



# FRUIT IN YOUR FOOD

Repositioning the perception of fruit in meals served by caterers

Master Thesis

Strategic Product Design

M. J. Dubbeldam

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## **Master Thesis**

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Strategic Product Design

Industrial Design Engineering

Delft University of Technology

## **In collaboration with**

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# ABSTRACT

Throughout history, there have been different attitudes towards eating fruit in the human diet. Currently, fruit is mainly perceived as a snack, that is to be eaten as a separate piece. Various developments in the history of the Netherlands like industrialisation, emancipation and internationalisation, have contributed to this position. With the competition of convenience snacks, a very small percentage of the population eats the recommended amount of 200 grams per day.

If seen as integral part of the meal, fruit consumption will become a more conscious and structured behaviour. Among consumers, the idea of eating fruit combined with other ingredients causes some friction. By serving meals with in a familiar place and a logical context, the consumer can familiarize himself or herself with the idea of meals that include fruit in an easily accessible way without any required preparation efforts.

Caterers serve meals to a large group of consumers on a daily basis. Consumers trust the expertise of the chef and are more accepting towards meals served by food professionals. Caterers therefore have a large influence and responsibility. There are some concerns among caterers around the creation of new recipes and the right approach towards consumers. To help caterers deal with these concerns, this thesis has created the Fruitdaging challenge. The Nationaal Actieplan Groenten en Fruit will be the project owner for this challenge and act as a neutral party who can reach out to, and connect with different stakeholders.

Research into consumer behaviour shows that changes to a lifestyle are triggered when several internal or external factors change simultaneously. By designing the external and triggering the internal factors, it is possible to steer towards these transition points. Eventually, intrinsic motivation must trigger the actual change in behaviour.

The most effective way to get people to accept dishes with fruit is by connecting them to the culture. A series of experiments were held to create a sandwich as iconic as the “broodje gezond”. From these experiments, a system for flavour pairing was created as a tool for creating recipes.

A toolbox is provided to assist caterers with the interpretation of the Fruitdaging challenge on both recipe development and consumer approach. In the toolbox are a workshop, a case study, a card game and an online platform to support and help caterers to create and serve more dishes with fruit as a main component. Four different packages suggest several activities to approach different types of visitors.

The challenge and toolbox are publicly available and self-explanatory. The challenge can be adaptable to fit to the resources and corporate structure of different type of caterers, to allow all caterers to join and create a widespread effect. When meals with fruit are served more frequently, the idea of fruit as an ingredient will start to become ordinary. It is expected that the challenge will cause people to start using more fruit in their meals at home, which leads to a higher intake of fruit.

# PREFACE

## FROM THE AUTHOR

That's right, a design graduation project about eating fruit. It is possible, and it is here. It does not seem a logical combination, but that does not mean it can or should not be done. It actually makes sense: as designers it is our ultimate goal to improve everyday life for as many people as possible, and we all eat every day. A design project about improving healthy food habits makes sense now, doesn't it?

I was able to combine my passion for food and eating with my master Strategic Product Design for my graduation project. The result of this project is written in this thesis. The



thesis provides a different approach to eating fruit, with a focus on served meals in food service.

During my project, I was given a lot of freedom to choose my process and methods and that has kept me motivated to the end. It has been fun, and I have some people to thank for that:

I would like to thank Rick Schifferstein and Rebecca Price, my support team from TU Delft. Rick, for introducing me to Food Design in the first place and supporting my ideas. Rebecca, for keeping me on track and guiding me in this sometimes rather unconventional process. Both have made me feel confident from the start that the project was worth all the hard work.

A big thanks also goes to the people from the NAGF: Karin, Nancy, Kim, Anne Marie, Maaïke, for trusting me and giving me the freedom to try all my crazy experiments. Your support and honest feedback has been so valuable.

And finally, thanks to all friends and family that helped me through the last weeks and checked my thesis, and my roommates Jaïke and Anne, for sharing the last month in quarantine with me.

Enjoy reading!

Merel Dubbeldam

# PREFACE

## FROM THE NAGF

The team of the National Action Plan for Fruit and Vegetables is passionate about projects and communication aimed at stimulating fruit and vegetable consumption on a daily basis. As a non-profit organization that is partly funded by the government, we see it as our responsibility to contribute to research and education. Therefore, interns are always welcome at NAGF.

From her own interest and experience with healthy eating, especially eating lots of fruit, Merel Dubbeldam approached us. Her question was whether we were interested in an instrument with which we could give fruit a different place in the daily diet; not as a snack or dessert, but as part of a meal. She offered to help us using the Design Thinking method. We were intrigued, so we decided to take the plunge.

Going into this process, we had little knowledge of the Design Thinking method and what it could actually yield for us. In recent months, we have seen

walls filled with post-its, piles of books on the subject of taste and had many conversations during lunch about fruit and flavour combinations. Together with our colleagues from GroentenFruit Huis, we readily agreed to test all of her new sandwiches. Merel spent hours cooking, cutting and tasting. Her 'Bammetje' even made it to the Horecava. In short, a colourful process.

Merel was then able to discuss her ideas with our contacts at a number of key catering companies. Then the design process started. So many ideas were now beautifully brought together in the fruit challenge. With this Fruitdaging challenge, Merel combines both the strategy of eating fruit at a different time (lunch) and at a different location (company restaurant).

We are very pleased with the result: a comprehensive toolbox that is beautifully designed. We will get started with this and start sharing the toolbox through our channels.

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# THESIS STRUCTURE

This thesis consists of an introduction, followed by seven chapters. In the introduction, the problem is introduced in the form of a design brief. Following the brief, the design goal is defined along with some requirements.

In the first chapter, research surrounding fruit consumption is described, starting with general statistics on fruit consumption. An overview is given of relevant moments in the history of the Dutch kitchen and food culture, followed by an analysis on current food hypes and insights on developments for the future. Lastly some observations are given on the current positioning of fruit in supermarket magazines and cook books.

Chapter two analyses the consumer perspective on fruit consumption, starting with the outcomes of an auto-ethnographic research, which is then translated to a wider applicable model. From this model, design opportunities are identified and a target audience is defined.

The third chapter focuses on the other stakeholders in the project, the Nationaal Actieplan Groenten en Fruit (NAGF) and food service professionals. The possibilities and roles in the project are defined for both stakeholders, and what this means for the design goal. The chapter ends with the definition of the project requirements.

In the fourth chapter, the process and outcome of several experiments around flavour pairing are described, following a systematic model for developing new flavour combinations.

After the chapters one to four are summarized in chapter five, chapter six presents a concept as a solution to the design goal. A toolbox that helps caterers create and serve meals that have fruit as a main component is explained.

Chapter seven describes the evaluation of the toolbox. Feedback sessions with the NAGF and caterers are held and adjustment and recommendations are made accordingly. The chapter also describes the expected impact of the toolbox on fruit consumption on both short and long term. The thesis ends with some recommendations on further development and a conclusion of on the project as a whole.

# DESIGN BRIEF

## Fruit consumption

Fruit has been part of the human diet since the Hunter-Gatherers walked the earth roughly 12000 years ago. There are many health benefits related to fruit consumption. The Voedingscentrum advises a daily intake of 200 grams of fruit in their "Schijf van Vijf" (Voedingscentrum, 2020). Eating 200 grams of fruit per day lowers the risk of heart disease and stroke. It is also related to a lower risk of type 2 diabetes, colon cancer and lung cancer. (Krieken, 2018).

Many types of fruit are available in supermarkets year-round for an affordable price. However, the average fruit consumption in the Netherlands only meets a little more than half the required amount (RIVM, 2016): The average fruit consumption of adults is 112 grams per day (over an average of four days per week). On average in the Netherlands, only 13% of adults are meeting this advice.

So far, no specific research has been done on why this number is so very low. However, for a lot of people, eating fruit occurs at moments that are perceived as extra eating moments of the day, besides the regular three meals per day. According to RIVM (2016), 57% of fruit is consumed as a snack. It is remarkable to see that all the other foods mentioned in the Schijf van Vijf are eaten during meals, at least 80% of the time (see figure 1).

What happens when fruit consumption relies so much on snack time? From conversations in my surroundings (see appendix 1), it turns out that people often forget to eat fruit then, as these eating moments are generally associated with unhealthy treats. If not skipped at all, fruit needs to compete against pastries, savoury snacks and confectionery to be eaten, which are often packed in convenient packages that do not require extra actions like peeling or cutting. Besides the competition from convenience snacks, eating fruit is often skipped because of the messy and elaborate preparation that is required by peeling and cutting, the release of juice and removing seeds. There is also a strong association with the consumption of fruit at work or study places. Most people interviewed mentioned they take their fruit to school or work and either eat it there or forget about it and take it back home bruised.

## Design opportunities

As a designer, I see opportunities to solve some of these issues. To avoid the competition with convenience snacks, fruit needs to settle into different eating moments where it will not be competing with convenience snacks. When fruit can be perceived the same way as other "Schijf van Vijf" food items, its eating moments should shift from snack to fixed moments in the diet. If fruit becomes the type of food that is more often used as a base ingredient in meals, the

moments that fruit is eaten during the day will increase and therefore the amount of fruit eaten per day is likely to grow over time.

This project aims to take a first leap towards a change of attitude towards fruit consumption.

The workplace is a logical context for fruit consumption. Taking away the efforts of preparation will lower the threshold to eat more fruit. Company restaurants, from where most caterers serve their food, impact the eating choices of a wide audience on a daily basis through their menu. The

professionalism of caterers ensure that the quality of meals is sufficient.

By serving fruit in the meals in a familiar place and a logical context, the consumer can familiarize himself or herself with the idea of meals that include fruit in an easily accessible way without any required preparation efforts. When caterers take the responsibilities to develop new eating behaviour among the visitors of their restaurants, the consumer, these new habits could eventually be taken home by consumers and influence other people in their environment as well.

### Consumption by eating moment

VCP 2012-2016, 1-79 year olds

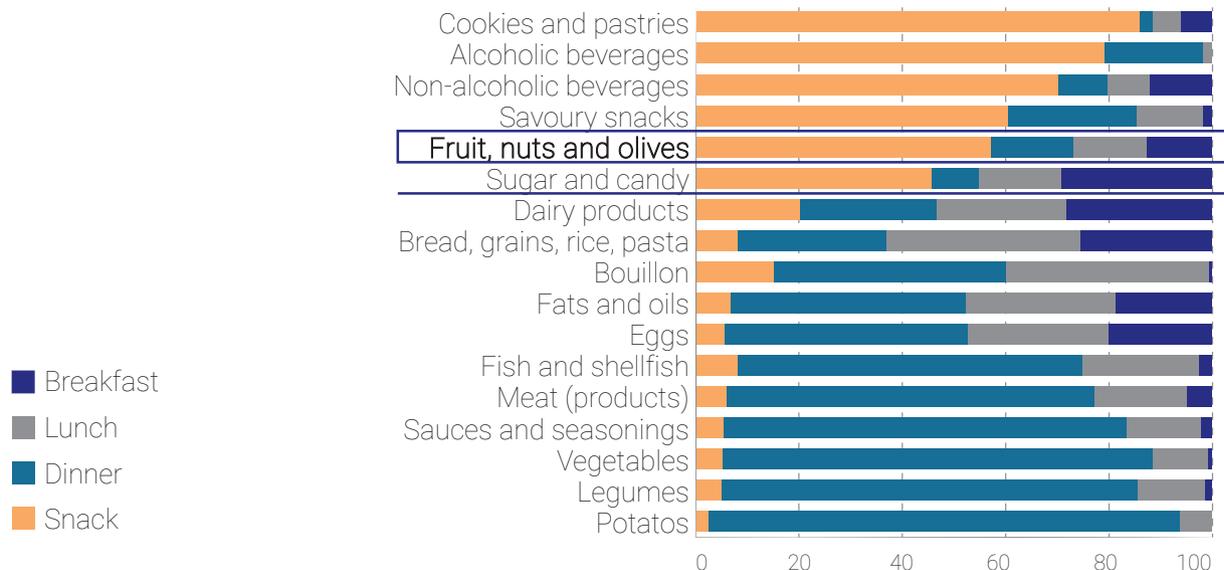


Figure 1: Consumption of different food groups sorted by eating moments in the Netherlands (RIVM, 2016).

## DESIGN GOAL

The Nationaal Actieplan Groenten en Fruit (NAGF) supports several initiatives to stimulate the consumption of fruit and vegetables. Some projects focus on vegetables in particular. However, there have been very few projects that focused solely on fruit consumption and none of them focuses on using fruit with savoury combinations in meals. They are interested to see what the possibilities are on this topic.

For the best result in the project, it is important to understand the perspective from caterers and their organizational structure when it comes to recipe creation and implementation. Also the consumer's (the visitors of the restaurant) behavioural aspects need to be considered.

The intended outcome is a concept that the NAGF can use to encourage caterers to take action and plant a seed for a renewed position for fruit in the Dutch diet. Therefore, this graduation project will focus on the following design goal:

*Create a concept for the NAGF, that helps caterers serve meals with fruit to their guests, to reposition the perception of fruit consumption.*

Based on the insights of the first three chapters, the design goal will be further specified by a number of project requirements in chapter 3.5: Project requirements.

## **DESIGN GOAL**

Create a concept for the NAGF, that helps caterers serve meals with fruit to their guests, to reposition the perception of fruit consumption.

# CHAPTER 1

# EATING FRUIT

1 BACKGROUND

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# 1 BACKGROUND

The Health Council reports that a higher consumption of fruit and vegetables per day produces health benefits (Gezondheidsraad, 2015). This advice has been incorporated into the Schijf van Vijf of the Voedingscentrum. The Voedingscentrum also carries out a regular research on the consumption of fruit and vegetables.

In this chapter, some relevant statistics and observations around fruit consumption and sustainability are summarized. A literature research is done on the history of the Dutch eating culture, in an effort to trace back the origin of the place of fruit in the Dutch diet and understand the current attitude towards fruit. Several expectations are expressed about the future, based on an analysis on the theory behind food hypes and current food trends. Finally, some observations are made on the current representation of fruit in printed material from supermarkets and popular chefs. The research confirms that fruit has an undefined position in the Dutch diet and that current trends indicate that now is a good time for a solution to reposition fruit. Insights on the Dutch sandwich culture have lead to the sandwich experiments, described in chapter four.

# 1.1 STATISTICS

## Consumption

Only 13% of Dutch people meet the daily recommended 200 grams of fruit per day (figure 2), with the average consumption reaching no further than 112 grams/day (RIVM, 2016). It is essential that this number increases, as eating more fruit can have significant beneficial effects on for example cholesterol levels and blood pressure. It also has proven to decrease the chance of heart diseases, strokes and several types of cancer (Gezondheidsraad, 2015).

## Nutritional benefits

Eating the recommended amount of fruit every day is associated with a lower risk of coronary heart diseases, type 2 diabetes, bowel and lung cancer. Fruit provide vitamins,

minerals, dietary fibres and carbohydrates. In addition, fruit contains acids and a large number of bioactive substances, such as carotenoids, lycopenes and flavonoids, which are all nutrients that are presumed to make a positive contribution to people's overall health (Gezondheidsraad, 2015). It is not clear which one acts against which disease. The effects are likely because of the different combinations of the vitamins, minerals, fibres and other substances in fruit (Liu, 2013). Different types of fruit contain different nutrients. The amount of nutrients is also dependent on the variety, the season, the type of soil, fertilization and climate (Marles, 2016). To get as many different nutrients as possible, the Voedingscentrum advises a varied intake of both fruit and vegetables (Krieken, 2018).

## KEY INSIGHTS

*The average fruit consumption in the Netherlands is far below the recommended amount of 200 grams per day. Fruit contains many nutrients, such as vitamins, minerals and dietary fibers. A varied intake of these nutrients can reduce the risk of several diseases.*

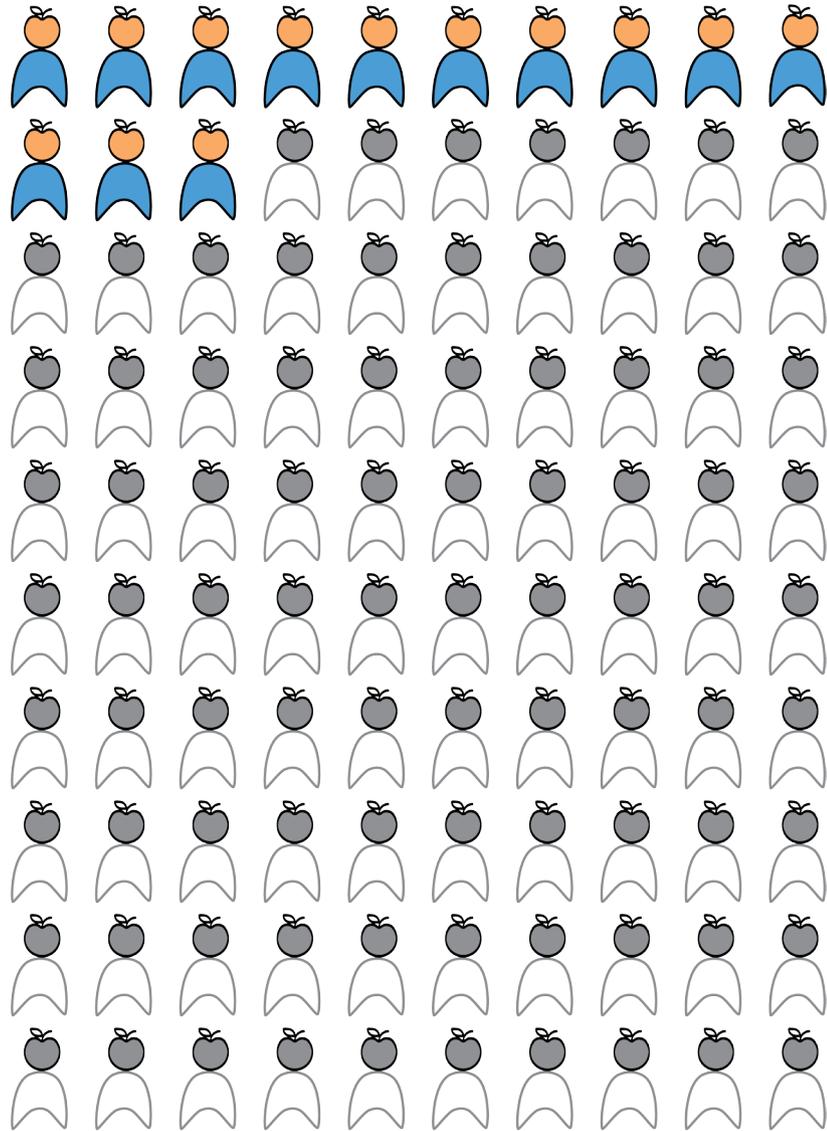


Figure 2 : Only 13% of Dutch people eat the recommended amount of fruit.

## Environmental impact

Compared to other food products, such as nuts, grains and legumes, fruit has a relatively low impact on the environment (Brink et al, 2016). A large part of its footprint comes from the use of energy and other inputs for cultivation, storage and transportation (Basset-Mens et al, 2016; Garnett et al, 2006). Fruit that is grown in a greenhouse or fruit that has been transported by plane have used more energy and therefore have a higher impact on the environment than outdoor fruit (Williams et al, 2006). Most (sub)tropical fruits require relatively large amounts of water, which makes extra irrigation necessary to allow them to grow in dry areas (Valk et al, 2016).

## Measuring sustainability

GiantLeaps is a startup that calculates the environmental impact of food. They use the impact tool that they have developed to quantify the purchase lists of caterers and restaurants. For them, the reason to focus on food service is because it allows them to reach the people who are not very involved in sustainable practices yet. In the Handbook Sustainable Restaurants (Heerema, 2019), they name eight topics to consider for a minimal carbon footprint on food. The handbook is available for entrepreneurs in the food service industry who are interested in making their business more sustainable. The eight topics are listed and briefly explained on the next page.

## KEY INSIGHTS

*Compared to other food products, fruit has a relatively low impact on the environment. This impact depends on the locality, seasonality and modes of transportation that have been used to import fruits to the Netherlands.*

## GiantLeaps' topics for sustainable restaurants

*Plant-based:* Livestock accounts for 80% of land use and 60% of CO<sub>2</sub> emissions. By reducing meat, for example by making vegetables the star of the dish, it is possible to significantly lower the environmental impact per meal.

*Better meat and fish:* The CO<sub>2</sub> emissions and water use of cows is much higher per kilogram of meat than that of for example chicken. Nearly 90% of the marine fish stocks are overexploited, causing an ecological unbalance of the oceans. For the lowest impact, choose for seasonal fish or true bycatch and selecting only certified meat with a lower impact.

*Local and seasonal:* These principles go hand in hand. Choosing for products that are both local and seasonal have the lowest impact, but a local product that is grown under unnatural circumstances (for example greenhouses) may have a higher impact than seasonally imported products, depending on the type of transportation.

*Reduce food losses:* Roughly one-third of the globally produced food for human consumption is lost or discarded. Reducing food waste leads to a reduction of the use of resources, water, land, and therefore less environmental pressure.

*Minimal waste and packaging:* 43% of the plastic in the ocean is single-use plastic items. By focusing on a circular system, little to no new input is required from nature.

*A better society:* Respecting the rights of farmers and producers by choosing for certificates that guarantee a safe and healthy working environment, like the Rainforest Alliance, attributes to a more transparent production and supply chain.

*The people around you:* For a sustainable restaurant, it is important to consider the social interaction of their direct community. When customers and staff are more committed and satisfied, there is more possibility for ideas and opportunities that support a more sustainable lifestyle.

*Restaurant infrastructure:* Reviewing the energy consuming factors inside the restaurant can make a big difference. Where food devices like refrigerators and ovens require around 35% of the energy in the restaurant, lightning, sanitation and insulation of the building makes up a large part of the emissions from the restaurant.

## Rating sustainability

Milieu Centraal has developed a calendar, that rates the sustainability of fruit and vegetables, using five letters, A to E, with A being the most sustainable choice. These categories are based on the required amount of fossil fuels, agricultural land and greenhouse gases to sell a product in a certain month (Milieu Centraal, 2017). In figure 3, a screenshot of the calendar can be seen, showing the results for grapes for all months. As shown, in June and July, grapes from Chili are a more sustainable choice than grapes from Egypt, because from Chili, the grapes are transported by boat only, while from Egypt, both boats and trucks are used to transport grapes to the Netherlands. In both countries, the grapes are grown on the fields.

Nearly all fruits are transported and stored cooled, which needs extra energy. In the Netherlands, growing fruit outdoors requires less energy and has therefore a smaller impact than growing in gas-heated greenhouses, unless the greenhouse is

heated by a sustainable thermal source. Keeping fruit refrigerated for a long time increases the environmental impact. Fruit from Europe grown outdoors emits less CO<sub>2</sub> from transportation than fruit from outside of Europe. Most fruits from outside of Europe are transported by boat, leaving a significantly smaller environmental footprint than the few types of fruit transported by airplane (Milieu Centraal, 2017).

