This cycle was repeated several times and led to a final design concept at the end of the project.
Interactive Institute
The Design Research Unit

The Interactive Institute is a Swedish experimental IT-research institute that combines expertise and perspectives from design, art and technology. This project was carried out for the Design Research Unit.

The work of the Design Research Unit is driven by a deep concern for cultural and societal development. The department does not do research for a specific material, technology, business or industry but instead follows its own agenda. This agenda is to open up a space for critical reflection upon the decisions made and the alternatives possible in the area of social and sustainable development.

The outcomes of the projects done by the Design Research Unit are not necessarily a better solution but more importantly a new perspective on the problems themselves.

The Design Research Unit has completed several projects in the area of environmental sustainability, specifically within the fields of sustainable living and smart textiles. Recently, a collaborative project between TU Delft and the Institute was carried out in which design students performed an initial exploration focusing on sustainable design within food practices in the Netherlands. This graduation project will be a follow up of this exploration, with the aim to investigate and promote new food practices in Sweden.
The phenomena described in the following discussion of sustainable behaviour design were presented and discussed in the course “Social Sustainability” given by Judith Gregory and Ramia Maze at Illinois Institute of Technology in Chicago. I followed the classes online and the topics discussed provided a starting point for this chapter.

The use phase, the phase in a products life cycle from the moment that it is purchased up to the moment where the consumer disposes of it, has gained more interest in the field of design for sustainability (see figure 2). Historically the efforts of designers focussed on making the production and the disposal of a product cleaner. The use phase was often seen as a black box that the designer could not influence.

The behaviour of the user does however not have to be seen as a given. Designers can go beyond simply trying to reduce the negative impact of user behaviour by making products more energy efficient. Realizing that the user behaviour itself has to change in order to reach a sustainable way of life has put focus on understanding how the behaviour of users can change during the use phase of products.

Additionally, phenomena such as the rebound effect and the spill over effect show that the efforts made by designers to make products more sustainable can be averted by the way people use them.
The rebound effect describes the situation in which a product is used more often or in situations it was not used before because of its low cost due to low energy consumption. The spill over effect describes the phenomenon when people spend the money they save in one segment of their lives on other possibly unsustainable activities or products.

These examples lead to the assumption that the consumer needs to have the attitude and the knowledge to act in a sustainable way. Even if the consumer wants to reduce his negative impact on the environment and knows how to do so he faces the danger of cognitive dissonance. Cognitive dissonance describes the gap between attitude and behaviour. People are good at rationalizing their bad behaviour. It is difficult to change.

The following three strategies are examples of how designers can impact consumer behaviour.

1. One idea is to appeal to the ethical ideology of people. Making people respond emotionally to environmental problems can move people to want to change their way of life.

2. Offering people personal gain, economic growth and convenience is another idea that sees a person’s individual interest as the main factor that determines their actions.

3. Supplying information so that people can make the right decision rationally sees people as rational decision makers.

These three ideas on how user behaviour should be influenced can work in different settings but also have their limitations.

**Behaviour Steering Design and Food Consumption Behaviour**

The way food is produced, distributed and consumed accounts for a large part of the man’s impact on the environment. The focus of this project is to understand how change can take place in food consumption behaviour. The question of how people can change their consumption towards only buying the food they need is very complex.

Food plays a huge role in people’s lives. Although for many in the Western World it is not a cause of concern any more, feeding oneself is still a primary interest in people’s day to day life. Food practices are con-
nected and influenced by many different aspects in people’s lives.

The emotional and physiological responses people have towards food can hinder them from making rational decisions. Kramer defines an emotional and a nutritional value of food (Kramer 2000). Eating is pleasure and food is often used as a way to treat oneself. Food can have an influence on a person’s emotional state and people have emotional responses to food that are not guided by rationality, for example, succumbing to a craving for chocolate can make us happy. Also, some foods have special personal value because they bring back memories or have status in society.

“Further, some argue that we now live in a world so different from the one in which our ancestors evolved, our normal (and still Paleolithic) dietary instincts can no longer be trusted to keep us healthy. [...] “Our craving for calorie-dense foods—such as fats, sweets, and starches—is the legacy of our Paleolithic ancestors,” but these instincts “betray us in our modern world, where... [they] are abundant and inexpensive.”” (Soojung-Kim Pang 2010) Physiological responses to food can stand in the way of rational decision making when it comes to food.

Much of the behaviour around food is routine behaviour. Routine behaviour is often a mechanically performed activity that is performed regularly. When switching to autopilot and not thinking any more one can still carry out those activities that one often engages in. Routines are carried out by people without thinking of why and how each activity is done in this particular way. There is little reflection on routine activities and people are not fully aware of their routine behaviours and the effects they have. Additionally, routinized behaviour is difficult to change as people’s bodies and minds are used to carrying them out.

Social and cultural surrounding has a big influence on how people consume their food. As the food is often shared with friends and family decision are not purely based on individual interest but are influenced by those people share practices with.

In summary, many decisions concerning food are made irrationally following emotions or physiological signals, are routine behaviour that people engage in without reflecting on their nature and effects and can be influenced by what is perceived as acceptable behaviour in the social circle. In light of this the three strategies for behaviour steering design introduced earlier (appealing to people to behave ethically, offering personal gain in return for good behaviour and presenting data that makes it obvious that good behaviour is rational) have their shortcomings. Realizing that people’s decision making is in fact often influ-
enced by factors other than rational reasoning leads to the conclusion that more is needed in order to actually achieve behaviour change.

Instead, attention has to be directed towards ordinary everyday routines when dealing with food. By making people gain a deeper understanding of their every day routines, the factors that influence their food practices and their effects, they can make the conscious decision to change.

Practice theory, a theory from the social sciences, sees routine behaviour as the basic unit of analysis, focusing on the different factors that shape and make a new behaviour to establish itself in society. Practice oriented product design uses the ideas of practice theory during the design process in order to realize products that actually lead to changes in consumer behaviour.
In the previous section practice oriented product design (from now on referred to as POPD) was introduced as a theory that could help unravel the complexes of food practices. It was decided to use this theory from the social sciences in this thesis in order to find a way to bring about changes in routine behaviour when dealing with food.

The POPD Manifesto, which was released in July 2006 at a workshop held between social scientists and designers at the Durham University, defines a new direction in design called Practice Oriented Product Design. In the Manifesto designers are invited to take on a practice oriented approach.

Practice Theory stems from the social sciences and has recently been brought into the design discipline promising to offer a way to understand practices also described as routine behaviour. The POPD Manifesto claims that “designers can see themselves as social architects and that they hold in their hands a little bit of the means to define practices.” (POPD Manifesto, 2006)

Some of the important points stressed in the document are that products do not exist on their own and people do not make decisions purely based on their rational thinking or purely based on what they believe in, but are influenced by their context, be it infrastructure, products or people around them. This interdependence is said to define and limit the scope of POPD. (POPD Manifesto, 2006)

The practice theory approach acknowledges the complex nature of daily routines and by that can offer a framework to provide the means to achieve more detailed insight into complex behaviour patterns. (POPD Manifesto, 2006)

Consumers and designers are seen as co-producing the practices through which objects and materialized forms of knowledge have meaning. This means that the designer does not merely answer to the needs of a consumer and a consumer does not merely chose the product that has the functionality that best fits his needs. “It rather points towards the idea that both the consumer practices stimulate design and that new products stimulate new practices.” (Ingram, 2007)

Practice theory looks at routine behaviour as the basic unit of analysis rather than the user or the product. The elements described as holding practices together are skill, material, convention, time and the collective.

Skills describe the factual knowledge and the latent know how, the things people can do without thinking about them.
The material describes on a larger scale the infrastructure and what it provides, on a smaller scale it describes the products and things that are used during a practice.

Convention depicts people’s values and beliefs, it describes how people want to see themselves and prefer to be perceived by others. Practices constantly change over time and time is needed for practices to take root.

If two extreme human behaviours were defined, one as making autonomous, rational decisions and the other as conforming to social norms, practice theory places people in between those two extremes (see figure 3). People make decisions based on their own rationale but they also conform to social norms. Different practices can be more influenced by autonomous decision making while others conform more to social norms.

As practices are shared between people they do not reside in a person but are constructed within a group of people. Conventions, skills and materials are brought together between individuals to shape practices together. Practices come to exist if enough people encounter a person acting in a certain way and reproduce this way of doing.
Example of how a new food practice took root in Sweden

In the past 5 years the ingredient quinoa has been introduced into the Swedish kitchen. How can the rising popularity of quinoa in Sweden be explained? This change in practice is used as an example to explain how the different elements can be seen to influence change in practice. By informing people that quinoa is healthy it appeals to the values of those who aspire for a healthy lifestyle (convention). In order to be able to actually consume the quinoa it has to be available in the regular stores, people need to have the equipment to prepare it in their homes (material) and they need to know how to prepare it to be tasty (skill).

Practices are enforced by reproduction of others. While more and more people start eating quinoa it becomes more normal and easier to do as it is sold in more places and more people know nice recipes for it. It also is not seen as different any more to eat quinoa which makes it a more acceptable practice for the majority of the population.

Food practices encompass many different levels of meaning and many different variables determine the practices that occur. As practice theory promotes to understand life in its complexity and is against simplifying human activity, it can help to unravel the complexities of food practices. Practice theory could offer assistance for observing and understanding the routine behaviour around food. Analysing the elements of practices, skill, material, convention, time and collective, and their relation with each other can lead to a deeper understanding of the current form of food practices.

As design does not only strive to understand current practices but aims to introduce new products or services in order to change practices, the focus of this thesis lies in understanding how change can be brought about through design interventions. “People both are habitual actors that are subjugated to the structures of a practice but at the same time are free agents with a reflective choice” (Wilk, 2009). Wilk introduces the term *cultivation* which describes the process when people consciously think about and reflect upon their routines. A second term he uses is *naturalization* describing the process when behaviour that is carried out over and over again eventually becomes routine (Gram-Hanssen, 2011).

In her paper Gram-Hanssen looks at how individuals reacted to the attempts to make changes in their daily routines and proposes the idea to guide people through the steps of cultivation and naturalization in order to bring about behaviour change. This would mean that as a first step people would have to consciously reflect upon their actions, followed by a step of consciously deciding to change their behaviour. As
a final step this new behaviour would have to become routine through naturalization. (Gram-Hanssen, 2011)

The POPD manifesto labels “the designer as a social architect” and deBorja describes a situation where “the designer can be interpreted as someone shaping the world from above”. (POPD Manifesto, 2006) (deBorja, 2010)

The designer and the consumer co-shape practices. It is important to not view the designer as a decision maker and the consumer as a follower, but to understand the value that lies in realizing users as co-shapers of practices and therefore an active part in the process of designing new forms of behaviour. The designer, in turn, who analyses practices from a greater distance, can realize what constitutes practices and has the ability to develop ideas on how people could be stimulated to change. The designer can trigger and facilitate change but cannot predict what kind of practices the change will lead to.

Another interesting point raised by Warde is that variations in an individual’s practices can be seeds for changes in collective practices (Gram-Hanssen, 2011). For this thesis it is a point of interest to investigate how the social surrounding of a person reacts to changes in a person’s practices. We therefore ask: Can this idea stated by Warde help spread new ideas about food consumption? How are different practices kept from becoming acceptable because they are not seen as “normal”?

In the case of this master thesis the aim is to bring people to consciously reflect on their routine behaviour when dealing with food and to explore new ways of behaving. Finally, a question that is aimed to be addressed in this thesis is if reflection on routines and experimenting to find new ways of treating food will actually lead to the development of new practices and if these practices will be implemented in everyday life.

Additionally this thesis puts consumers in an active position and acknowledges them as co-creators of practices. The focus lies with people who want to reduce their food waste, are looking for guidance on how to change their behaviour and are willing to actively engage in change.

Presenting the activities and experiences of the active members of society could provide the “seeds for change” as stated by Warde. When read by other, less active members of society, the stories could trigger reflection on behaviour and could open people’s minds to change in practice. (Gram-Hanssen, 2011)
One of the elements that constitutes practices, skill, is believed to hold potential for behaviour change in food practices that can lead to less food waste. Skills and competencies when dealing with food can lead to better decisions when dealing with food and will be the focus of the thesis. In the following section the reasoning of focusing on skills will be explained and different skill domains in food practices will be defined.
In order to structure the broad and complex area of food practices three skill domains were defined. In the following section it is described how the skills link to the production of food waste and how they can help change food practices to be less wasteful.

LNV the Dutch agricultural and food quality ministry published a report that listed the most important results of research done on food waste in households in Belgium and the Netherlands in 2006. The report named the following as reasons for food waste.

- buying too much
- cooking too much & not keeping left over’s
- rotten food
- not trusted (hygiene/ health concerns)
- not tasty
- losses during preparation

This list is viewed as a complete list of the reasons in Belgium and the Netherlands for food waste and offers a good starting point for this project.

The question that follows is how the reasons for food waste can be prevented. How can people buy the amounts of food they need? How can people prepare tastier dishes?

In the last fifty years the knowledge and skills people have about food has decreased. This can be explained by the decrease of time and effort that people spend on dealing with food.

**Food Management**

If a person buys and cooks too much food it means that they do not know how to estimate proper quantities. Food waste can be prevented if people learn to estimate the correct quantities and know how long food will stay good. Doing the shopping accordingly means that the food bought will be eaten. The skill domain that describes the ability of planning ahead, knowing right quantities and having an overview of the food that one has at home is called “food management”. This skill is particularly important when doing shopping but is also influenced by how food is stored at home and how food is usually prepared.

**Storage Knowledge**

Rotten food can not only be traced back to buying too much and being unable to finish it, but also to the way food is stored. If food is kept
Not trusting food means that one does not know if food is still healthy enough for consumption or not. Knowing when food is unhealthy can help a person avoid throwing out food that is still good and to keep edible food longer. For example, many people think that sour milk is unhealthy, however, it can however be used for cooking and baking. If lumps have developed it is unhealthy for consumption.

The skill domain that is related to storing food well and knowing when food is unhealthy will be referred to as “storage knowledge” in this report. It is factual knowledge a person needs to learn and remember.

The Art of Cooking

Preventing non-tasty dishes and losses during cooking can be achieved by improving one’s cooking skills. Becoming a better cook means that it becomes less likely that food gets thrown away because it is not tasty or food is lost due to for example burning it during preparation.

Cooking is a creative process, getting inspired by ingredients and coming up with new ideas on how to combine or present a dish means a person needs to have imagination and ideas. Knowing how to make food taste as good as possible even if it is already old and coming up with creative ways of combining left over ingredients can help to use the food that is still left in the refrigerator. This last skill domain is called “the art of cooking“.

The different skill domains “food management“, “storage knowledge“ and “the art of cooking“ happen at the different stages there are when dealing with food, namely shopping, storing and cooking food. There is a correlation between the different actions and knowledge in one skill domain is likely to influence all the activities around food. “Food management” is about planning and organizing, “storage knowledge“ is about remembering factual knowledge and being creative in implementing this knowledge into the given context while “the art of cooking” has to do with being creative and having many ideas.

It is assumed that a person’s skill level in different skill domains can vary while the food waste is still reduced. For example, a person that can whip up amazing dishes from left over ingredients might not need well developed food management skills.
In order to build up food skills, knowledge, ideas, tips and thoughts on how to deal with food have to be collected. As a second step these have to be put into practice and through repetition these actions can become a new routine.

Giard states that "Cooking cannot be understood as the end-result, but instead as the ongoing reproduction of “doing cooking” (Giard, 1998), where competencies are developed through performance.” The increased use of different technological devices and convenience or ready-made food requires a new set of skills than in traditional cooking. (Truninger, 2011) Re-introducing traditional knowledge is recognized to have potential value but is believed to not hold all the skills needed for the modern context of food practices. Processed and pre-prepared food can be combined into tasty dishes and this way of cooking might fit better to the way in which food is sold in supermarkets. This means that skills have to be developed that fit to the context instead of having to “re-learn” “traditional skills”. Therefore, focus will be on discovering what traditional skills will prove to be valuable in a modern context, what modern skills exist and how developing new skills will work.

Figure 3 shows how the three different skill domains can be used in order to reduce food waste. The different ways of dealing with food waste is believed to appeal to different people.

The storyboard in Figure 4 shows the chain of events shopping, storing and cooking, how uninformed decisions occur and how more knowledge about food can save food from the trash bin. Competencies and skills in dealing with food can become tools or aids to help people change their food practices in a way that will lead
to less food waste in the household. The skills and knowledge are believed to be necessary for people to make changes that have the desired result.

**Italian Mixed Brushetta**

"Keep a freezer list, note down items you put in the freezer and cross them off when you use them."

"Zucchini, egg plant, cucumber, tomato, avocado and bell pepper should be kept outside of the fridge. The fridge is too cold for them and makes them rot quicker."

*figure 3*
“Do you take a shopping list every time you go to the grocery store?”

“How many tomatoes do you eat per day?”

“How long do tomatoes stay fresh?”

“Do you ever buy sth. because you feel like it although you still have other food at home?”

“How can you tell if eggs are still fresh?”

“Where should you store tomatoes to keep them fresh for as long as possible?”

“What recipe makes tomatoes so irresistible that they would never be left over?”

“What dish can you make from soft tomatoes?”
Analysis

Existing Products
Online Research
Observational Research
Exploration Through Sketching
Existing Products

The following section will discuss some of the products that were developed with the intention to lower food waste in the household. Three different aspects of the products will be analysed. The first aspect is the approach that was taken by the designer of the product to influence consumer behaviour. The way a product is designed can have an influence on the way the user behaves when using the product. The assumed strategy of the designers will be discussed as well as the way those strategies are believed to lead to positive or negative effects when it comes to food waste production.

The second aspect discussed is the form of the different products. The examples of products explored range from a website and an iPhone application to an entire kitchen set, a kitchen cabinet and a refrigerator. The investigation will look at what kind of behaviour is common when dealing with the different forms of products and how those fit into everyday food practices. Additionally, the possible effects of interactions and use with other products present in food practices by the different forms of products will also be investigated.

The third aspect discussed will be functionality. This project focuses on how the building up of skills and knowledge concerning food practices can contribute to lowering food waste. The various products discussed offer different solutions for the food waste problem. Due to this they offer different functionalities. The functionalities presented by the products will be discussed with the goal of this project, “re-skilling”, in mind.

The analysis of existing products will be used to form an opinion on how products could and should “make an influence” on the behaviour of the user and how the functionality and form determines how a product will be used in context.

Self-cleaning Refrigerator

A collaboration between scientists at the University of Central Lancashire and the online supermarket Ocado is working on a self cleaning refrigerator.

Design Approach to Influence Consumer Behaviour

The refrigerator is an example of a product that relies solely on technology to solve problems of everyday life. The activities traditionally carried out by the user are taken over by the refrigerator. Shopping lists are automatically made up and send to online super markets, the consumption is tracked in order to tell the user what quantities to cook
and the products close to their expiration date are pushed to the front of the refrigerator’s shelve. The human error in dealing with food is almost entirely eliminated. It seems like the designers of this refrigerator think that people do not want to deal with their food and because of that try to keep human activity to a minimum.

In order to use the refrigerator the behaviour of the user has to adjust. He is used to making decisions about food on his own, now the machine is making the decisions for him. The behaviour change and change in values required in order to give up control about a basic need in everyday life would have to be really big. I can imagine that understanding such a complex technology and giving up control will be difficult for many people and is likely to be rejected.

Not dealing with food any more has a big chance to lead to further de-skilling. If some people cannot tell if milk has gone bad today, after using the refrigerator they are likely to be even more helpless when put in the situation to decide if they should toss the milk or if they can still drink it.

By erasing the human error the refrigerator also erases the human genius and creativity. While the refrigerator can have a list of left over recipes, it can not create new ideas like a person can. By disabling people and discouraging their involvement the refrigerator hinders people’s engagement with food and might stop the creative ideas people can have that machines cannot.

The design uses forced functions, forcing the user into a routine and thus forcefully changing the user’s behaviour pattern. The designers of the product seem to classify people as stupid and unable to make intelligent decisions and thus take away their decision making power. Lockton (2010) describes that “forced behaviour change in product design could provoke significant resistance which may poison attitudes towards environmental beneficial products”. (Lockton, 2010)

The Form of the Product

The refrigerator is the central product in food practices and many activities evolve around it. It is often believed to be the best storage space for food especially for perishable food products. The self cleaning refrigerator could change the role of the refrigerator in everyday food practice to a more active one that could have much more influence on routines and actions around food than the refrigerator has now.
iPhone Application - Consume Within

The iPhone Application (App) “Consume Within” can help people keep track of the food they have at home (figure 5). It enables users to make a list of all the food they have in the house and the associated expiration dates. The list can be organized, according to name, location or expiration date. In order to help people find the food in their kitchen, stickers can be ordered to place on the different food items. The product helps people maintain an overview of the food they have at home and its expiration dates. Forgetting food and buying items twice are phenomena that lead to food waste. By tackling this problem the app could be helpful in reducing food waste.

Design Approach to Influence Consumer Behaviour

Lockton (2010) writes that products, that accept people as lazy and offer an easy way towards more sustainable behaviour, often simplify the problem and by promising an easy solution make people consider the problem less. They assume the product solves the problem for them, but often the product’s effect is not far reaching. (Lockton, 2010)

The same kind of thing can be detected in the Consume Within iPhone app. The app does not have the intention of changing people’s behav-
iour but rather accepts the current behaviour as a given and introduces a solution that can reduce the negative effect of this behaviour. A deeper education or awareness of the problem of food waste is not reached by the user. All in all, the iPhone app can fix some causes for food waste superficially but will probably not lead to a significant change in practice.

**The Form of the Product**

People carry their phones with them at all times, using the app does not take much effort and using apps to organize various aspects in daily life is becoming more and more popular. The user of the app might resort to looking to the display of the iPhone instead of taking a look around the kitchen. People might spend a lot of time interacting with their iPhones resulting in less interaction with other products such as the kitchen cabinets and refrigerator. This might lead to a less tidy and cared for kitchen. Dirty refrigerators and rotten food make other food rot quicker. If people are unaware of this a new source for food waste could develop in untidy storage areas.

**The Functionality of the Product**

The iPhone app focuses on providing functionality that helps keep an
overview of the food one has but there are many more reasons food becomes waste that need to be considered.

Ekokook Kitchen

The kitchen designed by Victor Massip and Laurent Lebot of Faltazi focuses on how to best treat waste (figure 6). The product does not try to prevent waste from occurring but rather offers different ways to treat it. There is a compost section, packages that do not rot and smell can be reduced in volume to be stored more conveniently and there is a possibility to collect grey water.

