# SUPPORTING CONSUMERS TO MAKE SUSTAINABLE FOOD CHOICES

Master thesis report
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# SUPPORTING CONSUMERS TO MAKE SUSTAINABLE FOOD CHOICES

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## ACKNOWLEDGEMENT
### CHAPTER 01

# EXECUTIVE SUMMARY

**CHAPTER 02**

The daily consumption of food influences the health of society and the planet. The current food consumption of an average Dutch consumer could be described as unsustainable behaviour (Muilwijk et al., 2019). Especially the intake of animal proteins should decrease and be replaced with plant proteins to realise a positive impact (Kramer & Blonk, 2015). However, the consumer is not the only responsible stakeholder for this, because food processors, foodservice operators and retailers shape the market and influence consumers' dietary choices (European union, 2020). In other words, the consumption system influences the consumer.

Therefore a transition of the system is required to realise sustainable food consumption. This thesis applies a system perspective to explore essential actors and identify barriers and triggers for the transition (Loorbach et al., 2017). The system is locked in the feedback loop of demand and supply and the consumer strongly influences the demand side of the system. A change in demand means a change in consumer behaviour. Behaviour is influenced by a complex interplay of factors and to change the system a bottom-up strategy is applied. This requires a context-specific case to change the consumption system (McKenzie-Mohr,2011). In conclusion, the focus of this project is to design an intervention which supports consumers to replace animal proteins with plant proteins when ordering food.

The consumer journey emphasises the importance of the right choice in order to change behaviour and purchase differently. Due to unconscious routine behaviour, the consumer needs support in the decision process. Personalised triggers and simplification of the consumption process supports the desired behaviour and could lead to a new habit of consuming sustainable food (Eyal, 2014).

A concept is designed to match personalised meal suggestions with consumer preferences. Additionally, actionable support is provided to ease the choice between different forms of food delivery. The goal of the concept is to offer personalised inspiration, actionable support and accessible education for the consumer and the foodservice stakeholders to realise sustainable food consumption. The concept operates according to a platform business model where multiple stakeholders are included to add value. The added value for every stakeholder is validated with several expert interviews and online consumer discussions. The platform is self-learning and uses consumer data to advise the foodservice actors about anticipation of consumer needs. The translation of consumer data into valuable insights for the industry generates a viable revenue model. The key business activities are the data analysis and the matchmaking between consumers and meals. The implementation of the concept is explained according to a roadmap and indicates a strategy for entering the market. The concept is positioned as an honest and truthful platform that serves and supports stakeholders in their sustainable consumption behaviour. This creates a competitive advantage compared to other delivery platforms.

The concept covers all SHIFT factors to encourage sustainable food consumption and therefore owns the potential to change consumer behaviour (White, 2014). A change in consumer behaviour results in new consumer demand. The change will affect the supply side of the feedback loop and contributes to the transition of the consumption system.

# TABLE OF CONTENT

# READING GUIDE

## FOOD CONSUMPTION BEHAVIOUR

Includes all steps of the consumption process such as knowledge collection, decision making, purchasing, cooking and eating in the perspective of the consumer.

## SUSTAINABLE FOOD CONSUMPTION

The systems include multiple actors, relationships, unwritten rules, culture, mindsets and regulations that influence the consumption process.

## DESIRED TRANSITION

Shift in the food consumption system where all actors contribute to encourage, perform and facilitate sustainable food consumption.

## FOOD CONSUMPTION SYSTEM

Broadly speaking sustainable consumption means eating fewer animal proteins, more seasonal and local food, smaller portions and reduction of waste. This project concentrates on shifts in protein intake.

## QUOTES

*Quotes from participants during interviews or validation.*

### PUTTING PIECES TOGETHER

### RECAP CHAPTER

Describes key insights, thoughts and actions to finalise the design phase. The writer uses those chapters as a reflection on the design process to bring the important elements together needed for the next phase.

### TAKEAWAYS

Summarises the most important insights discovered in this chapter.

# PROJECT APPROACH

To structure the thesis the project is explained through the 'double diamond' methodology (British Design Council, 2019). The design process consists of four phases. Different methodologies and tools are used in every phase.

## DISCOVERY

The context related to food consumption is explored on a system level to understand underlying problems. Desk research and expert interviews are conducted to provide insights into the behaviour of multiple actors and the system in general. The behaviour of consumer consumption is analysed in more depth to indicate possibilities. The exploration of the current consumption system compared to the desired future indicates what needs to be done to realise the transition.
Methods used: desk research, expert interviews, stakeholder mapping.