Looking at the topics mentioned by GiantLeaps, it seems right to engage both caterers and their visitors into the project. While an increased fruit consumption during meals does not necessarily lead to a reduced consumption of meat or less waste or packaging, it does not rule it out either. The new position of fruit in the menu should not have a negative environmental impact, so it is important to consider the seasonality and locality of the fruit. The calendar from Milieu Centraal can be used as an indication. Some caterers already use this calendar when creating their menus or promoting dishes to their visitors (appendix 2).

< Terug naar startscherm

# druiven van alle maanden met alle scores

Zoekopdracht bewerken

## 1 producten gevonden

Download de PDF. Via de PDF kunt u uw zoekresultaten opslaan en printen.

PDF

Product	Score(s)	Maand	Land van herkomst		
<b>Druif</b> 	<span style="border: 1px solid green; border-radius: 50%; padding: 2px 6px;">B</span>	in Januari	uit Argentinië, Peru, Zuid-Afrika	<span style="background-color: #76b82a; color: white; padding: 2px 5px;">Goede keuze</span>	<span style="border-left: 2px solid #76b82a; padding-left: 5px;"> <span style="border: 1px solid #76b82a; border-radius: 50%; padding: 2px 6px;">B</span> Bewaartip                 </span>
		in Februari	uit Argentinië, Chili, Peru, Zuid-Afrika		
		in Maart	uit Chili, Zuid-Afrika		
		in April	uit Chili, Zuid-Afrika		
		in Mei	uit Chili, Zuid-Afrika		
		in Juni	uit Chili		
		in Juli	uit Chili		
		in Augustus	uit Griekenland, Italië		
		in September	uit Griekenland, Italië		
		in Oktober	uit Brazilië, Griekenland, Italië		
		in November	uit Brazilië, Griekenland, Italië, Peru		
		in December	uit Brazilië, Italië, Peru, Zuid-Afrika		
		<span style="border: 1px solid orange; border-radius: 50%; padding: 2px 6px;">D</span>	in Juni		
in Juli	uit Egypte				

Figure 3: the results for grapes of the seasonal calendar from MilieuCentraal (2017).

## 1.2 HISTORY

To understand why fruit has this undefined position, a literature research has been conducted on the history and perception of fruit consumption in the Dutch kitchen. Below is a summary of relevant events in history related to the development of the Dutch diet and the perception on food.

### Food as medication

Over the centuries, fruit has not had a defined role in the meal in the Netherlands. According to Kleijn et al (2018), fruit was perceived as food for the lower class people, such as farmers and their animals, as it grew close to the ground. It was believed that eating above or under your own class would make you sick. Later (around the 14th century), when Galen of Pergamon's humourism theory was the leading element in healthcare and diet, fruit was perceived as one of the tools to balance the juices in your body. The established combination of melon and ham for example can be traced back to this theory, as it is a perfectly balanced dish, combining an ingredient that is moist and cold with one that is dry and warm. Since most fruit (if not all) are moist and cold type of foods, they were only eaten by people that needed to balance their dry and warm insides (Kleijn et al, 2018).

### Food and functionality: the sandwich

Calvinism laid the basis for the functional role of food in the Netherlands. Calvinism is the Protestant Christian teaching of John Calvin. Originating from the 16th century, it propagates a lifestyle of moderation, frugality and sobriety (Veen, 2009). Due to this reformation, food was given no other purpose than to nourish. Enjoyment was not encouraged, so food became a very functional part of the Dutch culture (Lohman, 2015).

Being introduced to new spices during the Golden Age (17th century) caused the Dutch to become more tolerant towards new cultures. However, it also caused them to be even less bothered with their own culture and cuisine (Jobse-van Putten 1996). During the industrialization (19th century), there was less time to consume lunch during work days, so the working class started bringing simple sandwich lunches to work (Miranda, 1921; Oudejans, 2018). The sandwiches were the ultimate example of the efficiency and functionality that characterized Dutch food culture, where effort and hassle were to be minimized. Industrialization itself supported this lifestyle, as it became possible to make bread in mass production (see figure 4). In other European countries, the economic and technological developments lead to a rich restaurant culture, which is a result from a strong sense of food as national treasure, but in the Netherlands this did not happen, as this association was not part of the Dutch culture (Jobse-van Putten, 1996).

**EET MEER BROOD**

**3000 CAL.**  
2.039 KG. RUNDVLEESCH

**3000 CAL.**  
1,168 KG. BROOD

**3000 CAL.**  
4,950 KG. MELK

**3000 CAL.**  
4,863 KG. AARDAPPELEN

**BROOD IS DESTAF  
DES LEVENS**

En Mensch van Middelbaren leeftijd heeft voor matig zwaar arbeid nodig 3000 Caloriën liefst in deze Samenstelling  
100 Gr. Eiwitstoffen  
60 Gr. Vet  
500 Gr. Koolhydraten  
Brood komt die Samenstelling het dichtst nabij

100 GR. EIWIT 410 CAL.  
80 GR. VET 558 CAL.  
500 GR. KOLHYDRATEN 2250 CAL.  
2050 CALORIËN

**KOST PRIJS f 3,87**  
**BEVAT:**  
388 GR. EIWIT 148 GR. VET  
9 GR. KOOLHYDR. 1437 GR. WATER

**KOST PRIJS f 0,32**  
**BEVAT:**  
61 GR. EIWIT 5 GR. VET.  
651 GR. KOOLHYDR. 393 GR. WATER

**KOST PRIJS f 0,75**  
**BEVAT:**  
68 GR. EIWIT 148 GR. VET  
234 GR. KOOLHYDR. 4356 GR. WATER

**KOST PRIJS f 0,49**  
**BEVAT:** 60 GR. EIWIT  
3 GR. VET 838 GR. KOOLHYDR  
900 GR. AFVAL 3049 GR. WATER

## KEY INSIGHTS

Food in the Netherlands has always had a very functional role, striving for efficiency. Efforts for preparation are to be minimized.

Figure 4: an advertisement for bread in 1926.

## Exotic influences

Until the 17th century, sweet and savoury were served simultaneously during the meal. It is around this time that the French kitchen introduced the 'dessert', a sweet dish served after the meal, and the sweet food started to disappear from the main course. Since the French kitchen has had an enormous influence on most European kitchen, also on the Dutch kitchen, it did not take long before chefs in the Netherlands followed the French example. It is here that fruit has started to move away from the (main) course into sweet dishes, that eventually became treats. (Kleijn, 2018). It is interesting to see that countries where the French have been less influential on the kitchen and cooking culture, still often have fruit in the traditional dishes. Many Asian countries (Chang, 1998), but also traditional African cuisine have many dishes that include fruit (Oktay, 2018).

Through the 18th and 19th centuries, there were several food developments that did not include fruit: the import of spices from

the Far East, the discovery of bacteria and the hype it caused around hygiene. The rise of the sugar industry also took place during this time where fruit had little spotlight: first it was used as a spice, later as a medicine and eventually as an ingredient for preserving and sweetening other ingredients (Kleijn et al, 2018). As food and medicine gradually went separate ways, sugar stayed in the food part as the main competitor of fruit when it comes to the sweetening element in food.

It is only since the 1950s, when traveling abroad became more accessible for the people, that international dishes were introduced into the Dutch kitchen (figure 5). Since then, cooking became a little more experimental, mixing known ingredients with new and exotic ones to create new dishes. Many people (housewives actually since they were the ones cooking for the family) drew their inspiration for these 'fusion dishes' from magazines like *Margriet* and *Libelle*. The influence of these magazines into the households of Dutch families have been very large for a few decades (Verriet, 2015).

## KEY INSIGHTS

*Exotic cuisines have had influences on the fruit consumption in the Netherlands. It is generally much more accepted to use tropical/exotic fruits in exotic dishes, than Dutch fruit in "Dutch" dishes.*

de meesterhand van de „cuoco” zelf...

SPAGHETTI  
IN TOMATEN- EN KAAS SAUS

3/4 literblik f 1.23  
en onze nasi goreng is even lekker als in Indonesië zelf!  
Zet dat ook 's op het menu!

1/2 literblik f 1.59 1/2 literblik f 0.98

Spaghetti op precies dezelfde manier klaargemaakt als in zo'n romantisch eet-huisje in Italië! Even lekker... even apart! Omdat bij **Koenwiser** óók een echte Italiaanse kok in de keuken staat... En hij weet, hoe spaghetti smaken moet! Vraag daarom altijd naar **Koenwiser** wanneer u iets exclusiefs op tafel wilt brengen!

**Koenwiser** complete maaltijden:  
*exclusief... tongstrelend...*

Figure 5: an advertisement from 1960 for “exclusive Italian meals at home”.

## Cultural heritage

With the availability of international dishes and a growing demand for convenient foods, many adaptations of classical international recipes emerged. To make it easier to sell these dishes, they were given a name to make them easier to remember. Often, the name would not mention any of the ingredients. Over time, some of these dishes have become household names, with a common understanding of the ingredients that were included in the recipe. A few examples and their origins:

*Broodje gezond: cheap made fancy (figure 7)*  
A cheap sandwich that looks a million dollar, that was easy to make for a large group of people. The recipe originates from a student association that ran out of budget but needed to cater an event for its members (Miellet, 2012) (appendix 1). Nowadays, the “broodje gezond” is a household name. The sandwich with fixed combination of ingredients is commonly known by its name, which reveals nothing about the ingredients or the actual nutritional value.

*Kapsalon: cheap made convenient (figure 6)*  
A hairdresser in Rotterdam who had very little time to eat, asked the kebab store next door to put all the dishes on one tray (AD, 2006). This combination of ingredients is unique in the world, and “kapsalon” is the only name the dish carries.

*Hawaiian pizza: from experimental topping to heavy debate on fruit in meals (figure 8)*  
A Greek chef who lived in Canada started to experiment with pizza toppings. The name “pizza Hawaii” can be explained by the use of pineapple: at the time, Hawaii was the only place that exported pineapples (Nosowitz, 2018). The pizza Hawaii is known worldwide and There has been a heated debate since the president of Iceland has spoken out strongly against the use of fruit on pizza (Henley, 2017). Since then, there is a clash going on social media between people who agree with him and people who can appreciate pineapple on their pizza. When introducing this project to people, many named this pizza, followed by their opinion about the use of fruit in meals (appendix 1). It seems that the discussion on this pizza topping has had a significant impact on people’s association with fruit in meals.

## KEY INSIGHTS

*Some dishes have become household names, without any of the ingredients in their name. The pineapple-on-pizza discussion has provoked strong opinions against fruit as a component in meals.*



*Figures 6 to 8: kapsalon in its iconic aluminum tray, a broodje gezond and "Hawaiian pizza".*

## Marketing for health and convenience

On top of the international influences in the 19th century, the marketing industry (both nationally and internationally) on food brands was growing enormously, which meant that the consumption of some products (like milk, meat, margarine) were growing exponentially. Due to the intensive marketing, these products were perceived as crucial elements for a healthy diet (Kleijn et al, 2018) (figure 9). Fruit, since being a product that is not developed and packaged by one brand, has not been part of any of these promotions, which meant that their position in the diet started to lose definition and their place was taken by vitamin fortified foods or supplements.

After World War II, housewives were expected to take perfect care of their family, and with the ready-made packages the food producer aimed to help the women meet these high societal expectations (Verriet, 2015).

When women started to work more and had less time for cooking, the convenience food took over the influential power from the

magazines. Brands like CONIMEX and MAGGI were strong players in this market of combining the trend of exotic meals with convenient ways of preparation (Verriet, 2015) (figure 11). With new inventions, like canned food and the microwave, cooking at home became a convenience rather than a household task or a skill (Kleijn et al, 2018; Verriet, 2015) (figure 10). The recipe of the 'exotic' dish had been adapted to the Dutch taste, so if there was any fruit in the meal traditionally, that had often disappeared in the Dutch version of it. Exotic fruits in the supermarkets were sold like the known Dutch fruits, and there was no recommendation on how to consume them in the original context. The result of this, is that these "new" types of fruit are only eaten in the original recipe it was introduced with, or completely separate from the meal.

However, with the rise of other, more convenient, snack food, like cookies, chips and other ready-to-go snacks, but especially the rise of sugar and sugary snacks, there is an enormous competition for fruit for the eating moments between meals.

## KEY INSIGHTS

*Some dishes in the Dutch culture are established by their iconic names. The enormous marketing for convenience foods brought competition for fruit as a snack. Introduction of tropical fruits missed the connection with its origin, causing the original usage into recipes to not be adopted.*



Figures 9 to 11: advertisements for a milk campaign in 1950, Iglo ready-made dinners in 1975 and Conimex in 1980.

## A counter-reaction: slow food and the emphasis on healthy food

With the growth of convenience foods, a counter-movement developed that focused on the quality and nutritional value of food. The “Slow Food Movement” originated in Italy in 1986 after a demonstration on the intended site of a McDonald’s restaurant and spread its beliefs worldwide through the decades. Their initial aim was to “defend regional traditions, good food, gastronomic pleasure and a slow pace of life. In over two decades of history, the movement has evolved to embrace a comprehensive approach to food that recognizes the strong connections between plate, planet, people, politics and culture.” (Slow Food International, 2020). Effectively, this movement did not reach the Netherlands until 2008. Before that time, in 1986, the “Voorlichtingsbureau voor de Voeding”, Nutrition Information Office, now Voedingscentrum) published the first “Richtlijnen Goede Voeding” (Guidelines for Good Nutrition), after research showed that the current average consumption pattern in the Netherlands differs from the guidelines (PWAA, 2009). These guidelines were communicated to the public through several versions of the “Schijf van Vijf” (Wheel of Five) (Buiten, 2015).

Since then, the Schijf van Vijf has been updated several times (figures 12 to 17), to adapt to the internationalisation and availability of new foods, although the Richtlijnen Goede Voeding were unchanged until 2006 (Gezondheidsraad, 2006). The most recent guidelines date from 2015, however the advices in the Schijf van Vijf are constantly updated with the latest numbers on consumption (Brink et al, 2019).





## 1.3 FOOD HYPES AND TRENDS

At the 'Academie voor leefstijl en gezondheid' in Ede, a workshop was hosted, dedicated to explore the definition of a "food hype" (AVLEG, 2019).

The development of a hype often starts with a (new) scientific insight. Whether this expands to a hype with a large following, depends on the conclusions that are drawn by influential parties, and the message they carry. The common trend is that a message evolves into a hype for a new type of diet when it requires very little effort, no restrictions and when it is supposed to solve all one's problems quickly. The evidential value seems to be inferior to the promised result. The product adaptation curve can be used to indicate how a hype spreads through a population (see figure 18).

An interesting insight is that most hypes in the past have evolved around either big marketing campaigns or a message of fear. As soon as contradicting information comes to light, the popularity of the hype decreases (figure 19). However, sometimes the message is planted deep into peoples' mind, what makes it hard to update them with the new knowledge. The takeaway of the workshop (from a designer perspective), is that a hype usually is not carefully designed, but evolves naturally from triggers, like a news item. It is questionable whether it is desirable to design a hype following this format, since the effect is often temporary and not intended for a structural change. However, the information about adaptation by different types of people and the influences that are "necessary" to introduce a new experience is valuable for the design process of the project.

### KEY INSIGHTS

*Most food hypes start with the entry of new knowledge that seem to solve a problem that many people can relate to. It is questionable whether it is desirable to design a hype following this format. The theory about adaptation by different types of people and the influences that are necessary to introduce a new experience can be used to when designing for a longer lasting effect.*

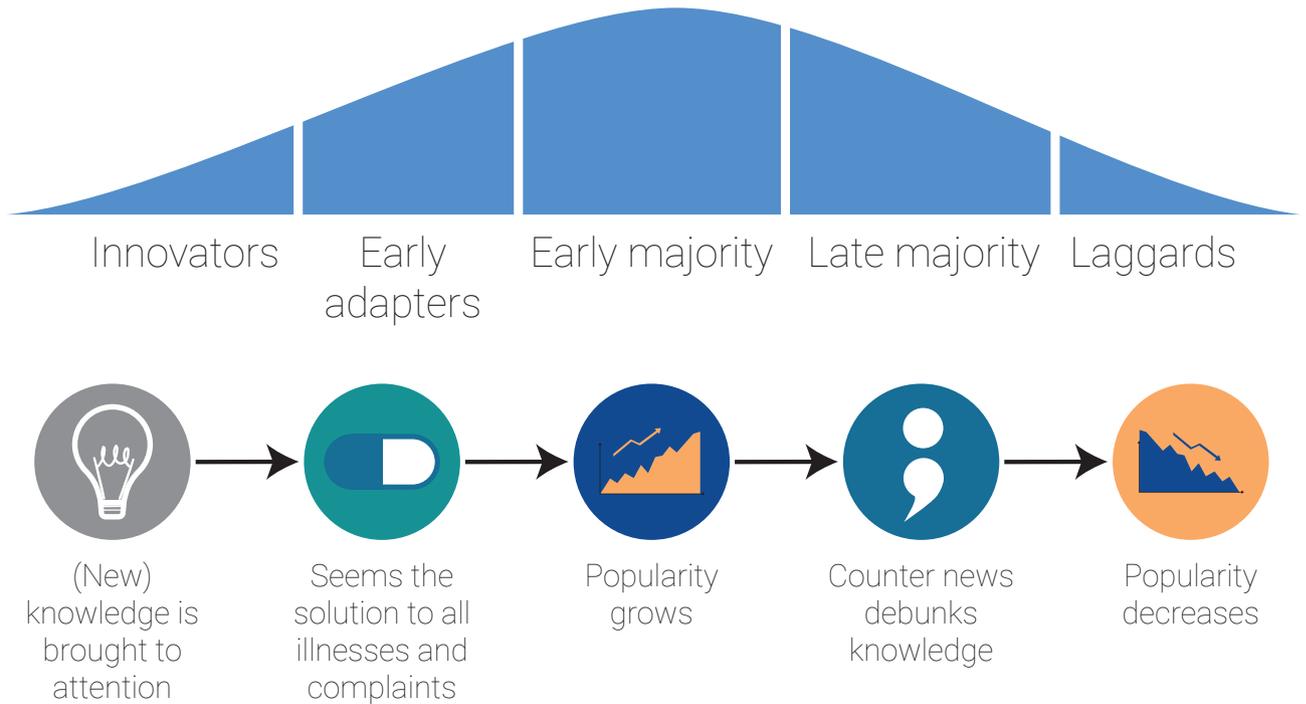


Figure 18: the Product Adaptation Curve. Figure 19: the course of a food hype.

## Food trends

Future food trends pick up on innovations due to new technological possibilities and they reflect what's important to the majority of the consumer. Platteau et al (2016) listed the most recent trends that have developed by describing the reactions from the industry and consumers:

### Convenience foods in large chains

Since the end of World War II, the demand for convenience foods has continued to grow and take a central position in our lives. "Ready to cook" and "ready to eat" products are widely available in the supermarkets. The rise of the internet enabled big restaurant chains to offer home delivery, to save the consumer even more effort.

### Authenticity, natural and origin

While the majority prefers their meals to be available in a convenient way, they also expect their food to be of excellent quality, without additives and as little processed as possible. The consumer has a growing interest in the locality of the ingredients (Wanders, 2017). The criteria "land of origin", "no additives" and "locally produced" are growing in popularity. This is reflected by food producers in two ways: reducing the amount of ingredients in the product or paying attention to local resources. There is a strong connection to nostalgia and

craftsmanship. The story behind the brand or the maker plays a major role in the branding of the product. Local produce is promoted through so-called "korte ketens" (short chains) by organising farmer's markets and offering subscriptions on grocery boxes with local produce (see figure 20). These boxes are conveniently delivered to the doorstep, a service model that connects this trend to the first one.

### Custom nutrition

There is a growing awareness of the relation between food and health. This translates into a focus on products that contain nutrients, either naturally or fortified. Marketeers use this trend as an opportunity by highlighting these nutrients on the packaging of their products.

Another aspect of this trend is the target group specific nutrition, following scientific insights that nutritional needs are different for different groups. Age, medical or genetic background, religion, but also culture, education or lifestyle (for example veganism) are parameters that identify different target groups (figures 21 and 22). A great variety of product have emerged from this trend. Also the emergence of products specifically targeting food intolerances, such as gluten or dairy free products, are examples of this target-group specific trend. It is expected that, with the development of 3D-foodprinting, the personalized food trend will continue to grow.



Figures 20 to 22: a home-delivered meal box with fresh (seasonal) products, a vegetarian adaptation of pâté and butter with extra omega 3.

## Sustainable food

The concerns on the environment have left their mark on the food industry. Both producer and consumer are addressed to consider their behaviour towards a more sustainable food system. This leads to varying reactions among consumers: some feel they are losing their freedom of choice and are therefore unwilling to change their behaviour, while others understand the urgency and are willing to make adjustments. Producers perceive the latter group as a new target group and develop new products that cater these people. Several certifications and labels help the development of this trend by providing a reference for the consumer. There are several developments around a more sustainable food system, that mainly focus on the reduction of the consumption of animal products. Some of them focus on developing comparable alternatives, for example the experiments around cultured meat and the use of insects. These developments however are not yet widely available nor accepted, so it is difficult to say whether these will be a trend in the near future.

## Implications for project

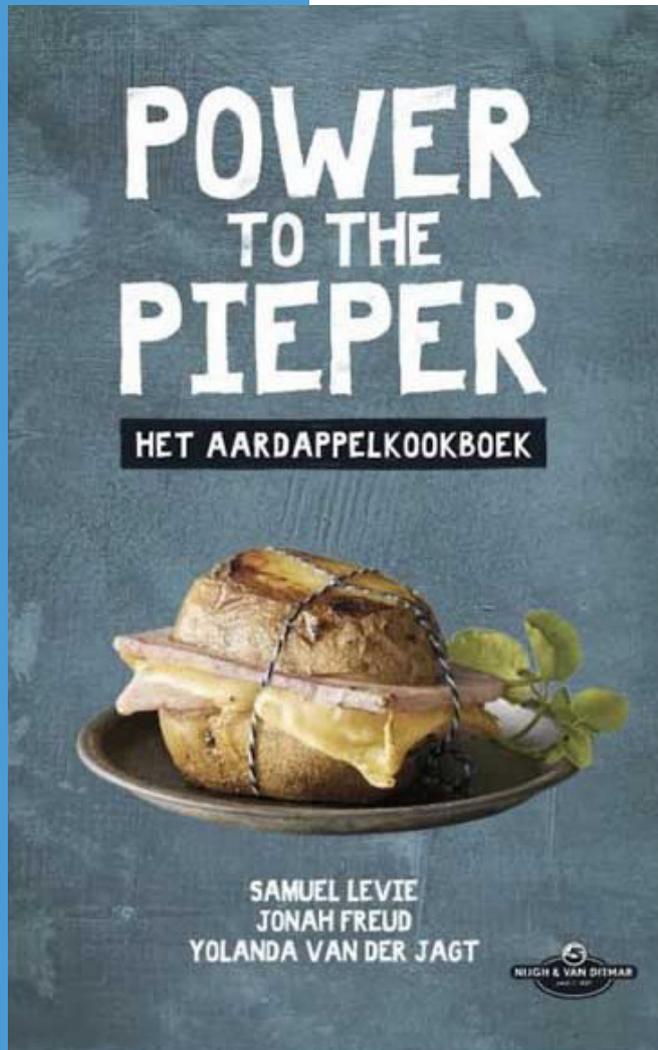
These trends provide a fruitful environment for a project that focuses on an increased fruit intake. However, there are some things to keep in mind. The majority of consumers is conditioned to conveniently available food and meals, and is not prepared to put a lot of effort into the preparation of meals. Fruit requires some preparation, so aiming for served meals through caterers seems a right choice. Since quality and origin are considered very important aspects of eating, this should be kept in mind when developing a final concept.