Design Approach to Influence Consumer Behaviour

The product makes all the desired actions as easy and convenient as possible. The product might not help raise the user’s awareness or educate him about different effects of his actions, however, some negative effects of the current practices will be reduced. (Lockton, 2010)

The Form of the Product

People in Western Europe are accustomed to buying entire kitchens for their homes. Usually they can choose what functionalities they want to be included in their kitchen. Differently sized sinks or storage areas can be selected. The Ekokook kitchen follows this principle and just like other kitchen customers can choose for different solutions for regulating their waste flow. The solution encourages a more thoughtful treatment of waste and fits into the current systems surrounding food practices.

www.lovefoodhatewaste.com

The website is a project of WRAP. WRAP is a government funded organization in Great Britain that works on helping businesses and consumers reduce their waste and recycle the waste that they produce.

Design Approach to Influence Consumer Behaviour

The website introduces the visitor to the problems of food waste and offers many solutions that can help to reduce food waste. The solutions offered range from advising kitchen equipment such as scales in order to cook the right quantities, to a huge library of left over recipes. The ideas are presented in an encouraging fashion with many focusing on how to reduce food waste in very creative and novel ways. The site
offers several different functionalities including, for example, the ability to download a week menu or use an application to estimate how much he should cook when he has guests or when he throws a party.

Users are encouraged to participate in the discussion about food on the forum of the website with the online conversations controlled by the hosts of the website. The “arctic aunt” busts myths about the freezer for example. People can post their questions and the hosts of the website answer them under the alias “arctic aunt”.

The website is co-created by its users who contribute valuable ideas and know how. People are seen as active and willing to change for the better and are encouraged to learn more and try out new things with their food helping each other with tips and tricks. The website starts by trying to change people’s attitudes by explaining the food waste problem. After that it provides ideas on how to change behaviour in order to produce less food waste. The tone of the website is positive and focuses on pointing out how using the tips listed on the website can bring about benefits throughout the household.

**The Form of the Product**

While a website offers the advantage of spreading the message to
many people there are also some disadvantages. The web is full of websites and it is difficult to make a website that stands out, is remembered and is visited regularly. It still needs to be researched how a web based product is used in the context of the kitchen and the household. Although the Internet becomes more present in people’s lives it remains to be seen how information read online will be integrated into daily practice.

The Functionality of the Product

The website offers a lot of useful information and focuses on providing knowledge and ideas on how people can change their habits. However, the large amount of information offered makes it difficult to find the information that one finds interesting; finding something one has read before is difficult as well. The website does not structure the information according to any system and does not help the user in any way to find the information personally relevant for the consumer.

Jihyun Ryou Kitchen Cabinet

The kitchen cabinet designed by Jihyun Ryou introduces a new way of storing vegetables, spices and eggs. For fruit vegetables like egg plant and zucchini the low temperatures of the refrigerator can be damag-}

ing. The cabinet offers a traditional way of storing such vegetables and will keep them fresh much longer than if they were stored in the refrigerator. In order to be able to use the product one first has to learn which vegetables should be stored in the cabinet and not in the refrigerator and some additional information concerning how to use the product. For example, there is a basin under the vegetables that has to be filled with water in order to keep the vegetables moist.

Design Approach to Influence Consumer Behaviour

Ryou’s product introduces a new idea of how to treat food. The idea is to make an effort, to care about the food one buys and to spend time learning about and creating the perfect storage space.

Ryou collected traditional knowledge on how to treat food and used the cabinet to transfer this knowledge. By using the product, people learn about traditional methods of keeping food fresh. The strength of the product lies in its unique way of transferring knowledge to the user; before being able to use the product correctly one first has to learn how to use it. This learning phase can make the user aware that there are things he does not know about food and that he has not been treating his food in the best way.
When using the product the different activities the user undertakes can make him see his food in a different light. The cabinet displays the food almost like a piece of art. The food gets a different position in the kitchen; it becomes more important. By following steps like refilling the water basin the user starts to care for the food as the act of filling the water basin is comparable to watering and caring for a plant.

Ryous’s design shows how products could steer a person’s behaviour. What is especially interesting is to see how different behaviour patterns belong to different emotions and different ideas about the “thing” that a person is dealing with. We water a plant because it is a living thing that we care about. When we start watering our vegetables our emotional bond to them might change.

It remains unproven if the product really brings about those envisioned changes in behaviour and this example leads us to ask: Is a product enough to make people change their behaviour this greatly?

**The Functionality of the Product**

The product focuses on conveying traditional knowledge that might not fit in a modern lifestyle. Do people have the time to water their food? Is there enough space to display your food like that in the kitchen? Food practices have changed quite a lot in the last 50 years and this change could point towards the need for a new kind of knowledge that helps people deal with the situations presented to them in modern life.

**Vision on Changing Food Consumption Behaviour Through Design**

The website www.lovefoodhatewaste.com shows that people can come up with many different creative ideas to solve the food waste problem when given the room to do so. It shows that if people are put in an active role the outcome can be very rich. This is why a design strategy that forces functionality on the user or that accepts the existing behaviour as a given will not be followed in this project.

The product will not prescribe one kind of behaviour through forced functionality or an easy solution but rather trigger people to gain more insights into their daily routine behaviour and to look at it from a different angle in order to stimulate new ideas for different ways of behaving things. If people gain an understanding of the reasons that lie behind their food waste production they can choose to make substantial changes in their behaviour.
Jihyun Ryou product’s method of introducing different behaviour patterns through its design is a great inspiration. Ideas of the designer, like Ryou’s idea to care for vegetables, can get people to think about how society deals with food in general and how they deal with food themselves. It is desired to design a product that has the ability to spark this kind of thinking. It is of interest to gain insight into whether or not a product can make people gain deeper understanding and change the way they look at their actions. For this reason, user testing will play a critical role in the design process.

Additional inspiration is taken from the way in which people exchange tips and tricks on the lovefoodhatewaste website. The online community is believed to activate and motivate people to engage in change. The website already shows that if an array of information is presented on a website, the means of presenting and structuring it is crucial to making it possible for the user to find the information he needs. In the case, the designer should offer the means for people to share their ideas with each other through tools and a coherent structure. Finally, the product should not take attention away from the food, kitchen and the products in the kitchen. It is assumed that one underlying reason of food waste is that people spend little time dealing with and thinking about food. Although this might not be something that can be changed, it should at least be made certain that the product does not reduce this time even more.
Methods

Part One
Research Plan - Online Research

The knowledge about how to treat food optimally was developed over centuries and was passed on from generation to generation. Institutions such as governmental organizations and companies working in the food industry have a great deal of knowledge in the area. This knowledge is generally not communicated to consumers but can greatly help people to reduce their food waste.

The research was divided into two parts. The first part sought to find the factual knowledge about how to optimally treat food. It mainly focused on the optimal storage of food but also included the conditions under which food should be transported and what signs show that food is rotten and unhealthy to consume.

The second part of the research was about determining how the three different skills defined earlier were developed and how they influenced one another. The goal of the research was to find out how people could be moved to improve their food skills. For this to be possible an understanding of the daily practices and routines of people had to be developed.

Research questions
• What knowledge is there that can help people develop the three food skills?

• How are different kinds of food stored optimally?
• How are different kinds of food transported optimally?
• How can you realize if food has become unhealthy? What signs (appearance, feel, smell) are there?

Methods

Online research was conducted in order to collect food facts. The sites visited were www.voedeingscentrum.nl, www.lovefoodhatewaste.com and www.etenisomopteeten.nl.

Jihyun Ryou has collected knowledge from older people with different cultural backgrounds, some of which is scientifically proven. The knowledge she used in her product was collected.

A refrigerator manual from Smegtech was read in order to collect knowledge on optimal refrigerator usage.

Jennie Koo, a skilled amateur cook, was interviewed in order to find out how valuable good cooking skills are for reducing food waste and how cooking skills could be learned. The full list of questions asked during the interview can be found in appendix 1.2.
Part Two
Research Plan - Observational Research

Five participants were observed while shopping, transporting the items they bought to their home, storing the items at home, preparing a meal and dealing with leftovers after finishing the meal (figure 8). The participants were young professionals living in the centre of Stockholm. One of the participants lived in the centre of Goteborg. Lotta was 26 years old, graduated from university and still lived in a student house. Julia, 26 years old, and Oskar 30 years old, work and live together. Patricia, 27 years old, works and is living together with her boyfriend. Tomas, 35 years old, lives together with his wife and 1 year old son. The food skills, namely food managing, storing and cooking, were used to structure the observations. The observations were used to get an understanding of what the skills were and how they were developed.

During this observation special attention was paid to understanding why people either made a conscious or unconscious decision to act the way they did. The researcher posed questions when she saw something interesting. In order to keep the person that was being observed acting naturally the researcher engaged in light conversation and if she realized that the person being observed did not feel comfortable the questions were avoided for some time. If this happened the observer noted the questions and asked them later after the observation.

After the cooking of the meal, the participants were asked to find rotten food and the food that they thought was most likely to go bad before consumption in their house. Together the participant and observer searched for rotten food. It was interesting to see how people behaved when dealing with rotten food. What were people afraid of? What did people dislike the most when dealing with rotten food? Finally, photos of the inside of the refrigerator and other storage areas were taken.
Research Methods

The method used was observational research in combination with interviews. Photos of the refrigerator and food storage areas were taken in order to compare different ways of storing food.

Research Questions

- What are good food management, storage knowledge and the art of cooking skills?

What works well in practice?

- What skills do people have at the moment?
- How do these skills influence one another?
- How do people attain these skills?
- Do people want to attain the skills?

Aspects that should be observed during the observation

Food management

- How do people make the decision to buy food?
- Is the process of buying food structured and planned or more spontaneous? What are different conditions for this?

- What helps people to plan their shopping?

Storage knowledge

- How do people store the different food items?
- What do people know about optimal storage?
- How much does this have to do with the storage possibilities?
- Do people always do this right away when they come home from the grocery store?
- How do people behave around food that is rotten?
- And how do they treat food that they are afraid will rot soon?

Art of cooking

- Do people enjoy cooking?
- Do people take their time to cook?
- Do people follow recipes? How do they follow recipes?
- How much do people consider the ingredients/ time spent on cooking and the right temperatures etcetera.?
- What are the different aspects considered when cooking?
Material needed

Digital and Video Cameras as well as pen and paper for note taking.

Interview

The interview was held following the observation. The interview began by first discussing the observations that were found to be interesting. The observer attempted to understand why the participant acted the way they did. Was it because it was how they always did it? Or was it because they had learned it was how they should do it? The full list of questions asked during the observations can be viewed in appendix 1.1.
Discussion Online Research

Following the different solutions for reducing food waste that were found online will be discussed. The Results of the online research can be viewed in appendix 2.

Different kinds of approaches for reducing food waste were found online. Reviving recipes for old food, tapas recipes for small left over portions and keeping a stock of easy to combine ingredients are some example of the more creative solutions that were found. It shows that saving food can be fun and a challenge for people and that there is a creative solution space that can be explored (appendix 2.3).

Another kind of approach found was to keep lists, to restructure and to reorganize the kitchen (appendix 2.2). This gives people the chance to keep an overview of the food they have in their kitchen. A tidy kitchen prevents rotting food from affecting the food around it.

The third approach found were exact instructions on how to treat food (appendix 2.1). Different sources were contradicting each other; a website in Great Britain said to keep the fruit vegetables, namely bell pepper, cucumber etcetera., in a loosely tied plastic bag in the refrigerator while a website in the Netherlands stated that they should be kept outside of the refrigerator. The instructions also varied in precision. While the “voedingscentrum“, the governmental food organization in the Netherlands, advises to not keep fruit vegetables in the refrigerator, Ryoo advises through her product to keep it in room temperature above water. One can imagine that the instructions do not work in all contexts. If cupboards are very warm they might be a worse storage area for fruit vegetables than the refrigerator. Additionally, for one organization to collect all the relevant information about food seems sheer impossible due to the huge amount of knowledge and know how that exists.

The different approaches are believed to hold value for people with different interests and abilities. A creative person is more likely to be inspired by other people’s ideas while a person that loves structure and order can find assistance in keeping lists.

The many tips and instructions that were found can be valuable for people. It is however important to not present them as the one true way of behaving. People need to understand that their personal context has an influence on if a tip will work or not.

A hierarchy between people is not seen as valuable. It is believed that if more people contribute to the exchange of tips, ideas and knowledge about food it will be more likely to achieve the goal of offering as many people as possible the information they are looking for.
Discussion

Observations

The Results of the observational research can be viewed in appendix 3. The three food skill categories defined earlier are “food management”, “storage knowledge” and “the art of cooking”. They were used to structure the findings. A more precise definition of the food skills is written in the red boxes. The following part will look at how these skills influence and are influenced by material and convention as constituting practices.

Food Management

"Food management" is keeping an overview of the food you have at home, estimating the right quantities, planning ahead and communicating with the people you share food with.

Material: Storage Space

The level of skill in estimating right quantities of food is related to the volume of the storage facilities a person has at home. Having less space forces people to develop the skill of estimating quantities of food. People can make the choice to limit their storage space in order to make sure they do not stock up on too much food.
Being unaware of what food you have at home can lead to not eating food before it rots or buying items twice, which in turn can lead to food waste. Tidy storage areas can help prevent this from happening (figure 9). Being tidy and organized is a character trait and has a lot to do with personal preference. Not all people want spaces to be tidy, like to tidy up or are good at it (figure 10).

A kitchen might look as if it is tidy but behind closed doors this may not always be the case. As most storage areas are kept out of sight it is important to realize that in order to keep an overview of the food in the house the storage areas should be tidy.

**Material: Grocery Stores**

Planning and preparing the trip to the supermarket can help prevent food waste. Writing a shopping list at home is easy because one can check their existing supplies. Buying food and not using ingredients you already have at home in the meals you plan can lead to food waste. Lifestyle, availability and the choice of grocery store has a strong influence on how well people plan and prepare their shopping trips.
More flexible lifestyles make planning ahead difficult. In city centers stores are nearby and people often go to the store every day. When stores are further away planning and preparing the shopping trips is more common as people often go only a few times a week. This is a result of people wanting to prevent forgetting something or carrying something they did not need over long distances.

There are many tricks super markets use to lure people into buying food they did not plan to buy. Baking bread in the store in order to make people crave fresh bread or positioning certain products in a way that attracts attention are two examples of selling strategies. If not conscious and alert to this, it is easy to let a momentary craving guide one’s shopping.

Discount offers can have a strong influence on the buying behaviour of people in the store and can lead to spontaneous, unreflected purchases. People might buy too much or buy food that does not fit with the other ingredients they have at home.

Recognizing if fruits and vegetables are not ripe or too ripe is a useful skill when shopping (figure 11). For customers in supermarkets it is often hard to tell how long food will be good and if it is ready for consumption. Skills that help judge the quality of the food can help in

Patricia: “She has this method of knowing if avocados are ripe. If the part that used to connect it to the tree can be pressed in easily it is good.”

figure 11
purchasing the right food for meal plans.

**Material: Technology**

Technologies such as the Internet, cell phones and black berries can help manage food (figure 12). The technologies can bring about new practices or can make old practices fit modern lifestyles. The SMS grocery list is an example of the latter. Online grocery services are taking over a part of the planning and managing of food and fit into modern lifestyles.

**Image: Value of Food**

Some types of food are viewed as more valuable than others. This is partially influenced by the price of the food but also with cultural and historical meanings attached to food. Many participants viewed meat as valuable and special. The fact that Patricia always looks for cheap offers on meat and that she recalls when she had to throw meat away hints at this. The value people attach to food can make them more aware of one particular food and make them want to prevent the waste of it while they pay less attention to other foods.

Patricia: “Normally I write my boyfriend sms grocery lists. I can check what we need at home so nothing is bought twice. Now that I went without a shopping list I bought tomatoes although we already had them.”
**Image: Character, Bodily Needs and Upbringing**

Cravings and the way people respond to them can make people change their plans and act in an unreflected and spontaneous manner. The way people respond has to do with physical shape, character traits and upbringing. Knowing how one responds to food can help when trying to lower food waste.

Some people want to have a stock of food at home that they can fall back on when they do not get the chance to get to the store. Some like the feeling of having a lot of food in reserve.

**Image: Team Work with other household members**

Communication is important in managing food. When sharing your food with your partner or your family, for example, it can happen frequently that both buy food and there ends up being too much.

People think consciously about what activities they spend their time on. Spending time working or with your family is preferred to spending it on doing groceries.

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**Storage Knowledge**

“Storage knowledge” is knowing how to find or create the best possible storage space and knowing when a food’s time has almost run out.

**Material: The Refrigerator**

The refrigerator is often assumed to be the best storage area. This is not true for all kinds of food. Bread, some fruits and vegetables and potatoes are better stored elsewhere. Other food products such as eggs can stay good for a long time outside of the fridge.

Sometimes people store food that could better be stored elsewhere in the fridge. They choose the refrigerator because it is a place they look at often. While people hardly ever look at some storage areas, the fridge is a place where people often look several times a day.

**Material: Storage Area**

Some facilities in a house can prevent a person from storing their food optimally. When trying to store food optimally it will often be more fruitful to look for the best possible solution as the optimal solution might not be available.
Material/Image: Food as Decoration

Fruit and vegetables can ripen better and rot less quickly when exposed to air. Stores sell fruit and vegetables in plastic wrapping or encourage the use of plastic bags (figure 13). Many people do not take the time to remove the plastic wrapping when storing the fruit and vegetables at home.

Sometimes a fruit bowl is used as decoration in the kitchen. When this is the case people put more effort into making it look nice and might remove plastic bags. Displaying food as decoration can make people spend more time and care on their food.

Image: yucky

Different foods can be found to be “yucky” or gross to different people. An old apple, while still perfectly enjoyable for one person, can be too gross to eat for another and this has an influence on when a person decides it is time to throw something away.
The Art of Cooking

“The art of cooking” is accepting failure as part of the learning process, loving to prepare tasty dishes, being able to make a tasty dish from what is left in the fridge and making “jucky” food taste good.

Skill: Use Left Overs

Using what you have at home and using left overs is something many good cooks can do. They have the knowledge needed to create a good meal from whatever is handed to them and are inspired by the ingredients.

Skill: Reviving Food

Good cooks can revive food that is on the verge of going bad. Adding an old banana to pancake batter is one example. The realization that there are methods to make old food taste good again could move people to try their best before giving up on food and throwing it away.

Skill: The Mystery of What Makes a Good Cook Remains

It is hard to describe what makes a good cook. Good taste buds, knowing secret ingredients that you can use in order to increase tastiness, knowing what ingredients bring out the best flavors in one another are

Image: Testing if Food is still Good

People often have developed methods for testing if food is still good, especially for food they are familiar with because they eat it regularly. Unknown or pre-processed food is thrown away more quickly because people trust their judgement less.

Most people know that the expiration date on dairy products is only a recommendation. They do not follow it but instead test themselves to see if the product is still good. Some people, however, strictly follow the expiration date.
characteristics that could distinguish a good cook from regular cooks.

**Skill: Reaching Proficiency by Practice**

When preparing a dish over and over again there is a chance of becoming better at making this dish. A personal characteristic that helps to develop the dish further is if a person tries new techniques and adopts those that had a positive affect.

**Image: Personal Motivation Needed to Use Skills to Lower Food Waste**

A good cook does not necessarily use his skills to make nice dishes from left overs. Motivating a person to lower food waste can get them to use their skill of being a good cook in a new way. Making a delicious, waste conscious meal could be an exciting challenge for cooks.

**Material/ Skill: Cook Books**

Some cook books teach cooking techniques and other facts about food; one can learn from them. Cook books often present more background information about food than recipes on the web.
Image/ Material: Atmosphere

One’s company and their surrounding are two important aspects that can increase the enjoyment of a meal. People are more willing to make an effort if they prepare a meal for others and if they know that they can eat it in a nice surrounding.

Image: Love necessary

If a person does not enjoy creating a nice meal they will not develop their cooking skills (figure 14).

Image: Diversity

People generally enjoy diversity in their meals. The wish for diversity triggers people to look for and try out new recipes.

Image: Dinner Party Social Pressure

Many people improve their cooking skills when they start earning their own money as there is more room to invest in quality ingredients. Dinner parties become more common and having friends over makes people put more effort into cooking.

Image: The Important Meal of the Day

There is typically one meal in the day that people want to eat with others and also put more effort into preparing. This meal is often dinner because it is the only time in the day that you can eat together.

Image: Unknown Food

Food that we do not know how to cook or that is unfamiliar to us is difficult to use. Experience with food makes people more daring. They will try out new things more quickly because they are more confident in their capabilities.
Acquiring Skills

Depending on natural or previously acquired abilities some skills will be easier to improve or attain for some people than for others. That is why it is easier for a person to improve their food skills when they know their own strengths, weaknesses and abilities.

The three skills I defined, “management skills”, “storage skills” and “cooking skills” were developed differently in the research participants.

When attempting to improve food skills it can help to first realise the skills a person already has. After uncovering a personal skill profile one can either start to improve on a weaknesses or continue to become better at what one is already quite good at. If a person is not so good at a particular skill it could mean that the person is not interested in learning this skill.

Being very good at one skill can help you to be better at another skill. Good cooks can keep ingredients in the house that they can combine easily with different kinds of left over food. A good cook can become a good food manager by using their personal abilities and interests.

A reason why a certain skill is not developed well could be that the abilities of a person clash with the skill. For example, an unorganized person would likely find it difficult to learn how to organize their kitchen.

How well certain skills are developed has a lot to do with personal characteristics, interests and how a person views themself. If someone wants to achieve something, is interested in the skill and if the skill fits with the image he has of himself, then they are more likely to follow through and be successful at developing the skill.

The mood a person is in at a specific time can also play a large role. There are days in the week and times in the day where people are open to learning new things and putting an effort into an activity. There are also, however, times when people simply are too tired or have other prerogatives.

People retain “food skills” that they once trained over a longer period of time. As it takes significant thought and effort to attain food skills, the acquired skills stay with a person even if they do not need them any more.
Constitution of Practices discovered in research

Figure 15 on the next page illustrates how the three different elements constitute a practice. It shows quotes taken from the observational research. The quotes were placed in the space between the three different elements, skill, convention and material in relation to how much the different elements influence the way people think about how and why they do things. Some thoughts, ideas and established practices are influenced more by one element and not as much by another.

Patricia likes to have a tidy fridge. This idea shows how the material context and her personal idea on how things should be, convention, come together to shape the practice of organizing her refrigerator. Lotta’s idea on how to best store potatoes originates from her idea that you should keep them in the basement. By knowing that this is the usual place and knowing the characteristics of a basement she can reason what a storage area for potatoes should be like.