## DEVELOP

During the development phases, multiple creative sessions are used to explore possible solutions for the design challenge. A variety of possibilities are the birthplace for the final concept.
Methods used: creative facilitation, theory of change, problem-solving.

## DEFINE

The insights from the discovery phase are used to define a future vision. This future vision is translated into a design challenge focussed on a specific context and situation. The design challenge is the starting point for the second diamond.
Methods used: analogy, future visioning, customer journey mapping.

## DELIVERY

The possibilities have been brought together into one concept. Validation with experts and consumers test the feasibility, viability and desirability of the concept. Furthermore, iterations and improvements lead to the final concept of this project.
Methods used: user interface prototyping, roadmapping, consumer & expert validation, branding



**DISCOVER**     **DEFINE**     **DEVELOP**     **DELIVER**

*Figure 0 - Double diamond*

## PHASE 01 - DISCOVER

During the discovery phase the consumption system in the Netherlands is explored. The current consumption is compared with guidelines for a more sustainable menu to indicate which changes are needed. The actors are analysed and the consumer is analysed in more detail regarding their behaviour. Research into behavioural science deepen the understanding how behaviour can be influenced.

# INTRODUCTION
## CHAPTER 05

The worldwide food system is responsible for approximately 30% of the total emission of greenhouse gases (Food and land use coalition, 2019). Different studies have shown that the food system is unsustainable and the 'small' problems of today will result in bigger problems in the future (Food and land use coalition, 2019, European Union, 2020, Muilwijk et al., 2019). This indicates that there needs to be a change in the food system. There are multiple ways to steer the system towards a sustainable direction and this project focuses on the last part of the food chain, namely the consumption. This perspective takes the consumer as a starting point to influence the active actors in the system. Food consumption is an impactful position to intervene because it is rarely considered as a solution, meaning there is a lot of potential to make small changes (Loken, n.d.).

The impact of consumers in the food consumption process is significant as well. This means that consumers are essential for a sustainable food system. The role of the consumer is visible in the performance of consumption behaviour because every purchase decision votes for a world they would like to live in. To a greater degree, the consumption choice of consumers is one of the most powerful actions an individual can take to combat climate change (Loken, n.d). The consumption of society shapes how food and land use systems evolve and therefore consumption is a good starting point to realize change (Food and land use coalition, 2019). Consuming sustainable products completes
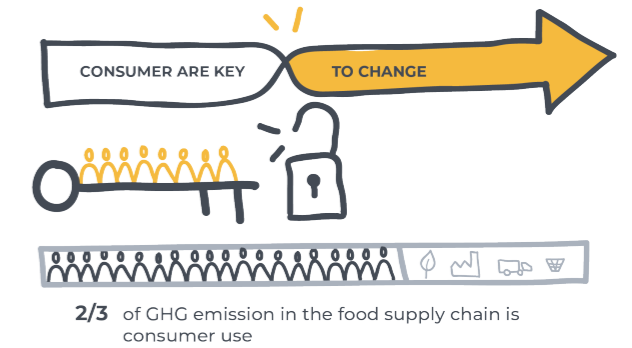


*The consumer has a big impact on GHG emission of the total chain. Therefore consumers are needed for a solution. (Unilever, n.d.)*



*The goal is to create a sustainable dietary habit.*



*Current problems of today will result in bigger problems in the future. (Zantinge et al., 2017)*



*These are the shifts in diets needed in a sustainable menu (Luben, n.d., Bosma, 2019).*

the circle of a sustainable food system. Unfortunately at this moment, the average consumer performance shows undesirable behaviour impacting the health of the planet and their own health. What consumers eat every day is influenced by a lot of stakeholders and should not be the responsibility of an unaccompanied consumer. This arises a problem for the consumer because the consumer is not capable of changing behaviour in a context that does not support the transformation.