Products that target specific groups, or focus on specific nutrients, are growing in popularity. People respond differently to externally imposed messages. Some will be resistant to any type of change while others are more flexible and open to the possibilities. This reaction depends on the marketing approach. For the project, it is interesting to see if there is a link between this target group segmentation and these changes in behaviour. If these factors can be taken into account, it is possible to reach a broad audience.

## KEY INSIGHTS

*Food trends emerge from new technologies and innovations. They reflect what is important to the majority of the population. Convenience, authenticity and customization are the biggest trends of this time. Also there is a growing demand for sustainable food from local sources.*

## 1.4 FUTURE



During an interactive lecture at the exhibition 'Voedsel van Morgen' at the Nemo Science museum (Zuiden, 2019), the question was raised what the future of food would be, when thinking about a more sustainable planet, preventing diseases and keeping up a large enough food supply with a growing population. Questions were raised about our habits towards food, where they come from and whether it is necessary to change some of our behaviour. The origin of typical Dutch dishes (AGV: potato, vegetables, meat) were discussed in order to put in perspective how quickly something can become a traditional dish settled in culture. During the lecture, consumption sociologist dr. Hans Dagevos confirmed our preference for convenience in our daily meals. He mentions an interesting paradox; people often make a big effort on holiday dinners, for example during Christmas, but avoid efforts on the daily basis. Helen Kranstauber from Food Cabinet explained how communication and branding can influence a different direction in a food system, and what can be done to ensure the desired direction (Food Cabinet, 2019b) (figure 23).

Figure 23: an image from Food Cabinet's campaign for the revaluation of the Dutch potato.

## 1.5 OBSERVATIONS

### Supermarkets

To get an idea of the position of supermarkets towards fruit and fruit consumption, the promotional brochures and seasonal magazines of the ten supermarkets located in Delft (see figure 24). In each brochure, the amount of products on sale are counted and compared with the amount of fruit products. Also the recipes and special features have been examined on the presence of fruit. The analysis lead to the following insights:

In today's supermarket brochures, fruit is little represented in sales: on average, around 3.4% of the promoted products contains fruit, while the fruit section usually takes up a central place in the physical shopping space. A possible explanation is the influence of big brands on the advertisements of supermarkets (see appendix 3). Some supermarkets highlight a certain (seasonal) fruit but omit to give suggestions on how to use fruit as a main component in dishes. However, the recipe section performed much better: an average of 23.5% of the recipes featured in the magazines and brochures included fruit, either although often with a decorative purpose or as a flavour enhancer (for example: lemon juice or orange peel). The fruit as a whole piece is barely used.

### Cookbooks

Cookbooks can give insight into the food trends of a moment in time, as people have always used cookbooks for inspiration and recipes (Kleijn et al, 2018). According to Bol.com (Kookboeken, 2019), among the top ten popular cookbooks are: Bush (2012), Graimes (2016), Oliver (2014, 2020), Ottolenghi (2011, 2019), and Thijssen (2008) (figure 25). In these books, all recipes were screened for the presence of fruit in the recipes. When present, the role of the fruit was also defined: decoration, flavour enhancer, supporting or key ingredient. The following was found:

Fruit is mostly either used as a flavour enhancer for other ingredients or in desserts. It is rarely a full ingredient in a main course. The recipes that use fruit as an ingredient, are the recipes that take more time to prepare than average and are often meant for 'special occasions'. Also most of these recipes are presented as exotic: promoting a yet undiscovered cuisine of another culture (Ottolenghi, 2011). This shows that fruit is generally not perceived as something that is to be eaten in daily meals. It also shows the scale of the issue: even chefs with a big following, like Jamie Oliver and Yoram Ottolenghi, do not perceive fruit as a main ingredient of regular meals. It is interesting to see to what extend vegetables play a different role from fruit: especially in vegetarian themed books (Graimes, 2016; Oliver, 2020; Ottolenghi, 2011), vegetables are key ingredients, where fruit rarely takes centre stage.

## KEY INSIGHTS

Supermarket promotions dedicate very little promotion to fruit, unless it is a seasonal special. Advertised recipes included more fruit, although it is often used in a decorative way or as a flavour enhancer. In popular cookbooks, vegetables play key roles in most (vegetarian) recipes, where fruit rarely takes center stage.



Figure 24 and 25: the supermarket brochures and cookbooks that were analysed.

## Public perception

There are different reasons for people not to eat fruit. People appear to have several preconceptions about fruit, based on both personal experience and (incomplete) knowledge. A few of these preconceptions and other obstacles have come up during multiple informal conversational interviews with over 50 people about their perception on fruit consumption. People are hindered to buy or eat more fruit because of the quick expiration time of fruit, the environmental impact, the high price and the levels of sugar, which they fear will cause a raise in their blood sugar and cause cavities in their teeth.

Some say they do not like the effort it takes to prepare and eat (peeling, cutting, messy hands from juice, removing seeds), others respond they forget to eat it when it is in their bag and they usually take it back home at the end of the day, and others say they already forget to pack it, so it stays at home and then at some point expires. People who

had access to free fruit at work were less likely to forget to eat a piece. It is notable that most people associate eating fruit as an activity to be done on a workday, at the times they were not at home.

During the conversations, it unanimously appeared that the taste of fruit is not an obstacle: from all the persons asked, not one said to dislike the taste of fruit. When it comes to fruit in a meal, most people can think of one dish they have once tried that contained fruit. The (often positive) memory is linked to feelings of surprise and specialty. Some tell they have one 'signature dish' that includes fruit that they sometimes make. Fruit is not considered as a standard component in daily meals. During the conversations, some people perceived the usage of fruit in meals as not unusual, but were stunned when they realized how little it is done. Others were more sceptical towards the sweetness in savoury dishes, recalling the discussion on the Hawaiian pizza.

## KEY INSIGHTS

*People have different reasons for not eating fruit, but there is a joint agreement that the taste of fruit is not an obstacle to eat it. Using fruit as an ingredient in meals is not in the system of most people, so they do not think about trying flavour combinations with fruit. Overall, most people are not very deliberate about their fruit consumption.*



# CHAPTER 2

# FRUIT EATERS

2 CONSUMER BEHAVIOUR



# 2 CONSUMER BEHAVIOUR

This chapter elaborates on the consumer side of the project. An auto-ethnographic research is analysed and translated into a model. This model shows that changes to a lifestyle are triggered when several internal or external factors change simultaneously. By designing the external factors and triggering the internal factors, it is possible to steer towards these transition points.

This model is compared with several existing models of behaviour change to define the target audience. Based on the target audience, design opportunities are identified.

Finally, several archetypes that represent the target audiences for each design opportunity are defined.

The design opportunities combined with the four types of visitors provide the basis for defining a suitable approach towards consumers. This is defined in the final concept (chapter 6.6) to help caterers recognize and approach their target audience.

## 2.1 AUTO-ETHNOGRAPHIC RESEARCH

An auto-ethnographic research focuses on a specific topic, with the designer taking central stage (Mcilveen, 2008).

During an auto-ethnographic analysis, I mapped my personal relationship to food and eating in a timeline. I made a distinction between different aspects of my life: Lifestyle, shopping behaviour, cooking, meals, knowledge and interest on nutrition and diet, social viewpoints and fruit consumption. The developments in these aspects have been influenced by four factors: a growing seriousness about sport, a search for solutions to achieve the desired body shape and weight, encounters with people and changes in living situation. All of these factors have developed and impacted each other over time (see figure 26).

There were a few moments in the timeline where two or more factors changed at the same time. These moments can be identified as crucial moments for future lifestyle choices, as they often caused a disruption or change of direction. It is interesting to see how the factors impact the lifestyle choices. This is different for each factor. While the first two are mainly internal factors, based on motivation and personality, the third and fourth factors are mostly external and dependent on the surroundings.

### Sport

As the intensity of training increased, so did the awareness that nutrition affects performance and recovery. The intrinsic motivation to improve performance has lead me to become interested about nutrition.

### Body shape

Since what you eat influences the shape of your body, I felt an urgency to be aware of my eating habits. Being able to gain weight easily, I am always looking for solutions to avoid gaining too much.

### Encounters with people

Different encounters with people (or books, documentaries, articles) with an outspoken viewpoint on food provided me with more context and knowledge on food.

### Living situation

Moving from my parents' house to a student house with eight roommates, and later to smaller houses, influenced the degree of independence I had around choosing what to eat.

A detailed analysis can be read in appendix 4.

## KEY INSIGHTS

*Four factors influence the choices I make on food and eating, when multiple are changing simultaneously. These factors are continuously evolving and influencing each other.*

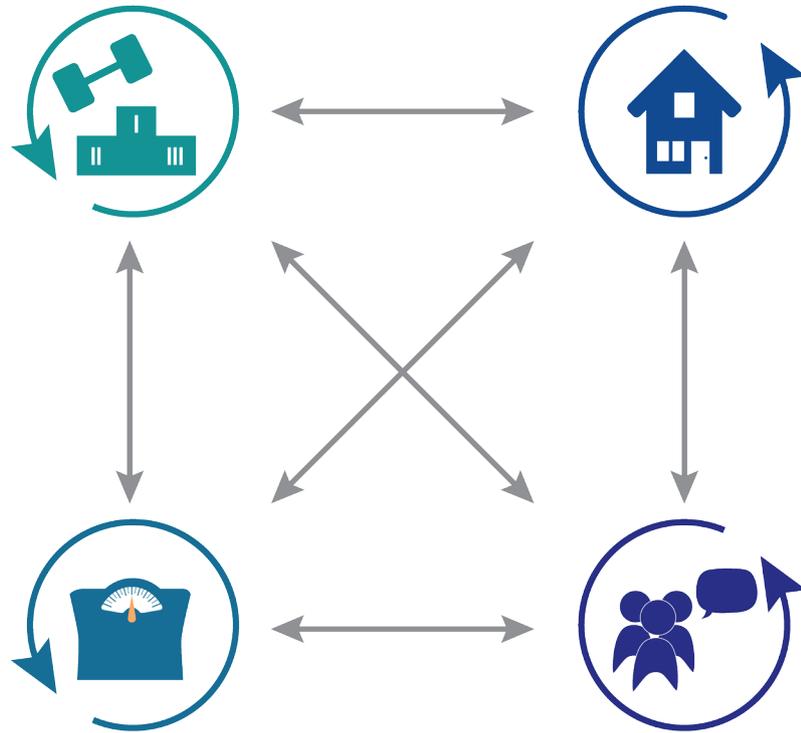


Figure 26: shows the interaction between different factors.

### Factor topics

The topics of the mentioned factors are illustrative. They are based on events that represent a personal interest or lifestyle. For other people, these interests

are obviously different, but the structure of the internal and external factors that influence behaviour can be used in a broader perspective.

## 2.2 BEHAVIOUR PHASES

In the auto-ethnographic research, it was possible to identify a number of phases that characterized my attitude towards food (figure 27). The transition from one phase to another was caused by the moments that multiple factors changed simultaneously. This often brought new information that was applicable into the context at the moment. When only one factor changed, it was often resisted until a different factor changed as well. This second factor would influence the direction of the change.

To be able to use the insights from the auto-ethnographic research as a systematic model, each phase has been characterized according to the five stages defined in the “stages of change model” (Greene et al, 1999) (figure 28). This model focuses on the motivational readiness of people to change a health behaviour. A sixth stage, “resistance” is added from the auto-ethnographic research (figure 29). To influence people into transferring from one stage to another, the (external) factors that activate this transition need to be designed and positioned strategically. When (new) information from an external source is presented from a certain phase, it will be rejected if the audience is not in that stage yet. In order to design transition between these stages, the readiness of the audience for certain approaches must be taken into account as well.

According to Greene et al (1999), all people are expected to go through these stages when they are changing their behaviour. This means that there are opportunities for designers to make an impact on a structural behavioural level in each stage.

The product adaptation curve, as previously mentioned in chapter 1.3: Food hypes and trends, can also be used to predict how people will respond when they encounter something new. Each phase in the curve describes the attitudes of people in different behaviour phases towards an innovation. Comparing both models, the people in the later stages of the behaviour change-model are likely to respond like Innovators and early adapters from the product adaptation curve (figure 30). The laggards will remain around the resistance phase until a majority has been convinced of the possible positive outcomes. In that sense, The different phases in the product adaptation curve can be helpful to better understand the target audience and the best ways to approach them.

### KEY INSIGHTS

*The “stages of change model” focuses on the motivation and readiness of people to change their behaviour. Comparing this model to the product adaptation curve, it indicates that there are different type of people with different mindsets that will require a different approach.*

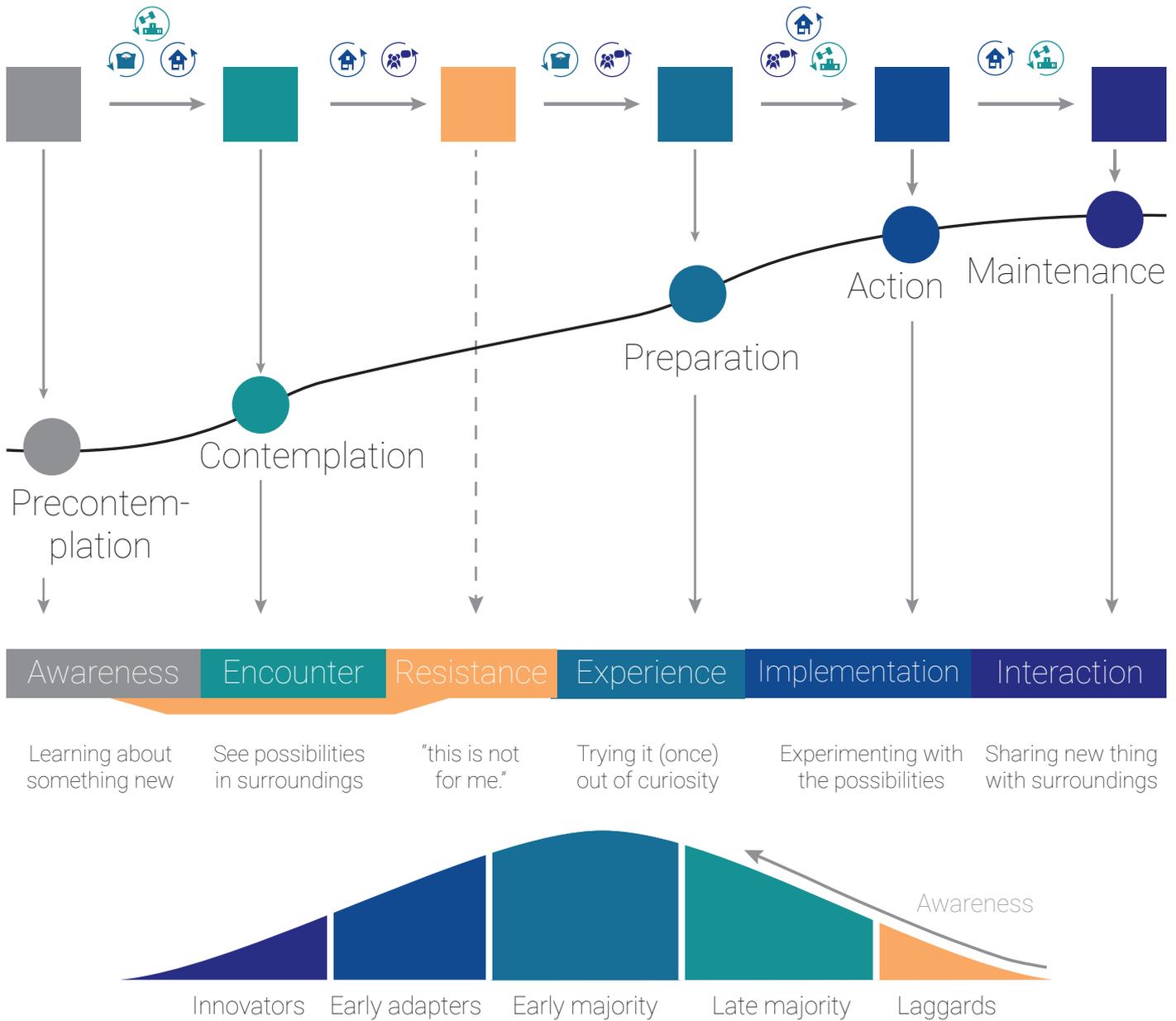


Figure 27 to 29: the influence of different factors during auto-ethnographic research, the "stages of change model" and the translation to attitude towards food.

Figure 30: the product adaptation curve, linked to the different attitudes in the behaviour model.

## 2.3 DESIGN OPPORTUNITIES

To design external factors that stimulate behaviour change and the approach towards the consumer, it is important to consider a person's mental readiness to implement new information. The conscious competence learning model (Howell, 1982) can be used to define this.

Traditionally, this model illustrates how a person develops a new skill, by going through four stages (figure 32). In the first stage he is unskilled, but also unaware of his inability. He moves to the second phase once he becomes aware of this. This usually only happens when an external factor has an influence on the perception on the issue of the person. Once the person is conscious about his lack of skill, he will improve his ability by learning or practising until he is skilled. The transition from the second to the third phase happens when the person is intrinsically motivated to take action. The last phase begins as soon as the newly acquired skill becomes a habit, an automatism, about which the person no longer has to think consciously.

This model can be compared to the previously defined attitude phases (figure 31), as it requires a transition through several phases in order to implement a new habit. The resistance phase is not part of Howell's model, since this model assumes that the person undergoing the transformation is open for new experiences and intrinsically motivated for change. When designing for a change in behaviour or mindset, there will be a phase where a person might not see the urgency or have the motivation and will therefore resist to take action. When it comes

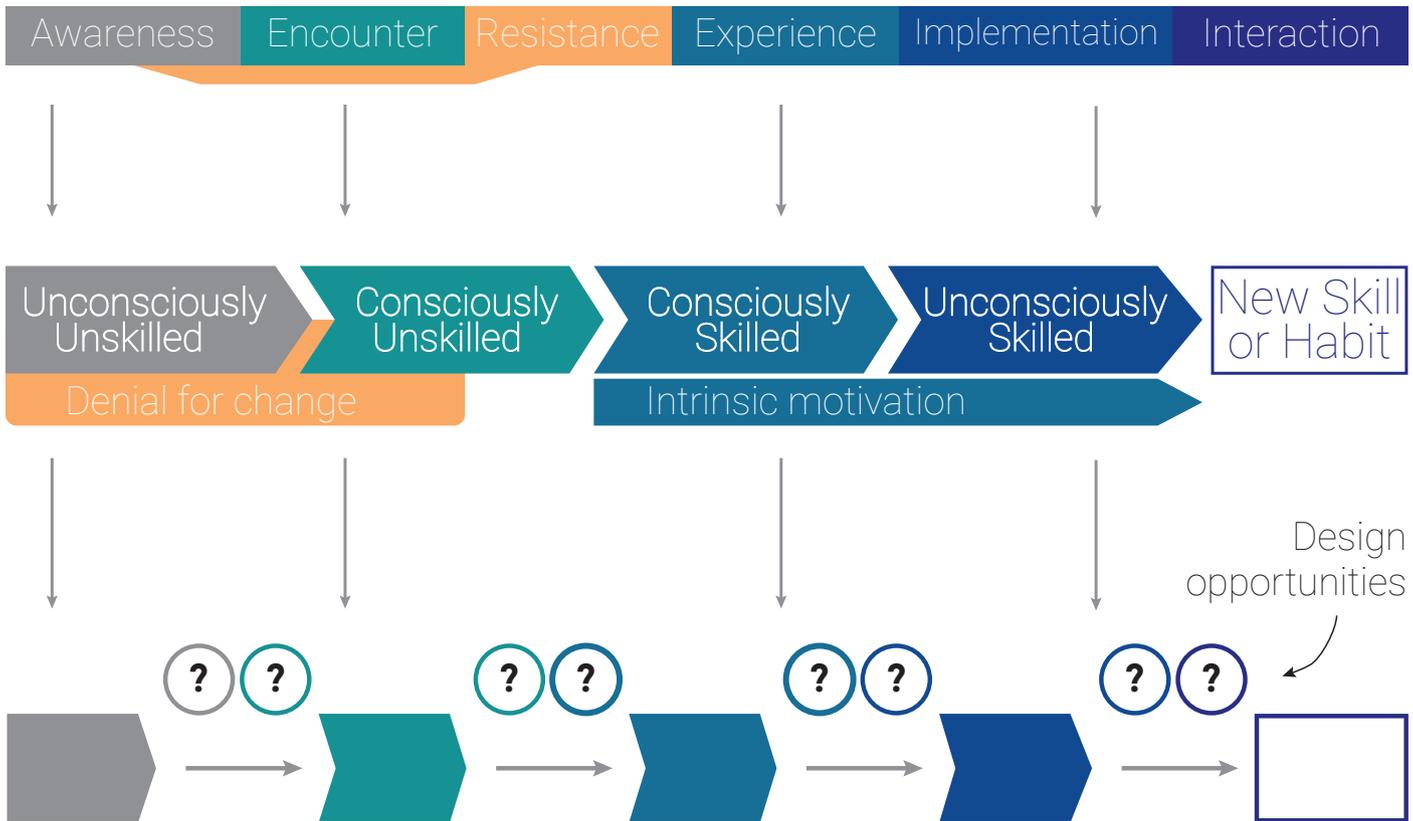
to food habits, people can be very conservative (appendix 1). As they are unavailable for any new experience until there is a motivation that drives them to open up to new ideas, the design opportunity that lies in the resistance phase needs a different tone than the other phases, focusing on interaction without obligation using recognizable concepts, with the goal to get people to be available for new ideas. The design opportunities in other phases can be more persuasive, assuming that people are curious for new type of dishes and unfamiliar flavours.

A new phase is reached when an experience takes place that makes the person reconsider his or her beliefs and is open to new or different experiences. Before this stage,

External factors can help to activate these persons. To move to the third stage, an intrinsic motivation is needed that drives the person to change his habits.