The elements skill, convention and material play different roles and can be of varying importance in different situations. This could be of interest when designing for a specific situation.
“In my culture it is custom to always have enough food in case someone comes by unannounced.”
- Jennie

Tomas buys an extra milk carton with a screw top because his son is thirsty. He forgets to use it and gives him milk he still has at home once we reach the house.

“I put cinemon in the meat balls by accident and it was kinda good so I always do it now.”
- Tomas

“I generally take over recipes from the people I live with.”
- Oskar

“I gave the recipe of a dish to my friends and explained in detail how to make it but they just cannot prepare it like I can.”
- Jennie

“Sometimes Oskar does not see that something is already opened and opens a second carton.”
- Julia

“My mother has good taste buds. She knows what kind of taste needs to be added to make the food even better.”
- Lotta

“I like to have a tidy fridge in order to have an overview of the things I have.”
- Patricia

“I continued to do very organized shopping for a while when I moved here but now I don’t any more. I have less time and I guess it is just habit.”
- Julia

“I like to have canned tomatoes and beans and condiments to use when creating dishes from my leftovers.”
- Patricia’s friend

“I do not know what to use this ginger for. I bought it for a special recipe and now I will probably throw it away.”
- Patricia

“Our freezer is very small so I just think that the minced meat will not fit. We should not buy it.”
- Julia

“Potatoes can stay good for as long as a year if you keep them in a dry cool place.”
- Lotta

“I throw dairy products out 1 day before their expiration date.”
- Patricia’s friend
Conclusion

Given that only six people were observed, four households visited and one additional person interviewed no complete overview of all the phenomena that influence the production of food waste could be achieved. Many different behaviours and factors that drove people to behave in different ways were, however, witnessed. The project will build on the grounds of this acquired data acknowledging that there is more to be learned but also realizing that the collected data is rich and offers plenty of material to work with.

Practices Evolve and Change Over Time

This project attempts to bring about changes in food practices. Practices change over time and interesting insights can be drawn by analysing old practices and why they stopped existing. This project realizes that and will not aim to reintroduce old practices. While writing a shopping list is a food practice that is not as common as it used to be, investigating why people do not write shopping lists any more can be very insightful.

Personal interests and the lifestyle of a person change over time. When people move in together or have children their food habits change as well. New problems can arise while others disappear. That is why when subjected to life altering changes people have to become aware of the new factors that influence their food practices and need to realize what practice is best to adopt.

Best Practice

As food practices are influenced by so many factors one can say that there is no “one size fits all” solution to the problem of food waste. Each person has to find the practices that fit with their individual situation.

No social isolation

The changes people make in their food practices affect those sharing food practices with them. Eating is a social activity. That means that changing food practices in social isolation is more difficult than changing together with a group of others, especially those one often shares meals with.
**MOTIVATION TO CHANGE**

**Motivation to lower food waste**

So far there is no law or common goal formulated by the government to lower food waste. People have to find motivation by themselves to make an effort to lower food waste.

There are different reasons why people dislike throwing food away. Some do not like to waste money, some think of the energy that was wasted during the production of food, some think of those who do not have enough to eat and others simply think it is gross to deal with rotten food.

People consciously realize the moment they throw away food because they experience it as unpleasant; they either think it is gross or they feel it is morally wrong. There is no justification for throwing away food. The general dislike of throwing away food could motivate people to make an effort and change their practices. It is not yet clear though if this dislike is enough of a motivator.

Being more aware of one’s food practices can bring other benefits besides reducing food waste. Keeping a balanced diet, planning meals during a busy work week and spending less money on groceries are some benefits people could gain from having a raised awareness of their own practices.

**REFLECTING**

**Personal Profile**

People often do not have an objective and complete view on their food practices. Often they do not know exactly how much food waste they produce. People might reflect on some of their food practices and therefore gain an understanding of some reasons for their food waste.

Raising awareness and making one’s perspective on one’s routines more complete is necessary in order to help people improve their food skills. If a person knows all the factors and their impact on the waste production, they can take better steps and change their practices more effectively.

There are many factors that influence the way a person deals with food. Common problems among the people observed were difficult to find. Factors such as personal taste, physical shape of a person, cultural background, personality, influences from other cultures,
historical background, social surrounding, kitchen facilities, financial situation and personal abilities all influence how people deal with food. Some factors are of external character (a person’s work schedule) while others have to do with personality. Getting to know the factors imposed on a person and their strengths, weaknesses and particularities can help the person in question to improve their food skills.

A different set of skills can work in different contexts for different people. It is important that a person finds out what practices fit them best. It is much easier to change practices when those practices fit and are according to a personal profile.

**EXPERIMENTING**

**Difficult to realize effect of actions**

It is challenging to realize the effects of certain actions when it comes to food practices.

There are many different actions that can lead to food waste. The sheer quantity of different reasons makes it difficult for people to realize the reasons for their food waste production. The fact that the effect of a certain action becomes evident only after several days or weeks also makes it hard to link the action to the effect. You only realize that you bought one carton of milk too much once the milk has gone bad.

Personal values and ideas can influence the memory of a person. Events that have brought about a stronger emotional reaction will be remembered more vividly than others. This could be influenced by one’s finding some food more valuable than others or finding some food, when rotten, particularly disgusting. When a person gets used to throwing away a certain kind of food they might accept it and not reflect on it any more. A person might remember throwing away meat while forgetting the rest of the musli that was also thrown out because the musli is less valuable and he throws some of it away every day.

**Ongoing conversation about food facts**

There are many food facts and skills people can attain in order to lessen their food waste. How much people really need to learn or to change is not known. In order to lessen food waste people have to learn some of the skills and put them into practice. A collection of food facts is never 100% complete or true and therefore the exchange of food facts has to be ongoing; everybody should be seen an expert.
Exploration through Sketching

The sketch book was kept during the analysis phase of the project as a means to reflect on the insights gained during the literature research, observations and interviews. Besides reflecting on insights the sketching was used to analyse in what way design could address the different phenomena that were encountered during the research. The sketching was used to decide what phenomena were promising to continue to work on and helped narrow down the theme of the project as the project progressed. In that way it was investigated what was interesting and promising to work on. The following section shows a brief summary of the idea development and holds the reasoning behind the choice of the final design space.

Section 1

Section 1 shows the first analysis of how food becomes waste. The ideas are focusing on assisting people during the activities that were discovered to cause food waste.

The shopping bag that can be opened as a spider web in the kitchen is meant to make food, especially fruit, more visible in the kitchen to prevent people from forgetting the food and letting it rot. (S.B. page 7).

The idea of monitoring one’s shopping behaviour is meant to give peo-
ple and understanding of their behaviour in order to make it easier to change it (S.B. page 5). The poster that shows people what they should or should not put into the refrigerator is meant to teach about optimal food storage at the moment when it is relevant, namely when people put their food in the refrigerator (S.B. page 8). These two ideas explore the option of raising awareness of the food practices and teaching knowledge about food.

The different activities of shopping, storing and cooking are now mainly seen as separate and solutions are explored for one problem at a time. The different activities affect each other. A more holistic approach should be taken that respects this relation between the different stages of handling food. The idea of combining plotting the food that is available in the house on the refrigerator door and taking a photo with the phone before going to the store is the first idea that includes several activities, dealing with the influence storing and shopping has on each other (figure 16).

Section 2

Section 2 shows the reflections on the observational research. During observations and interviews it was discovered that people did not have a holistic view on their food practices. Keeping track of all the different
food in the house was complicated and people were unaware of what the reasons were they produced food waste. The many different time frames that food stayed good were seen as a factor to complicate food management. The late feedback, food will become waste only several days after a person bought too much, on bad food practices was seen as another factor that made awareness low.

The idea was developed that people first had to reach an awareness of what they were doing before being able to make changes. Four different steps were defined, “awareness”, “reflection”, “learn”, “do”, as possible steps to go through in order to guide people through changes in their food practices.

One of the ideas developed in order to guide this change were challenges that were send to people via email or were written on a calendar. The idea is to mix the challenges with facts about food. Guerrilla marketing methods are considered to spread the challenges (S. B page 16).

Besides that there were ideas of trash bins that show the amount of waste produced more vividly to raise awareness (S.B. page 18), ideas of information displays (S.B. page 20), an idea to monitor the food in the house and label the food that is bound to go bad as rescue food (figure 17) and the idea of monitoring what food is eaten and what food is thrown away in the form of a game of packman (S.B. page 21). The products show ideas on how to raise people’s awareness and activate them to change their behaviour. The main insight gained in this section is that people have to go through different steps in order to change their behaviour.

While the ideas sketched in Section 1 were mainly meant to assist people with their problems the ideas in Section 2 ask more activity from the user and are meant to trigger people to change their practices, like the challenges for example. Many ideas have in common that people are asked to become active while the product helps them to do so.

Section 3

Section 3 shows reflections on some of the phenomena found during the observational research. The ideas are mainly meant to solve some problems that were discovered during the research. One idea tries to stimulate acquiring knowledge. It is the lamp that has many notes attached to it. When more notes are removed and thus read the lamp opens up and there is more light in the kitchen (figure 18).
Section 4

The last section starts with the idea of changing behaviour in a group context. The role-playing game “Dungeons and Dragons” was used as an inspiration. In that game there is a game leader who supplies a guided fantasy to a group of people. In Section 4 the different possibilities for a group activity in the form of a role-play are explored.

One outcome of the observational research was that many factors influence a person’s food practices. The idea was that if a person understood what factors played in his life he would be able to come up with solutions to deal with these factors. The factors could have to do with a person’s personality, cultural background, upbringing, life style etcetera. Part of the role-playing game “Dungeons and Dragons” is a character sheet that is filled in, in the beginning of the game and defines what abilities and skills the person has in the game.

If the guided fantasy is played among friends it offers a great opportunity for people to reflect on their actions. Friends are experts on each other and a friend’s point of view can be very insightful.

The idea was explored to make filling in the character sheet part of the game and have the group reflect on each person’s food practices. Self
reflection as a group discussion was discarded. It would take too long and would quite possibly not be enjoyable. The correlation between personal factors and food practices was also not studied deep enough to offer a good guidance for the people playing the game.

Different activities could offer the possibility to self-reflect and find out more about ones weaknesses and strengths when it comes to dealing with food. Keeping track on a sheet of paper might be a good idea. Any kind of behaviour change is always easier when done in a group.

Changing behaviour within a group of friends is easier as you have a certain commitment to the group, you are used to behaving similar to your friends, you can help each other with the challenge of changing etcetera. The idea of having the group formulate a goal together in the beginning of the game came up.

A game offers a safe space where new things can be tried without having any consequences in the real world. A fictive scenario that had some connection points and could possibly be real was developed. The scenario would be that garbage had drowned Stockholm in waste and that the group had to succeed in the game in order to save their city.

The ideas developed during the games should be taken into real life in the form of challenges. Those challenges were to be carried out in everyday life and were to be part of the game. If people would succeed in doing the challenges they would succeed in the game.
Conclusions

Finding solutions to causes of food waste were explored. There are many reasons food becomes waste. Some of them like lack of overview of the food one has at home are present in many households, others are seen less often. Through sketching some solutions for those reasons were explored. During the observational research as well as in literature research it was discovered that many routine behaviours are not reflected upon by people. This meant that they do not realize many of the different reasons they produce food waste. A product that would specifically solve one reason for food waste would assume that people knew that this problem lead to food waste in their household and would also like to buy a product that would solve this problem. They would have to consciously think about their daily routines around food and realize the effect those routines have. Earlier in the report I referred to this process as cultivation as it was defined by Warde and mentioned that this usually does not happen.

The realization that the many different factors that influence food practices make them highly individual and also make them change frequently during a person’s life brought about the idea that each individual case needed an its own solution.

Early in this report people were accepted as co-creators of practices. It would thus make sense to not offer solutions to them but to put them in an active role giving them a tool to find solutions themselves.

The direction that was chosen was to stimulate and guide people to gain more insight into their food routines and activate them to change certain aspects of routines that led to food waste. The chosen direction was believed to have the potential to have a big impact on food practices.

It was chosen to design this as a group activity. During the research it became clear that food practices are often shared. That is why it was believed that friends and family have a big influence on a persons food practices and that it would be easier to go through changes in those practices together. A group could make a person more committed, people could assist each other and it is less weird to do something different if others are doing it to.

A game or fun activity was believed to motivate and trigger. A game can also offer a safe space to experiment and do things differently and a certain distance to the problem at hand that can lead to new insights.
Design/ Testing

Introduction to Ideas
The Workshop
The Dinner Game
The Blog
Arguments for Choice of Activity and Setting
Testing and Developing The Food Challenge
1st Group & The Food Freaks
Recommendations for The Food Challenge
The following brief forms the link between the analysis part of the report and the idea and concept development part. It describes which theories and phenomena discovered during the analysis phase will serve as a basis for the product development and how.

The word product is used in a broad sense in this design brief as activities are of central interest. The product should make the activities possible and should guide, trigger and facilitate them in the best possible way. In what shape or form the product can best do that still will be explored during idea and concept development.

The product is targeted at people who have realized that food waste presents a problem and are looking for a way to make changes in order to reduce their food waste.

Earlier in the report it was described how building up food skills can play a key role in lowering food waste. If people knew how to better treat food there would be less waste. Three skill domains were defined that described the different activities when dealing with food, shopping, storing and preparing food and it was recognized that these skills can have different characteristics. Cooking demands creativity while knowledge of the correct storage spaces for different kinds of food requires remembering factual knowledge. The evolving and changing characteristic of practices led to the realization that skills change. A modern context asks for a new set of skills; skills that are possibly yet to be developed or in the process of being developed. During the observational research it was noticed that many factors influence a person’s food practices and thus the skills that would be useful in individual situation.

It was therefore decided to focus on facilitating people in reaching a precise and deep understanding of their individual food practices. It is assumed that gaining increased insight into one’s personal routines and the factors that influence one’s food practices will make a person more skillful in dealing with their food.

Another discovery that was made during the analysis was that there is no easy solution for food waste. Besides that, it is very difficult to change routine behaviour by only hearing or reading what to change. That is why the strategy for the product is to not tell people how to behave, but to inspire them to tap into their own genius and stimulate waste.

The three steps described by Warde to lead to a change in behaviour are the act of consciously reflecting on ones routines, deciding on and...
carrying out changes in routines and carrying these changes in action out over and over again until they become a new routine (Gram-Hansen, 2011). The process of conscious reflection and experimenting with new ways of behaving will be the main activity the product should trigger and facilitate.

Ingram states that people co-produce practices (Ingram, 2007). The product should trigger people to become active and should leave space for them to explore freely.

The product should inspire people to find solutions for their individual food waste problem. Insights into personal routines that are usually not reflected upon and realization of the personal factors that have an impact on those routines should be gained. The product should push people to try out new things and experiment to get new ideas and see what effects a change in practice can have.

In order to reach the goals formulated for the product, two facilitating factors will be included. The product should incorporate game elements and should join a group in an activity. The game element will motivate people and offer people a certain distance from their daily activities. The distance provides a different view of the situation and new valuable insights. Additionally, a game offers a safe space where people can think of solutions more freely.

Performing an activity in a group can also lead to team spirit. This team spirit is motivating and gives a sense of belonging and unity. When trying something new and different the feeling of belonging can make it easier for people. Ideas, tips and knowledge from other team members can also help people in the process.

A final outcome of the concept development phase should be a product or service that supports the described activity. This product or service should reach as many people as possible.

In the following section the ideas on how reflection and experimentation on food practices can be facilitated in a game setting as a group activity will be developed. The means in which the vision can be created and given form will be explored.

The assumptions made about the effect of self reflection and experimenting in a game context within a group will be verified throughout the concept development and will go hand in hand with determining how the assumed effects can best be reached.
Introduction to Ideas

The following proposals are ideas for activities that are believed to promote the process of reflecting on routines and experimenting with “new ways of doing” described in the product vision.

As previously mentioned, a participatory design approach was chosen during the idea development. Ideas were tested in groups with participants at an early stage and developed further with the insights gained from observing participants during the test as well as with the ideas expressed by the participants.

There are several reasons why participants were included so intensively in the design process. The product vision as such describes a specific kind of activity. The activity is supposed to inspire people, create a team spirit and have game-like characteristics. It is difficult to predict how these different demands on the activity can be realized.

The participatory design approach made it possible to get immediate feedback on how ideas were interpreted and how they would be carried out in the group. It showed how a group would discuss, interact and think about the different activities.

The ideas were abstract at the time of testing and could be reshaped or changed easily in this stage of the development. During the testing the participants contributed to the design process, gave shape to the activities by interpreting the instructions and were stimulated to state their ideas for adjustments to the activities or different activities all together.

The activities were tested in three different settings: a workshop, a dinner game and a community based blog. The different settings offered different grades of influence by the researcher on the activities. The goal was to develop a product or service that would trigger and guide people in a certain activity that would be used by people without guidance from the researcher. The goal was to inspire people and in order to do that it was necessary to find out the limitations of this goal. An understanding of what kind of activities would get people enthusiastic and encouraged them to engage in an activity had to be reached. The ambition was to find out the limits of when an activity was asking too much and would be rejected.

The participatory design approach was used to find out what activities were possible with different levels of control and guidance. The workshop was guided by the researcher through direct leadership and control of the different activities. The proceedings of the dinner game were dictated by the researcher through text. The dinner game was a role playing game that was guided by one of the participants with the help of explanatory material. The blog was designed as a community
based blog with limited control. The only way the researcher influenced the activities of the blog was through the design of the various features, the presentation of the text, and the stimulation of participation.

The workshop was not seen as a possible format for the final concept but as a means to test and develop the ideas for activities. The dinner game and blog were seen as possible formats for the final product.

The following section will explain the different activity concepts that were developed, present the results and conclusions from the tests and present the selected activities and setting.
Fictive/ Future Scenario

The goal of this activity is to guide a group discussion about daily routines that leads participants to reflect on the routines they usually do not reflect on. Additionally the discussion should bring about ideas for solutions for problems encountered that could be implemented in the everyday life of the participants.

A fictive scenario is formulated and presented to a group of people. The fictive scenario can provide a safe space where problems of everyday life can be discussed and solutions proposed. The safe space could lead people to think less restricted and come up with more creative solutions. It could make people look at their daily routines with different eyes.

It is important to find the right balance between fictive elements and references to the “real world” in order to bring about a discussion that is both stimulating creative ideas by distancing the group from the “real life” context and staying on topic, offering insights into people’s everyday life and the problems they face.

A future scenario could offer such a setting. It offers a reference to the world as people know it and at the same time signalise that things can be different.

After ideas are developed in the fictive scenario the group should be guided back into the real life context and discuss within the group what it would mean to implement the ideas and what this implementation could look like.

The future scenario could be introduced in a lively way via a fake news report or newspaper clipping. The group could be motivated by the way the story is told. They could be told that the fate of the world lies in their hands for example.

This idea was tested in two different settings. The first setting was a workshop given by me. In the workshop setting a fictive future scenario was introduced that was set in Stockholm. People were given passports of a fictive country with their names and photos. A map of Stockholm was presented that showed large parts of the city flooded by waste. During the whole workshop people were playing themselves in the future scenario.

The second setting was the dinner game and was guided by a participant provided with instructions on what to do and say. This time the participants were situated in the same future scenario but instead of playing themselves they were playing fictive characters with more prominent characteristics and different interests.
The Challenges

There are 10 challenges that are meant to confront people in their everyday lives. One example of a challenge is: “The survival challenge: Do not buy any food for one week and try to survive from the food you already have at home.” (Figure 19 shows 2 other examples.)

The challenges break the routines of people by introducing something they have to do differently. By introducing a difficult task into people’s everyday lives they start to think of their behaviour and notice elements of their routines that they would otherwise pay little attention to.

The titles and descriptions of the challenges, as well as the activities themselves, should encourage and trigger people to take on a challenge. The challenges should sound fun and present varying levels of difficulty with an assortment of activities targeted at the different personal interests of the participants. The collection of challenges should therefore be quite broad.

The challenges are meant to force people to start finding new ways of doing things. It is assumed that by finding new ways of doing and by trying out new things one will learn about one’s routines while building up skills and acquiring knowledge.

Many of the challenges take several days to complete. In the ideation phase there was not enough time to test the challenges. During the workshop and the dinner game people were asked to formulate challenges for each other and then asked if they would be willing to try them on their own. The focus was to find out how people would react to the proposition to take on a challenge.

The challenges were also presented on a blog to distribute them and test the initial reactions of potential participants.

![Expedition kitchen](http://thefoodchallenge.tumblr.com/)

**Expedition kitchen**
Next time you prepare a meal take only one ingredient from each of the different storage areas in your kitchen. Take one ingredient from your fridge, one from your freezer and one from each of the cupboards or drawers you have in your kitchen. Find a creative way to combine those ingredients to a tasty dish.

![Edgar the tomatoe](http://thefoodchallenge.tumblr.com/)

**Edgar the tomatoe**
Keep Edgar the tomato for two weeks. After the two weeks are over eat him. In order to keep Edgar edible for two weeks you have to come up with a method to preserve him. Other vegetables that could be fun to keep for two weeks are mushrooms, cucumber, egg plant, zucchini, bell pepper and many more. All fruits can be used for this challenge as well.

![New ways of doing](http://thefoodchallenge.tumblr.com/)
Motbok

The motbok was a booklet that was used in Sweden from 1917 until 1955. It was used to control alcohol consumption. Each citizen was allowed a certain amount of alcohol per month. An analogy with the motbok, that is known to the older generation in Sweden, could be used to introduce the idea of controlling one's waste production. People could set a goal for themselves of staying under a certain self-defined amount of food waste per week or month. The booklet could be used to record individual waste production.

By recording everyday routines one gets more aware of what one is doing. There is no self recorded unaware consumption.

Besides setting goals for waste reduction the motbok could offer a way to note down and collect tips and tricks on how to deal with food and could become a collection of one's own knowledge when it comes to dealing with food. The motbok comes in a handy small size and can be carried along as a tangible reminder.

The motbok could include a definition of food waste and the different skills defined earlier. Personalizable pages, a zip lock bag to collect waste, removable post cards to share information with friends and inspiring examples and questions could be included in the motbok.

During the workshop and the dinner game little booklets in the form of passports were handed out with questions (figure 20). The passport was chosen because it fit with the fictive scenario. No further instructions were given with the booklet but it was noted how people dealt with it.
Hidden Agendas

During a dinner the different participants receive hidden agenda’s. The hidden agenda’s are goals the participants have to reach during the dinner.

The hidden agenda’s can be of different origin. One idea is to use agenda’s that are closely related to the activity of enjoying the dinner. An example of such an agenda could be to make the person that is sitting next to you finish all the food that is on their plate. Another kind of agenda could be to spread a myth about food. There could be some true facts about food and some well constructed myths. In the end of the dinner it is revealed what the true facts and what the myths were.