This thesis develops a solution where consumers are supported to change dietary habits with the involvement of multiple stakeholders. Lancet EAT 2020 performed in-depth research and def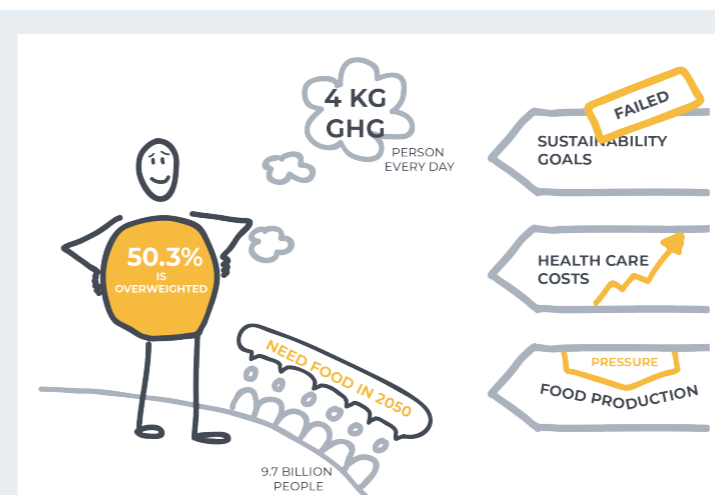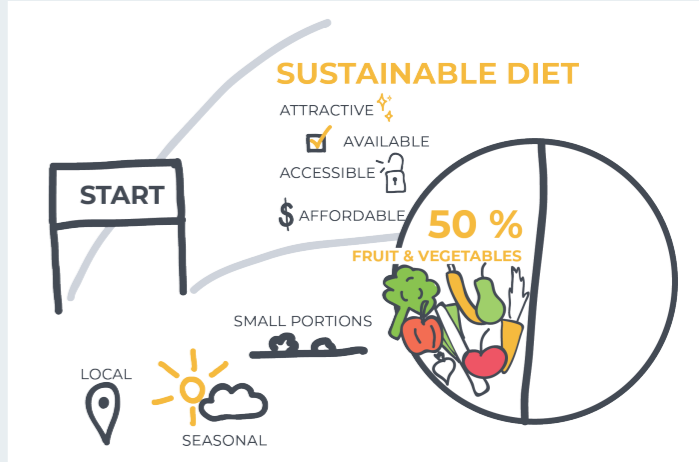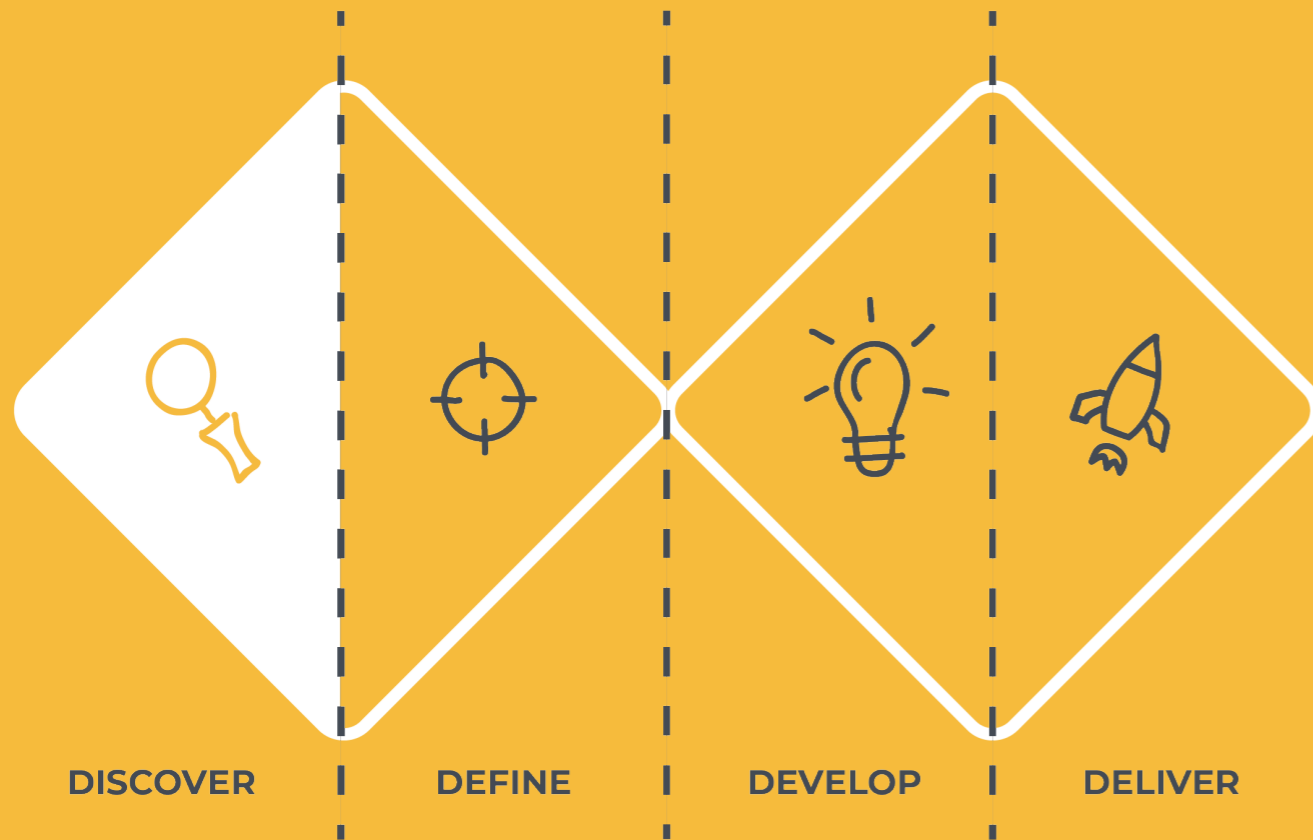ined a planetary diet that is sustainable (Loken, n.d.). The aim of this thesis is to replace the average diet of Dutch consumers with the Lancet diet as explained in chapter 7.2. An alteration in a diet is accompanied by a different behaviour. Changing behaviour is a complex transformation without one ideal solution. Factors influencing behaviour are shaped by actors of the consumption system. Therefore those actors need to facilitate a new set of factors that support the consumer to change their behaviour. This is an opportunity for the actors in the Dutch consumption system to create a sustainable system. Actors could also leverage strategic positioning in the market and take responsibility. Additionally, advantages for the consumer and planet could turn into advantages for the industry. This change might not happen overnight and multiple interventions are needed. This thesis illustrates one concept that supports consumers to make sustainable food choices and behave differently.