### Design opportunities

Design opportunities can be identified on the moments where external influences can have an impact on the perception of the perceived target audience, in the same way the (external) factors identified from the auto-ethnographic research (figure 33). These moments are on the transition moments from one phase to another in the competence learning model, because these phases illustrate clearly whether the focus should be on consciousness (creating awareness) or skilfulness (interacting and offering possibilities).



## KEY INSIGHTS

The factors that influence the transition from each phase of consciousness and skillfulness can be used as design opportunities. By designing the external and triggering the internal factors, it is possible to steer towards these transition points.

It is important to consider the readiness of the target audience to implement new information. According to the conscious learning model, an intrinsic motivation is needed at some point to move forward through the acceptance model.

Figures 31 to 33 show the different attitudes phases, the conscious competence learning model and the design opportunities on this model.

## 2.4 TARGET AUDIENCE

As all people have different personalities, it can be assumed that they respond differently when presented with unfamiliar food. To make optimum use of previously identified design opportunities, a short research is done on models that define personality types, followed by an outcome that is suitable for the project.

### Archetypes

The 12 Jungian personality archetypes model defines twelve different personality types (Gomez, 2010) (appendix 5). The adaptation into the 'Food type model' (Bordewijk, 2019) (figure 34) translates these different personalities into different attitudes towards food. In the model, each personality is distinguished by four features divided over two axes, the "I" versus "we" and the "freedom" versus "control". These features can give an indication of the mindset of the consumer and his or her openness to novelties brought by a caterer. Where the people with the "control" features are likely to be more resistant to unfamiliar dishes, the "freedom" type of eaters will probably embrace even the most experimental ideas. Depending on an "I" or "we" attitude, acceptance can be achieved through either a personal or more socially connected approach.

Introducing fruit in meals will require different solutions, depending on the type of visitor. It is therefore key that the caterer can create an idea of his intended target audience, to be able to use appropriate methods when introducing new dishes.

Linking the archetypes to the previously mentioned product adaptation model ( see chapter 2.2: Behaviour phases) (Rogers, 1962) and Howell's conscious competence model (1982, see chapter 2.3: Design opportunities), four visitor types are created: *The sceptic conservative, the tempted treater, the curious co-worker and the experimental risk-taker*. These four types can be used as a target audience in the design opportunities, each representing one of the transitions from one phase to the next. In chapters 6.6: Canteen test and 6.7: Four types of visitors, these types and their characteristics are further explained.

### KEY INSIGHTS

*Introducing fruit in meals will require different solutions, depending on the type of visitor. It is therefore key that the caterer can create an idea of his intended target audience, to be able to use a suitable approach when introducing new dishes. Four types of visitors represent different attitudes towards the introduction of new foods into the restaurant.*

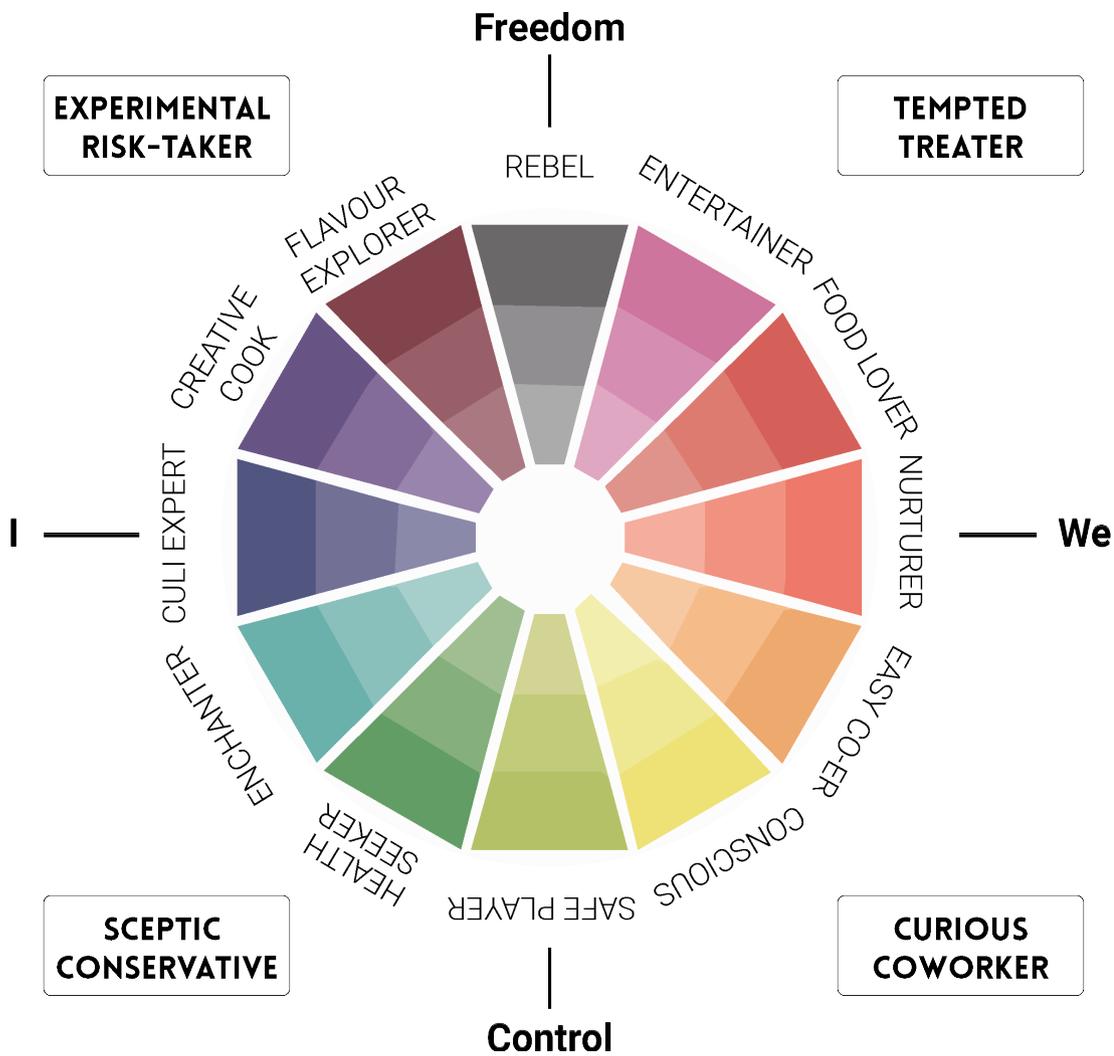


Figure 34: the food type model, with the four visitor types in the quadrants.

# CHAPTER 3

# CONTENT

3 STAKEHOLDERS

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# 3 STAKEHOLDERS

This project addresses the deficit in fruit consumption, an issue that is relevant for the majority of the population (Rivm, 2016). To be able to connect with the right channels to reach this audience, an organization was found that is already involved in many projects and initiatives around fruit consumption: The Nationaal Actieplan Groenten en Fruit. This organisation will act as problem owner and is therefore the main stakeholder.

To bring the outcome of this project to consumers, an extra stakeholder is needed, to convince people to change their eating habits, try new foods and learn how to prepare it themselves all at the same time. To lower the threshold for consumers, the preparation of the food will be outsourced.

In this way, the consumer is served the food and will only need to try it. For this role, the focus has been set on caterers who are active in the food service industry. Caterers have a broad audience that consume served food on a daily basis. By designing a solution that can be implemented by different caterers, it is possible to reach this large consumer base.

This chapter describes the work of the NAGF, their possibilities and the role they can play in this project. Also, different types of caterers are described. Next, the design goal is reviewed along with the project requirements that resulted from the insights from the first three chapters. These requirements serve as guidelines for development of the final concept.

## 3.1 NATIONAAL ACTIEPLAN GROENTEN EN FRUIT

The Nationaal Actieplan Groenten en Fruit (NAGF) was established to close the gap between the recommended intake and the actual consumption of fruit and vegetables. NAGF is an initiative from the Dutch government with the goal to stimulate the consumption of fruit and vegetables during a three-year program (from 2018 until October 2020). The mission of the NAGF is to “Increase the consumption of fruit and vegetables by inspiring, connecting and stimulating new initiatives that make it easier to eat healthier and more sustainable.” (NAGF, n.d.)

The NAGF is open to co-operate with all parties that can contribute to an increase of fruit and vegetable consumption and acts as a catalyst for creating new collaborations. It is involved in many initiatives and projects from different stakeholders, such as governmental organizations, corporates and civil society

organizations. The goal for the NAGF in these projects is to “Familiarize consumers with (new) types of fruit and vegetables, its preparation and storage and possibilities to eat more fruit and vegetables at other times and in other places to increase consumption” (NAGF, n.d.). The focus of this project suits the goal of the NAGF well, as it aims to familiarize consumers with the possibilities of the preparation of fruit at other times than currently is most common.

Through analysis on their input in past projects and information from NAGF employees, an overview is made of the different types of involvement and activities. The mission of the NAGF defines three core activities: inspiring, connecting and stimulating. Analysis on involvement in past projects adds three other activities: reporting, facilitating and developing. On the next page, an overview of these activities is presented.

### KEY INSIGHTS

*The Nationaal Actieplan Groenten en Fruit is interested to see what can be done to stimulate fruit consumption during meals. The NAGF is open to co-operate with all parties that can contribute to an increase of fruit and vegetable consumption.*



nationaal actieplan  
groenten en fruit



## INSPIRING

The NAGF manages an online database that provides information about product properties of fruit and vegetables, use and preservation method, nutritional value and information about the origin (Veggipedia, 2020). The website contains information over 475 types of fruit and vegetables and over 400 recipes. Veggipedia is the only channel from the NAGF that targets directly to consumers.

The "Ga Voor Kleur"-campaign (choose colour) entails everything that is directly aimed at the consumer, however it is also used for projects with other stakeholders. The social media channels of the NAGF are centered around this campaign. The "Ga Voor Kleur"-campaign was originally started in collaboration with Food cabinet (food cabinet, 2019a), a marketing agency who has since been involved in the graphic representation of the NAGF.



## STIMULATING

Often, a project is developed in a department of a company. To assist this department while pitching the project, the NAGF endorses the project. Because of their key role in the promotion of fruit and vegetable consumption, this type of support is an important addition to the pitch. The NAGF is also member of several advisory boards, for instance "peas please", an initiative of the food foundation in the United Kingdom that pledges for the consumption of more vegetables (Food Foundation, 2016).



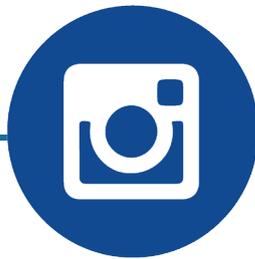
## REPORTING

The NAGF arranges for studies to be done during projects about fruit and vegetables. The study "Arts en Groenten" (doctor and vegetables) was commissioned by the NAGF and carried out by the association "Arts en Leefstijl" (doctor and lifestyle). The purpose of the study to identify which lifestyle projects are ongoing that involves general practitioners (GP) and the learning points of these projects. In addition, a study was conducted to make an inventory on how GPs apply lifestyle advice and which actions are done to specifically promote fruit and vegetable consumption. After the study, the report was analysed and approved by the NAGF and the outcomes were shared with the members of the association



## CONNECTING

The NAGF is in close contact with stakeholders on different (corporate) levels, from local growers to food service professionals to governmental organizations. Their network is a convenient tool when a stakeholder enters into a new project.



## FACILITATING

To help the shaping of new projects, the NAGF facilitates brainstorm sessions for stakeholders to get an understanding of the relevant aspects of the project. They also assist with the planning of campaigns and PR plans.



## DEVELOPING

The "Ga Voor Kleur"-Lab is a collective project that finds its origin in a nudging experiment done in 2018 at Dirk Supermarket.

The NAGF was closely involved in the organization and execution of this experiment. It also monitored the procedure and the outcomes. The NAGF is actively looking for new stakeholders to develop their own versions of the nudging lab. The NAGF provides some tools to help these stakeholders get started.

## KEY INSIGHTS

The NAGF has a broad range of capabilities. For this project, the most valuable activities are the ones that communicate and connect as many people as possible. Experience and contacts from previous projects are a convenient tools.

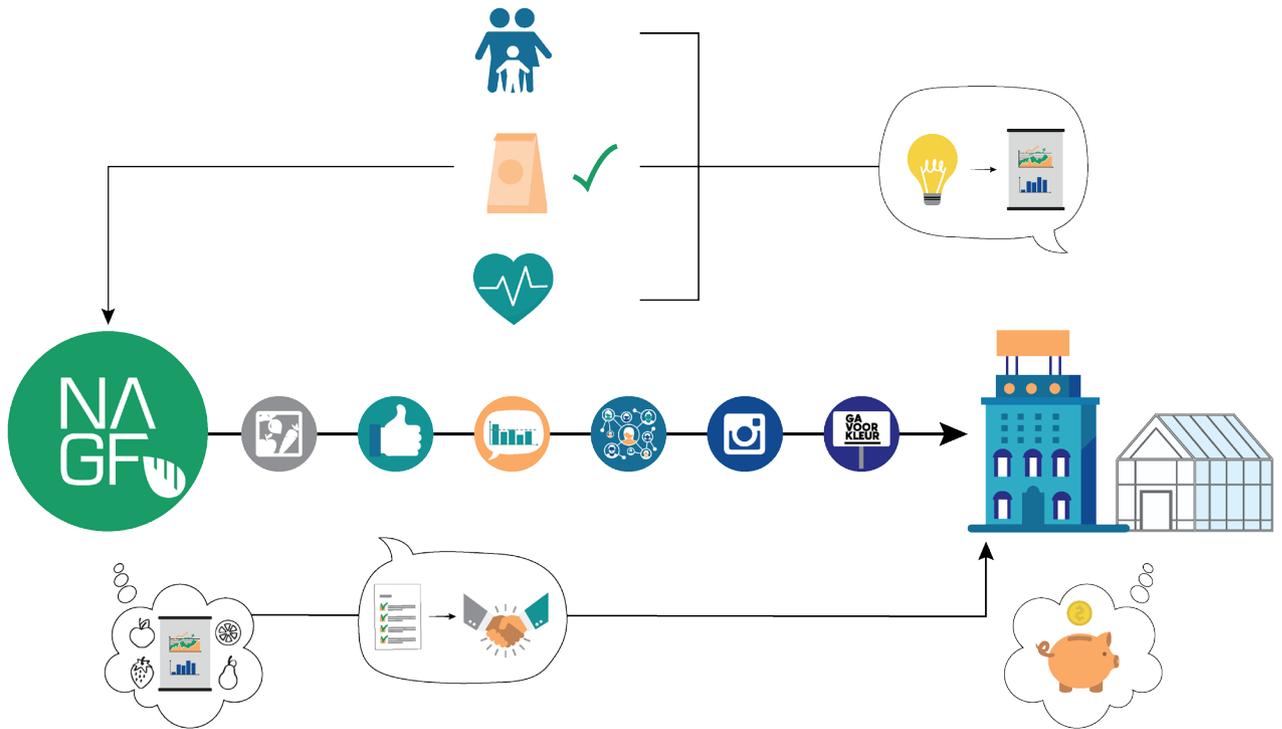
## Working Procedure

The scope of the NAGF contains three spear points that form the boundary of their projects: young families, out-of-home and health care. When a new project proposal is presented, the NAGF needs to decide whether the project is within their scope. When it is, one or more out of six types of activities can be provided. Figure 35 gives a schematic overview of the interaction that follows.

Usually, a company or organization approaches the NAGF with a request for specific support. This can be a supermarket, a growers' association or another company that is motivated to stimulate the consumption of fruit and vegetables. Sometimes, the NAGF also reaches out to companies to encourage them to start a project on fruit and vegetable consumption or invite them to collaborate on a developing project. Next, it is up to the company to take further initiative into developing such project, and the NAGF will be involved for assistance according to one of core activities. The activities of the NAGF have a varying intensity in each project. This leads to their contribution being different in each project. This role depends on the type of collaboration that the stakeholders needs. Though the projects often focus on influencing consumer behaviour, the involvement from the NAGF usually focuses on working with other businesses as stakeholders, instead of directly aiming at the consumer (NAGF, 2020)

For most stakeholders, making a profit is one of the main motivations for projects where the NAGF is mainly motivated to see an increase in the fruit and vegetable consumption of the target audience. For projects that involve sales, there is a mutually beneficial outcome, as an increased consumption also leads to an increase in sales of fruit and vegetables. Other projects, like the "Arts en Groenten" study, are more dependent on the motivation of the stakeholder to contribute to a healthier diet of their customers.

Most projects that have been done are of a temporary nature: the projects run for an agreed amount of time, finishing with a research report and many insights. When a company agrees to do a project, there is little to no guarantee that there will be a follow-up after the project has ended. One of the reasons for this seems to be that a big commitment is asked from the stakeholder to keep the project running after the test period is finished, since the NAGF does not have the capacity to carry and coordinate every project longer than the project period. This makes the efforts from the NAGF often lead to a temporary result, and therefore not yet a very efficient process. Now that there have been some interesting projects with promising effects, the challenge has come to see how the NAGF can move their work from project-based towards more sustainable business concepts that will keep running as soon as the three-year program is finished.



## 3.2 DESIGN FOCUS: THE ROLE OF NAGF

This is the first project at the NAGF that develops without the direct involvement of a stakeholder providing a context or direction, which allows for a broader view on the system around fruit consumption in the food service industry. The ideal outcome would be a project, where not the NAGF, but the caterer is the main carrier, so that it can develop into a self-sustaining project with lasting beneficial results for all stakeholders and participants. The NAGF is an ideal project owner for this project, because there is no commercial interest in the outcome of this project for them. Therefore, it can act as a neutral party among different caterers, detach the project from the mutual competition and ensure that all caterers are able to take their responsibility and put their efforts into a common goal: increasing fruit intake.

*Figure 36: a poster from the "Ga Voor Kleur"-campaign.*

### KEY INSIGHTS

*The NAGF can act as a neutral party among different caterers. To have a sustainable result, a commitment into carrying the project is needed from other stakeholders. The NAGF can use their resources to get the project off to a promising start by connecting these stakeholders.*

**GA  
VOOR  
KLEUR**

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## 3.3 FOOD SERVICE PROFESSIONALS

Caterers serve food on a daily basis on an enormous scale. About 50% of employees find themselves in a company restaurant during lunch time (Werkhoven, 2017). In this setting, a caterer influences the dietary choices of these people. Caterers understand that they have this wide reach and therefore a big responsibility on the daily food intake of the visitors in the restaurant. Therefore it is necessary that they are prepared to make some efforts to increase the intake of fruit. Most caterers already have a focus on serving healthy and sustainable food to their guests.

However, there are some obstacles that prevent them from making big changes. It is sometimes difficult for chefs to create recipes that use fruit. Besides, caterers fear that the introduction of unfamiliar flavour combinations will cause a part of the visitors to stay away.

### KEY INSIGHTS

*Caterers understand that they have a big responsibility on the daily food intake of the visitors in their restaurant. Therefore it is necessary that they are prepared to make some efforts to increase the intake of fruit.*



*"If you want to realize the behavioural change, there is a big role for communication at the place where it is eventually bought or eaten."*

*- Michaël, caterer*

## Corporate structures

Interviews with different caterers revealed there are differences in structure among different catering companies (see appendix 2 ). Some type of caterers have a menu that is largely the same for every location. This menu is created from a central kitchen and is usually composed for a longer period, for example one season. The challenge for this caterer is to think ahead and consider seasonality. He also needs to make sure the recipes are easy to understand, so that chefs on all locations are able to make them, but also exciting enough to keep all employees captured.

Other types of caterers give more freedom to each location, by providing a purchase list where location managers can choose their ingredients from. Each location can decide on their own menu, as long as they stick to the spear points within the caterer's policy (for example: 50% of the dishes must be vegetarian). Some of these caterers have an online platform where chefs share recipes to inspire each other. Appendix 2 provides an overview of the input that was received from several caterers during visits, phone calls and meetings.

Besides the menu composition, another difference between caterers is the way that the food is served: where some caterers work with the traditional pay-per-piece model, where dishes are prepared and served in

predefined portions, others work with new concepts, where guests pay a set price to enjoy small portions of different dishes, for example with a fill-your-plate concept for a set amount of money or completely unlimited. The setup of this concept often features some sort of self-service, like a salad or yoghurt bar and large platters of wraps and simple sandwiches. Of course, a mix of these concepts is also available at some locations. Some fill-your-plate concepts have a separate coffee bar where separate pieces are sold (figure 37).

Every few years, a caterer needs to renew his contract at a client. It is up to the client to decide whether he would like to continue a new term with the current caterer, or starts a new collaboration with a different one. All caterers are allowed to make offers, often bidding against each other with good deals. Some caterers, often the ones with a more fragmented structure, offer a custom concept per location, while the ones with a central structure often offer unity over all locations.