The hidden agenda is a subtle way of steering the conversation within a group towards the topic of food waste. The group has the power to decide how much time during their dinner they want to spend on talking about the topic of food waste and how much they want to talk about topics of their own choosing.

The hidden agenda’s were tested during the dinner game. They were embedded in the fictional story. (figure 23)

Hidden agenda

Leyla wants to play behind her house again. She suffers greatly under the situation right now as she loves to be outside and she likes to walk and go wherever she wishes. Why do grown ups always have to make everything so complicated?

The Girl

This is the character you will play during the Dinner Game. Below you can find some information about the character to spark your imagination. You can tell the other players all the information except the hidden agenda. It can be more fun if you get into character and let the others find out who you are and what you stand for as the game goes on.

Leyla is 12 years old and has recently started high school in Stockholm. She is a bright girl and grew up with her mother in the suburbs of Stockholm. As her mother was a single mom and had to work full time Leyla is independent, used to finding her own way around and caring for herself. She is self secure and is not afraid to start a discussion with grown ups.
Play with Food/ Recipe to Raise Hosts Awareness

A recipe is a rare moment where people follow instructions. The recipe is designed to direct a person to act in a certain way.

Food could be used as a material to design with. The food could be designed in a way to stimulate thoughts or certain activities and could become a game pieces.

The ingredients listed in the recipe could be unusual ingredients, like the stem of a broccoli, or old food that is usually thrown away, like sour milk, old bread or simply apples (figure 22). By making the recipe extreme the person cooking the dish could get new insights about what food has to be thrown away and what food could still be used. When sharing the meal the food could lead to a discussion about the same topic.

The recipe could be used to describe how food should be served. An example of an activity, that could be stimulated by the recipe, is to turn the plate around when finished with a course, a surprise under the plate.

This was tested during the dinner game where the recipe was used as the only means of communicating the proceedings of the game to the game leader.

PREPARATION
1. Heat the oil in a large saucepan over moderate heat. Add the onion and garlic and cook for 3 minutes.
2. Remove the stem of the broccoli and keep it.
3. Add the stock, broccoli and zucchini. Cover and simmer for 15 minutes.
4. Before serving the soup cut the broccoli stem in 1 centimeter thick coins. Serve two broccoli stem coins per soup.

PREPARING THE TABLE
Prepare the table in the way that you like. Use a table cloth that can get dirty. Place the seating cards at the different seats. Place the cards with the numbers counting up next to each other. Put the note pads with two pens each between the seating cards with the numbers 1 and 2, 3 and 4 and 5 and 6.

SERVING
The short film that you can find on the website of The Food Challenge under the link www.thefoodchallenge.com/video1.game is the introduction to the dinner game. Once all the guests have arrived, you can watch the film together. The movie will explain the seating arrangement. After everyone is seated and the first task has been fulfilled it is time to serve the first course.

The broccoli stems are game pieces in the first course of the dinner game. Many people do not know that the stem of a broccoli is very healthy and tastes quite good. Your guests might taste the broccoli stem for the first time.

During the first round of the game the broccoli stems will represent pieces of waste. The players have to find solutions for this waste. Each player has to find two solutions for waste.
Medals

There are three different medals corresponding to the different skill domains defined earlier in the report, one medal for managing food, one for storing food and one for cooking. The medals can be given to others, family members or friends, in order to show appreciation for their skills.

The positive feedback can stimulate thinking about the different skill domains and how good one is at the particular skill. Friends and family members of a person are seen as “experts” on that person and can present this person with new insights about himself and his abilities and strengths. Getting positive feedback is meant to encourage to practice one’s food skills. The exchange of medals is envisioned as a group activity.

The giving and receiving of medals was tested during the workshop and during the dinner game. During the workshop people received medals to understand what effect the receiving of medals has. During the dinner game the exchange of medals was tested.
The Workshop

Workshop

During the workshop the following ideas were tested:

- fictive/future scenario
- the challenges
- personalized fake passport (motbok)
- activity of turning the plate around/pieces in the food as game pieces
- medals

The workshop included a fictive scenario, that was meant to help people to look at their daily routines from a distance and come up with more creative solutions to everyday problems. Those ideas were to finally be implemented into reality. The goal was to find out if people would commit to challenges. The intention was to find out what people’s reaction was to the idea to integrate this aspect of the workshop into their daily life. During the workshop different assignments were introduced to the participants, that had the purpose to activate the group to discuss the problem of food waste with one another and to find solutions for the problem together.

A fake passport, (from the Republic of Wasteland) (appendix 6) was given to the participants in the beginning of the workshop. The passport was a sensitizing booklet and was personalized with a photo and the name of the participants.

The food and activities around the food served supported the workshop. By exchange knowledge, tips and myths about food, the participants should become aware of how much knowledge they had as a group. Discussing problems and finding solutions for those problems together should trigger the group to become active and to change some of their routines together.

At the end of the workshop the group should be interested enough to commit to a challenge together. The challenges were formulated by the participants during the workshop and if followed should lead to changing habits and routines and experimenting with new ways of behaving. The group could help each other to stay committed and to achieve doing the challenge.

_Figure 25 shows the proceedings of the workshop. For more detailed information view appendix 5._
The workshop was tested during lunch from 12:00 to 14:00 with 5 participants who were master students, PhD students and researchers. The participants were colleagues who knew each other well but were not very close friends. The discussion about how to implement the challenges in real life had to be cut short due to time limitations. The participants also did not fill in the sensitizing material before the workshop, the passports were only given to them in the beginning of the workshop.

How to find a good mix between game and reality was a crucial point of interest during the test of the workshop. The activities during the workshop should spark the participants imagination but still let them think of their personal problems when it comes to wasting food. It was very difficult to predict how the workshop had to be organized in order to bring the desired discussion and also be enjoyable. Practical questions like how to combine eating and doing assignments, how much time the different parts of the workshop would take and what parts people would enjoy had to be tested. The workshop offered a setting where it could be tested in what way activities would reach their full potential.

The workshop was held in a meeting room at the Interactive Institute. The table was made up nicely with napkins and cutlery. (figure 24)
Conclusions

The workshop was received enthusiastically. The participants stated that they understood that the point of the lunch was to come up with solutions for the food waste problem and that the many rewards they got during the workshop made them like it.

All in all the workshop took almost two hours. The participants said that that was not a problem as it was a nice activity.

The assignments were solved in pairs. Afterwards the ideas were shared with the entire group. Discussing problems and solutions in that way worked well.

Fictive/ Future Scenario

The fictional scenario was viewed as good and people thought that it would be good to develop the fictional scenario. The idea was stated to show google map as an image with different street view images that are flooded with waste. This would make the fictive scenario more real.

The difference between solving assignments and eating was seen as somewhat awkward. Participants said they did not know what to talk about during the meals. (The group was a group of colleagues who saw each other during lunch every day and were not very close friends.) The group thought it would be nice to introduce fictional characters with hidden agendas to stimulate more discussion within the entire group during the time of eating.

Making up Challenges in the Group

The challenges that were developed during the workshop were not realistic and could not easily be implemented into reality as they were developed in the fictive scenario context. (One example of a challenge: “Only if you follow a cooking class are you allowed to use the kitchen.”)

A discussion was started on how to change the challenges so that they could be implemented in reality. There was however not enough time to finalize this step nor was there a moment where the entire group committed to doing the challenges. Creating challenges in the group and committing to one or more together could be a great motivation to actually follow through on the challenges.

Personalized Fake Passport

The booklet was presented in the form of a passport and was received enthusiastically. It was seen as a funny personalized gift. To get peo-
ple excited about the workshop. I had asked participants to look like criminals when taking their picture for the passport. They did not know what the picture was for. This worked well, people wanted to know what was going to happen and were excited to find out. Although people were happy about receiving the booklet only one participant gave me a filled in booklet back. The others forgot about filling it in or left it lying around the office. I asked during the workshop to return the booklet but did not remind anyone after the workshop was over.

**Activity of Turning the Plate Around/ Pieces in the Food as Game Pieces**

Broccoli stems and m&m’s were used as game pieces in two activities. Using food as game piece was seen as a nice idea and advised to develop further. The action of turning the plate upside down was viewed as a very simple but confronting activity. It showed people the food they wasted at that moment.

**Medals**

The participants were told that they received medals from the Republic of Wasteland because they were experts in one of the different skill domains, food management, storage and cooking. It was seen as a reward to receive a medal and it motivated people to engage in finding solutions.

**The Workshop as a medium**

Because was leading the workshop was led by the researcher she had almost full control over the different activities. The different assignments could be explained and when participants had questions she they could be answered immediately.

The participants joined the workshop because they were asked personally and knew the person conducting the research. She prepared a three course meal for the workshop and put a lot of care in the preparation of the different activities. This motivated people to participate actively. The workshop led to the realization of the full potential the different activities. The fictive scenario and making up challenges were two activities that led to good group discussions. The broccoli stems in the soup and the action of turning the plate around were reported to trigger thought and reflection on food waste. After realizing the full potential of the activities it was of interest to test in how far the activities would be successful in a less controlled situation.
The Dinner Game

During the Dinner Game the following ideas were tested:

- fictive/ future scenario
- making up challenges in the group
- passport of fictive character (motbok)
- hidden agendas
- recipe
- activity of turning the plate around/ pieces in the food as game pieces
- giving medals to each other

After testing the workshop I had the idea to develop a game that was essentially a recipe. The game would be played with the different items of food. Once the dinner was over, the game would be finished and all the game pieces gone. The rules of the game, the way the game should be played, would be explained in the recipe and the person making the meal and hosting the dinner would become the person leading the game. In this setting I could take influence on how people would carry out the activities via the recipe. A recipe is a unique moment where people are used to following directions. This test was done to discover in how far people let themselves be guided by something like a recipe.

The main purpose and the proceeding of the dinner game were the same as the one of the workshop (figure 26).

In order to continue testing how much fiction and how much reality should be present in the game the idea of introducing fictional characters with hidden agendas was tested. (appendix 7)

Each person taking part in the dinner game was given a different character. The description of the characters was kept vague to give people room to make their own interpretations. Besides that the characters were chosen to clash, the heir of the biggest grocery firm and the environmentalist were bound to clash in their opinions. The idea was that the characters would contribute to a lively discussion as they offered people more distance and a different way of looking at the topic. By looking at the topic from different eyes the discussion was expected to become more fruitful. The proceedings of the dinner game were the same as the proceedings of the workshop and can be read in appendix 5.

The host of the dinner game had to decide which person should play which character and distribute the invitations accordingly, had to prepare the meal and read the explanation of the game to be able to lead the game.
The material provided to the host can be found in *appendix 7*. The introduction to the dinner game was given by me, I explained the scenario of the Republic of Wasteland. This time there was no projection on the wall as there was no beamer and the laptop did not fit on the table.

Throughout the dinner the host read out texts that explained the next steps in the game.
Test

The dinner game was tested with a family, parents, two daughters and their boyfriends at the Easter weekend.

Sara is one of the daughters and prepared lunch for everyone, she was the game leader during the test.

I was there to help her during the preparation of the dinner and try to answer as few questions as possible.

During the dinner I did not take part but merely observed. When in a situation where the group did not know what to do I told them that they should figure out themselves what they should do next.

Conclusions

Participants stated that they wanted to know more about the problem of food waste before starting to play the game. They wanted to know how much food waste was produced in Sweden, what the problems were and the definition of food waste.

Fictive/ Future Scenario

Some of the participants felt uncomfortable playing a fictional character. One participant stated that he had a very awkward and uncomfortable dinner although he was eating with his family, a group of people he normally felt very comfortable with. A participant thought that better designed characters and including an activity where people introduce themselves as their fictive characters could help overcome the awkward feeling. It was mentioned that one normally knows the people one dines with and in this setting it was unclear who was who.

People did not identify with their fictional characters. They viewed themselves as separate to the characters. That is why they did not feel bad about producing food waste and why they did not actively try to come up with solutions. The fictional character was thus hindering the discussion about personal problems and the generating of solutions.

The same phenomenon was observed in the testing of the workshop.
During the workshop one person was taking on a fictional character and he was the only participant that did not contribute valuable ideas to the discussion but rather blocked the discussion. This is evidence enough to realize that fictional characters do not work well for the purpose of finding solutions for real and personal problems.

The game was seen as obtrusive to the dinner. People were used to talking about personal topics during dinner, it was one of the times that everyone came together to enjoy each others company. The game should thus be more subtle and free, leaving the option to people to keep on discussing the topic if they wanted to, but not forcing them to.

Challenges

The Challenges were not realistic and parts of the group stated they would not want to take on a challenge. Others thought it was a nice idea to take challenges home and actually get active after playing the dinner game.

Hidden Agendas

The hidden agendas were seen as fun. If formulated in a different way they could be used to guide the conversation in a subtle way, not forcing participants to talk about food waste but triggering conversation.

Due to shortage of time the characters and hidden agendas were not developed well. The discussion was steered towards mainly political issues and the more personal problems of food waste were not addressed.

Passport of Fictive Character

The questions in the booklets were not designed very well and were difficult to understand for the participants. Some participants did not understand the connection between a passport and food waste. The idea of making a motbok (a book used in Scandinavia to control the purchase of alcohol) was introduced.

Recipe

When the host had to put the broccoli stem in the soup she had an inner conflict. She normally bought frozen broccoli because she did not know what to do with the broccoli stem. This kind of confrontation with the problems of food waste is believed to be valuable.

Activity of Turning the Plate Around/ Pieces in the Food as Game
The activities planned during the dinner were too complicated and too
too many to be easily lead by another person than myself. The explanatory
texts had to be read out up to four times before everyone at the table
understood what they had to do. The host had a lot of work to do. The
cooking and leading of the game took a lot of effort and energy. This
unequal distribution within the group was strange and it was too much
to ask from the host.

The discussion within a group that is close is seen as valuable. If the
amount of activities would be made more simple to understand and
PRUHÀJXUHDQG
have an activity during dinner.

The group thought that the mandatory activities in the game should
not take up more than one quarter of the time spend on the dinner. Activities like the hidden agendas, a recipe that uses unusual
ingredients and challenges that would be presented at the dinner and
then taken home were seen as possibly more subtle and less obtrusive
and thus more easy to include in a dinner activity.

The setting of the dinner game is shown in figure 27 and 28.
The Blog

Through the blog the following idea was tested:

- challenges

The blog is the medium with the least amount of control by me. Successful online communities like “windowfarms” (http://www.windowfarms.org/) show how a great feeling of belonging can be achieved via a website. By testing the blog an understanding of how people could become active and co-create a blog together was aspired. The example of “windowfarms” was a big inspiration while developing the ideas for the blog. (*Figure 29 shows the proceeding of taking on a challenge.*)

It was essential that the message of the blog was clear and easy to understand. The choice activity for the blog were the challenges as they were viewed as having the strongest message when standing on their own without further explanation.

Besides the challenges, hidden agendas and recipe were the other two activities that were seen to have potential in being done in a group without guidance by the researcher. It was believed that the challenges were easier to communicate via a blog and that people would understand quicker what was expected of them.

The challenges introduce demanding assignments into peoples everyday life that force them to do things differently and by doing so makes them reflect and experiment. The manner in which the challenges were displayed on the blog can be seen in *appendix 8*. All ten challenges can be viewed in *appendix 9*. The blog has an introduction text that explains the problem of food waste. It is explained that building up skills and knowledge about food can help to save food from the bin. The visual of the three steps “accept a challenge”, “share your experience” and “challenge others” should make the purpose of the blog clear in one glance. People should to take on challenges, and motivate others to take on challenges as well (*figure 30*).

The three different skill domains are introduced and their role in reducing food waste is explained in more detail on separate pages.

It is possible to follow your interested in improving your cooking for example. When the cook icon is selected only the challenges that will help you improve your cooking skills will be displayed. Besides that each challenge is marked with the icon of the skill that it is believed to train. The more difficult challenges display more icons. This could be
developed further so that people can actually collect icons by taking on and completing challenges.

The third step described in the visual is “challenge others”. Once a person has done a challenge they might formulate a challenge of their own. If that happens the person has become active in questioning his own and other people’s behaviour.

Test

The blog was spread via facebook to my friends. First reactions were noted. Some people were interviewed.
Conclusions

Challenges

The overall reactions to the blog were positive. On facebook some people that were not personally adressed reacted positive as well. Not one person got the idea to actually do a challenge though.

Silje: “What is challenging about them is to actually do them. I would probably think, I should try that some time and then never really do it. But even by reading the blog you get more aware of food waste, I am thinking: that is right I should remember eating this or that, lying in my fridge.”

When developing the blog further the most important problem to solve is how to activate people. After all the basic idea is for people to co-create a platform.

If no one is active on the blog there is no feeling of community. It is believed that once people become active and start posting the community feeling will become bigger. Photos and comments of others doing the challenges are believed to motivate people to take on a challenge as well.

Some of the more critical readers were demanding trustworthy references for the information posted on the blog.

The challenges take a lot of personal investment, mainly time, effort, energy etcetera. Showing different levels of difficulty of challenges, how long each challenge takes and what the person gains from doing a challenge could make it easier for people to take on a challenge.

The Blog as a Medium

The blog is easy to spread around to many people. The blog itself does not move people to become active. Without the participation of people the community blog does not work. It is believed that if more people start to participate it will motivate others to participate as well.

The challenges get positive feedback. People love reading through them. They do however not activate people yet. An important realization is that the challenges are believed to make people reflect only by reading them. This means they have an effect even if people remain passive.

The blog has yet to be developed to become a community blog.
Arguments for the Choice of Activity and Setting

The following section will discuss why the challenges were chosen above the other activities and through which medium they will be presented to the user. The way in which the chosen ideas should be developed further to meet the product vision will also be examined.

However successful, the fictive scenario was performed during the workshop, it proved to be very difficult to ensure a positive outcome when not guided by the researcher personally. People reacted differently to the role playing assignment and it was therefore necessary to have a skilled game leader to make sure everyone in the group would take part in the activity.

Following the workshop and the dinner game people were aware of the food waste problem and were eager to make a change. The challenges presented people with a way to get active; this was well received. The challenges have the clearest message of all the activities. Additionally, they have the biggest impact in daily routines as they specifically ask the participants to change some of their ways of behaving.

The motbok was not used by those who received one. Filling in a motbok is an individualistic activity which does not fit with the design brief.

| Future Scenario | has potential to lead to fruitful discussion | demands a skillful guide to secure positive outcome |
| Challenges | implements action in reality, satisfying to get suggestion what one can do | still unclear how to activate people to take on challenges |
| Motbok | people happy about receiving personalized gift | too individualistic, are forgotten and lost easily |
| Hidden Agendas | guides discussion in a non obtrusive way could be changed into challenge | challenging to get people to do this without personal introduction |
| Recipe | triggers reflection in non obtrusive, simple way could become a challenge | challenging to get people to do this without personal introduction |
| Medals | motivates people | does not trigger deeper reflection |
The hidden agendas could be integrated in people’s dinners and could trigger conversation in a subtle way and could be spread in a similar way as the challenges were on the blog. The challenges were chosen above the hidden agendas because it was believed that they had a clearer message and were easier for people to implement.

The recipe that used unusual ingredients like broccoli stem and the activities during the dinner such as turning around your plate were effective and appreciated by participants. They were simple, non-obtrusive and powerful. Just like the hidden agendas, the challenges were chosen above the recipe.

The medals did not trigger self reflection or conversation about food waste. They were seen as a reward and had the effect of motivating people to engage in the other activities. On their own they do not have enough effect.

The positive feedback on the challenges by the people reading the blog led to the decision to further develop the challenges. The challenges have a clear message that is quickly understood and sticks in people’s memories. They trigger reflection and thought about change even when only reading them. This makes it possible for people to play an active and passive role. The hidden agendas and the recipe could be listed as challenges on the blog.

When taking on a challenge people are forced, in a way, to behave differently. They cannot continue with some of their routines and consequently some of their other routines have to change. This leads to reflection and experimentation at the same time.

An aspect that makes the challenges interesting for behaviour changing design research is that they are carried out over an extended period of time and in the every day context of people’s lives.

The setting of the dinner game had some nice characteristics. The purpose of the dinner was known to everyone and the dinner offered a good frame for discussing the food waste problem. Becoming active as a group is much easier and nicer when you are in one place. The dinner game setting immediately creates a sense of community and the desired team spirit. It is important, however, to keep the activity flexible so that people get the chance to decide how much time they want to spend talking about food waste.

The blog is now merely a platform where people can post their ideas. A community feeling does not exist and people do not get inspired to become active. The blog needs to be promoted in a way that inspires
people to take on challenges. Once several people have completed challenges and posted about their experiences a community feeling may arise and the blog could inspire others to take on challenges. If a person is reading about someone else who is doing the same challenge, he can relate to this person and they can exchange stories. The posting of comments could be stimulated via email.

The chosen form of the product is a combination of the dinner game and the blog. Through the blog people will be stimulated to meet with their friends and perform challenges together resulting in the immediate introduction of the team spirit element.

**Product Vision**

The product should inspire people to find solutions for their individual food waste problem. By stimulating and guiding people through a reflection on their everyday routine and experimenting with new practices people will be offered a deep insights that will facilitate the adoption of less wasteful practices. A game setting and team spirit will facilitate the process.

In the following phase the blog, The Food Challenge, will be developed further. The blog should stimulate people to meet with their friends or family and attempt challenges together in a group context.

In order to reach the product vision several aspects of The Food Challenge had to be improved.

**Activating people in order to create community feeling**

The main problem of the blog was that people were not active on the blog and because of that a real community feeling did not exist. In the following section of the concept development people were asked to take on challenges and post their experiences on the blog. It was believed that if posts appeared the blog would start to come alive and more people would join in to do challenges.

**Reflection on routines and experimenting with new ways of doing**

The effect of the challenges had to be tested in order to determine the extent to which reflection and experimenting would take place.
Testing and Developing The Food Challenge

1st Group

The 1st group was asked to take on a challenge of their choice. In order to facilitate a community feeling on the blog, the group was asked to post comments concerning the challenge. It was assumed that this would make the blog more lively and would encourage other people outside the group to take on challenges. The second goal of this test was to find out what kind of effect doing a challenge would have on the participant’s insight into their daily food routines and if it could lead to a change in practice.

Two lunches were shared with participants. During the first lunch the participant were introduced to the challenges and asked to select one to attempt together. During the second lunch the experiences participants had while doing the challenges were discussed.

The group consisted of seven master students from the Interactive Institute. During the first lunch a power point presentation was given that explained why food waste is a problem and how learning more about food can help reduce food waste. The researcher introduced the three different skill groups and explained that by taking on a challenge they could learn more about food. The challenges were printed and distributed to the participants who were then asked to select a challenge they would like to attempt.