## KEY INSIGHTS

*Each caterer has their own corporate structure that decides how menus are created. It is important that the final solution is adaptable to these differences. As caterers have an impact on the menu choices of a large audience on the daily basis, they must overcome their competition and work together to achieve a common goal.*

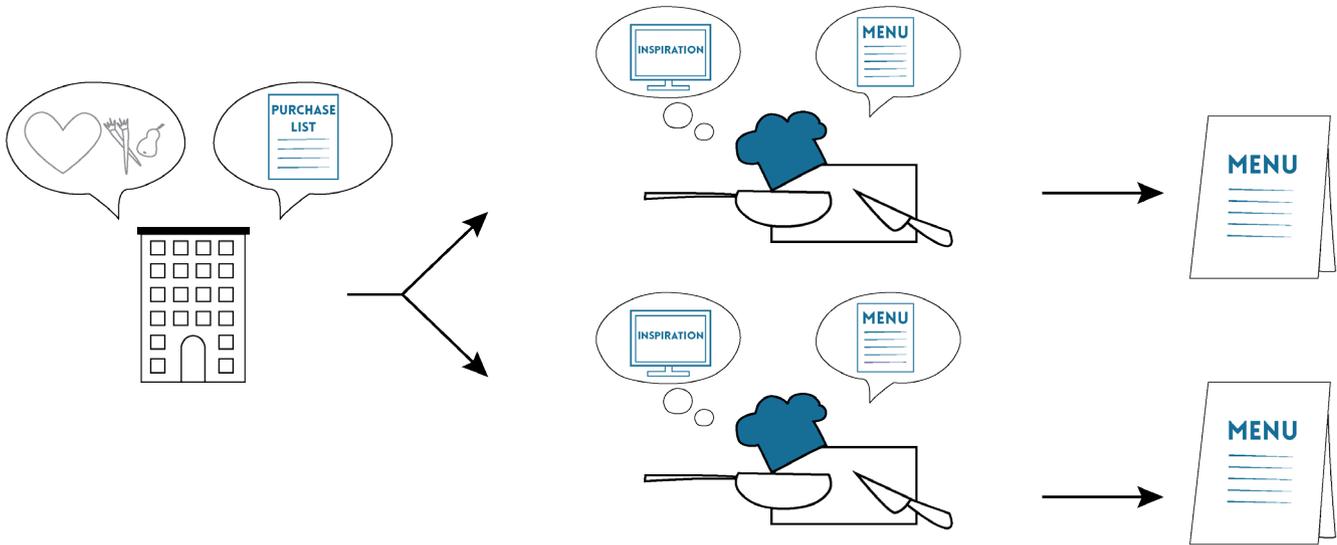
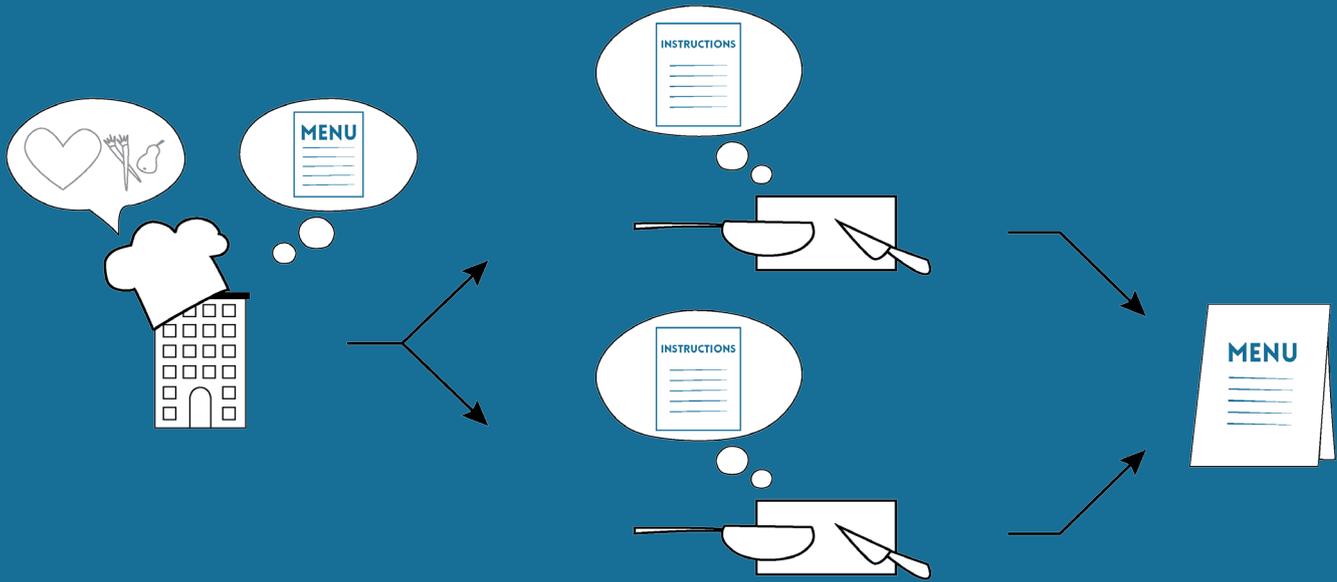


Figure 37: two different structures for menu creation at caterers: a centralized menu and a purchase list-based menu.

## Fruit serving initiatives

All types of caterers, can take an extra step in serving and promoting fruit. At the caterers that were contacted (see appendix 2), most of the fruit is presented as separate pieces. While some serve dishes that include fruit, they mainly stick to a decorative function or as a supplement in yoghurt. Sometimes fruit can be found in salads and sandwiches, although the use of fruit here is often limited to apple. Interviews with different caterers point out that however chefs are excited to experiment with new flavour combinations, often fruit is not part of the flavour base of a dish. It turns out that many chefs find it difficult to use fruit in a different context than the usual one. Besides, some creative chefs are either unable to serve experimental dishes to guests, because of the caterer's corporate structure. Others are hesitant, because they expect that the novelty will not be accepted and that it will cause them to lose visitors. While their clients agree to

servicing healthy and sustainable meals, and in some cases even enforce them to cut down on the usage of meat, it turns out guests often prefer the familiar, traditional snacks and meals (meatball, kroket, toastie with ham and cheese, etc). On top of that is the fear that new recipes will take too much time to prepare in bulk. These obstacles cause chefs to revert to their original palette.

Managers are cautious with making big changes to the concept, because of the risk of missing incomes when guests stay away. Since fruit is generally one of the more expensive products, adding them to recipes in unusual combinations is a risk they are not ready to take if they are not sure that it will be accepted. Here, chefs from different locations could play a role. As they are in daily contact with their guests, they can estimate how the guests will respond to the introduction of new recipes. An overview of the insights from the meetings with caterers can be found in (appendix 2).

## KEY INSIGHTS

*There are two challenges for caterers: creating exciting recipes and convincing visitors of the restaurant to try them. An environment is needed where chefs are encouraged to experiment and assisted to extend their palette. Included in the solution needs to be an approach to open visitors' minds to new food experiences.*



## 3.4 DESIGN FOCUS: CATERERS

To get caterers on board with the introduction of fruit as main component in meals, it is important to consider the concerns mentioned in chapter 3.3: Food service professionals and create an environment, where chefs are encouraged to experiment and assisted to extend their palette. A tool to help them with this might be a solution.

There is an impression amongst chefs that using fruit as ingredients mean that the dishes should be very experimental and novel. To change this mindset, a solution is to demonstrate that something recognizable and simple might be the way to introduce something new.

Overall, it is important to emphasize the shared responsibility to encourage a common goal, because if caterers join forces and stand behind the message that it is normal to eat fruit in the meal, the idea will be accepted and normalized by consumers in a smooth way.

### KEY INSIGHTS

*Caterers have a shared responsibility and need to take an active role in the project to promote fruit as a main component in meals.*



COMING UP

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## 3.5 PROJECT REQUIREMENTS

Based on the key insights of chapters one to three, there are some things that need to be taken into account. They are listed here as project requirements.

The NAGF does not have the time nor the money to invest in the concept after the project is finalized. This means that the final concept must be **ready to be implemented** at caterers right away.

Also, since the project has not been included in the initial planning, there is a limited time available to accompany caterers in the implementation of the outcome of the project. Therefore, the project must be able to run on its own as quickly as possible. The resources of the NAGF allow for a central meeting with caterers where the final concept is demonstrated. Apart from that, the concept should be **available digitally and self-explanatory** for participating caterers.

Since caterers have very different structures and serve a large variety of meals, the intention of the project is not to create one specific dish. The final concept should therefore be **adaptable to different caterers**.

To reach as many people as effective as possible, the final concept must take into account that **different type of consumers** require a different approach towards unfamiliar food combinations.

It is not the goal to establish a completely changed view on fruit conception by the end of the project. The design goal is aiming for an outcome that is **scalable** into a series of small behaviour changes, that can make a significant impact over time.

The goal is also not to completely change the way fruit is consumed, because this will require drastic changes on an enormous scale. The inclusion of fruit in meals is meant as an **addition to the regular** ways of fruit consumption.

# DESIGN GOAL

*Create a concept for the NAGF, that helps caterers serve meals with fruit to their guests, to reposition the perception of fruit consumption.*

Ready to be implemented without additional development from the NAGF.

Available digitally and self-explanatory.

Adaptable to different caterers and different type of consumers.

Scalable

Addition to regular fruit consumption

# CHAPTER 4

# RECIPE DESIGN

4 EXPERIMENTS

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# 4 EXPERIMENTS

To help caterers introduce fruit to their visitors, some assistance is needed with the creation of new recipes. The following chapter elaborates on the different theories behind flavour pairing. A systematic approach is created based on one theory and put into practise during a series of experiments. A series of experiments was held to explore the possibilities of combining fruit with other ingredients. The goal of the experiments was to create a sandwich with a combination of ingredients that would have the potential to become as established and recognizable as the Dutch “broodje gezond”, a sandwich that is known by its name and fixed set of ingredients. If a sandwich that includes fruit in its ingredients can be as common as the “broodje gezond”, this could be a great step towards normalizing the use of fruit combined with other ingredients.

The series of experiments give a good impression of the reactions of both caterer and consumer. The resulting sandwich and the process in creating it is used as an example case to demonstrate caterers the possibilities of introducing dishes with fruit to consumers. The system of flavour pairing is used to create a tool for caterers to create new ingredient combinations.

## 4.1 FLAVOUR PAIRING THEORY

There is a difference between 'taste' and 'flavour'. Taste, as described by Segnit (2015), are the five qualities that are detectable with the mouth: sweet, salty, sour, bitter, umami, while flavour includes all other aspects that contribute to a tasting experience, such as sense of smell and sound. The project will focus on the aspects of flavour, as it is more interesting to explore the possibilities around the eating experience of people, rather than the tasting alone.

There are different theories to flavour pairing. Segnit (2015) presents pairs of ingredients that have been used in traditional dishes, or dishes served by leading chefs in the industry (figure 39). Popular chef Ottolenghi explains that the recipes in his book (2011) are built around his favourite ingredients. These ingredients would serve as the core of the dish, and all ingredients that were added had to contribute to this core. Schmeinck (2012) uses a similar approach for her book, taking one ingredient and creating a flavour profile around it. She attempts to create a system where ingredients can be paired to each other, together with a preparation method (figure 38).

In the digital tool "Gastronomixs", an online database of ingredients and their possible pairings and preparations is provided (Gastronomixs, 2020). This tool is already being used by chefs in catering when creating recipes (see appendix 2). Fruit is included as ingredients, but will only be included in meals when deliberately picked out as the starting point.

Another way to approach flavour pairing derives from wine tasting. Klosse (2009) explains the flavour profile theory: there are three factors which classify a certain flavour: the roundness and the astringency of the mouthfeel and the intensity (see figure 40). This model was chosen for further development, because it provides a systematic assignment of flavours and therefore proves useful for a larger scale of flavour pairing.

### KEY INSIGHTS

*There are different approaches in matching flavours. To create a system where caterers and chefs can be inspired to use fruit in unexpected combinations, the wine tasting model proved most suitable.*

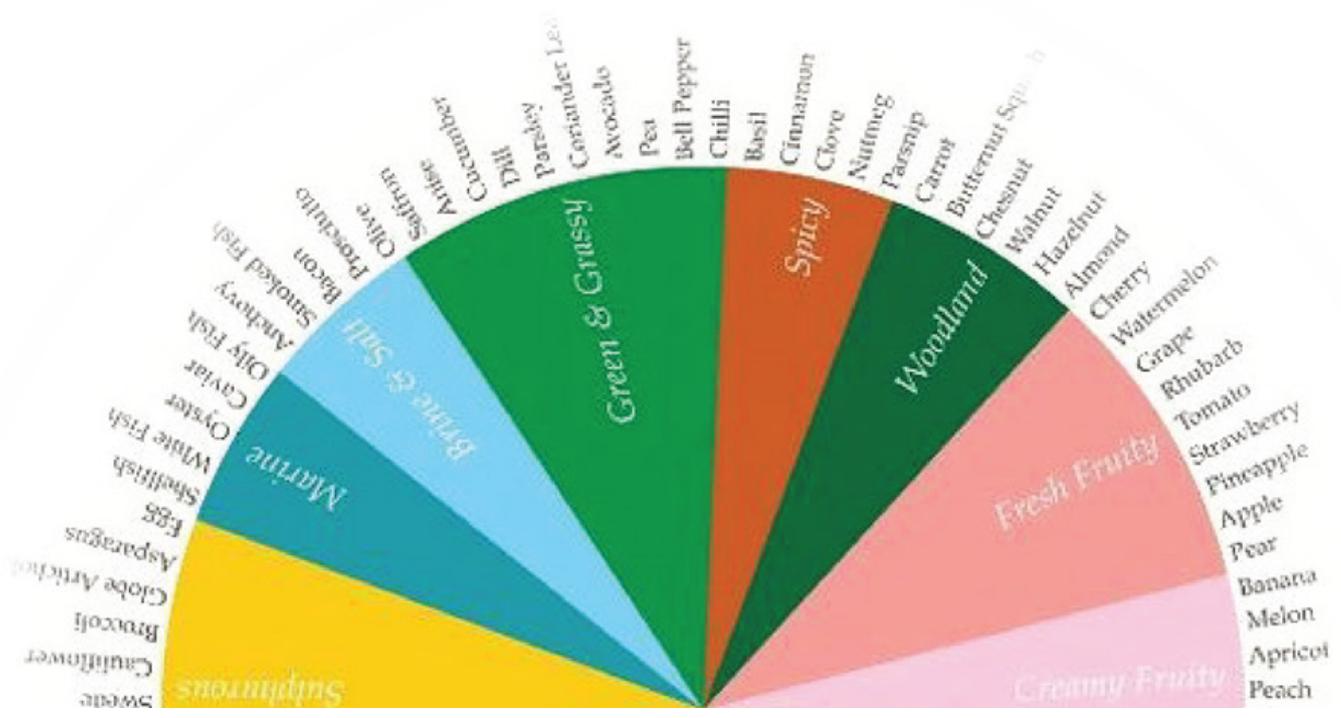
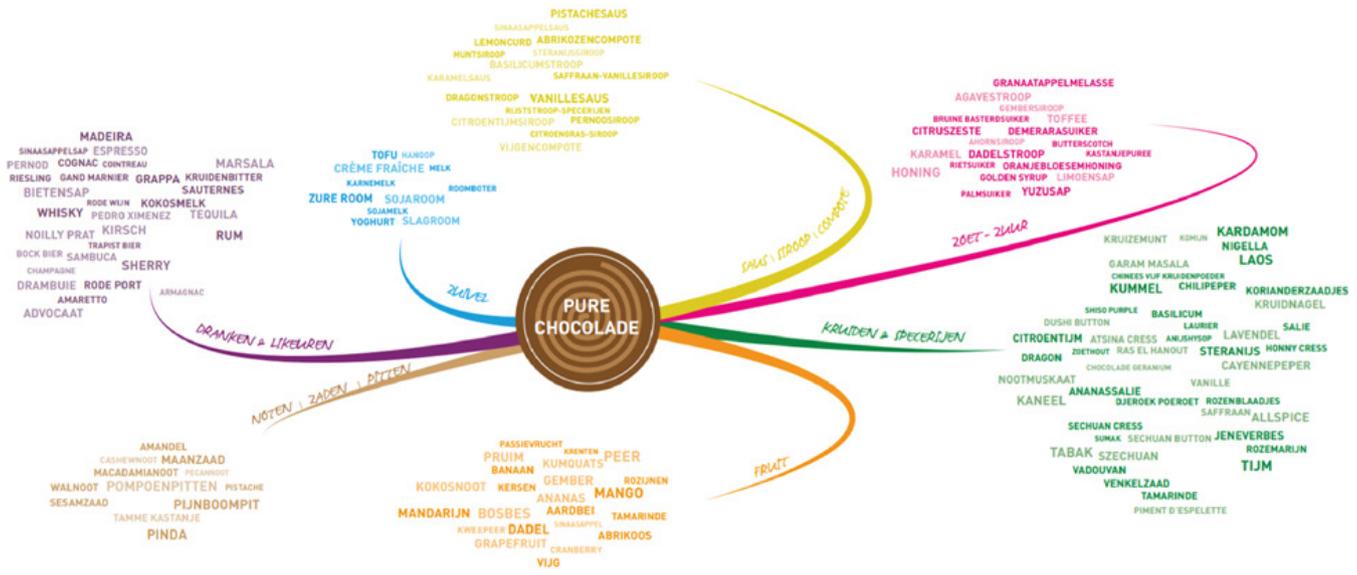


Figure 38 and 39 show the flavour profile from Schmeinck (2012) and Flavour categories as described by Segnit (2015)

## 4.2 A SYSTEMATIC APPROACH

The wine tasting model uses three defining factors for flavour. Each factor can either be a high or a low 'state'. The combination of three factors that can each be two different states, combines into eight different flavour profiles. With these profiles, it is possible to create a system that is widely applicable to the flavour pairing of ingredients.

The wine tasting method was used to assign all ingredients from the flavour pairing experiments to one of the eight categories (figure 40). Flavour combinations are made by choosing opposites of each factor. What is different about this system is that combinations of three ingredients are made instead of two, as is the case with the methods of Schmeinck (2012) and Segnit (2015). Combinations of three allow for a more dynamic pairing process, because there is more than one possible combination.

These combinations serve as the flavour bases for the dish. When one of the ingredients in the combination is fruit, there is a set of interesting flavours for a new dish that already has fruit in the basis. Using this system, chefs could be inspired to create recipes that combine fruit in a more unusual way.

The flavour combinations from the pairing experiments were used to verify the system. The combinations were linked to the system and compared with the ratings that were given during the user tests (appendix 6). Although the tested sandwiches consisted of more than three ingredients, which made it difficult to decide which ingredient, there was clear indication that the sandwiches with better matching combinations were assigned higher grades.

### KEY INSIGHTS

*The wine tasting model is defined by eight profiles. Assigning each ingredient to one of these profiles allow for a systematic pairing system. Pairing is done by choosing opposite factors in the system.*

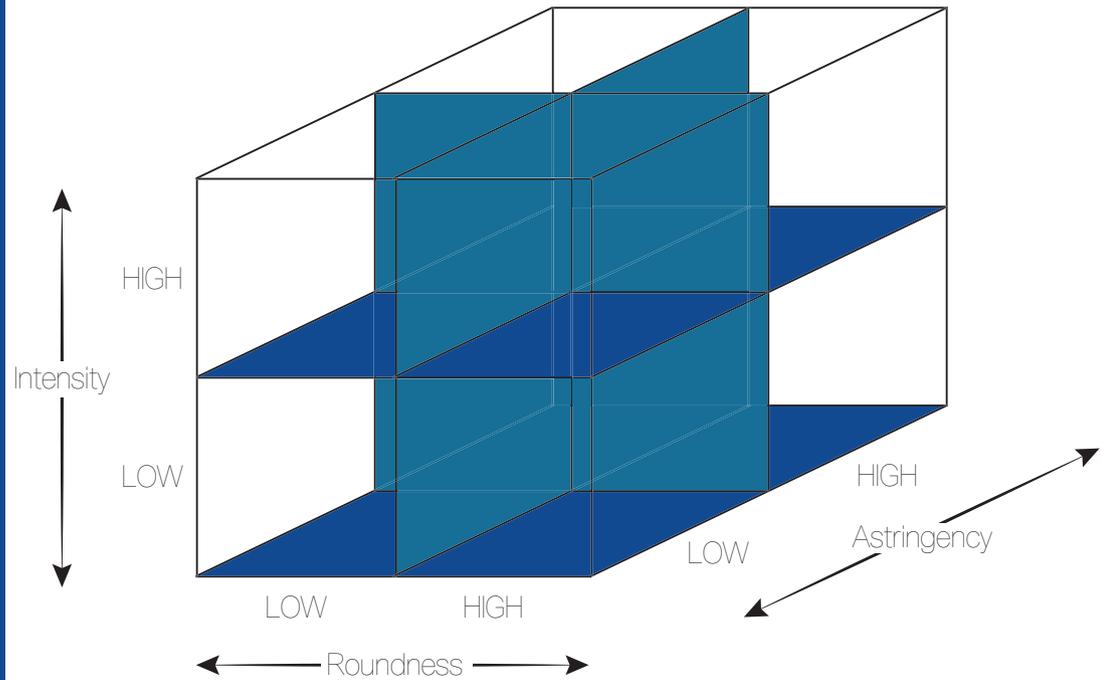


Figure 40: the system behind the wine tasting method from Klose (2009).

## 4.3 FLAVOUR PAIRING EXPERIMENTS

As mentioned in chapter 1.2: History, sandwiches are a regular part of lunch for the majority of Dutch people. The “broodje gezond” is well-known by its name and the fixed set of ingredients. The most effective way to get people to accept dishes with fruit is by connecting them to the culture.

The goal of the experiments was to create a sandwich with a combination of ingredients that would have the potential to become as established and recognizable as the Dutch “broodje gezond”, a sandwich that is known by its name and fixed set of ingredients and integrated into the Dutch eating culture. The pairing experiments had their starting point with the types of most commonly eaten (RIVM, 2016) fruits that are available in the Netherlands year-round: apples, pears, oranges and grapes. The first round of experiments started with long lists of commonly used ingredients on sandwiches, divided into different categories (figure 42). These categories all marked the role each ingredient played on a sandwich: some served mostly as a filler, an element to add more volume, while others were mainly used as a binding component. The different elements and their contribution to a sandwich were defined to categorize the ingredients (see figure 41).

Bread was also defined as a separate category, where different types of bread were listed. Note: except for the “Herbs & spices” category, flavour has not been considered as a specific contribution, as it is assumed that this is a characteristic from all ingredients.

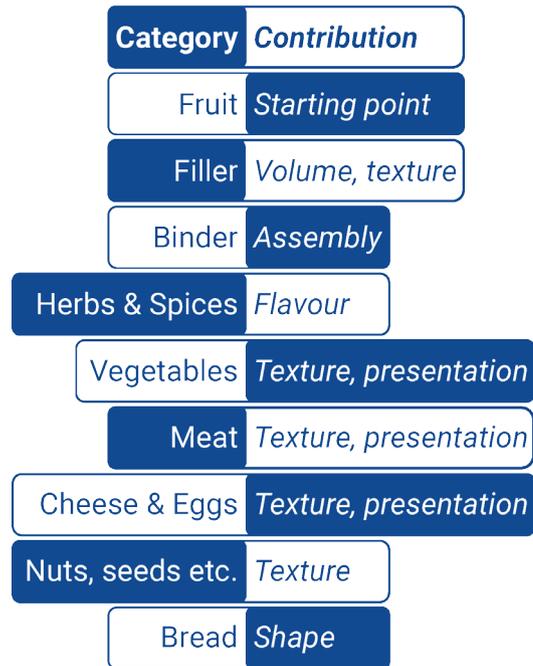


Figure 41: the contribution of each element to a sandwich.

### KEY INSIGHTS

A series of experiments were held to explore the possibilities of creating a signature sandwich with comparable recognizability as the well-established “broodje gezond”. Ingredients were sorted into different categories, that served as different components necessary to make a sandwich.

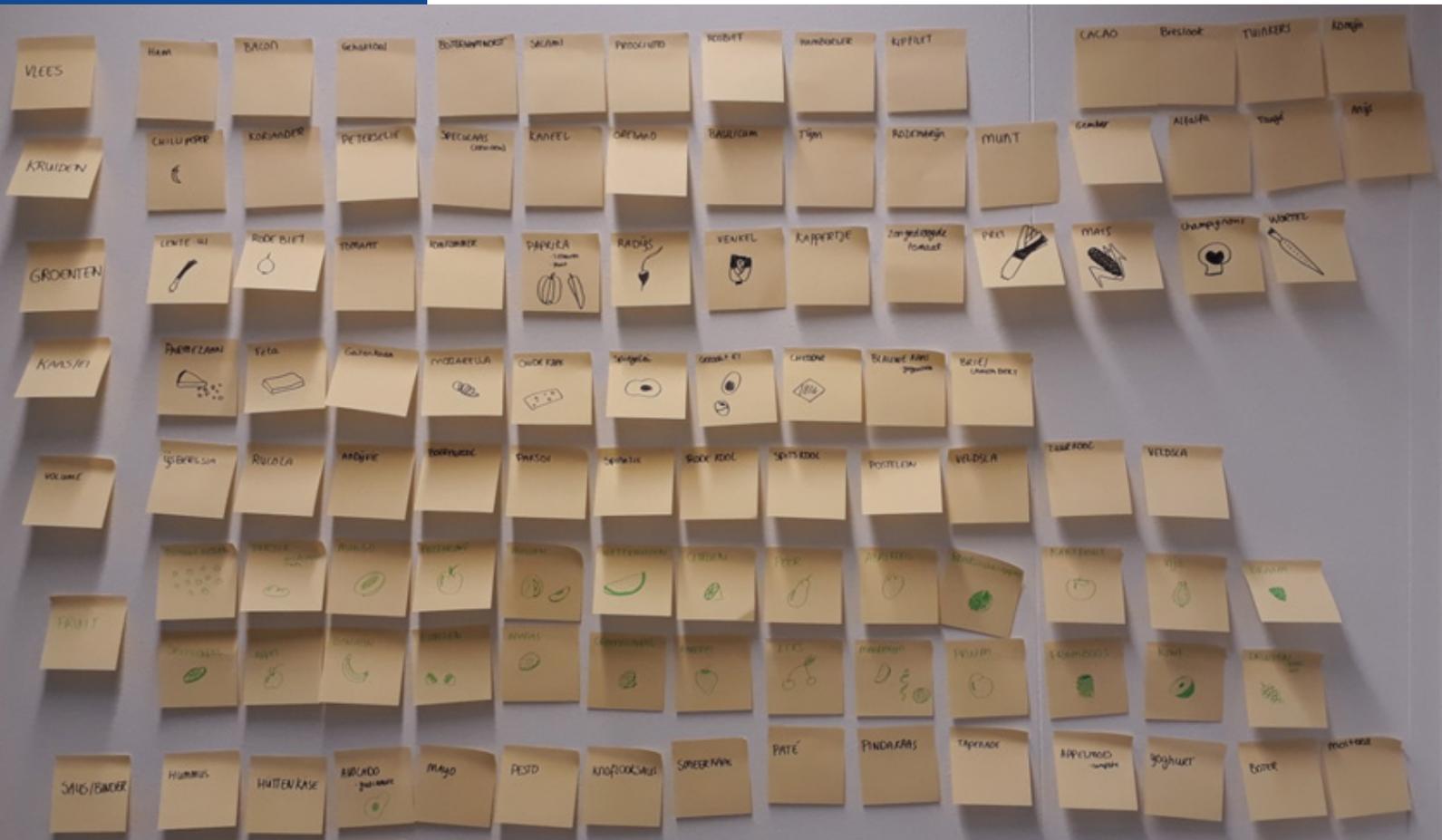


Figure 42: categorization of ingredients to these elements.

## 4.4 REQUIREMENTS

A set of requirements is defined for creating a signature sandwich. These requirements served as a guideline to ensure the sandwich concepts would be of equal standard. This is important, since the concepts were to be compared and rated by others rather than the designer.

- o The flavour combinations must be correct  
*Using the system as described in chapter 4.2: a systematic approach.*
- o The fruit component is not (overly) processed (heated, puréed, canned et cetera)  
*This is a requirement from the Schijf van Vijf (Voedingscentrum, 2020)*
- o The fruit component is from the Netherlands, or available from nearby sources year-round  
*In order to be able to serve the sandwich all year long and make it timeless.*
- o Visible ingredients  
*Makes it easier to reproduce by people at home.*
- o Made with fresh ingredients  
*In line with current trends, see chapter 1.3: food hypes and trends.*
- o Possible to hold with one hand  
*Easy to eat for consumers.*
- o Same price as regular sandwich  
*The sandwich can not be too exclusive; it should be approachable.*

### The preparation needs to be suitable for a catering setting, which means:

- o Quick to make  
*Can be served within 7 minutes. This was a requirement from the Horecava sandwich competition (Appendix 7). More about this in chapter 4.5: A signature sandwich.*
- o Possible to make in bulk  
*For example in a production line*
- o Needing not more than one pan, cutting board and knife(s) (optional: a grill or oven)  
*More tools means more time and more effort.*

### Presentation must be attractive, meaning:

- o Colourful  
*Making it possible to connect the results to NAGF's "Ga Voor Kleur"-campaign.*

- o Kept unrefrigerated for at least one part of the day  
*This is a regular procedure for caterers.*
- o The sandwich is served in a napkin or on a plate and can be handed over with one hand  
*Makes it easy to hand over to consumer.*

### Other preferences:

- o Vegetarian/vegan  
*This is in line with the current trends, see chapter 1.3: food hypes and trends.*
- o Free from common allergies: no nuts, peanuts, lactose, gluten  
*Allows for a accessible sandwich for everyone.*
- o Healthy: Following the "Schijf van Vijf"  
*According to the Voedingscentrum (2020), this means whole grain, avoiding saturated fat and refined sugars.*



## 4.5 A SIGNATURE SANDWICH

Using flavour combinations suggested by Segnit (2015), a total of 27 concepts for sandwiches that included the four previously mentioned fruits (apple, pear, orange, grape) were made. The combined pairs of ingredients mentioned in the book served as a starting point, creating the rest of the sandwich with five to eight ingredients was mostly done using intuition. An overview of all the concepts can be found in appendix 8.

After the sandwich concepts were prepared and tasted (figure 43 to 45). Feedback was collected on the flavour combinations as well as the saleability for these new sandwiches with fruit. Besides, people were asked to give name suggestions, if the flavour combination was associated with something from their memory. An overview of the reactions can be found in appendix 9. An interesting insight from these tests was that the suggested names often lacked creativity, and mostly used the ingredients to create a name. A possible explanation (aside from a lack of creative minds among the participants) could be that, because the flavour combinations were new, no association could be made yet.

### Dubbel-bammetje

The experiments resulted in a sandwich called the “Dubbel-bammetje”. The name is a fusion of name of the maker, Dubbeldam, and the word “bammetje”, which is another word for a sandwich made with sliced bread. During the project, the dubbel-bammetje has served as a demonstrating concept to test the reactions from consumers, caterers and food professionals. On the following pages, an overview of these feedback moments is given.

*“If you can't think of a name, just name it after yourself.”*

*- R. Price*



Figure 43 to 45: the process of preparation and testing of the sandwich concepts.

## Consumer feedback

To collect feedback on the sandwich, a test was conducted at the faculty of Industrial Design Engineering. This time, the dubbel-bammetje was given for free, and information was collected about the appearance, the taste, the expected and the accepted selling price. A total of 50 people filled out the survey, of which 49 were students from different faculties. Based on appearance, 50% of the people would order the dubbel-bammetje over another one. Reasons for this were mostly appearance, price and the fact that the sandwich seems healthy. When asked what the expected selling price was, the average estimate price was €3,56, while the average price people were willing to spend was a little lower, at €2,81. According to the cost price calculation (see appendix 10), the dubbel-bammetje can be made for around €1,95, which would indicate that a selling price people are willing to pay would still make a profit of almost 70%. A more elaborate overview of the outcomes of these surveys can be found in appendix 1.

## Testing: in the restaurant

At the faculty's cafeteria, the sandwich was sold as a regular sandwich, without any extra emphasis or explanation, at a comparable price (€2,95). The goal of this test was to see whether regular customers of the cafeteria would buy the sandwich as much as the regular sandwiches in the assortment, in other words, whether the dubbel-bammetje would be considered a normal sandwich. The results were promising: the dubbel-bammetje sold out quicker than most of the other sandwiches. In total, the sandwich was sold about 40-50 times, which is comparable to the regular assortment. Some of the people (around 10) that had bought the dubbel-bammetje were interviewed to collect some feedback on their thoughts and perceptions. When given a short introduction on the experiment and the project, they were asked to judge whether this sandwich belongs in a catering environment. All people interviewed agreed that it did. From all the people asked, all but one would buy it again. Overall, people were surprised with not only the combination of ingredients, but also by the fact that they were surprised about this. Some people mentioned that they had never considered fruit as an option to put on a sandwich, but they did not object to the idea. The fact that it was served in a professional food environment removed some people's reservations about the quality and taste. The majority was positive about the taste, praising the combination of sweet and salty flavours. One person was less excited, as he thought the grapes were too sweet. An overview of the reactions can be read in appendix 12.



*Figure 46: the presentation of the dubbel-bammetje at the faculty restaurant.*

## KEY INSIGHTS

*Following a set of requirements, 27 concepts were made and tested on various aspects. Eventually, one sandwich was chosen and tested intensively among consumers. Reactions were positive, indicating that people are open to this type of dishes.*

## Testing: Consumer capability

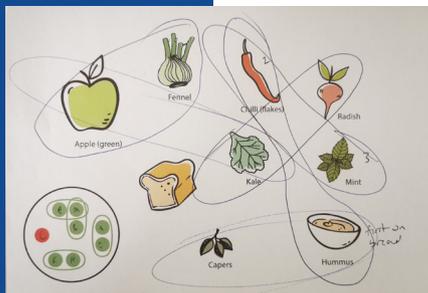
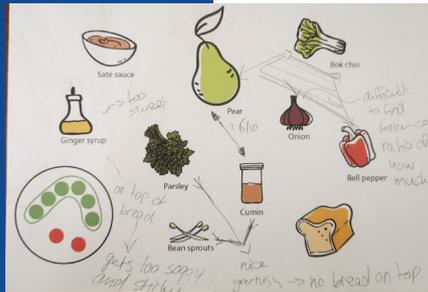
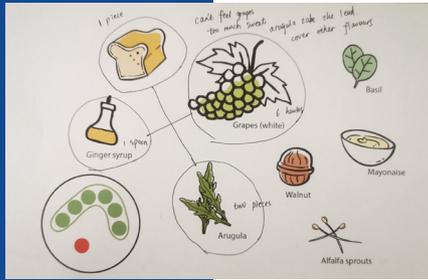
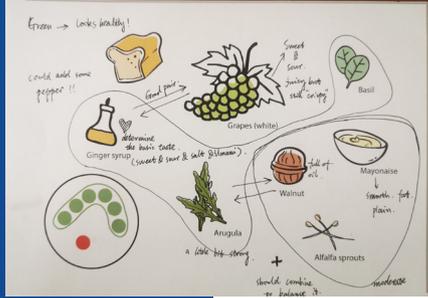
During the Food and Eating Design elective, students were given a set of ingredients and a worksheet that described the different characteristics of ingredients in a sandwich. The ingredients were based on the four best-scoring sandwiches from previous experiments. The students were asked to think about the contribution that different textures, flavours and colours bring to a sandwich. Next they were asked to create their own sandwich, using the set of ingredients provided (figures 47 to 50). On the form provided, they were asked to figure out the flavour pairing system and explain why some combinations worked well together, and some did not. It was very interesting to see how everyone approached the assignment in a different way, resulting in many different variations on essentially the same sandwiches (figures 51 to 54). Also the reactions from the students showed great variation: from very enthusiastic to sceptical. However, inviting them to create a sandwich in their own way helped to make them more open-minded for different flavour combinations they would usually not try.

This experiment showed that sometimes, giving people a little push to make something that is out of their comfort zone can help to overcome their scepticism. It also showed that, when given some direction, people are well capable of creating a dish that includes fruit.



## KEY INSIGHTS

*When people are allowed to approach a new and unfamiliar context in their own way, it enables them to be more open-minded about the outcome.*



Figures 47 to 50: students at work during the experiment. Figures 51 to 54: different responses on the pairing analysis form.

## Horecava

A competition for the best lunch dish among caterers was held at the Horecava, the Dutch annual hospitality trade fair. To collect feedback among catering professionals, compare the dubbel-bammetje with other catering dishes and to generate awareness for the project's purpose, the dubbel-bammetje was submitted as a participant. The competition required its entries to comply with a set of rules, which can be read in appendix 7, but this did not require any adjustments on the recipe of the dubbel-bammetje. It was noticed that the dubbel-bammetje was the only entry that had used fruit. This shows that even among food professionals, fruit is a very uncommon ingredient. However, other participants assured that this is not the case and that they would often use fruit in recipes, but then failed to give many examples. This indicates that there could be a distorted view among food professionals on the actual use of fruit, and little recognition of the urgency. However, the jury and organization were enthusiastic about the project and the sandwich, and their feedback was positive: the flavours were right and compliments were given for the refreshing and creative idea appendix 2.



Figure 55 shows the jury of the best lunch dish competition.



Figure 56: the display of the dubbel-bammetje, along with the other entries.

## 4.6 IMPLEMENTATION

A signature sandwich was developed to demonstrate that a sandwich with fruit can be as established as a “broodje gezond”. This sandwich has been tested multiple times on different stakeholders. The sandwich experiments show that people are much more accepting towards fruit on a sandwich as originally thought, even though it is not very common yet. The process of the development can be used to convince caterers that using recognizable dishes can be a way to allow guests to adapt to novel dishes.

An overview of the sandwich experiments can be read in the case study that is part of the final solution (see chapter 6.3: Case study: “broodje gezond”).

### KEY INSIGHTS

*The sandwich proves there are opportunities for flavour combinations with fruit, accepted by both caterer and consumer.*



# CHAPTER 5

# IN BRIEF

5 INTERIM SUMMARY

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# 5 INTERIM SUMMARY

The research from previous chapters is summarized. What can we learn from the Dutch (fruit) eating culture? How will consumers respond to the introduction of fruit in their meals? What can be done with the outcomes of the flavour pairing experiments? How to create a fitting solution for caterers? What can the NAGF do?

Can we solve the design goal:

*“Create a concept for the NAGF, that helps caterers serve meals with fruit to their guests, to reposition the perception of fruit consumption”*

## INTERIM SUMMARY

*“Create a concept for the NAGF, that helps caterers serve meals with fruit to their guests, to reposition the perception of fruit consumption”*

In an effort to trace back the origin of the place of fruit in the Dutch diet, research is done on the history of the Dutch eating culture. The research indicated that fruit was originally used as a sweetener in meals, but was moved towards the end of the meal due to influences from the French “haute cuisine”.

Since then, fruit is mostly eaten as dessert after the meal or as a snack in-between meals, and almost always as a single piece, separated from other foods. On these eating moments, fruit needs to compete against widely available convenience foods and is therefore often overlooked. Since the industrialization, food has mainly had a functional role in the Netherlands. This is one of the explanations for the immense popularity of sandwiches.

Preparation effort, expiration date and avoidance of eating between meals, were the most common answers from people when asked why they did not manage to eat the required amount of fruit. Since only 13 percent of adults in the Netherlands eats the daily recommended amount of fruit, it is relevant to look into the possibilities to increase the consumption of fruit.

The Nationaal Actieplan Groenten en Fruit is interested to see what can be done to

stimulate fruit consumption during meals. Although their time is limited for the execution of the project, they can use their experience and network from previous activities to spread awareness for the project. The ideal outcome would be a project, where not the NAGF but another stakeholder is the main carrier, so that the project can develop into a self-sustaining project with lasting beneficial results for all stakeholders and participants.

As caterers have impact on the menu choices of a large audience on the daily basis, they are the intended carriers of the project. There is a wide variety among caterers when it comes to menu creation and food presentation. Competition and secrecy between caterers allows for little cooperation. The outcome of the project must be adaptable for each caterer, while the common goal should remain intact: offering visitors a different approach on fruit consumption.

During interviews with caterers, two concerns were identified: creating exciting recipes and convincing visitors of the restaurant to try them. The solution requires an environment is where chefs are encouraged to experiment and assisted to extend their palette. Included in the solution needs to be an approach to present these new food combinations to visitors.

To define the acceptance of new habits towards food, the “stages of change”- model (Greene et al, 1999) and the model for competence learning (Howell, 1982) are

used to define a six-phase model. This model shows that changes to a lifestyle are triggered when several internal or external factors change simultaneously. By designing the external factors and triggering the internal factors, it is possible to steer towards these transition points. Subsequently, intrinsic motivation must trigger the change in behaviour.

For each design opportunity, a type of restaurant visitor is defined. These types of visitors are written into four profiles based on the personality archetypes (Gomez, 2010). The profiles describe the possible target audiences for the caterer and can help the caterer to choose the right approach to communicate his efforts into the project to his visitors.

For creating recipes, different flavour matching theories are analysed and a system is developed that pairs fruit with two other ingredients into intriguing and exciting combinations. This system has been tested extensively during a series of experiments that explored and confirmed the acceptance of the use of fruit on sandwiches. A signature sandwich was developed to demonstrate that a sandwich with fruit has the potential to be as integrated into the Dutch culture as the "broodje gezond". This sandwich has been tested multiple times on different stakeholders. The experiments show that people are much more accepting towards fruit on a sandwich than originally thought, even though it is not very common yet.

# CHAPTER 6

# TOOL BOX

6 CONCEPT

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# 6 CONCEPT

To help caterers to introduce more meals with fruit to their visitors, a toolbox is developed. With this toolbox, the caterer can participate in the Fruitdaging, a challenge for both caterers and consumers to create and try new dishes with fruit as a main component.

The toolbox consists of eight parts, aimed at both the caterer and chefs, and the consumer, the visitors of the restaurant. The different parts in this toolbox can inspire and assist caterers to experiment and create new flavour combinations that include fruit, and guide consumers towards a new perspective and experience towards fruit consumption.

The different parts in the toolbox are intended to take both the caterer and the visitor by the hand in the process. On the next page, an overview of the different parts can be seen. The pages that follow give a more detailed explanation of each part. The first three parts focus on the caterer's system and serve as preparation for the challenge. Parts four and five are tools to help the caterer with the development of recipes. Parts six and seven focus on analysing and defining the type of consumer in the restaurant and describe the differences in possibilities to reach these people. In part eight, four packages are presented with options for the content of the Fruitdaging challenge in the restaurant. Finally, the role of the NAGF is explained.

## 6.0 CONTENT TOOLBOX

The Fruitdaging challenge is a starting point for both caterers and consumers (restaurant visitors) to experiment with a different way of consuming fruit. The challenge is an ongoing programme with regularly recurring events. This could be every Monday, the first week of the month or the first month of the new season, depending on the resources and preferences of the caterer.

The toolbox is aimed to guide the caterer in his contribution to the Fruitdaging. Because the caterer needs to get the chefs and other staff on board before he can turn to the consumers, the different parts in the toolbox are aimed at supporting caterers by following the phases of behavioural change described in chapter 2.2: Behaviour phases (awareness, encounter, resistance, experience, implementation, interaction). For caterers, the awareness phase takes place before the start of the project, as they already need to acknowledge the necessity of a focus on fruit consumption when starting a new project.

The first part of the toolbox is where the NAGF can use their skills as a catalyst, as a general meeting for caterers is held and the challenge is introduced. The intention of this meeting is to invite caterers to join the challenge and then start working with the other parts of the toolbox by themselves.

To ensure all participants of the challenge start with the same mindset, part two is a workshop for chefs and other food professionals that challenges the views on well-known dishes. In part three, a case

study about the flavour pairing experiments is offered for illustrative purposes, in order to remove any doubts that caterers might have about the effectiveness of the challenge. It is mainly intended to inspire and encourage caterers and chefs to start working on new recipes with fruit themselves. These first three parts of the toolbox cover the encounter phase of the caterers, and provide some persuasion to get the ones that are hesitant through the resistance phase

The experience phase is covered in part four and five. To help chefs with the development of new recipes with fruit, part four of the toolbox provides both a printed card game and a digital variation in the shape of a web application. Part five is a digital platform that allows caterers to interact with each other as well as with a broader audience by sharing their creations.

Parts six and seven cover the implementation phase, where the caterer is given a test to identify in which of the behaviour phases the majority of the visitors in his restaurant are. Based on these phases, four type of visitors are described in part seven. Fitting with the type of audience, an advice is given for an approach of the final phase, the interaction phase. The eighth part focuses on approaching consumers and therefore on the challenges for consumers when it comes to eating unfamiliar dishes. The Fruitdaging offers consumers an introduction to an unfamiliar and different use of ingredients in dishes. Their challenge will mainly be to be prepared to try these dishes and eventually,

to start making them themselves. To achieve this, four different packages have been composed, consisting suggestions for activities that are, suitable for different types of visitors of the restaurant, to promote the new dishes and invite visitors to try dishes beyond their usual choice. In this part, the phases of behavioural change for the consumer are taken into account.

The challenge requires a different approach for caterers than it does for consumers. For caterers, the Fruitdaging will be an opportunity to showcase the experience and creativity from the kitchen. Chefs are encouraged to develop dishes with fruit and serve them under the name of the challenge.

Taking up the Fruitdaging challenge shows that the caterer takes responsibility towards a healthier diet for his visitors. Fruitdaging can serve as an opportunity for caterers to express their engagement with society in terms of health and sustainability, such as seasonality use of local produce of fruit and other ingredients. It is also possible to use this challenge to collect feedback from guests, by involving them in the creation of new dishes.

The complete toolbox as presented to caterers can be read in a separate booklet. This document is accompanied by a separate appendix with parts that need to be used in printed form.



Figure 57: different parts of the toolbox.

## 6.1 STAKEHOLDER MEETING

During a meeting for caterers, organised by the NAGF, the Fruitdaging challenge will be introduced. A presentation is held to explain what the challenge involves, what caterers and chefs can do and why they are the right industry to take the lead. During the meeting, the toolbox will be available in physical form for viewing and distribution. After the meeting, the toolbox can be found digitally on the project page on the website of the NAGF (figure 58).

The stakeholder meeting enables the NAGF to put their catalysing experience as from activities in previous projects to good use, as this is an ideal moment to inspire, stimulate and connect caterers to be involved and work together in the challenge. After the meeting, it is mostly up to the caterers to take initiative and carry on with the Fruitdaging.

Caterers or chefs who are interested can join the Fruitdaging through the project page on the website of the NAGF. This page provides the links to download the toolbox, play the web version of the game and add posts to the community platform .

When taking on the Fruitdaging, the caterer needs to define his possibilities. This is probably different for each location as each location caters different people in a different setting. The caterer needs to consider his possibilities and available resources, such as space to display activities and budget to print posters or install a screen or table.

When the meeting has passed, this part in the toolbox will be used to give a summary of the presentation given during the meeting and provide information on fruit consumption.

The screenshot shows a web browser at the URL [nagf.nl/projecten/nagf/fruïtdaging](http://nagf.nl/projecten/nagf/fruïtdaging). The page features a green header with the NAGF logo (a circle containing 'NA' and 'GF' with a hand icon) and navigation links for 'Nieuws', 'Projecten', 'Kennisbank', and 'Ga voor kleur'. A search icon and a menu icon are also present. The main content area has a green background with the title 'Fruïtdaging' and a sub-header. Below this, there is a 'Delen' button. To the right, there is a large logo for 'FRUÏTDAGING' featuring a stylized pear. Below the logo, a breadcrumb trail reads 'Projecten > Projecten > Fruïtdaging'. The main text describes the project's goal to encourage fruit consumption through catering, mentions a toolbox developed for this purpose, and lists the components of the toolbox: an online platform, a card game, a workshop, and a case study.