The challenges were made more tangible as they were printed (appendix 15). Refrigerator magnets that displayed the different logo’s for the different skill groups were handed out to those who took on challenges as a small gift so that the challenges could be posted on the refrigerator where they would serve as a visible reminder.

In the week between the two lunch meetings the participants were asked via e-mail to post their experiences and ideas on the blog. This was only done with the 7 people that were present during the lunch.

The challenges were also spread among 13 additional people who had not participated in the “lunch” group. They did not get a power point presentation but a more informal introduction to the challenges. They did not receive e-mails to remind them to post their experiences.
1st group - Results and Conclusions

Communication on the Blog

21 people agreed to take on challenges and were enthusiastic at the moment they took on the challenge; 10 posted comments. All the comments can be viewed at http://thefoodchallenge.tumblr.com/.

Activating the blog and creating a sense of community failed. There was no snowball effect that made other people take on challenges. Few comments were posted and people often had to be reminded several times to add their comment to the blog. The comments were sometimes not interesting to read and a conversation among different food challengers on the blog did not occur. There was only one comment on another persons post. (*Examples of posts can be found in figure 33.*)

The goal was to have people post their experiences throughout the challenge in order to strengthen the feeling of commitment. This did not happen. However, many participants said they talked to many of their friends about the challenges and that people were generally interested and wanted to learn more about The Food Challenge.

The following quote from Javier shows that he wanted to share his experiences. Javier did not post the pictures on the blog he took from his food. He also did not post any comments. Instead he decided to tell his girlfriend about it. It would be supportive to the community feeling if messages like this one would be posted. What is of interest is how people could be motivated to share those exact situations.

**The Survival Challenge**

“Sometimes I stood in the kitchen for a really long time thinking about what I could make. And then I was really proud when I managed to make something good. I even took pictures, I know it is nerdy. And I told my girlfriend about it.”

Following it will be discussed what is believed to have kept the community blog from coming alive and inspiring to others. First of all the template of the blog stood in the way of creating a community. In order to view comments the titles of the challenges had to be clicked and it was not obvious that the titles were links. Even if many people were active on The Food Challenge blog it was not visible to site visitors as the comments were not immediately visible.
People had to remember the Internet address of the blog and had to type it in themselves in order to access the blog. It should be made as easy as possible to access the blog and people should be reminded of the blog as well. Facebook, twitter and status update e-mails can make it easier for people to keep participating in the blog.

Participants reported that the blog felt impersonal. Everyone can visit the blog and read their posts. This made people hesitate to post. It felt strange for people to post personal information. An online forum should be created that enables people to see the other members or only share information with their friends.

Posting on the blog has to be made as simple as possible and there should be updates when new comments are posted. The blog should emphasize participation and should put people’s comments and photos on centre stage.

It is nice to add a tangible element and give people small objects that remind them of the challenge in the time when they are actually dealing with food. Refrigerator magnets, coins for the grocery cart or grocery bags are suitable for this purpose. They are central objects in food practices, are inexpensive to produce and could help promote The Food Challenge.

Some participants promoted the food challenge on facebook. While this did not have the effect that more people started taking part in the blog community, it does show that facebook could be used as a tool to promote the food challenge (figure 32).
Comments Survival Challenge

Showing 6 comments

Challenge accepted! I just discovered that I have some frozen stuff that I never care about plus lentils, chickpeas, rice, tuna, olives and cheese. It is going to be a good thing to use what I already have and not accumulate more

3 weeks ago  1 Like  Like  Reply

catalanska

The mango challenge— we got around 25kgs of mangoes on the market for cheap because they were almost due... so we invited a lot of people, and started making mango juice, mango salad, mango cake, frozen mango... very happy day! besides, we made african chapatis with the leftovers in the house, and our dumpster divers contributed a lot to the dinner!

3 weeks ago  1 Like  Like  Reply

laura

well well well, I choose this one! well I checked fridge, I probably gonna survive :) I have rice, chicken, meet! I have plan to make food for 4 days, lets see what will happen in fifth day !!

2 weeks ago  Like  Reply

Morvarid Kashaniapur

As a result of survival challenge, I waste less food and save more money. one of my biggest problem was lack of organization in my food program, I was out of breakfast from second day, but I had more stuff for main dish of day. This challenge help me to face with this fact and organize my shopping program.I would like to use this challenge as sort of organization of my daily shopping program and controlling food waste everyday...

1 week ago  in reply to Morvarid Kashaniapur  Like  Reply

Morvarid Kashaniapur

allright we're going to survive! Our focus is going to be on not buying any new food, so bringing about new ways of getting food and using the things that have been in the house for a long time. Lentils, for instance! We have lettuce, rucola, rubarb, spinach, carrots, tomatoes, potatoes and courgettes in the garden but unfortunately we can only harvest the first two now. Quite a challenge!

3 weeks ago  Like  Reply

laura

PaulineSpengemann

Wow 25 kg, amazing! how did you make the juice? What is african chapatis? Do you have a recipe?

3 weeks ago  in reply to laura  Like  Reply

laura

Subscribe by email  RSS
Effect of Challenges

Overall it is believed that the challenges are a successful way of getting people to think about their routines concerning food and getting them to try out new things. *(A complete list of all 10 challenges can be found in appendix 9)*

People’s reactions to the challenges are very positive. They find them to be original and funny and when asked to take on a challenge people readily take them on. The challenges trigger people’s interest and often become the conversation topic when introduced in a group. In that sense they contribute to the exchange of knowledge and ideas about food.

In the following section the insights into the effects of the challenges taken will be discussed. Potential personal gain of a challenge should be presented alongside the challenge. If people know that they will spend less money or learn to become better cooks they might be more motivated to do challenges. The benefits for each challenge are formulated in the following section.

**The Survival Challenge**

The survival challenge is the most frequently chosen challenge. The challenge asks people to not consume. This gives people a better understanding of their consumption pattern, a valuable insight when trying to reduce food waste.

People that did the challenge realized that going to the grocery store is a routine that is not necessarily connected to the need for food. People have developed a pattern of going to the store at set times per week. The challenge made them realize what food they really need.

People put thought into how to combine the ingredients left in their home into tasty dishes and when they succeeded they felt proud. New kinds of food were tasted and dishes, that were not prepared often because they were time consuming, were created.

**Personal gain:** Save the money of one week’s shopping and clean out your kitchen from all the food you have stocked up over time.

**Three is a magic number**

The description of this challenge is not clear to everyone. Some think they should buy all the ingredients listed in brackets and plan three meals from those ingredients. That version of the challenge makes people learn more about planning ahead.
The danger of this challenge is that people end up with food that they do not like and end up throwing away. It is part of the challenge to prepare food one does not like or know in a tasty way. The insight gained, "I feel like. I decide spontaneously what to eat and do not eat what I don't feel like."

Many people like this challenge because they think it is exciting and fun. The challenge resulted in an interesting post on the blog. It offers the opportunity to get to know food one never even knew existed. By The challenge asked to buy fresh ingredients but Elena bought frozen food. She did not have to treat the food in order to preserve it and did not experiment with different ways of preserving food as was the goal of the challenge. She said it was difficult for her to plan one month in advance and that she failed and ate some of the ingredients she planned to keep for the meal a month later.

**Personal gain:** Learn the lost art of preserving food. Walk in the footsteps of your granny and find out how preserving can make food taste great. Besides marmalade, can you think of other ways to preserve food?

**The Survival Challenge**

"I realized that my refrigerator is usually quite empty as I have ingredients like pasta and tomato sauce that stay good for long and I buy fresh ingredients when I need them and use them right away." Paolo

**Super Market Spies**

"I realized that I always eat what I feel like. I decide spontaneously what to eat and do not eat what I don’t feel like."

Elena

"I buy fresh ingredients when I need them and use them right away." Paolo

"Besides marmalade, can you think of other ways to preserve food?"
DIY take away food

“I have a lot of food at home that is not perishable and can be used in various dishes. I think that is because the most important aspect of a meal for me is that it makes me full. I do not care so much about taste. So I often make simple dishes.”

Marcus

Witnessing someone else’s consumption additional insight into one’s personal consumption can be gained. The person doing this challenge got inspired and decided to make the challenge more interesting by going to an Asian supermarket.

**Personal gain:** Get to know food you did not know existed. Maybe you find your new favourite dish.

**DIY Fast Food**

Marcus collected several different recipes and was enthusiastic about trying them out. It was interesting that the person doing this challenge also got insights into his usual consumption pattern. It was expected that the challenge would only lead to learning how to cook. Marcus never found the time to actually prepare those dishes. Setting the goal to do so, however, made him think about his food practices.

Marcus posted links to recipes which can be interesting to follow. Preparing three dishes is quite a lot. This challenge could be changed to ask to only prepare one dish.

**Personal gain:** Find out what is in the meals you eat every week and learn new and tasty recipes.

**Edgar the Tomato**

Many people find this challenge very funny and like to talk about it. The challenge inspired people to test out different areas to keep Edgar in. People did not, however, preserve Edgar. They kept one in the office, one in the refrigerator and one in the kitchen and compared what worked best. The danger is that the tomato is good for two weeks and then gets mouldy on the last day.

Testing out preservation methods should be stimulated. One could
include a time frame tomatoes usually stay good, in order to communicate that action has to be taken in order to keep the tomato for two weeks.
No comments were posted on the blog.

**Personal gain**: Build up a close-and-personal relationship with a tomato. Who said that food should not have a face?

**Story Telling**

The comment posted by the person doing the story telling challenge was interesting and nice to read. The person reported that he learned more about what different areas of the world his food came from. He did not, however, gain much insight into his usual consumption pattern.

**Personal gain: Publish your first short story!**

The challenges GO Japanese, 2-A-Day, Expedition Kitchen, and A Friendly Swap were not chosen by anyone in group 1. The challenges were chosen by some of the 13 additional people asked to follow challenges. No feedback was received from those 13 people. Although some challenges were more popular than others all the challenges were found interesting by someone.

In the group that was tested different people showed different levels of activity and not everyone actually did a challenge. It was mentioned earlier in the report that people were triggered to reflect on their behaviour simply by reading the challenges. It should be taken into consideration that the passive reader of the blog is also effected by it. The challenge 2-A-Day asks people to only buy two items of food each day. Although this can seem boring and people do not want to do the challenge, it can make people think of consumption and of how much they buy everyday. In the final product it is desirable to facilitate all the different levels of participation while always aiming to make people more active.

The survival challenge asks people to not consume. Usually people are always asked to consume. People are not used to hear that they should not consume and that leads to interesting realizations. The challenges have the goal to make people question their current behaviour. By looking for these kinds of contradictions the challenges can be made increasingly interesting.
The test of the 1st group pointed out that the challenges were successful but that the blog did not achieve to facilitate a group feeling. The group feeling was believed to be essential in motivating people to attempt challenges. That is why the focus of the test with the second group was on the communication within the group while doing a challenge.

The goal was to find out how to facilitate the sharing of experiences within a group and to determine what effect the sharing had on the experience of doing the challenge. It was of interest to see if the team spirit would lead to the desired motivating effect. The kind of information people want to share and who they want to share it with was of interest.

Some insights gained in the previous test were implemented with the second group. The blog was not used during this test. Instead, the participants were asked to create a Facebook group. A Facebook group offers the feeling of sharing information only with your close friends. People of the age of the participants use Facebook several times a day which makes a Facebook group easily accessible. Additionally, Facebook sends e-mails that inform people when a new message is posted in the group. The second group was given printed versions of the challenges and magnets as tangible objects to remind people of...
The second group consisted of seven friends. One dinner was held in order to introduce the group to the challenges. The same power point presentation was given as to the first group and the challenges were printed out and distributed. The second group was asked to pick one good challenge, one bad challenge and one that they would choose for the person sitting to their left. This activity was done in order to trigger a preliminary discussion within the group about the challenges. After explaining their choice, the group was asked to pick one challenge to do together. These exercises were used to get an idea of what people thought about the various challenges. The discussion about what challenge to pick would show arguments for and against doing the different challenges.

The group was asked to each bring two old food items to the dinner they would like to get rid of. During the dinner the group was asked to “adopt” the food of someone else.

Each person was given a package with two stamped postcards and three refrigerator magnets inside (figure 34). The participants were asked to adress the postcards to themselves and write a question they would want one of their friends to answer while doing the chal-
They were then asked to give the postcard to that person. As the focus of this test was on communication the postcards were used to introduce another communication tool besides the cell phone and the Internet.

The group was asked to use one of the postcards to ask the person that “adopted” their food about what happened to their food. This was done to stress the importance of actually eating the “adopted” food and to make it easier for people to come up with questions to ask on their postcards.

The facebook group was created together with the group. The group could decide on the name and if they wanted to have an open group that was visible to others or a closed one. Finally the group was asked to come up with topics they wanted to discuss while doing the challenge.

The setting of the dinner can be seen on figure 35 and 36.
The assignments of choosing a challenge for someone else in the group and to choose a challenge to do together brought about a nice discussion in the group. The group was finding out about the potential the different challenges had together and when choosing a challenge compromises had to be found. The participants also ended up modifying the challenge to better fit their group situation. The survival challenge they chose asks people not to buy any food for five days. Some people were unable to do the challenge for five days so the group decided to work together. As they were seven people and the challenge took 5 days they had to do the challenge for 35 days as a group. This meant that it would be alright for a person to drop out one day early as long as someone else was willing to make up the difference. Another aspect that the group decided on together was that they could eat lunch at work. The group believed that the decision to work together had an effect on the tone of the group interaction on the facebook group. They felt that had there been a competition between the members of the group there would have been more teasing in the facebook group. Now there was a feeling to be in it together and comments were encouraging. The group liked this.

Making the facebook group together was an activity that worked out very well. The discussion about what name the group should have took a long time but was a lot of fun. The result: “Foodfreaks of Nature
The topics were introduced in order to offer people ideas about what they could post about. Most comments that were posted on the wall were not under a specific topic. The participants did not need help realizing what they could share and therefore the act of creating topics will be removed in the final concept.

It was initially planned to send e-mails that would stimulate people to participate in the discussion online. This did not have to be done, however, as the discussion was very lively and took its own path without any intervention.

Three participants went on with the challenge much longer than the challenge asked them to. The challenge asks the participants to not buy food for 5 days. Julia and Oskar did the challenge for 11 days and Erik even tried to continue the challenge when he went on vacation in San Francisco.

The tone of the quotes in the group showed a lot of motivation. Therese said, for example, that her mother threw out her old milk but that she would have used it. People encouraged each other and Erik said that the group was sparkling with creativity.

The comments on the facebook group were mainly about what kind of doing the Fridge’athon". It is believed that making the group together creates a sense of unity and team. The group joins together in their first common activity and everyone feels that they belong to the group.

One assignment given to the group while creating the facebook group was to think about topics they would want to discuss while doing the challenge. The group decided on the following topics:

- "do not try this at home" Under this heading people could warn others about difficult experiences they have had. No comments were posted on this topic throughout the challenge.
- "questions" This topic was introduced for general questions about the challenge. No comments were posted on this topic throughout the challenge.
- "cooking inspiration" The topic was about general advise and ideas for cooking. There was one comment under the topic.
- "starve-o-meter" This topic was so that people could keep each other updated about their personal state. There was one comment under this topic.
- "expiry date" The topic was to signalise when people would stop participating in the challenge. There were 4 comments.

Food people were preparing and a few comments were general tips
about what to do. As was known from the previous group, people gain insights into their consumption behaviour but they did not post any of them. On the following pages the comments that most characterize the type of interaction of the group are listed.

Quotes from the facebook Group:

- **Katarina**
  
  “The adopted sour milk contributed to the holiday breakfast: scones, kiwi, boiled eggs, coffee and half a glass of orange juice.”

- **Julia**
  
  “Did R taste it? Wait - save it for the postcard .…”

- **Therese**
  
  “I made my lunch box; tuna fish with kesella, balsamic vinegar and pepper. Mixed bean salad with the last of my cucumber and tomato. Served with a slice of WASA. Otherwise, I have a lot of boiled eggs lately....Oh, and my mom visited and threw away the milk claiming it had gone sour. I would’ve used it!”
“Hi Guys! I expired a few hours ago I'm afraid. I felt that I had to have some fruit for tomorrow’s bus ride to Skavsta. Beats breakfast at McDonald's at four in the morning. The first one to bite the dust. See you soon!”

“Okay, now I'm going down to the store to treat myself with a reeeaally nice breakfast before sitting in a car for four hours and eating out the rest of the day. The Cederin-Söderling household drops the prestige and admits defeat.”

“We're all winners, Katmus! I'm very impressed by the sour cream.”

“One hour ago, the Henrikson Spada residence treated themselves with cloudy apple juice. Our cravings for vegetables, fruit and juice is taking over. We could have survived longer on our sausages but oh, they get quite boring after a while!”

“Dinner tonight was leftover polenta mixed with 3 eggs and fresh rosemary, then baked in the oven for about 40 minutes. Drizzled with a lot of olive oil and served with prosciutto, salad and red wine. Tasty!”

“Is that salad from B.F.C. (before food challenge), or did someone just expire? Very impressive, either way.”

“Nope, not from BFC. I'm trying to impose the food challenge here in SF whenever I can, stay tuned for updates.”

“Use an old sauce as a base for a new one, to avoid food waste AND to make the new sauce much tastier (especially tomato sauce). Yesterday, Monday's sauce remains teamed up with some new salmon and turned into a delicious Spaghetti al Salmone.”
“Starve-o-meter: 0. I hate (?) to brag, but we've got food for several weeks. This challenge will be piece of molded cake.”

“Henrikson-Spada still hanging in there for the team! I was just telling Oskar that now's when this gets interesting, because now's when we need to get inventive. No fruit or vegetables, no eggs, no tomato sauce left. It'll be dry food from now on.”

“Two great ingredients that really make this challenge a lot more enjoyable is;
1. Parmesan cheese
2. Salt peanuts”

“Thankfully, we've still got 1,5 Parmesan cheese left, and that will probably add at least 3 days to our challenge.”

“Dinner: Sourcream pancakes with onion, black trumpet mushrooms, mungbean sprouts and garlic mustard. Choice of beverage was homemade spruce shoot lemonade.”

“Dessert: Semolinapudding with homemade jam made from last summers raspberries.”

“You always win, Erik ...”
Conclusions of The Food Freaks

The test with the 2nd group was a great success. Participants were highly motivated and enjoyed the experience a lot. The next question was: How could a product or service facilitate other groups to have the same experience?

One aspect that was highly appreciated was the social aspect of participating in the challenge together in a group of friends. This means that people should be stimulated to do the challenges together in groups and should also be encouraged to meet in person to choose the challenge together.

It is desirable to let people create their own forum for doing the challenge where they can share their experiences privately amongst the group. It is believed that a smaller group creates a team spirit and has a motivating effect. This is in contrast to online forums where people exchange recipes. In those forums people feel a certain pressure to post interesting information. In order to maximize the effect of doing the challenge people should not feel shy to take part in the discussion online. Another aspect mentioned by the group is that they would not be interested to be kept updated of the experiences of a stranger. They could, however, imagine browsing around other groups if they had the time. For this reason the groups should be accessible for everyone.

The activities of choosing a challenge as a group and creating a Facebook group should be incorporated in The Food Challenge. They are a good starting point as they facilitate a first interaction as a group and have the result that the participants feel ownership of the platform, in this case the Facebook group.

Every member of the second group had an iPhones which offers the opportunity to access the Internet at all times and makes it easy to quickly snap a picture and post it online. It is believed that this was important in the second group’s success. People know immediately when someone else has posted a comment and can access it right away. iPhones and smart phones can be used to bridge the gap between the Internet platform of The Food Challenge and the food practices of people. This is believed to be essential for the success of The Food Challenge. As the challenges already require significant effort from the participants, all other activities should be as easy as possible. Communicating day-to-day events is easiest via a phone with a camera and Internet connection and therefore The Food Challenge should be developed for iPhones and smart phones.

The group said that they were used to sharing personal day-to-day events on the Internet with their friends and that they did not find it strange to post their food challenge experiences. The Food Challenge
A discussion in the group shows how different strategies are better suited to different households. Katarina thought that they should have more food in the house while Julia thought having less food in the house was better for reducing waste. Katarina and Rasmus had almost no food in the house while Julia and Oskar were used to stocking up on food yet both situations lead to food waste. Katarina and Rasmus buy items twice because they usually do not have food in the house and should target individuals that are open to this type of activity. This will most likely be a younger audience who is actively using facebook and twitter or is at least open to such services.

“But especially the time that you need for planning is the one you need to realize. It is not only shopping and cooking you need time for.”

During the dinner that was held after completion of the challenge the Food Freaks were each asked to read through all the comments that were posted one more time and to choose their favorite. Afterwards, a discussion was held about the experience of doing the challenge and the insights gained. The insights discussed show that the participants were already beginning to change their behaviour. For example, Hillevi said that she looked at the expiration date in order to decide if she should use milk or yoghurt for her cereal.

“I thought that it is may be good to have some things in the freezer so that if you do not know if you have it at home you can just rely on at least having some basic things in the freezer. We buy what we need every day. It is not economical but good to reduce food waste. The only times we do throw away food is when I think we have no food at home and then we do.”

house was better for reducing waste. Katarina and Rasmus had almost no food in the house while Julia and Oskar were used to stocking up on food yet both situations lead to food waste. Katarina and Rasmus buy items twice because they usually do not have food in the house and
Julia and Oskar forget food they buy because they have so much. This discussion shows that in order to change behaviour people first have to understand their personal situation. When doing The Food Challenge

"I have some groceries that I buy quite seldom and that I now found in the back of the fridge. Like olives for example. And usually I never use them because I just buy new food and use that."

Oskar

As previously mentioned, the group was asked to look back at all the comments and choose their favorite quote from the facebook group. It would be desirable to let people create a summary of the challenge they did in order to help people realize what they achieved by becoming active.

"The quote about your dish with the brussel sprouts was inspiring because you could tell that you had to be inventive with the things you had in the fridge."

Julia

people’s insights are most valuable for themselves and they cannot simply be published for others to follow.

During the last dinner there was room for reflection on the experience of doing the challenge. This is seen as important. The food challenge should incorporate the step of reflection and possibly stimulate a meeting with the group.

The participants talked about the food challenge with their colleagues and friends which leads to the assumption that there is a strong opportunity to promote The Food Challenge through active members. The group liked the postcards, and in addition to the refrigerator magnets and grocery bags, they could be incorporated as a means of promotion.
The skill domains food management, storage knowledge and the art of cooking were believed to help people to better understand which different activities and skills were useful to reduce food waste. They were used on the blog to help people find what interested them but the connection to skill groups was not completely clear. For this reason the skill groups will not be mentioned in the final concept.