## Fruïtdaging

Tijdens de Fruïtdaging zetten cateraars zich in om maaltijden met fruit te stimuleren, om zo meer fruit in het Nederlandse eetpatroon te krijgen. Fruïtdaging is ontwikkeld tijdens een afstudeerproject bij het Nationaal Actieplan Groenten en Fruit.

[Delen](#)

# FRUÏTDAGING

Projecten > Projecten > [Fruïtdaging](#)

Het meeste fruit wordt als tussendoortje gegeten (RIVM, 2016). Hierdoor heeft het veel concurrentie van de "makkelijke" snacks. Door fruit meer als ingrediënt in te zetten, is het makkelijker de dagelijkse portie van 200 gram te verdelen en zo over de dag verspreid vaker en meer fruit te eten. Cateraars hebben veel invloed op voedingskeuzes, omdat zij dagelijks maaltijden klaarmaken en serveren aan een grote groep mensen. De Fruïtdaging campagne is gestart in samenwerking met cateraars om de drempel om nieuwe smaakcombinaties te proberen voor deze mensen zo laag mogelijk te maken. Om cateraars te helpen met de opzet van de campagne, is een speciale toolbox ontwikkeld. De Fruïtdaging toolbox bestaat uit verschillende onderdelen: Het eerste deel helpt chefs, receptontwikkelaars en andere food professionals met het creëren van nieuwe gerechten en smaakcombinaties met fruit. In dit deel zit een online platform waar creaties en inspiratie verzameld en gedeeld worden, een kaartspel voor het vinden van nieuwe combinaties (ook beschikbaar als webapp), een workshop en een case study ter inspiratie. Het tweede deel is er om cateraars te helpen met het introduceren van deze gerechten aan hun gasten. Dit deel bestaat uit verschillende pakketten die aansluiten op verschillende typen mensen, waaruit de cateraar een selectie kan maken op basis van zijn mogelijkheden.

Figure 58: a screenshot of the project page on the website of the NAGF. The full text on the website can be found in appendix 13.

## 6.2 WORKSHOP “OMDENKEN: THE CLASSICS”

To get all participants aligned at the start of the challenge, the second part in the toolbox is a workshop for chefs and other food professionals in the catering that challenges the views on well-known dishes.

For caterers who missed the kick-off at the stakeholder meeting, the workshop is the first activity of the challenge. If the caterer has the budget, the NAGF can be approached to facilitate the workshop, but if this is not possible, the workshop can also be done without the help of the NAGF.

During this workshop, chefs, managers, recipe makers and all others participating will be challenged to reflect on classical dishes served in the restaurant. During the workshop, participants are asked to describe

a dish's core purpose. Next, the participants are challenged to create a new dish that fulfils the same purpose. A final round is held to complete the dish into a complete recipe.

The biggest challenge for the caterer is the creation of new recipes. The aim of the workshop is to inspire chefs to think out-of-the-box and encourage them to redefine the essential role of their dishes, without making the association with the ingredients. After the workshop, the other elements in the toolbox are easier to understand and can therefore add more value to the execution of the Fruitdaging.

The procedure of the workshop is described in the toolbox brochure. The corresponding work sheets are available in the separate print file.

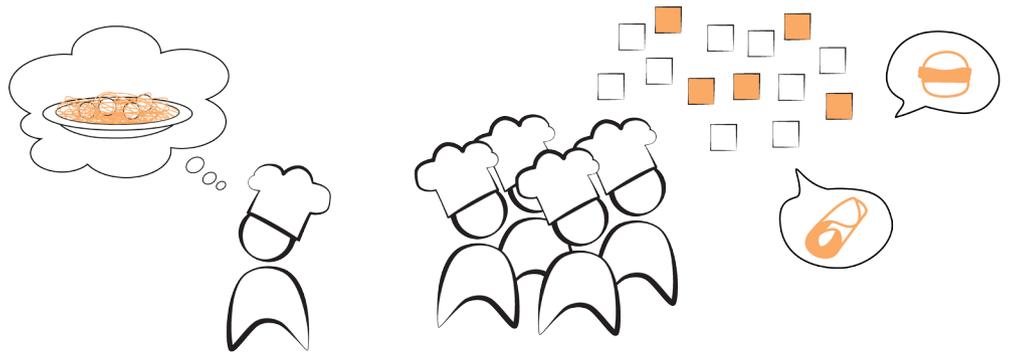


Figure 59: the workshop. Figure 60 and 61: creative sessions in action.

## 6.3 CASE STUDY: BROODJE GEZOND

The process of the flavour pairing experiments (see chapter 4: Experiments), with a signature sandwich as result, are written down in a case study. The case study describes the origin and the process of creating the dubbel-bammetje as a signature sandwich. Also the development of the concept, testing among consumers and feedback from professionals are listed. The study illustrates how a novel food concept is introduced into a catering environment, and it shows the reactions from chefs, caterers and consumers that followed.

The sandwich that is developed during the experiments has served as a boundary object between different stakeholders. A boundary object is an object that is both defined enough that several stakeholders can recognise it, yet flexible enough that each stakeholder can use it according to their own needs (Star & Griesemer, 1989). It can be a very useful tool when involvement is required from different stakeholders, while still engaging in collaboration, because it can assume a different type of role for each stakeholder (Nicolini et al, 2012).

Paavola and Hakkarainen (2005) describe two essential roles for boundary objects: they can be objects that are co-created but also serve as catalysts for the co-creation process.

While the sandwich serves the first role, the case study serves the second: as the sandwich is developed in an iterative process in which different parties were repeatedly involved, the result of the experiment is a co-creation between stakeholders. Now, the results and process described in the case study can serve as a catalyst for new processes where chefs either use the outcome as an example, or use the development processes as an inspiration to start creating on their own, where the NAGF can use the case study to showcase caterers the effect of the Fruitdaging challenge and a possible reaction from visitors. In return, the caterer can get an impression of how the challenge could be approached at his locations.

By providing the case study at the start of the Fruitdaging, it can act as a bridge for the communication between the NAGF and the caterer. The study is provided for illustrative purposes and to clear any doubts about the impact of the challenge. While it serves a different purpose across stakeholders, its main goal is to inspire and activate caterers and chefs, without requiring an intense collaboration.

The full case study can be read in the separate toolbox booklet.

# CASE STUDY "BROODJE GEZOND"

A series of experiments to find a new iconic sandwich - with fruit



## 6.4 CARD GAME/WEB APPLICATION

The flavour pairing experiments in chapter 4: Experiments resulted in a system for creating new flavour combinations. To use this system to inspire chefs to be more experimental in combining ingredients, the system was translated into a card game. The game is based on making combinations, inspired by the card games Halli Galli and Set (Bol.com, 2020, a+b).

The Fruitdaging card game serves as a tool to discover new flavour combinations. Its purpose is to inspire or lay the basis for a new recipe. The game consists of 102 ingredient cards and 18 cards with additional options. The ingredient cards are divided into 24 green cards, on which different types of fruit are written, and 82 white cards, with other types of ingredients. On the other side is a symbol. These symbols are different in shape, a circle or a triangle, and colour, being blue or orange. Also two different 'patterns' are used, a full or an open variant. By combining these characteristics, eight different symbols are created. A new flavour combination is made when a combination of three symbols is made, where all the characteristics are represented (figure 62).

The players have the freedom to shape the dish themselves by choosing the preparation techniques and adding extra ingredients. It is advised to keep any additional flavours simple, as the three-card combination is meant to serve as the flavour basis for the dish, and often already leads to intriguing combinations. With the symbol cards alone, there are already

59,225 unique possible combinations, so an enormous variety of new dishes can be created.

Because some caterers compose their (weekly) menus in a short time and others hold extensive sessions for a full season, a web version and a print version are available, so the game can be played quickly and individually, as well as more extensively in a group. On the next pages (pages 107 and 108), some screenshots of the web applications can be seen. All the screens can be seen in appendix 14.

The cards indicate whether an ingredient is in season (when applicable). It is also marked if an ingredient is not in the Schijf van Vijf. This helps caterers to make more sustainable and healthier choices.

The procedure to play is similar for both the web application and the physical card game. The only difference is that the card game allows more puzzling and viewing all the options simultaneously, while the web application automatically excludes incorrect combinations and uses a step-by-step approach for selecting ingredients, taking away some of the playful elements of the game. On the other hand, an advantage of the web version is that the final result is easier to share to the community. It is also possible for the NAGF to keep track on the activity on the web application, which gives them a sense of the level of involvement that is invested by stakeholders into the challenge.

## How to play:

1 Choose for a hot or a cold dish (on the dark blue card).

2 Choose the type of dish (one of the light blue cards).

3 Pick one green symbol card (this is fruit)

4 Combine the green card with two white symbol cards (these are other ingredients).

*The combination of three cards must contain all of the following:*

▲ ● 2 shapes

■ ◆ 2 colours

□ ■ 2 fillings

Flip the cards to see the ingredients.

5 Pick an orange card to define the "shape" of the dish.

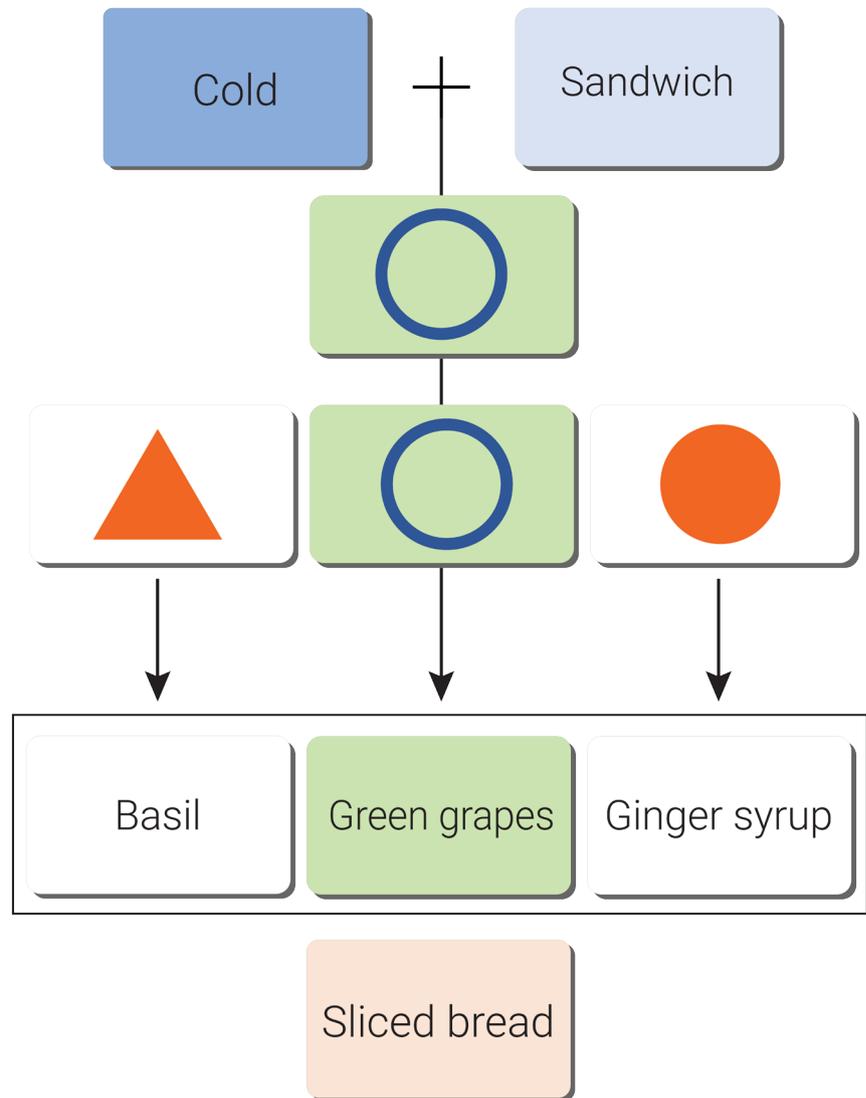


Figure 62: an overview of the card game.

What is the type of dish  
you want to make?

MEAL SALAD

SANDWICH

LUNCH DISH

FULL MEAL

SIDE SALAD

SPREAD/DIP

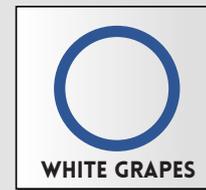
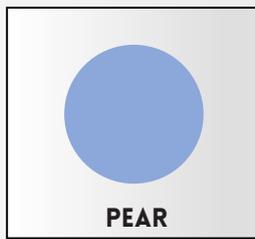
SOUP

SMOOTHY

BEVERAGE

◇ NEXT STEP ◇

Pick a fruit:



You can also

PICK RANDOM

or

GA  
VOOR  
KLEUR

## Create a flavour combination

This combination must contain all of the following:

-   2 shapes
-   2 colours
-   2 fillings



+



+



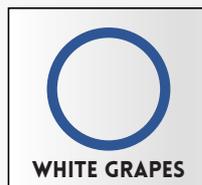
In for a surprise? You can also PICK RANDOM or GA VOOR KLEUR

◇ NEXT STEP ◇

## Overview of your Fruitdaging:

Create a **COLD** **SANDWICH** with **SLICED BREAD**,

using the  
flavours



in the taste  
palette.

## 6.5 #FRUITDAGING COMMUNITY BOARD

In order to preserve cohesion in the Fruitdaging challenge between caterers, a central space is necessary where the common goal can remain outside the competition.

A digital platform (a group board on Pinterest (see figure 63), will be the digital basis of the joint initiative of all participants of the Fruitdaging challenge. On the platform, chefs can share the dishes that they have made for the challenge. The visibility of the platform is set to public, which means everyone will be able to view, comment and like the creations, however only the people who accessed the board through the invite link on the project page of the website of the NAGF are able to upload photos. In this way, there is a possibility for interaction between chefs and consumers, while the content is still only from chefs who are participating in the challenge.

The platform encourages chefs to come together to strengthen the common goal of the challenge. If chefs would like to share their creations that are part of the challenge on other social media, the hashtag #fruitdaging can be used. A collective hashtag is convenient to spread awareness about the Fruitdaging and create an overview of all entries.

On a regular basis, a creation and its maker are highlighted on Veggipedia and the social media channels of the NAGF (figure 64). In this way, chefs are encouraged to be engaged and share their creations. Positive feedback and compliments on the posts can also be used to convince guests in the restaurants to try a new recipe as the influence from experts and professionals can help lowering the threshold for consumers to accept novel foods (see chapter 2.1: Auto-ethnographic research).

One of the benefits from this system is that the Fruitdaging challenge is very accessible as everyone who is interested can participate. Even if a caterer is not involved as a company in the challenge, an enthusiastic chef is still able to share his or her creations and contribute to the purpose of serving more meals with fruit as main component. The Fruitdaging challenge, the toolbox and the link to the digital platform are available for everyone on the website of the NAGF. As time goes by and the amount of participants in the Fruitdaging challenge grows, it is likely that the hashtag #fruitdaging will be picked up by home cooks and cooking channels on social media and, whether or not unconsciously, support with the spread of the goal of the challenge. When this happens, a stricter monitoring of the platform might be desirable.

## Fruïtdaging

3 pins

Jouw pins Meer ideeën



De bedenker van het dubbel-bammetje presenteert...

Fruïtdaging



Dubbel-bammetje

Merel Dubbeldam

#FRUITDAGING

Fruïtdaging

Fruïtdaging

Instagram

Search



gavoorkleur

Following

Ga voor Kleur

Gun je leven eens een beetje meer kleur met groenten en fruit. Dat is lekker, maar ook super gezond! 🍌🍎🥕🥦🥬 Deel jouw kleurrijke eten met #gavoorkleur

[www.veggipedia.nl/recepten/witlofgrapefruitsalade](http://www.veggipedia.nl/recepten/witlofgrapefruitsalade)

Followed by nofairytales, eattherainbow.nl, chloerutzerveld + 1 more



#Fruïtdaging



Snacks



Traktaties

518 posts

1,487 followers

826 following



Figure 63: a screenshot of the community board.

Figure 64: Ga Voor Kleur Instagram with highlighted Fruïtdaging dishes.

## 6.6 CANTEN TEST

Since there are different types of caterers, with different type of people visiting each location, there is no one-size-fits-all solution. To enable every caterer to join the Fruitdaging challenge, different activities have been developed to align with the type of guests visiting the restaurant (see chapter 6.8: Four Packages). To identify which activities will resonate with the visitors of each restaurant, a test for the caterer has been developed.

The canteen test mainly serves as an aid to form an image of the mindset of the average visitor. The test results lead to an advice on how to use the elements from one of the four toolbox packages, appropriate for the visitors.

Figure 65 shows a line on which the different types of visitors are depicted. The line runs from the most conservative eater to the absolute adventurer. Below the line are a number of characteristics of each visitor, assigned to four icons:



This sign describes what this type of visitor finds most important when he or she visits the restaurant to eat.



The offer in the restaurant, if the current menu in the restaurant already matches this type of visitor.



The type of meal this type of visitor mainly buys.



The (expected) attitude of this type of visitor towards changes in the menu. The caterer is expected to reason what kind of people mainly visit the

restaurant and determine where the majority of the visitors in the restaurant are located on the line. Under each visitor type there is an advice for one of the four packages with suggestions for activities to activate this type in the right way. A more conservative eater will probably feel intimidated by initiatives that are a lot more experimental than him- or herself, while a more adventurous eater will not feel challenged by a more conservative offer. Activities from surrounding packages can be added to serve a broader audience or challenge visitors to take an extra step.

The line should be considered as a scale. There are no clear boundaries between the different types of visitors. It is possible that “the average visitor” of a restaurant is a combination of different types. For this reason, it is important that the chef, who works at the locations and knows the visitors best, is involved in choosing the visitor type.

The test works best when one location is kept in mind. If a caterer plans to carry out the Fruitdaging at several locations, it is advised to decide the target audience for each location (or locations with similar visitors, such as schools), in order to decide on the best fitting package.

On the next pages, each visitor type is described in more detail and the essence of each package is further explained.

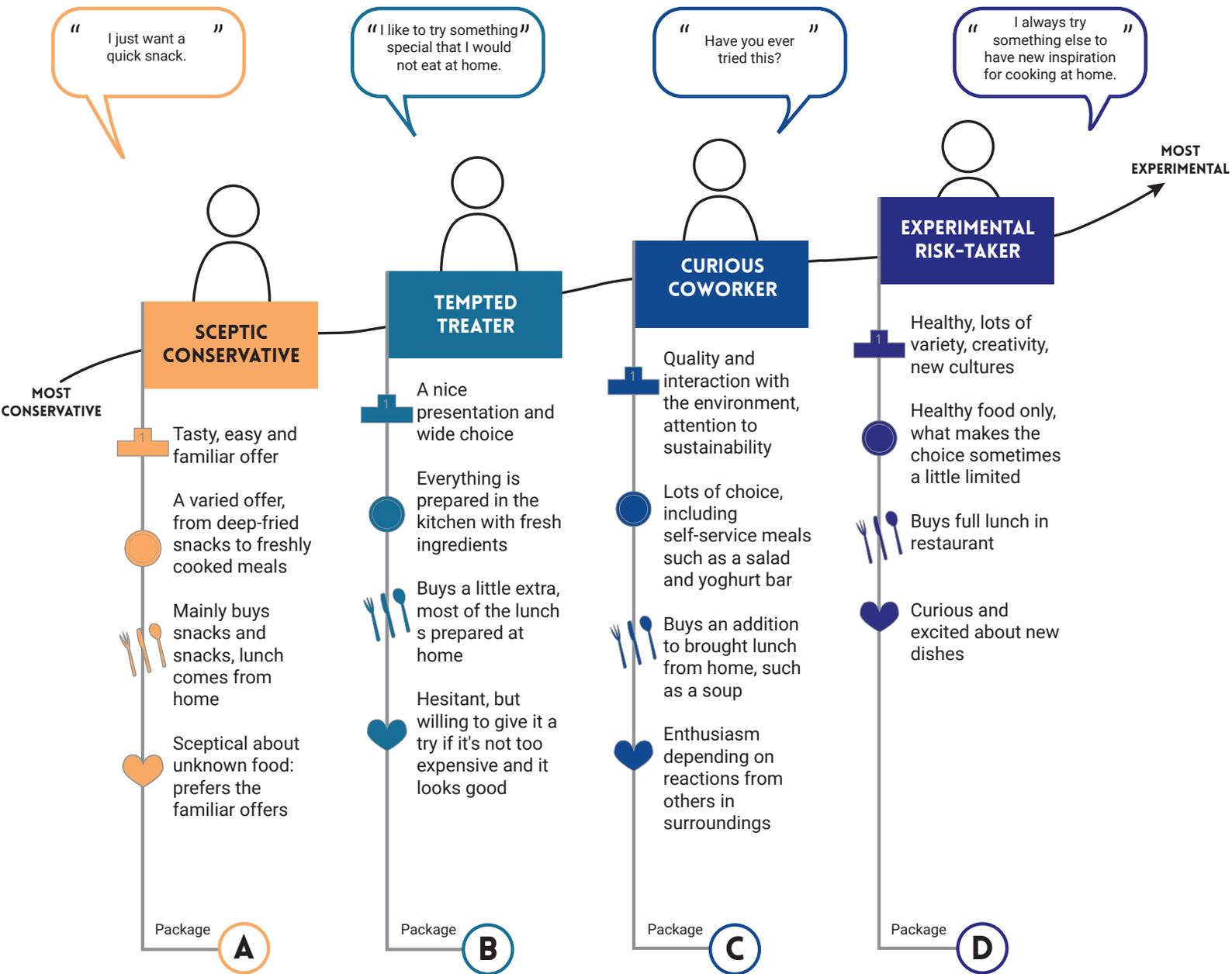


Figure 65: scale with the different visitor types.

## 6.7 FOUR TYPES OF VISITORS

To help the caterer, the toolbox contains the description of four type of visitors. These visitor types attach different values to their food. They can be aligned to different phases of the conscious competence model described in chapter 2.3: Design opportunities, and the personality archetypes from chapter 2.4: Target audience (figure 66). Understanding the different types allow the caterer to identify the opportunities, but also the obstacles that he can encounter when confronting his visitors to unfamiliar dishes.

### Conservative sceptic

The conservative sceptic is very attached to existing structures. He won't try something new if it doesn't look like something he already knows and likes. If the restaurant does not offer what he wants to eat, he will be more likely to take something from home or pick up his lunch elsewhere. These people are generally not as much concerned with health when they eat out-of-home. To them, the urgency of eating more fruit is very low.

### Tempted treader

For these types of visitors, consumption in the restaurant is perceived as a treat, for a special occasion. This person will therefore be quicker to choose something "special", paying more attention to the presentation than to the nutritional value of the dish. This type of visitor knows that he or she should eat enough fruit, but is not immediately prepared to make radical changes to his or her diet.

### Curious colleague

The curious colleague thinks it is important that the food is of good quality. These people want to know exactly what is in their food and where it comes from. They consider lunch as a social moment to get together with colleagues. Eating fruit is acknowledged as necessary, but these type of visitors are not yet able to think of new applications themselves.

### Experimental adventurer

The experimental adventurer is interested in different cultures and tastes. These people are often more conscious about healthy food and they are curious about food trends, such as "superfoods" and veganism. When this type of visitor sees something new on the menu, he tends to choose it over something he has eaten before. This type of visitor is most likely to take inspiration from the Fruitdaging dishes served in the restaurant and reproduce them at home to treat their friends and family members.

Based on the visitor types, several activities are given to serve Fruitdaging dishes. These activities are sorted into four packages, that each focus on approaching one visitor type in a suitable way. On the next page, these packages are further explained.

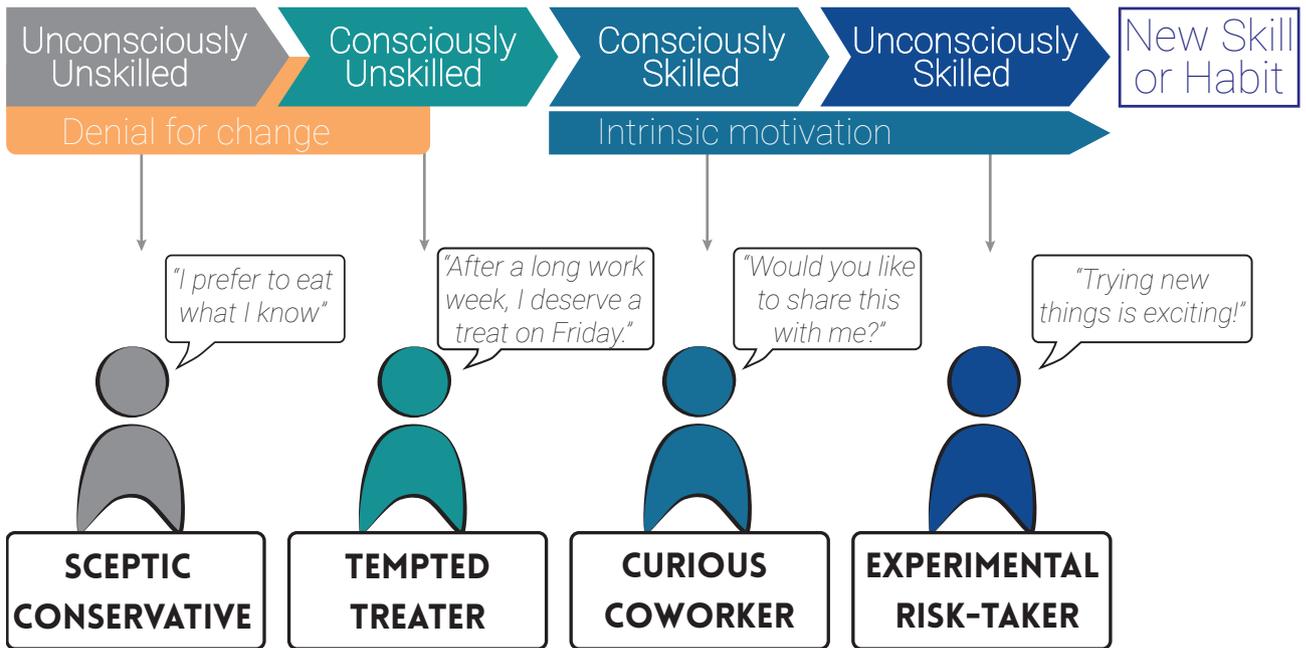


Figure 66: the four visitor types linked to the conscious competence model.

## 6.8 FOUR PACKAGES

Four packages are designed to achieve different goals that match with the mindset of the four visitor types. Each package covers one of the design opportunities defined in chapter 2.3: Design opportunities (figure 67). The basis for each package is the serving of Fruitdaging dishes in the restaurant, but depending on the type of audience, the way it is served can be very different.

A logo, will be available to label dishes and promotion material that are part of the Fruitdaging challenge, in a similar way that vegetarian meals or food allergies are indicated. In this way, guests are made aware about the Fruitdaging challenge without feeling pressured or judged on their actions.



Below, the essence of each package is explained. The details on each activity can be found in the separate toolbox booklet.

### Package A: Low threshold

The first package is aimed at visitors who are very conservative about food (described in 6.8 as "type A: conservative sceptic"). The main goal of this package is to get visitors to be more open towards new food, and have them try something different. Because they are hesitant towards unfamiliar food, it is important that the boundaries to do so are as low as possible, and there is no

emphasis that can be perceived as intrusive or compulsory. The main message to communicate is that the dishes served during the Fruitdaging are nothing new; merely a different combination of well-known ingredients. The Fruitdaging dishes need to blend in well with the regular assortment. The visitors need to feel as if they are invited, without having to give up their own comfort, otherwise there is a chance of resistance and counter reaction.

### Package B: Exclusive

Opposite to the first, the second package will convey the idea that the Fruitdaging dishes are state-of-the-art recipes that are only available for a limited time. The dishes will be highlighted on signs, special serving platters and emphasized through other communication methods. This package aims to reach the visitors that are curious for new dishes, but hesitant about the quality. By serving exclusive dishes for an affordable price and enabling them to view and provide feedback, the visitors will be made curious to discover the new creations.

### Package C: Co-creation

This package targets the social aspects of a public eating location. It is also an opportunity for the chefs to connect with their guests. In this package, storytelling and personalization will take centre stage by showing recommendations from the

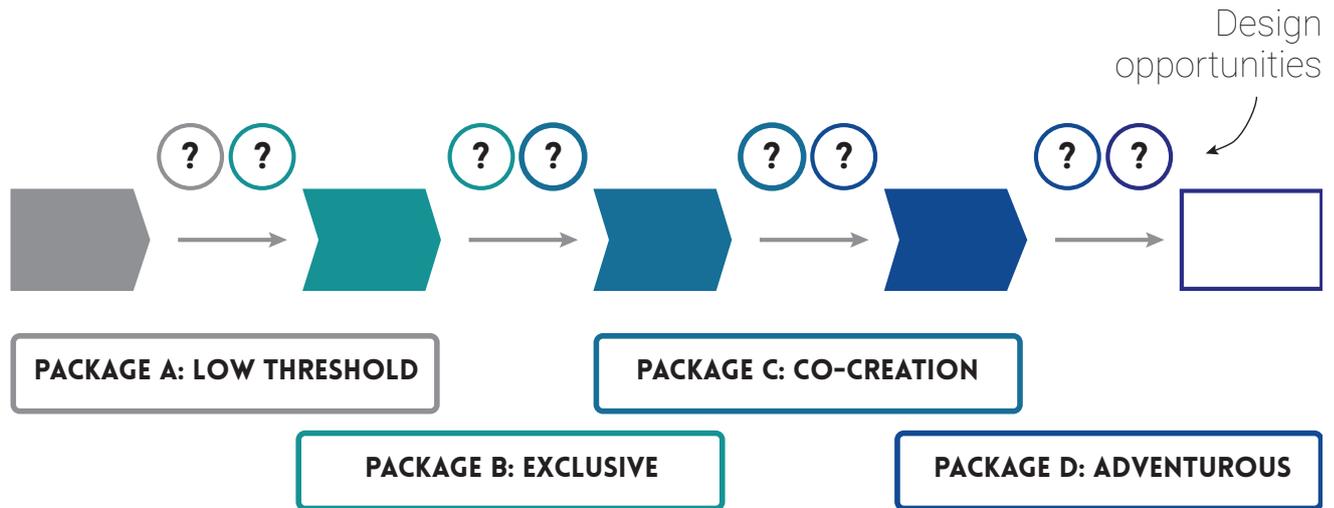


Figure 67: the packages in relation to the design opportunities explained in chapter 2.3: Design opportunities.

grower, reactions from (other) chefs in the #Fruitag challenge and giving a sense of participation to visitors of the restaurant. The latter is achieved by communicating about the involvement of (other) visitors of the restaurant, enabling guests to inspire their chefs and holding a tasting contest that influences the future offer of items on the menu.

### Package D: Adventurous

The fourth package allows for the most radical changes and broadest variety of dishes. This package is suitable for locations where people are curious for new and different experiences. The Fruitag expresses this in the form of a mystery meal box, a tapas try-out plate and a competition between dishes, where the purchase counts as a vote. A large activity in this package is the “Try before you

die” festival, which is an excellent opportunity for experimental chefs to showcase their creativity, and guests to extend their taste palette.

### Choosing a package

The packages can be tailored by the caterer to meet the available resources, budget and restaurant size. When the resources and target audience are defined, a package can be composed. The pre-defined packages serve as an example, where components can be added, removed or adjusted according to the available resources. When the caterer decides to target a broader audience, it is also possible to combine components from two packages. This flexibility ensures that it is possible for every caterer to join, regardless of the budget, corporate structure and type of locations.

## 6.9 INVOLVEMENT NAGF

As mentioned in chapter 3.1: Nationaal Actieplan Groenten en Fruit, the NAGF does not have the money or resources to invest in the development of the project. Therefore, the toolbox is made as such that caterers who join the Fruitdaging challenge can download and use the toolbox without much involvement from the NAGF. The toolbox will be available to download from the project page on the NAGF website. On that page will also be links to the platform and the web application.

The caterer is free to go through the different parts of the toolbox and use only the ones that are suitable for his situation, as every part can be used independently and is optional. In this way, every participant of the challenge can control their expenses and efforts into the challenge. Because the toolbox is so flexible, it is easy to scale up or down for bigger or smaller catering companies, or even individual chefs. When caterers prefer to start with one (type of) location and scale up later, the parts in the toolbox can be reused to modify the contents of the Fruitdaging.

From the NAGF, most of the effort is required at the kick-off and little extra workload is given during the challenge. At the start of the

Fruitdaging, the main task of the NAGF is to contact caterers and make them aware of the challenge. This can be done during the expert meeting or by sending a message, for example by spreading an online newsletter to partners from previous projects or posting an article in the magazine of the Dutch Catering Association Veneca, where the purpose and procedure of the Fruitdaging challenge is introduced. Veneca is the collective of caterers committed to a progressive, responsible and vital catering industry (Veneca, 2020). By reaching out to them, it is possible to reach many different caterers at the same time.

During the project, several caterers have been involved in the development of the toolbox. All of them have informed to be interested in the final result. The NAGF can contact these caterers to be the first participants of the Fruitdaging challenge. It is advised to start the challenge with a monitored test-run, to be able to get feedback on the toolbox and make some necessary adjustments, in order to smoothly connect other caterers.

When the Fruitdaging challenge is running, the NAGF is able to view and collect input that is shared to the digital platform. This platform provides them with additional

content for their own social media channels. By promoting this content on their own platform, they can both praise the caterers and chefs for their commitment and contributions, and involve the consumer in the challenge. Since posting recipes and vlogs about food is already a regular activity, this will not be extra work, but mainly an extra source of input. Furthermore, the NAGF is able to monitor the use of the web application of the game, to collect information on the engagement of participants in the challenge.

At the NAGF, subsidies are planned to end by October 2020, which means that the input from the NAGF to engage caterers into the Fruitdaging project will stop. The Veggipedia website and GaVoorKleur social media channels will be handed over and maintained by the GroentenFruit Huis, who is the current employer of the NAGF. The Fruitdaging community platform will be migrated along with these websites and continue its function in providing content for the other channels. The Fruitdaging challenge can keep running, as long as caterers can continue to carry the project.

# CHAPTER 7

# MAKING IMPACT

7 VALIDATION

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# 7 VALIDATION

To validate the viability of the concept, it is important to know the thoughts from caterers. Earlier conversations (see chapter 3.3: Food service professionals) showed that they have an interest in a project that focuses on eating fruit. But is this toolbox usable for them? And what is the expected effect on consumers? Can the toolbox also be used for different purposes, or by other people? Through phone calls, one caterer and a chef have shared their thoughts on the Fruitdaging challenge and toolbox.

This chapter describes the expected outcome when Fruitdaging is launched at restaurants and the long-term impact that the activities in the toolbox can have. The feedback from the NAGF and several people in the catering industry is included. Next, a discussion and some recommendations for further development of the project are provided. Finally, the design goal and project requirements are reviewed and the conclusion of the project is given.

## 7.1 FEEDBACK SESSIONS

For the NAGF, the most important requirement for the outcome of the project is, besides an effective promotion of fruit consumption, a self-sustaining solution where minimal time and effort is required from them. Through continuous meetings and intermediate sharing of results, the NAGF was involved in the development of the concept throughout the project.

To collect feedback from caterers, the concept was shared with two different caterers that had already been involved in the project before. The aim to collect feedback on the usability and viability of the toolbox.

Based on the project requirements defined in chapter 3.5: Project requirements, the questions for the tests with caterers were:

- Is the toolbox applicable by caterers, without the help of the NAGF?
- Do caterers believe that the elements in the toolbox is effective to create a different perception towards fruit consumption?
- Are there essential things that are missing or incorrect in the toolbox before it can be used? What is necessary to improve these things?

*"It would be nice if this could contribute to our efforts for healthy food in our company restaurants."*

- Michaël, caterer

The feedback sessions were held through phone calls (see appendix 15). The toolbox was sent to the caterers beforehand, to test if the caterer could understand what to do without further explanation. This is important because when the Fruitdaging is kicked off and available on the website of the NAGF, it should be self-explanatory. During the calls, the caterers were asked for their reaction and thoughts, while all the parts of the toolbox were being reviewed one by one. After each call, a new and revised version of the toolbox was sent to the caterer and additional feedback was given.

There were some limitations to this telephone setup. The feedback sessions were held with few caterers, not all participants had read the toolbox beforehand and the caterers were not able to experience a printed version of the card game. Fortunately, the card game had already been demonstrated to another caterer during a physical meeting.

## 7.2 RESULTS FEEDBACK SESSIONS

### NAGF

Because of the frequent interaction, the feedback from the NAGF has been implemented during the process. Because of this dynamic process, the final concept meets the requirements concerning the NAGF as stakeholder: the Fruitdaging requires some effort at the start, but as soon as caterers start the Fruitdaging, little effort is needed from the NAGF, while the project continues to have an impact.

### Caterer

The responses to the card game was positive, even though most caterers had not seen in use: *"This is fun. Looks like it is easy to get started,"* one caterer said. There were some hesitations by some whether a chef would use it every time he composes a menu, but a digital version would seem an adequate solution. In general, the feedback was very

positive. It was agreed upon that the toolbox was a very complete package that had been well thought out. One of the caterers: *"For example, that cost price calculation. This shows that it is very well possible to make a profit without much extra cost. I think it's a good thing that that's included".*

### Points of improvement

There were also some points of improvement mentioned during the sessions. The biggest one was about the canteen test, which originally was a quiz where the answers had to be filled in on a figure. This was thought to be unnecessarily difficult, as *"a chef knows his own audience already anyway"*. For this reason, the canteen test is simplified into the scale with description. A concern was mentioned for the community board, as one caterer feared that taking a picture and uploading it to an online platform might require too many steps: *"They are chefs, and not photographers, after all"*. One caterer was very inspired by the card game, and suggested to use it in a broader way, for example at hospitality schools, where students learn the basics of recipe design, so it can already be included in the basic education of future chefs. Overall, most caterers were pleased to see a solution for the promotion of fruit consumption presented in a practical way.

*"The topic is appealing, the document is colourful, approachable and focused on concrete implementation. I think it's a total package of possibilities."*

*- Michaël, caterer*

## 7.3 EXPECTED IMPACT

### Direct impact

The Fruitdaging challenge will already have an impact when one caterer decides to join with one location. However, the more caterers join forces and share their experiences on the challenge, the bigger the effect will be. The toolbox offers the same tools to every caterer and a digital platform connects all participants. Because of these aspects, it is possible to retain the collective goal that is set for the challenge and collaborate beyond competition to keep the Fruitdaging running.

### Long-term effects

The Fruitdaging challenge is aimed to require small efforts at the startup and will sustain itself after that. That means that the challenge does not need to have an end date and can therefore have an impact that lasts as long as one or more caterer(s) continue to carry the challenge.

For the Fruitdaging challenge, an end date or final result has not been defined, as the implementation of fruit is supposed to

continue to expand into the Dutch eating culture. An end date would imply that there is an end goal, but there is not: a mindset or behavioural change is an ongoing process and be measured in a final number or clear statistics. The challenge is meant to be self-sustaining and developing as soon as it is up and running in restaurants.

If the Fruitdaging challenge is received well in restaurants, consumers will be able to experience new possibilities for the consumption of fruit at their workplace. The intention of the challenge is that this experience helps the consumer to adapt new eating habits around fruit. When these habits start to settle, consumers will start using fruit as ingredients themselves. Ultimately, the adopters of this mindset will influence the people in their close circle, friends and family, who in their turn can spread it onwards to more people. In this way, a “new normal” for fruit consumption can settle its way into society in a very natural way.

## Durability

To get the Fruitdaging started, dedication and some effort is asked from caterers. In order to keep it going, it is important that chefs are committed to the Fruitdaging and continue to feel challenged to find new ways to serve fruit. It is also important that the approach towards consumers is reviewed and adjusted according the reaction of the visitors in the restaurants. It is expected that people will get accustomed to a frequent offering of dishes with fruit over time. Then, the caterer can consider to change his approach or stimulate consumers to prepare Fruitdaging dishes at home as well.

The moment that people start using fruit as a main component in regular meals at home, will mark an important point in the repositioning of fruit. It is not possible to predict when this will happen, as it depends on the intensity and scale of the execution of the challenge by caterers.

# RECOMMENDATIONS

Although the toolbox is readily available for caterers, there is always room for further development of the project. For example, there are other ways to use the toolbox to engage consumers on different ways of consuming fruit:

## Launch

It is advised to start with a monitored test-run at one or two caterers, to be able to get feedback on the toolbox and make some necessary adjustments, in order to smoothly connect other caterers.

## Developments

Looking at possible improvements on the toolbox, some things are worth mentioning:

For the NAGF, it would be useful to see if it is possible to see if an approach similar to the Fruitdaging can be used to promote vegetable consumption. More research is needed to estimate the desired impact of such a project.

At the moment, the nutritional value of the ingredients is indicated by its place in the Schijf van Vijf. However, there is a variation within some of the ingredients that makes it difficult

to give the full flexibility the game needs (for example, for bread only the whole grain options are included in the Schijf van Vijf). Also, the nutritional value and therefore the position in the Schijf van Vijf changes for each preparation method. In 2021, Nutriscore is scheduled to be brought into use (Rijksoverheid, 2020). This label compares the nutritional value of products within one food category. When this system is settled, the card game, as well as other aspects of the toolbox that involve nutritional information, need to be revised on whether it is relevant to update them with this label.

The current web application of the game has not been built into a fully functioning web app yet. Besides the programming of the basic functions, the functions of the application can be improved. For example: link the outcome of the game to recipes on Veggipedia or integrate the community board. Another option is to allow chefs to add new ingredients or rate used combinations. An AI script should then be installed to learn from these suggestions to keep the database updated. It is also useful for the NAGF to collect data from the usage of the app. This also needs further definition of the desired effect and refinement to comply with the privacy laws.

## Expansion

Schools teaching hospitality can use the toolbox to teach their students how to create recipes. This is important, because these people will be the future food professionals who serve meals to consumers. A previous study at the NAGF has shown that the educational institutes are a very effective starting point in order to spread a message and plant seeds on healthy eating habits (Goldbach, 2019).

If chefs are engaging on the digital community board, it is possible that Fruitdaging is picked up by other food makers, for example: (public) restaurant chefs, supermarkets, food bloggers and influencers. The toolbox will need some adjusting or additional items to enable these people to contribute to the challenge as well.

Children can learn about food in schools. Some items in the toolbox, for example the card game, can be provided as course material to help children associate fruit with meals.

An adaptation of the card game can be used at home by children and parents. This might be something for a later stage, when the Fruitdaging has had settled a little already.

Fruitdaging also provides a great message for Dutch fruit growers, who can use it to promote their products.

# CONCLUSION

## Recap design goal

*Create a concept for the NAGF, that helps caterers serve meals with fruit to their guests, to reposition the perception of fruit consumption.*

The goal of this project was to add a new perspective to the way fruit is consumed. This perspective implies that fruit can also be used as one of the main components in a meal. In order to achieve this, the project was aimed at caterers, who serve dishes to consumers on a daily basis.

The final concept offers a way to increase the use of fruit in meals. Tools to create recipes and approach consumers are included. The toolbox targets caterers, but can also be used by other food professionals or amateur chefs.

## Recap project requirements

*Ready to be implemented*

Besides the web applications, the elements in the toolbox are finished and can be used by caterers right away. During the project, several caterers have been involved in the development of the toolbox and all are interested in the final result. The NAGF can contact these caterers to be the first participants of the Fruitdaging challenge.

*Digitally available and self-explanatory*

The toolbox is designed to be ready to use by anyone who is interested. Most parts are described in the booklet, but some parts require some physical tools: the card game and the workshop. These tools are assembled in one printable file, along with a few examples for posters. The web application of the card game and the online community board require links. All these things are publicly available on the project page on the website of the NAGF.

The booklet describes every part of the toolbox in an easy-to-understand language. The feedback sessions with the caterers, chapter 7.1: Feedback sessions showed that the explanation of the tools were clear and applicable without assistance.

*Adaptable to different type of caterers and consumers*

The toolbox is adaptable to match the available resources of the caterer. The recipe developing tools are based on the generic composition of meals and only provide guidance to focus on one specific type of dish if desired. In this way, caterers with different menus or corporate structures can use the same tools. The approach towards consumers is based on different types of visitors that are placed on a scale. For each

range of the scale, there are suggestions for suitable activities. Each activity can be done independently, so the caterer is free to compose a set of activities that suits him best.

#### *Scalable*

The Fruitdaging starts small, targeting consumers in an easily accessible way at a very specific location. Over time, the expectation is that the idea of fruit as component in a regular dish will become more commonly accepted. Ideally, the Fruitdaging challenge creates a snowball-effect where consumers start to make dishes with fruit at home. Eventually, it will seem like fruit has always been included in meals and nobody will realise that this perception has changed slowly over time. But this will take time and perseverance from the caterers and other food service professionals in the beginning.

#### *Addition to regular fruit consumption*

The Fruitdaging challenge focuses specifically on using fruit in dishes during regular meal times. The current fruit consumption should not be affected by these meals, as this usually happens in-between meals.

The consumer approach never focuses on promoting the dishes as a replacement for the regular fruit consumption.

# REFER ENCES

REFERENCES

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# REFERENCES

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