”I have come up with an idea post food challenge. I only eat sour cream with tortillas so I came up with a good idea. We also use it when we make dip. So the plan is to combine tortilla night with chips night.”

”This morning I used milk instead of yoghurt in my musli because the expiration date was closer. I sometimes did that before but now I do it more often after I did the challenge.”

”I am a bit afraid of old food, and it looked funky when we put it in the dough. I didn’t get ill and it tasted nice. And i made the scones again this weekend but then with sour milk.”
The following list of recommendations was used while developing the service website The Food Challenge. They stem from the conclusions that were drawn from the Food Challenge tests and were implemented in the final concept of The Food Challenge.

- The website promotes a group activity: to meet with friends in person and choose a challenge to do together.
- People can create a separate platform on the website The Food Challenge where they can share their experiences only with their friends. Members of a group are notified about activities in this platform. Outsiders can visit the platform.
- Links to the website are made available via Facebook, Twitter and e-mail in order to make accessing the website and taking part in the discussion in the forum as easy as possible.
- The website puts the participants and their contribution centre stage.
- The website can be accessed via the iPhone and smartphones. The use of iPhone and smartphone is promoted.
- People are encouraged to participate in the discussion online throughout the challenge via e-mail and messages.
- New challenges are added regularly so that people can try several challenges. Participants are encouraged to propose new challenges.
Final Concept

The Service Blueprint of The Food Challenge
Choosing a Challenge on The Food Challenge
Creating a Group on The Food Challenge
The Business Model Canvas
Promotion of The Food Challenge
The service blueprint of The Food Challenge shows the different steps a user goes through. First he gets aware of the service, after that he joins the service and as a final step he will advocate it to his social surrounding. The customer journey shows the user scenario, it shows how a user gets aware, joins and advocates The Food Challenge. The front-of-stage shows the screens that the user interacts with and the back-of-stage shows what actions are neede by the people maintaining the service in order to keep it running. In the following section the service blueprint will be explained in more detail. Recommendations on how to go about the further development of the service are included.

The Food Challenge is a website. The website has to be readable on an iphone and smart phone but can also be accessed via the computer.

**Awareness**

The Food Challenge should target people that are either already actively networking with their friends via the Internet or are open to such activity. That is why channels like facebook and twitter should be used to make people aware of The Food Challenge. The website can be linked to facebook and can use functionalities of facebook for promotion. During the tests The Food Challenge frequently became conversation topic. Word of mouth is another way of getting people aware of the service.

The introduction on the first page of The Food Challenge is short, clear and should motivate people to read more. The three steps “invite friends”, “choose challenge” and “create group” are explained. These are the steps promoted to take when doing a challenge. There is the option to dig deeper and read more about why food waste is a problem. Three links direct people to the option to invite friends, browse through the challenges and look at the groups that are currently doing challenges.

The archive is a collection of interesting quotes from people who did a challenge before.

**Recommendations for future development:**

Earlier the possibility to include promotion material like magnets or post cards was discussed. These materials should be developed alongside the promotion campaign.

During the testing of The Food Challenge a personal introduction was
given. The introduction for the website should be developed in order to get closer to the effect the personal introduction had during the testing.

People usually get inspired when reading the challenges themselves. It would be desirable to direct people towards the challenges link and make sure they read them.

**Join**

The first step of taking on a challenge is to invite friends to do the challenge with. An e-mail format is available on the website. The e-mail has the default setting to invite 10 friends. Less invitations can be send. It is believed that a group of 5 to 8 people is good for doing the challenge together.

The e-mail includes an introduction to motivate people. Place, time, date and activity of the meeting can be chosen and a personal message can be added.

When coming together with the group people are asked to use an application available on the website to choose a challenge together. The application is used on the Iphone. People can sit around the table and the application stimulates a discussion about the challenges. In this application the same assignments as given to the second test group, to choose a challenge for another person in the group and to choose a challenge as a group, are given. (*The choose challenge application can be viewed in figure 37.*)

Once the group has chosen a challenge they can create their group on The Food Challenge. This has to be done on one Iphone. Creating the group means to add the names of members, their picture and to come up with a group name. The photos can be decorated with moustaches and cooking pans and strainers as hats. It is an option to use this foto as a profile foto on facebook in order to promote The Food Challenge.

Both group activities are meant to be fun and to give the group the feeling that they are working together and that their group on The Food Challenge is their space where they can do the challenge as they wish. (*The create a group application can be viewed in figure 38.*)

Members of the freshly created group receive a feedback e-mail that encourages them to do the challenge and offers options to share the fact that they took on a challenge on facebook. In order to motivate active participation on the group forum a motivating automatic message is send if there is no activity in the group within 24 hours. All the
groups are listed in chronological order under the group tap and comments, photos, videos and voicemails can be posted. A notification e-mail is send with each new post that entails an embedded link directly to the group. There are options to comment on other people’s posts.

As a reflective moment people get to choose their favorite quote of the group once the challenge is over. A “hall of fame” of the favorite quotes will be created. Just like in the test with the 2nd group this gives people the opportunity to look back on the outcome of their challenge.

Automatic e-mails have to be send to participants at several moments. These moments are after a group is created, when there was no activity in the group for 24 hours, when a comment was posted in the group and when the challenge was completed. Besides that the website has to be updated. New challenges have to be posted and the archive has to be maintained.

**Recommendations for future development:**

How to motivate people to meet so that they can choose a challenge and create a group still needs to be worked on. One possible idea is to improve the invitation people send to their friends. If the invitation would be exceptional or funny it could lead people to want to share it with their friends. Making people understand that doing a challenge with your friends is much nicer than on your own by showing experiences of previous groups is another possible way. It has to be tested if people need to be motivated more and how people should be motivated. It would be desirable to also include an activity that helps people reflect after finishing the challenge.

**Advocate**

After finishing a challenge people can advocate the fact that they successfully completed a challenge on facebook and twitter. Besides that the website offers the opportunity to tell friends about the website.

After doing one challenge another challenge can be taken on and people can visit the archive for inspiration. People can also come up with challenges on their own and send their ideas to The Food Challenge to get them published on the site.

**Recommendations for future development:**

How the archive should be given form still needs to be determined. Another aspect that is not yet worked out is how it is for people to do
another challenge. The test group said they would like to do another
class challenge. It is possible to give groups points for each challenge they
do or include different levels. It should feel to the group like they are progress.
service blueprint of The Food Challenge

**customer journey**

- hear about The Food Challenge from someone
- read introduction to The Food Challenge
- get intrigued, read on click to the challenges

**line of interaction**

- read challenges
- browse through groups and archive
- decide to do challenge

**line of visibility**

- select invite friends
- personalize message
- send invitation

**back-of-stage interactions**

- meet friends
- select choose challenge
- agree on a challenge to do together
service blueprint of The Food Challenge

customer journey

select **create group**
enter e-mail, name and picture of members
decide on team name

e-mail with positive feedback for joining challenge/ option to publish on facebook

24 hours after creating group e-mail with link to group where photo and text can be posted

post by clicking **groups**
-> **team name**
other group members notified via e-mail

notification of a new post in group with link read post and comment

front-of-stage interactions

automatically e-mail (positive feedback)
embed option to link events on The Food Challenge website to facebook

automatically e-mail (motivating message and link to the group) distribution

back-of-stage interactions

embed option to link events on The Food Challenge website to facebook
service blueprint of The Food Challenge

**customer journey**
- receive notification of completion challenge
- choose favorite post
- post reflection
- option to publish on facebook, tip to visit the archive and to do another challenge
- option to share the website of The Food Challenge with friends via e-mail

**line of interact on**
- e-mail with option to publish on facebook, choose other challenge and visit archive
- partly pre-written e-mail message people can send to their friends with links to the website and to the group

**front-of-stage interactions**
- automatic e-mail (motivating instructions, link to the group) distribution
- embed option to link events on The Food Challenge website to facebook
- e-mail format people can personalize

**back-of-stage interactions**
Choosing a Challenge

The first activity as a group is to choose a challenge together. As a first step people are asked to choose a challenge for the person to their left in order to get familiar with all the challenges. After that the group chooses a challenge together.
Creating a Group

Once the group has decided on a challenge they want to do together they get to create their own group. Each new member is asked to enter his name and e-mail address. As the next step a picture can be taken with the decoration offered by The Food Challenge. Once no more members have to be added the final step is to decide on a group name together.
Possible Partners
- Organizations dealing with food consumption that own people's trust and have valuable knowledge
- Governmental organizations
- NGOs

Key Activities
- Maintain website
- Organize archive
- Post new challenges

Key Resources
- Intellectual (understanding of what challenges have to be like in order to affect food practices)
- Create new challenges
- Stimulate/activate people
- Structure archive

Value Proposition
- Insights on individual food consumption behavior
- Inspiration, tips, and ideas on how to deal with food
- Fun activity with friends, dealing with a serious problem in a fun way
- Start discussion & spread awareness about food waste problem

The Food Challenge

Channels
- Iphones and smart phones make internet more prevalent in daily life
- Early majority - people not aware of food waste problem

Revenue Streams
- Data collection of ideas, tips, knowledge
- Collection of insights on people's food consumption
The business model canvas captures how The Food Challenge creates, delivers and captures value (figure 39).

**Customer Segments**

There are two different kinds of people that are targeted with the service. The first group, the serious food challengers, are active people who are aware of the food waste problem and are looking for assistance and ideas on how to reduce their food waste. They like to try out new, different things. These people are called innovators and early adopters and are adventurous, opinion leaders, respected and thoughtful.

The second group of people, called food challenge readers, are more passive. They like to read about the activities and experiences of the serious food challengers and get inspired by that. They might follow the lead of the more active group.

**Value Propositions**

Both groups, the serious food challengers and the food challenge readers, get more insight into their individual food consumption behaviour. When actually doing a challenge more insight is gained as routine behaviour is disrupted. Reading about new ideas and others people's insights can however also lead to self reflection which in turn can lead to gaining insight.

The food challenge offers ideas for fun activities with friends, it offers a way to deal with a serious issue in a light and fun way.

The participants of the food challenge co-create a collection of ideas, tips and insights that can serve as a source for those who are looking to make a change in their food practices.

The food challenge triggers discussion which makes people aware of the food waste problem and encourages the exchange of tips and knowledge about food.

**Channels**

Iphones and smart phones make Internet more prevalent in the daily life of people. Social networking sites like facebook and twitter introduce the trend to share normal every day events on the Internet. The Food Challenge aims to use this phenomenon in order to increase the team feeling; the feeling of community between food challengers. The Internet connects people at all times and makes it possible for people...
to be present and take part in every day activities.

The online community the food challenge, status updates on facebook and automatic e-mailing services will be used as a means to connect people with the online community.

**Customer Relationships**

The Food Challenge is meant as a platform for people to co-create a collection of new ideas and insights about food consumption behaviour. People are put in an active role and a community feeling is stimulated. The website facilitates co-creation and community feeling and stays on the background. The website only reaches out via motivating e-mails that are send in moments throughout the challenge when it is believed to be crucial to keep people motivated. The e-mails should feel personal.

The challenges have a direct impact on people’s every day life as they literally ask people to behave in certain ways. In order to make people open to this kind of thing they are formulated in a fun and inspiring way.

**Revenue Stream**

The revenue of the food challenge is the collection of tips, ideas and knowledge about food that is collected. When organizing the data and modelling it so that it is easily accessible to consumers it could be offered as a product.

Besides that the website offers insights into people’s food consumption.

Anyone interested in gaining more insight into food consumption behaviour can benefit from this collection.

**Key Resources**

The key resources needed are of intellectual character. In order to keep the food challenge running new challenges have to be created, material has to be designed that stimulates and activates people and the archive has to be structured and organized. For these activities a person is needed that has insight into the topic of changing routine behaviour.

Programmers that can build and update the website as well as graphic designers are needed as well.
**Key Activities**

The key activities are to maintain the website by posting new challenges, presenting new activating and stimulating material and organizing the archive.

**Key Partnerships**

Partnering up with organizations that are working in the field of food consumption is advisable. Organizations that exist for a longer period of time own people’s trust and that have valuable knowledge that could strengthen the service the food challenge offers. These organizations can be governmental organizations or NGO’s.

The organization could benefit from the food challenge as it offers them a unique channel to reach the people they want to reach and they get more insight into food consumption behaviour.

When working together with private companies it is advisable to control what the consumer data is used for. If the use is contradictory to the overall goal of the food challenge, namely to reduce unsustainable food consumption, it should be prohibited.
The Food Challenge can only be successful if a lot of people hear about it and take part in it. This is why the promotion of the food challenge is important. The people that did the food challenge during the test all talked with their friends, colleagues and family about the food challenge and it was reported that people were generally interested and wanted to know more. Additionally to the word of mouth promotion the following strategies can lead to the food challenge to become known to many people and stimulate getting active on the site.

**Promotion via facebook**

Facebook is a great way to spread something to as many people as possible. Once people start to share something with their friends and it catches on it will spread to many many more people. People can be proud to do the food challenge, they are getting active, doing something fun and different and are helping to reduce food waste. People should be able to “show off” on facebook with the fact that they are active on the food challenge. This could be done by offering the opportunity to publish on facebook when one takes on a challenge and when one is done with it. It can also be done by uploading the decorated picture of the food challenge as a profile picture. The foto is funny and triggers curiosity. People have to ask to know where a person got the picture. Conversation about the food challenge
is stimulated. The “like” function of facebook can be used on websites. People can click on the website that they like the site and that will show on facebook where people can click the link to look on the website and see if they like it.

**twitter**

Twitter could be used to mobilize a larger group of people to work together. A common goal with the request for people to join in reaching the goal should be published. It should be a goal specifically for twitter.

**e-mail promotion**

The food challenge can offer people the chance to send emails to their friends to tell them about the food challenge. People should not be pressured to do so but the option to share with friends should be included.

**Little Objects**

Magnets, post cards, coins for the grocery card and shopping bags can be produced in order to promote the food challenge. They are not expensive products and can catch people’s attention when they are shopping or cooking at a friends house.

People who are active on the food challenge can also use these to show that they belong to the group of food challengers. When seeing others in the store with a grocery bag from the food challenge they can feel a sense of belonging.
Reflection

Sustainable Behaviour Design

Throughout the project practice theory was used in order to better understand how changes in practices could be inflicted through design. Following is a reflection on the value of practice theory for the designer when designing for sustainable behaviour and the role of the designer when using practice theory.

In the field of design for sustainable behaviour, routine behaviour is in my opinion particularly interesting to work on for designers. Routine behavior is the kind of behaviour people do not reflect upon and whose effects they are not fully aware of. Assistance in getting more insight and ideas on how one could change, can be of value to the user. In many cases people would like to live sustainably but do not know what changes to make in their individual situation.

In my eyes designers should help people gain insight in their routine behaviour and help them to come up with ideas on how to change. I think that it is valuable to get people to become active and look for solutions on their own. This is in contrast with giving people a passive role and developing products that either only reduce the negative impact of a person’s behaviour or limit the person’s actions forcefully. In the case of food waste I do not believe that there is a solution the designer could present to the user. In my opinion this is the case for many activities people engage in every day. That is why I think designers can make a positive impact simply by offering people the idea that it is possible to change their behaviour and inspire and trigger them to do so. Different ideas on how to look on every day behaviour from a different angle and ideas for possible actions that can be taken, can make a difference.

Practice Theory

As practice theory takes routine behaviour as the basic unit of analysis it can be helpful in order to get a good understanding of what constitutes routines. The topic of analysis in this thesis was food practices. The way in which food practices are established is very complex. There are many different factors that influence the food practices of a person. Practice theory helped me to understand and organize this complex system.

Where people often try to simplify problems in order to find solutions for them, practice theory kept me from doing so. With problems as complex as the food waste problem one has to realize that there are no simple solutions. Realizing complexity as a given is helpful in having a realistic view on what design can offer and how it can make the most positive impact. If one simplifies the problem and comes up with solutions in the belief that the problem will be solved, the product is likely to not have such a big impact.
The social aspect

Practice theory stresses that practices become accepted when they are copied by people. One person or a group of people can be the seed for a change in behaviour at the moment where others accept their way of behaving and copy it. While they copy they might change and this is how a practice modifies over time. Throughout the thesis it was one major goal of all the product ideas I developed to include a group activity. Group dynamics are difficult to understand and it was the most complicated problem I had to solve throughout the development of The Food Challenge. Different topics require different kinds of group dynamics.

People and designer co-create

Changes in practices are often an interplay between many different factors in a persons surrounding. Products do have an influence on the behaviour of a person. They are however not the only influence. Many different variables, be it infrastructural or societal, define the practice. The designer can never predict or influence all these factors. I think that it is impossible for a designer to predict how the use of a product will be exactly. For the designer to inflict a precisely pre-defined way of behaving would not work and is not desirable. The designer in my eyes is not a genius who knows all the answers and can decide for a group of people how best to behave. The genius of the user has to be utilized. Finding a solution is in this case not the task of the designer. The designers should stimulate the users to co-create better and more sustainable ways of doing.

Inspiration

Practice theory shows that designers do not have the power to change the behavior of people. It shows that there are a lot of factors influencing behavior (material, image, skill). The factors included in the domain ‘material’ include products. They include the entire material world though. The one product that is made by a designer is a quite small factor in this. A designer can never predict how his design will change practices. He knows it will change something, to a certain extend he can predict this as well, but not entirely.

The idea that many factors influence why a practice is considered normal or why people adopt a certain practice, can be inspiring. It was refreshing to realize that there are more factors that can guide people towards living a more sustainable life. Often it is believed that in order to get people to behave more sustainably they have to be offered monetary gain, comfort, saving time or be entertained and motivated through a game. Practice theory understand that there is a much wider variety of reasons
why people choose to behave in a certain way. Sometimes it costs a lot of money or time, but people accept that, if they feel it is necessary. This point of view can lead to a wider spread of ideas.

**What can practice theory do for the designers?**

Practice theory was really valuable in helping me make the hunches I had more concrete. Often throughout the project I had a feeling or idea and then it helped to read a paper and get theoretical evidence for an idea that had already started to form in my head. The theoretical proof would not have been valuable for me had I not done research on my own. Only because I already had a good idea about the situation could I know in what way the theory was interesting. The theory made my ideas clearer, in a way structured them and helped me to follow through on them. One example is the one of cultivation and naturalization. The theory of Wilk made me understand the value of the challenges, that they offer in insight and made people experiment with new practices at the same time. It helped to pursue the idea and develop it further in a more successful way.

It is important to see the more the realistic view on how far the power of the designer reaches as inspiration and not as limitation. In The Food Challenge a big part of the outcome depended on the participants and their input. This means that I could not be certain about the outcome.

**What can the designer do for practice theory?**

It can be helpful to read some studies about what role products play in changing behaviour. These examples can however not be used in product design. To see how a product will actually change behaviour at the moment the designer is designing it, is impossible in my eyes.

Designers can however help understand how change comes about. They think about how things can be different, they strive for the new, the innovative. That is why the part of practice theory that helps understand how change can be brought about is most interesting for designers. This is also the topic where designers can add to the field of practice theory.

Designers have the imagination and creativity to think of possible change, how things could be different and how that can bring change. Designers could build on the existing research of how changes in practices occur and can gain new insights by testing different new ideas.
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List of References
List of References

Literature

Conny Bakker; Food Matters Preventing food losses in the kitchen; 2006

Juan deBorja, Lennke Kuijer, Walter A. Aprile; Designing for Sustainable Food Practices in the Home, Delft University of Technology; 2010

LNV Consumentenplatform Voedselverliezen, verspilde moeite? Consumen- tenpanels; 16 June 2006

Jack Ingram, Elizabeth Shove, and Matthew Watson, Products and Prac- tices: Selected Concepts from Science and Technology Studies and from Social Theories of Consumption and Practice, 2007

Oliver, Jamie, Cook with Jamie, my guide to making you a better cook, the Penguin group, 2006.

Klaas Jan Kramer; Food Matters On reducing energy use and greenhouse gas emission from household food consumption; 2000

Dan Lockton, David Harrison, Neville A. Stanton; Modelling the User, How design for sustainable behaviour can reveal different stakeholder perspectives on human nature; ERSCP-EMSU conference TU-Delft, 2010

Michael Pollan ; The Food Movement, Rising; The New York Review of

Books, May 20, 2010

Elizabeth Shove; Lancaster University; Dale Southerton University of Manchester; Defrosting the freezer: from novelty to convenience A Nar- rative of Normalization; 2000

Elizabeth Shove; Converging Conventions of Comfort, Cleanliness and Convenience; Journal of Consumption Policy; 2003

Alex Soojung-Kim Pang; Using Futures 2.0 to Manage Intractable Fu- tures”; year????

T. Tang, Department of Design and Technology, Loughborough University, UK/ T. A. Bhamra, Department of Design and Technology, Loughborough University, UK; Understanding Consumer Behaviour to Reduce Environ- mental Impacts through Sustainable Product Design; 2008

Monica Truninger, Cooking with Bimby in a moment of recruitment: Exploring conventions and practice perspectives, Journal of Consume Culture, 2011

Kirsten Gram-Hanssen, Understanding change and continuity in residen- tial energy consumption, Journal of Consume Culture, 2011
Websites

www.etenisomopteeten.nl
www.hollandsetapas.com
www.lovefoodhatewaste.com
www.voedingscentrum.nl
Appendix

1 Interview Questions Observational Research
1.1 Interview Questions During Observations
1.2 Interview Questions Cooking Expert

2 Results of Online Research
2.1 Storing Facts
2.1.1 The cupboard
2.1.2 The refrigerator
2.1.3 The freezer
2.1.4 The transport
2.1.5 Deciding if food is still good to eat
2.2 Managing Facts
2.2.1 Overview
2.2.2 Planning ahead
2.2.3 Voedingscentrum Table showing how long food stays good
2.3 Cooking Facts
2.3.1 Recipes

3 Results Observational Research
3.1 General Research Questions
3.2 Food Management
3.3 Storage Knowledge
3.4 The Art of Cooking

4 Brainstorm of Different Ideas for Activities

5 Workshop Proceedings

6 Material used for Workshop

7 Material used for Dinner Game

8 Material Used on the Blog

9 The Challenges
1. Interview Questions Observational Research

1.1 Interview Questions During Observations

**Personal data**

What is the name and the age of the participant?  
What different cultural influences did the participants have in their lives? How did these influence the way in which they dealt with food?  
In what different ways did they live? What was the best way to live for dealing with their food?  
When did they change practices?

**How do people store food?**

What do you know about how to optimally store food? How do you decide where you should store the food?  
Are there some reasons why certain ways of storing food do not work for you? Do you sometimes forget some food? Is there a spot where you find rotten food a lot?  
Where would you look to find ideas about how to best store food?  
How do you decide if food is bad and should be thrown away?

**How do people manage their food?**

Do you always do your shopping at the same store? Do you always walk the same aisles? Is there a structured pattern of how you do your shopping? Times in the day/week? When did you develop this?  
How do you make the decision to buy something?  
Do you think about what you have at home when you are in the store? Do you know what you have at home?  
Are there some food items that you always have in the house? Why?  
Do you keep emergency food that you can eat if you can not make it to the store? Do you ever buy food to make a nice meal from left over other food?
1.2 Interview Questions Cooking Expert

The goal of the interview is to find out how one could possibly learn to become a good cook.

Do you think you are a good cook?
What do you think is a good cook?
Looking around you and looking at how others prepare their meals. In what way do you prepare food differently?
Were you always interested in cooking well? When do you think this interest came about? When did you start to be a good cook?
Can you remember how you used to cook when you were a student or when you did not have children? In what way did you change and in what way do you still cook the same?
How do you usually prepare a meal? Do you follow recipes or do you invent your own recipes?
How do you know in advance if a combination of ingredients will be tasty?
Do you know any good cooks? What do you think makes them good cooks?
Would you say that you are creative with food? What do you need to know to be able to be creative with food?
Do you reuse left over meals and left over food? Do you have a certain way of dealing with left overs?
What has been a dish lately that you have been proud of cooking? What made you proud?
2 Results Online Research

What knowledge is there that can help you develop the three food skills?

Cooking knowledge can help a lot when trying to reduce food waste. Websites like www.lovefoodhatewaste.com and www.hollandsetapas.com present creative ways of making nice dishes from left over food. Tapas are served in small quantities and offer a way to use left overs, that are too little for a real meal. Hollandse Tapas offers creative ways of using up the rests of food people do not know how to use. Lovefoodhatewaste presents ideas on how to revive old food that is often thrown away because people do not like to eat it any more. Old milk is great for making scones and old bananas can be frozen and used at a later time for pen cake batter or to make banana bread.

Lovefoodhatewaste suggests to keep a stock of nonperishable food in the house that is easy to use when making dishes from left overs. Items like frozen pizza dough or soft tortillas can be used as bottoms or envelopes for left over meat or vegetables.

One tip presented to help people prepare the right quantities is to write down how much every member of the family ate for dinner for several days may be weeks. It is said to help people become better at estimating the correct quantities.

Some websites advise to keep a lists of all the food people have at home and of their use by dates. Besides keeping lists of refrigerator and freezer content restructuring the kitchen in order to be able to keep a better overview is advised.

www.etenisomopteeten.nl explains how to make a storage area for potatoes. They advise to take a bucket and put newspaper on the bottom of the bucket.

How are the different kinds of food stored optimally?

There are several guidelines that are reported by different government organizations online.

Different sources name different guidelines to store food. One example of such disagreement is that in Great Britain it is advised to keep bell pepper in a loosely tied plastic bag in the fridge whereas the site in the Netherlands states that bell peppers should not be kept in the fridge.

Different areas in the refrigerator have different temperatures and can better be used for different types of foods. The coolest area in the fridge is often above the vegetable trays. The temperature in the door fluctuates. It is advised to measure the temperature in the fridge and
keep an average temperature of 4 degrees Celsius.

Many sources state that fruit, especially tropical fruit, and fruit vegetables like egg plant, courgette, bell pepper, cucumber etcetera should not be stored in the refrigerator. The temperature is too low and damages them.

Potatoes should be kept in a dry and cold place. The refrigerator is too moist.

The freezer if used well can keep food good for longer. Food can be frozen up until its use by date and can stay good in the freezer for a longer time.
*More guidelines about optimal food storage can be found in appendix 5.*

**How are the different kinds of food transported optimally?**
When transporting fruits and vegetables it is important to not bruise them this is stated by www.lovefoodhatewaste.com. Bruised fruit and vegetable rots quicker.

It is advised to keep frozen or cooled product cooled during the transport from the store to the house. Each hour that milk is not cooled subtracts a day from the time it is good for consumption.
*More facts can be found in appendix 5.4.*

**How can you realize if food has gone unhealthy?/ What signs (looks, feel, smell) are there?**

Governmental organization, though stating that the use by date is only an indication for how long food can be eaten, state that when in doubt one should always throw away food to not risk sickness.

Non-governmental organizations, like www.etenisomopteeten.nl, advise to use senses like smelling, tasting and feeling in order to determine if food is still edible. They do however not give guidelines to what are signs that one could look for when checking food.

Some organization offer tables on their sites that show how long different kinds of food stays good. *The tables can be viewed in appendix 5.5.*
2.1 Storing Facts

2.1.1 The cupboard

“Zucchini, eggplant, cucumber, tomato, avocado and bell pepper should be kept outside of the fridge. The fridge is too cold for them and makes them rot quicker.”

“Potaotes should be kept dry, cool and dark. They are very sensitive for moisture. That is why the refrigerator is not a good place to keep them. Remove the plastic bag and use a bucket with newspaper on the ground. Good spots are basements, meter cupboards, the garage or a garden sheds.”

“Keep bread in an air tight container or bag in room temperature.”

“Green beans can get brown spots if you store them below 4 degrees Celsius.”

“When using only part of a bell pepper leave the stem and seeds on the part you keep for later. It will stay fresh longer that way.”

“Tropical fruits like bananas, pineapple, mango, mandarines, oranges, lemons, kiwis, pears and peaches are best kept in an open bowl or an open bag. The refrigerator is too this way they can cold for them and ripen. In an air tight plastic bag they will rot and get moldy. Once one fruit in the bowl rots it is better to remove it as quick as possible. It can effect the other fruits.”
2.1.2 The refrigerator

“Summer fruit like strawberries and other berries should be eaten right away. If you want to keep them keep them in the fridge in a paper bag.”

“All items in the fridge have to be wrapped air tight to not emit or take on any moisture or smells.”

“Remove perishable food products from the fridge when you go on vacation for several days. You can put them in the freezer.”

“Keep your fridge organized so that you can keep an overview of all the food you still have.”

“Keep eggs in a dark and cool place. The temperature in the refrigerator door fluctuates too much but the other spots in the fridge are suitable.”

“The items should not touch each other or the back wall of the fridge.”

“Meat, fish and dairy products perish quickly. Keep them in the fridge. Every hour milk is kept outside of the fridge shortens the life span of it for 1 day.”

“4 degrees Celsius is the right temperature for the fridge, use a thermometer to check the temperature.”

“Keep products that will perish first in the front of the shelves.”

“Apples, strawberries and grapes stay fresh longer in the fridge.”

“Both fruit and eggs do not have to be kept in the fridge.”

“Let things cool off before putting them in the fridge.”

“The coldest part of the fridge is usually above the vegetable boxes. That is where the products that will expire the quickest should be kept.”

“Summer fruit like strawberries and other berries should be eaten right away. If you want to keep them keep them in the fridge in a paper bag.”

“All items in the fridge have to be wrapped air tight to not emit or take on any moisture or smells.”

“Remove perishable food products from the fridge when you go on vacation for several days. You can put them in the freezer.”

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“Let things cool off before putting them in the fridge.”

“The coldest part of the fridge is usually above the vegetable boxes. That is where the products that will expire the quickest should be kept.”
2.1.3 The freezer

“Partially boil and freeze potatoes for up to a month before roasting or frying them.”

“Divide big quantities (e.g. meat or fish) in smaller portions before freezing them.”

“When you defrost meat and cook it thoroughly you can freeze it again.”

“Freeze the milk you will not finish before it expired and defrost when needed.”

“For a quick supper cut raw meat into stripes before freezing it. It will defrost in no time whenever you feel like it.”

“You can freeze food right up to the use-by date.”

“Divide your freezer into sections like meat, bread, vegetables, ready made meals and deserts. Then you can find items quicker in your freezer and do not have to keep the door open for as long. Also it is easier to keep an overview of the food you have in the house.”

“Grate hard cheese before freezing it and use on pasta, toast or pizza.”

“Label the things you freeze in order to avoid unidentifiable objects in your freezer.”

“If you freeze your bread you can use it for a longer period of time. Cutting it first means you can take out the amount you need at the time.”

“Partially boil and freeze potatoes for up to a month before roasting or frying them.”

“You can freeze food right up to the use-by date.”

“When you defrost meat and cook it thoroughly you can freeze it again.”

“Divide your freezer into sections like meat, bread, vegetables, ready made meals and deserts. Then you can find items quicker in your freezer and do not have to keep the door open for as long. Also it is easier to keep an overview of the food you have in the house.”

“Grate hard cheese before freezing it and use on pasta, toast or pizza.”

“Label the things you freeze in order to avoid unidentifiable objects in your freezer.”
2.1.4 The transport

“Watch out that you do not bruise fruit and vegetable. Bruised fruit and vegetable goes bad quicker.”

“Use a cooler bag to transport frozen products from the store to your home.”

2.1.5 Deciding if food is still good to eat

“Pre-cut vegetables and fruits rot quicker than uncut ones.”

“The molded part of hard cheese can be cut off and the rest can be eaten.”

“Opened jam or pickle glasses stay good for about one month. Once pickled products get white lines they are rotten.”

“A lot of food stays good longer than the expiration date suggests. Use your senses, look, feel, smell and taste to see if something is still good.”

“Molded bread and molded jam has to be thrown away you cannot take off the molded part and use the rest.”
2.2 Managing Facts

2.2.1 Overview

“Keep a freezer list, note down items you put in the freezer and cross them off when you use them.”

“Keep a freezer list, note down items you put in the freezer and cross them off when you use them.”

“Make one night a week freezer night and eat something you still have in your freezer.”

“Planning for parties can be hard think about how long the party will last and how many people you will invite and try to guess how much each person will eat.”

“Write down how much everyone ate for dinner after the dinner. It will help you to know how much you need to cook.”

6.2 Planning ahead

“Plan the dinner menu for the week and do the appropriate shopping in the weekend. You can use online shopping services like Maatkassen to give you recipe tips and help you understanding of how much you need.”

“Keep tabs on the expiration date of the products in your fridge.”

“Make one night a week freezer night and eat something you still have in your freezer.”

“Cook twice as much of family favorites like Bolognese sauce and freeze the left overs for a later meal.”

“Measuring mug, spaghetti measurer and a kitchen scale can help you make right sized portions.”

“Write the date on the products when you put them in the freezer.”

1 kilo potatoes is enough for 4 people
4 to 5 potatoes per person
100 grams of uncooked rice per person
85 grams of uncooked pasta per person
70-100 grams of meat per person
2.2.3 Voedingscentrum Table
2.3 Cooking Facts

Some products are easy to combine with many different kinds of food or can be used to make a meal extra tasty. Following are a couple of suggestions by www.lovefoodhatewaste.com of items that can help you to make nice dishes with left overs. Many of the items do not perish quickly. They can be kept as a permanent stock.

1. Olive oil, sunflower oil, vinegar
2. Pasta, Couscous (should be kept in air tight bag or container), Rice
3. Sugar, Syrup, Dried fruit, Flower
4. Canned tomatoes for instance pizza sauce, pasta sauce or curry sauces, canned chick peas to add to salads, Mediterranean dishes, curries or to make Falafel, beans easily mix with other flavors and foods, soups or stews, olives to add to pasta or salads
5. Tortilla chips, soft tortillas perfect envelope for left over veggies and meat, pizza crusts long life or frozen ideal to use with left over meat, vegetable and cheese
6. Jalepeno peppers, pepper, dried chilly peppers, madras curry paste
7. Herbs, salt, stock cubes
8. Stir fry sauces, soy sauce, tomato paste, worhestershiresauce, chilly sauce, ketchup
9. Canned fish if left over do not store in tin can but use another container with a lid
10. Honey, Mustard
11 Thai curry paste

12 Coconut milk, left overs can be frozen in ice cube trays once frozen you can transfer them to plastic bag, keeps good for up to three months

13 Yeast extract for gravy and casseroles

14 Butter, good for cooking in general

15 Yoghurt, add to curry or make quick dip

16 Milk, sour milk is excellent for making scones

17 Cheese, for omelets, soups, salads

18 Crème fresh, for lace soups, stews, sauces, also for sweet dishes,

19 Eggs, for omelet's and pies

20 Mayonnaise for sandwiches and dressings

21 Ready to bake bread, to accompany meals

22 Frozen vegetables, can be used without defrosting

23 Fish filets

24 Minced beef

25 Garlic bread, accompany meal

26 Chicken filets

27

28 Ready rolled puff, shortcrust or “bladerdeeg” ideal for pies

29 Potatoe wedges can accompany many meals

30 Mixed seafood and prawns, can be added to stir fries without defrosting

Sausage meat, easy to use for quick meat sauces especially when cooking for children
2.3.1 Recipes

There are many creative ideas on how to deal with left over food. I will just name two particularly nice examples in this section.

Dutch tapas is the first example. Tapas are small snacks that you can eat in the evening when drinking a glass of wine or that you can serve as appetizers. It is a good way of using your left overs. Often times you do not have large quantities of left overs. When you only have a little left of something you can use it up by making tapas.

www.lovefoodhatewaste.com has many left over recipe suggestions. The picture on her right shows how they present them.
3 Results Observational Research

3.1 General Research Questions

What were good management, food storage and cooking skills?
What skills did people have?
What worked well in practice?

Different practices worked better for different people. What worked had a lot to do with the facilities people had at home. Lotta knew she should store potatoes in a dark cool place but she did not have such a place. She chose the refrigerator. She thought it was the best solution for her situation. She reasoned that potatoes should stay good for a long time as they were harvested only once a year.

The skills people had were different. Some were good cooks and some were good at managing their shopping. The skills had a positive effect on reducing food waste. Julia who organized her shopping trip by writing a shopping list did not buy items she still had at home. Participants who were good cooks reported that they often used the ingredients they had left in the refrigerator and that they had developed recipes in order to use up their left overs.

Character traits influenced how well skills were developed and how easily people could attain skills. Tomas was a chaotic person that was easily distracted. That made it hard for him to follow a plan or structure when it came to doing shopping.

Julia was very structured and calm and followed her plan rigidly. Different people had different interests. While Tomas wanted to try out a recipe I told him about right away, Julia started to put the tips I told her about how to store food into practice right away.

How did the skills influence one another?

Patricia’s friend who was a very good cook had found a way to manage her food. She had some sauces and canned vegetables in the house that she could combine to delicious meals with her usual left overs. If she was not a good cook and would not know what ingredients could be combined easily and how to do so she would not have come up with this creative way of managing her food.

How did people attain these skills?

Most people learned how to deal with food from their parents. When they first lived on their own and had questions about how to prepare a certain meal or if food was still good they called up their parents and asked them. Another way of attaining knowledge was triggered by living together with friends or with a boyfriend or a girlfriend. When living with others people often copied practices from others. Jennie used to
call her mother when she had cooking questions. Oskar learned to
cook the dishes Julia used to cook a lot and Julia said that he is better
at preparing them then she is.
Lotta learned some general cooking tricks from her Italian boyfriend.
She puts a whole garlic clove in the sauce because it gives a more
subtle taste. She also uses partly bouillon instead of salt for the
sauce.

There were many “ways of doing“ that people took over although they
could not remember where they heard or saw it. Lotta heard that you
should put some sugar in the tomatoe sauce and did it but could not
remember where she heard it.
Some skills were attained by experiencing that some things work bet-
ter than others. Patricia realized that bananas stay good longer out-
side of the refrigerator.

Julia used to do very structured shopping when she was a student and
had to save money. Now that she has more money she can still use
those skills when she goes shopping for the whole week. She does
this regularly but not all the time. She also does smaller shopping at a
store close to her apartment.

**Did people want to attain the skills?**

The personal interest of people had a big influence on what skills they
wanted to learn. Being able to create tasty dishes is something all the
participants said they want to achieve. Becoming good at buying the
right amounts of food or storing food well was less popular. When told
that it can lead to waste reduction to store food correctly three of the
four participants showed some interest. Only Julia immediately put the
food in the places where I told her to best store them.

Lotta said she asked the people she used to work with in the super-
market how to best store food. She forgot most of their responses
though.
Lotta wanted to become a good cook like her mother but she did not
know how to do so. She asked her mother and said she learned when
cooking together with her.

Patricia said she wanted to learn how to cook more diverse. When
preparing a new recipe for the first time together with her friend she let
her friend take over and did not learn how to prepare the dish.
3.2 Food Management

How did people make the decision to buy food?

Was the process of buying food very structured and planned or more spontaneous? What were different conditions for this?
Advertisements and offers in the store had a big impact on Tomas. He bought some food he did not plan to buy or did not particularly need. Tomas saw the advertisement of taco hamburger buns, which made him crave hamburgers. He decided to eat hamburgers for dinner because of this sudden craving. Tomas said he liked to be inspired by food he sees in the store. He decided spontaneously what he wanted to buy.

Other people did their shopping more structured. When shopping for the entire week Julia and Oskar wrote a shopping list at home. They did not want to carry anything from the store to their house that they did not need. They bought what was on the shopping list and special offers they found in the store. Their biggest goal was to spend as little money as possible on food. Julia and Oskar thought about what they could need next week and how much room they had at home to store food. When the space was not sufficient and the price was not really low they did not buy the food. At the moment of purchase they did not have an overview of the week ahead of them. They told me that they would have to go to the store closer to their house several times during the week to buy ingredients. They decided what to eat each day.

Julia told me that she used to do very structured shopping all the time when she lived in her old apartment. There was a store that she had to walk to over a longer distance. She went to that store because it was very good. Because of the distance she could not go to that store often and had to plan her trips.

Patricia always walked the same aisles to make sure she did not forget any of the food she always wanted to have in the house. Patricia liked to have a fully stocked refrigerator. She would buy according to what was missing in her usual stock of food. Patricia told me that as the store was really close she would go to the store whenever she needed and did not have to plan the grocery trips.

Patricia had forgotten the shopping list she wrote at home and partly remembered what she had written down and partly came up with ideas on what to prepare for dinner in the store. The shopping trip was thus partially structured.

Patricia mentioned she would always look if there was meat with reduced price because she would always buy the cheap meat offers.
Lotta decided every day what she wanted to eat. She often did not know her plans ahead of time. Lotta decided what she needed at the time and for breakfast.

Tomas had a more structured life as he had a son. He used an online grocery order service. The online grocery system let him choose a menu and then delivered the right quantities to his house. He said the website helped him to plan the meals for the coming week. He liked to sit down on Sunday with his wife and plan together. He liked it that the website offered recipe choices and compared it with choosing a meal in a restaurant from the menu. He thought that if an online service supplied the right amounts of food needed, food waste could be reduced. He did however think that he would miss being inspired by food he saw in the store. He did not like to do groceries regularly, he thought it was boring.

Tomas only realized that the avocado was not yet good after he cut it open at home. Already cut open it would not ripen well any more. Patricias friend knew a trick on how to check if avocados are ripe. She pressed in the part that used to connect the avocado to the tree and if that was easy to do the avocado was ripe.

Lotta liked buying cherry tomatoes instead of normal tomatoes because they were easier to dose. A big tomatoe has to be cut in half and will then rot quicker.

Lotta always buys the big milk carton even if she does not need that much milk because it is not a lot more expensive than the smaller one.

What helped or hindered people to plan and do their shopping?

Patricia and Tomas send sms grocery lists to their partners. All couples said they sometimes bought food twice because both would buy the same food at the same time.

The store offered a lot of distractions. It was sometimes hard for participants to find items in the store. Tomas was distracted and had difficulties finding food he was looking for. Some items took him up to five minutes to find. While searching Tomas got distracted by other food he saw. Some of those encounters led to spontaneous purchases.
3.3 Storage Knowledge

How did people store the different food items?
What did people know about optimal storage?

A lot of people used the refrigerator to store their perishable foods. Most participants thought that the refrigerator was the best place for dairy products, fruits and vegetables. Some fruits and vegetables stay good longer outside of the refrigerator.

The refrigerator of Julia and Oskar was so full that they could not see the items in the back of the fridge any more.

Tomas put everything in the fridge except for the fruits and vegetables he would use soon.

The freezers of the participants were mostly full. Julia and Oskar used the freezer to prolong the expiration date for meat when they bought a lot of meat for a low price.

Tomas said that they always had a full freezer.

Julia said that they sometimes forgot something they put in the freezer and they just realize that when they defrosted it. They did not write dates on the items they put in the freezer and did not keep track of what was in their freezer all the time.

Patricia told the story about buying meat that was priced off. She could not use the meat within the two days that it was still good and did not think of putting it in the freezer to keep it for longer.

The only food items that were visible in some kitchens were fruits and vegetables. Patricia hid the fruit bowl because she did not like fruit. The fruit was for her boyfriend and he was away during the week.

Patricia hid the blood pudding her boyfriend liked and she thought was gross in the back of the refrigerator. She likes to have a system or structure for her storage space. She prefers to have a tidy fridge.

Oskar said he found it really hard to see all the food in the fridge. He sometimes opened a package when there was already another package of the same food opened.

Julia thought it would be a good idea to cut the big piece of meat they bought for a reduced price in smaller pieces before they froze it. That way they could make portions that fit the quantity they normally eat.

Fruit and vegetables were often not taken out of their plastic wrapping.

How much did this have to do with the storage possibilities?

Jennie decided to buy a smaller freezer in order to reduce the storage space and thus reduce the food she could store with the intention of reducing the food she would forget in the freezer.
Julia had a very small kitchen which made her pay attention and be more aware of the quantity of food she bought. Lotta did not store perishable food like fruits and vegetables outside of the refrigerator because she shared the kitchen with 13 other people. She said she had to pay a lot of attention to not let anything rot because of that. Besides she thought the cupbords were too warm and she looked less often inside the cupbords which made her afraid to forget food in those areas.

**Did people always put away the food right away when they came home from the grocery store?**

Most participants stored their food right away. Only Tomas who was distracted by his son who was hungry and thirsty did not put away his shopping right away. When he wanted to start cooking he first cleaned the kitchen quickly by putting food away. He said he needed a clean area to cook.

Tomas did not have an overview of the food he had at home. He did not know what food they usually consumed and how and where they stored the food.

**How did people behave around food that was rotten?**

There was different food people found gross when it was rotten. Patricia’s friend disliked dairy products that had gone bad. That is why she threw away milk one day before its expiration date. Patricia really disliked left over meals. She kept them and tried to eat them but often did not and ended up throwing them away.

Patricia came up with a method to test if the milk had gone bad. She took a small cup and poured a little bit of coffee in there to mix it with a little bit of milk. When the yoghurt had a bit of mold on the lid she only removed the mold and still ate the rest of the yoghurt.

Tomas did not trust his own senses. He explained that he often asked his wife to tell him if something was still good or not. If he had to decide on his own he just threw it out.

Lotta was sceptical towards food that was pre-processed or food she usually just tried if the food was still good by tasting the product.

The moment people found food old and not edible any more varied. Patricia threw out a banana with brown spots whereas Lotta used an ap-
ple in the salad that had wrinkles and was dried out from the inside.

There are some foods people did not like when old while others were still seen as fresh enough to eat. This depended on preferences in taste. Lotta generally ate food also if the use by date is passed. She said that she started doubting her senses at a certain point. When the food was one month over its use by date for example.

**And how did they treat food that they were afraid would rot soon?**

Most participants did not report that they tried to save food they were afraid could go bad. Patricia said she always went to the store and never knew how to use the food she still had in the fridge. Her friend said she often used the food that was still left in the fridge. She also said she had a less full fridge than Patricia.

Jennie said she sometimes tried to present the food that she thought would not get eaten to her husband and daughter. Many times her strategy did not work out and the food ended up being thrown away anyway. She was more successful when using the food in left over recipes.
3.4 The Art of Cooking

Did people enjoy cooking?

If a person enjoys cooking depends on individual interest. This personal interest can be stimulated by having enough money to spend on nice ingredients for a meal and having nice kitchen appliances. Being expected to host friends and family for meals can also make a person put more effort into becoming good at cooking. Patricia’s friend really liked to come up with ideas for recipes by herself and experiment with taste combinations.

Enjoying a nice meal, liking to eat together with others and enjoying to offer a nice meal to others are all personal preferences that can make a person want to become a better cook. Patricia and her two girlfriends prepared a nice elaborate dinner and saw it as a chance to make their time together more enjoyable.

Living with a person that is good at cooking can make a person shy away from trying out and developing their cooking skills. Tomas stopped trying to become a better cook after he met his girlfriend. He said he left cooking to her because she was much better at it.

Practicing ones cooking skills often entails failure along the way. Patricia’s friend and Jennie both were good cooks but said that they failed many times when trying to prepare a nice meal.

Did people take their time to cook?

There are meals that are more special than others. Tomas had the day off from work. That made him want to prepare a special meal. He had the time to do it and he felt like his day off required a special meal. All the participants observed took their time to cook. They were not observed in a stressful moment where they did not have time or had to rush. Patricia and her friend prepared a special birthday dinner, Tomas was free from work, Julia and Oskar had Sunday dinner and Lotta was unemployed.

Julia and Oskar liked to take their time to prepare a nice meal for dinner when they were both at home. Lotta said that she ate more to eat. She did not like to put an effort into cooking generally, only if it was a special dinner she shared with her friends or boyfriend.

Did people follow recipes?
How did they follow recipes?

The people who were referred to by their friends to be good cooks used
recipes as a starting point and then added their own twist. Jennie said that she learned some things from cook books. She owned a lot of cook books.

Patricias friend said she likes to come up with her own ways of cooking. That was what her grandmother told her to do.

Lotta and Patricia often looked for recipes on the Internet. Lotta said she liked to follow recipes. If she liked the dish she would continue preparing it. She did not like to make a lot of big alterations in the recipes. She would use one kind of nut instead of another but would not make more extreme changes than that.

How much did people consider the ingredients/ the time spend on cooking and the right temperature etcetera?

Lotta said that her boyfriend was really good at cooking. She said that he knew how long all the different ingredients had to cook and that everything was ready at the same time. She said that she thought that was difficult to do.

Tomas was very careful when considering what ingredients to buy. He looked at texture and taste of the ingredients carefully before using them. He thought about the combination of tastes.

Patricia’s friend mixed potatoes, oil and salt with her hands before she put them in the oven.

Jennie said that her friends tried to copy a dish that she prepared often and that they loved. Even though she told them what ingredients to put and when to put them exactly they still failed to make the dish as well as her.

What were the different aspects considered when cooking?

Tomas was creative with ingredients and loved to think of making a nice meal. He did not use these skills when dealing with left overs. If he had a motivation he could develop the skill of making left over recipes. Patricia’s friend had less money and Jennie did not like to throw away food. They had some dishes they really liked to make with left overs.

Lotta did not like to cook only for herself and the kitchen she shared with 14 people was not a space that she could enjoy a well prepared meal in.
Patricia's friend is used to making guacamole a lot. She recently discovered that it tastes better when you make it with a blender. She adopted this new method of preparing guacamole.

Tomas paid attention to what did not taste good and finds solution on how to prevent the bad taste. He did not like the way fresh onions made the minced meat taste when marinading the meat. He found out when first frying the onions it tastes and smells better. Tomas and Moa bake their own bread.

Jennie's husband chose recipes offered by the grocery store and prepared those for the family. Jennie said that she spoiled him a bit by cooking all the time before.

*For an overview of all the skills and knowledge, to see which of those were defined as weaknesses and strengths and for an overview of the particularities found in the participants view appendix 9.*
4 Brainstorm of Different Ideas for Activities

Goal:
- Change some food types in group to reduce food waste
- Reduce sources of food waste creation
- Make all students that will food do experimentation
- Goal: waste

Method:
1. Order Letter
2. Receive package
3. Send home
4. Court Soup
5. Discuss solutions

Hidden Agenda
- Make people want to choose their food
- Good myths

ACTIVITIES:
1. Intro Letter
2. Intro Dinner
3. Do the challenge
4. Send postcard
5. Receive postcard
6. Discuss personal problems
7. Discuss solutions to problems
8. Take as a challenge

Material - Invitations
- Problem cards for those who did not eat any (box comes)
- Checkmark challenge
- Take black

How to provide tips/diagram:
- Control: what to do
- Tips: what to do
- Tips: what to do
- Tips: what to do
- Tips: what to do
- Tips: what to do
The workshop started by greeting the participants with the following text and simultaneously handing out the passports to them:

“Welcome my dear citizens of the Republic of Wasteland. I know the past few weeks have been difficult for you. I am happy to tell you that we have worked hard to get the situation somewhat under control. As you know we had to confiscate your passports during the evacuation. I am happy to return the passports to you. Two pages have been added to the document that you will have to fill out, in order to pass customs and return to your homes.”

The map of the centre of Stockholm that is projected on the wall shows the different addresses that are written on the passports and a red circle around the very centre of the city.

“Our beautiful city has been drowned in waste. Only the area within the red circle remains free of waste. In these difficult times we have to help each other. That is why the city has asked those of you living inside the red circle area to offer shelter to those without a home. Please sit down in the seat that reads your address. The person to the right of you will be the person that you offer shelter. Together you now share a house.”

After this introduction the first course, broccoli soup with raw, unpeeled broccoli stems, is served.

After the first course the group is addressed with the first assignment.

“You had to report the amount of waste you create within a week in your passports. Please add up the waste you and your new house mate generate together and note down the weight on the paper lying between you. The broccoli pieces represent waste. For each broccoli piece you have to find one solution for food waste. The food is going old but is not yet waste. You have three days to come up for solutions for this food in order to save it from the trash bin.”

After each team came up with four solutions and presented their ideas to one another the next course, quiche, was served. After the quiche was finished the participants were asked to turn their plates upside down. Under the plate a round piece of paper was taped.

“The Republic of Wasteland has awarded you each a medal for excellency. You are the cities experts in shopping, storing and cooking food. The city asks you to formulate laws for the other citizens. Please work together with your fellow expert and come up with one law each. When you have decided on your law write it on the back of the medal...”
and place it upside down in the middle of the table. Now it is time to get some coffee."

While the participants leave different colored m&m’s are placed in front of each person’s seat.

"Please place your m&m on one of the laws in the middle of the table."

The desert is chocolate pudding with different colored m&m’s on top of it. The participants were asked to take the law that matched the color of their m&m.

The last step of the workshop is to leave the fictional story and talk about how to implement the laws in reality. The participants were asked if they would try to follow the law and why they would or would not try to follow it. Broccoli stems, is served.
6 Material Used for Workshop
7 Material Used for Dinner

Name two things that you can do well when cooking:

Name two things that are not so good at when cooking:

Name two things that you can do well when planning your food:

Name two things that you are not so good at when planning your food:

Name two things that you can do well when knowing how to store food:

Name two things that are not so good at when knowing how to store food:

Weigh your food waste for three days and note down the kilogrammes:

What does your food waste look like?
SHOPPING LIST

1 tablespoon olive oil
1 large onion, finely chopped
2 cloves garlic, chopped
750 ml chicken or vegetable stock
8 medium zucchini, diced
400 g broccoli
Freshly ground pepper
3 medium lemons
600 g spaghetti
75 g butter
5 garlic cloves, crushed
2 red onions, finely chopped
3 long red chili, deseeded, thinly sliced
3 x 400 g cans of artichoke hearts, drained, quartered
½ cup finely chopped fresh flat-leaf parsley
6 servings of chocolate puddings
1 bag of m&ms
1. COURSE OF THE DINNER GAME

Broccoli Zucchini Soup/ ready in 30 minutes

INGREDIENTS

1 tablespoon olive oil
1 large onion, finely chopped
2 cloves garlic, chopped
750 ml chicken or vegetable stock
8 medium zucchini, diced
400 g broccoli
Freshly ground pepper

PREPARATION

1. Heat the oil in a large saucepan over moderate heat. Add the onion and garlic and cook for 3 minutes.
2. Remove the stem of the broccoli and keep it.
3. Add the stock, broccoli and zucchini. Cover and simmer for 15 minutes.
4. Before serving the soup cut the broccoli stem in 1 centimeter thick coins. Serve two broccoli stem coins per soup.

PREPARING THE TABLE

Prepare the table in the way that you like. Use a table cloth that can get dirty. Place the seating cards at the different seats. Place the cards with the numbers counting up next to each other. Put the note pads with two pens each between the seating cards with the numbers 1 and 2, 3 and 4 and 5 and 6.

SERVING

The short film that you can find on the website of The Food Challenge under the link www.thefoodchallenge.com/video1.game is the introduction to the dinner game. Once all the guests have arrived, you can watch the film together. The movie will explain the seating arrangement. After everyone is seated and the first task has been fulfilled it is time to serve the first course.

The broccoli stems are game pieces in the first course of the dinner game. Many people do not know that the stem of a broccoli is very healthy and tastes quite good. Your guests might taste the broccoli stem for the first time.

During the first round of the game the broccoli stems will represent pieces of waste. The players have to find solutions for this waste. Each player has to find two solutions for waste.

Read out this text to the group after everyone is finished with the soup.

“Dear citizens of wasteland. You have added up the amount of waste you produced in three days with your new flat mate. Find one solution to food waste for each stem of broccoli. Each person has to come up with two solutions. You have to find solutions with your new flat mate as you now share a kitchen. You can write down the solutions on the piece of paper between you and your flat mate. After reaching an agreement with your flat mate present the solutions to one another.”

Once each couple has found 4 solutions and the group discussion is over you can serve the next course.
2. COURSE / ROUND OF THE DINNER GAME
Artichoke, Chilli and Lemon Spaghetti / ready in 25 minutes

INGREDIENTS

3 medium lemons
600 g spaghetti
75 g butter
5 garlic cloves, crushed
2 red onions, finely chopped
3 long red chillies, deseeded, thinly sliced
3 x 400g cans of artichoke hearts, drained, quartered
½ cup finely chopped fresh flat-leaf parsley leaves

PREPARATION

2. Meanwhile, melt the butter in a frying pan over medium-high heat. Add garlic, onion and chilli. Cook, stirring, for 3 to 4 minutes until golden. Add to pan.
3. Add lemon rind, lemon juice, reserved liquid, artichoke, parsley.

SERVING

Before filling the plates with the pasta tape the medals to the bottom of the plates. Then serve the pasta.

After the second course is finished tell your guests to turn their plates upside down. Read them this message when they turn the plate around.

“The city of wasteland will give away medals of excellence in different fields of food treatment. The medal under your plate is yours to assign to one of the other citizens. The pink medal is the medal for expertise in food management. The person that receives this medal is good at planning the correct quantities of food. They are also good at planning ahead when shopping. The green medal honors those experts at the art of storing and preserving food. The person receiving this medal knows where and how food is best kept and can identify if food is unhealthy to be eaten. This person knows how to keep food good for as long as possible. The people receiving a golden medal are experts at the art of cooking. They know what tastes to combine and can be creative with ingredients. People should not receive more than one medal. When handing a medal over to another citizen please provide your own speech. It is a custom to mention some of the person’s achievements in his field of expertise. Make the speech as personal as possible.”

After receiving the medal each person should formulate a law on how to deal with food. Read the following text to the dinner party guests.

“The fate of the Republic of Wasteland lies in your hands. As you are experts the city asks you to help the other citizens of Waste City to lower their waste. Formulate one law each for the citizens to follow in order to lower their waste. Place the law upside down in the center of the dinner table.”
3. COURSE/ROUND OF THE DINNER GAME

Chocolate pudding with m&m's/ ready in 1 minute

INGREDIENTS

6 servings of chocolate puddings
Bag of m&ms

PREPARATION

Place one m&m of each color on top of the pudding.

SERVING

Place one m&m of each different color in front of each of your dinner guest. Tell them to not eat the m&m but instead to place the m&m at one of the laws in the middle of the table. There should only be one m&m per law.

After m&m’s are placed on the laws serve the pudding. Each person has to pick up the law that matches the color of the m&m on their pudding.

Read this message to the group:

“As experts you know that one cannot know anything for certain unless one does experiments. Now we leave wasteland and go back to reality. The law that was given to you by chance is the law that you should experiment with next week. If you do not feel like following the law you can trade the law with someone else.”

The End
Dear citizens of the Republic of Wasteland. I know that the past few weeks have been less than ideal for you. We have worked very hard to get the situation under control and I am happy to inform you that you can now return to your beloved city.

As you know we had to confiscate your passports due to homeland security before the evacuation. I am glad to inform you that we can return the passports to you. A few pages have been added to the document. In order to be able to return to the Republic of Wasteland please fill in these pages before you come to the Dinner Game.

The Environmentalist

This is the character you will play during the Dinner Game. Below you can find some information about the character to spark your imagination. You can tell the other players all the information except the hidden agenda. It can be more fun if you get into character and let the others find out who you are and what you stand for as the game goes on.

Kevin is 25 years old and a Freegan, Vegan, and child of mother earth. He tries to not buy anything but always use things that others throw away. He studies environmental studies and is member in many different activist groups. Kevin believes strongly that the consumption society can be turned around and that people can live as one with Mother Nature.

Hidden Agenda

Kevin is very idealistic but he is also smart. He wants to convince others that his way of life is the right, the good way of life but he knows that if he forces his ideas on others they will reject them. He chooses a more subtle way of convincing others.
Dear citizens of the Republic of Wasteland. I know that the past few weeks have been less than ideal for you. We have worked very hard to get the situation under control and I am happy to inform you that you can now return to our beloved country. As you know we had to confiscate your passports due to homeland security before the evacuation. I am glad to inform you that we can return the passports to you. A few pages have been added to the document. In order to be able to return to Wasteland please fill in these pages before you come to the Dinner Game on the …

The Millionaire’s Daughter

This is the character you will play during the Dinner Game. Below you can find some information about the character to spark your imagination. You can tell the other players all the information except the hidden agenda. It can be more fun if you get into character and let the others find out who you are and what you stand for as the game goes on.

Xi Ling is a 20 year old Chinese exchange student living in the center of Stockholm. Xi Lings father is a millionaire and likes to make her every wish come true. She lives together with her little dog, butler, cook and personal assistant. When the waste hit Stockholm her father tried everything to get her back to China but he was not successful. Xi Ling is glad to live far away from her father who she finds too protective. She loves the European culture. She currently spends all her time on learning Swedish.

Hidden agenda

Xi Ling has been patronized and cared for all her life. She moved to Stockholm to get away from it all but her father send three servants making her every wish come true. She never even boiled an egg. She is eager to learn more about the reasons for the waste crisis and is interested in the other people’s back grounds and to find out their points of view.
Dear citizens of the Republic of Wasteland. I know that the past few weeks have been less than ideal for you. We have worked very hard to get the situation under control and I am happy to inform you that you can now return to our beloved country. As you know we had to confiscate your passports due to homeland security before the evacuation. I am glad to inform you that we can return the passports to you. A few pages have been added to the document. In order to be able to return to Wasteland please fill in these pages before you come to the Dinner Game on the …

The Senior Citizen

This is the character you will play during the Dinner Game. Below you can find some information about the character to spark your imagination. You can tell the other players all the information except the hidden agenda. It can be more fun if you get into character and let the others find out who you are and what you stand for as the game goes on.

Anders is 78 years old and has been living on his own since his wife died three years ago. He can still manage fine although the daily routines do get more difficult each day. He used to be able to go the grocery store whenever he needed something. Now a trip to the grocery store takes him effort. He does not have a lot of money and needs to pay attention to what he spends his money on.

Hidden Agenda

Anders is deeply dissatisfied with the current government. How could they let the situation come this far? In his time this would have never happened. Anders wants people to wake up and take responsibility for their actions. Above all he wants the multinationals to take responsibility.
Dear citizens of the Republic of Wasteland. I know that the past few weeks have been less than ideal for you. We have worked very hard to get the situation under control and I am happy to inform you that you can now return to our beloved country.

As you know we had to confiscate your passports due to homeland security before the evacuation. I am glad to inform you that we can return the passports to you. A few pages have been added to the document. In order to be able to return to Wasteland please fill in these pages before you come to the Dinner Game on the …

The Heir

This is the character you will play during the Dinner Game. Below you can find some information about the character to spark your imagination. You can tell the other players all the information except the hidden agenda. It can be more fun if you get into character and let the others find out who you are and what you stand for as the game goes on.

Peter is 52 years old and the heir of the family company Wallmart. Wallmart is the second largest grocery store chain in the world. Peter has apartments in ten different cities in the world and a private jet. He is not used to staying in a place for very long. Now he is stuck in Waste City. He is held responsible for the disaster in Waste City. He is used to this and has learned to not to let the public opinion get to him.

Hidden agenda

Peter lives for his business. He does not want sales to go down. He wants to find a solution for earning more money and still lowering food waste. The bad press of the waste crisis is bad for business.
Dear citizens of the Republic of Wasteland. I know that the past few weeks have been less than ideal for you. We have worked very hard to get the situation under control and I am happy to inform you that you can now return to our beloved country.

As you know we had to confiscate your passports due to homeland security before the evacuation. I am glad to inform you that we can return the passports to you. A few pages have been added to the document. In order to be able to return to Wasteland please fill in these pages before you come to the Dinner Game on the …

The Girl

This is the character you will play during the Dinner Game. Below you can find some information about the character to spark your imagination. You can tell the other players all the information except the hidden agenda. It can be more fun if you get into character and let the others find out who you are and what you stand for as the game goes on.

Leyla is 12 years old and has recently started high school in Stockholm. She is a bright girl and grew up with her mother in the suburbs of Stockholm. As her mother was a single mom and had to work full time Leyla is independent, used to finding her own way around and caring for herself. She is self secure and is not afraid to start a discussion with grown ups.

Hidden agenda

Leyla wants to play behind her house again. She suffers greatly under the situation right now as she loves to be outside and she likes to walk and go wherever she wishes. Why do grown ups always have to make everything so complicated?
The average Swedish household throws away 25% of the food purchased, in Holland 10-15% of the food is wasted. In the US the average food waste lies at 27%. In those cases not only the food but also the energy and resources used for growing, processing, packaging and transporting food to the consumer is wasted.

There are some handy skills that can help you with the challenge of lowering your food waste. Left over recipes and knowing how much food your family consumes per week can help to save food from the waste bin.

The challenges presented on this blog offer a fun way of learning more about food and getting a different view on how you usually shop, store and cook your food. It can help you to build up skills that you can use to lower your food waste.

Do you want to throw away less food? Pick up one or more of the challenges and challenge yourself! As it isn’t easy to complete the challenges do not hesitate to share the insights you gain or write about the problems you face.

**If you have an idea for a fun challenge, post it! You can do so by submitting a comment.**

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**GO Japanese**

Cook dinner GO HO: 5 different cooking methods (steamed, simmered, fried, cooked, grilled, sautéed, raw etc.). GO SHIKI: 5 different colours (red, white, yellow, green, red, etc.). GO MI: 5 different flavours (sweet, sour, spicy, salty, bitter).

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**Three is a magic number**

Buy enough of any of the following ingredients (dairy, meat, fish, vegetable, fruit, bread) to use for three meals. Use it in one meal on the day you buy it, prepare another meal one week after you have bought the ingredient and prepare one dish one month after you buy the ingredient. In order to keep the food from rotting you have to come up with a way to preserve it for all three meals.

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**The survival challenge**

Do not buy any food for 5 days. Try to survive from the food that is left in your fridge, freezer and cupboards in your kitchen.
9 The Challenges

A friendly swap
Swap food with your friends. Choose three food items that are close to their expiration date each and exchange them. Try to consume the food before it goes bad.

http://thefoodchallenge.tumblr.com/

Edgar the tomatoe
Keep Edgar the tomatoe for two weeks. After the two weeks are over eat him. In order to keep Edgar edible for two weeks you have to come up with a method to preserve him. Other vegetables that could be fun to keep for two weeks are mushrooms, cucumber, egg plant, zucchini, bell pepper and many more. All fruits can be used for this challenge as well.

http://thefoodchallenge.tumblr.com/

2 a day
Buy only two food items per day. You can buy as much of the two food items as you want as long as you do not buy more than two different ingredients each day.

Story telling
Do you like to tell stories? Tell the story of your favorite recipe. Read the packages of the different ingredients and use it as inspiration for your story. Where are the different ingredients from? How did they meet? Post the story on the blog and see if people can recreate your recipe by reading the story. Create a story together with your friends or children.

http://thefoodchallenge.tumblr.com/

Expedition kitchen
Next time you prepare a meal take only one ingredient from each of the different storage areas in your kitchen. Take one ingredient from your fridge, one from your freezer and one from each of the cupboards or drawers you have in your kitchen. Find a creative way to combine those ingredients to a tasty dish.

http://thefoodchallenge.tumblr.com/

Super market spies
Follow a stranger. Next time you go to the grocery store pick a person to follow at the entrance and buy all the food they are buying. It is fun to choose a person that has a different life style than yours. The real challenge starts after you bought the food. Pay attention and really try to eat the food you bought and to not throw it away.

http://thefoodchallenge.tumblr.com/
**GO Japanese**

Cook dinner GO HO: 5 different cooking methods (steamed, simmered, fried, cooked, grilled, sautéed, raw etc.), GO SHIKI: 5 different colours (red, white, yellow, green, red, etc.), GO MI: 5 different flavours (sweet, sour, spicy, salty, bitter).


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**DIY take away**

Learn how to make your favorite take away food. Pick three take away dishes that you eat regularly and prepare them at home.