**The power is on everybody's plate.** So it is time for everybody to accept responsibility and take action.
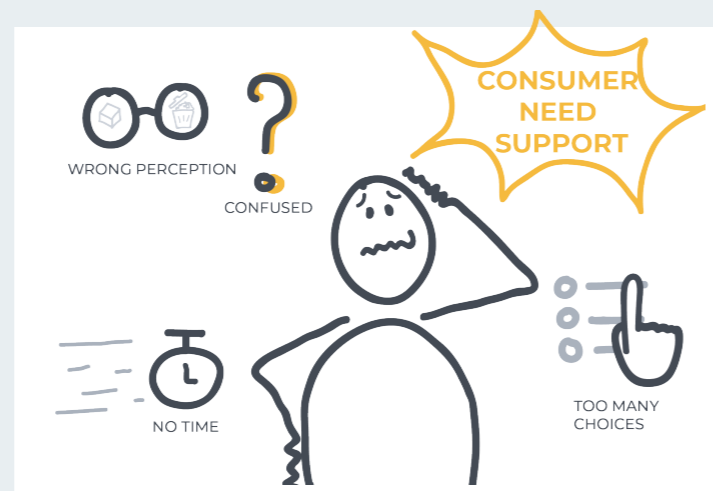


*For this change, actors need to support the consumer.*
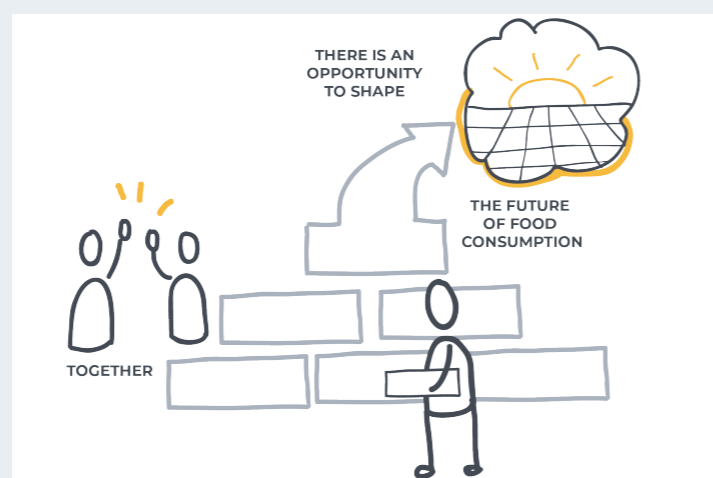


*This is an opportunity for all actors in the Dutch food system to change it for the better*



*A complex interplay of factor changes behaviour and needs a lot of stakeholders to realise this.*
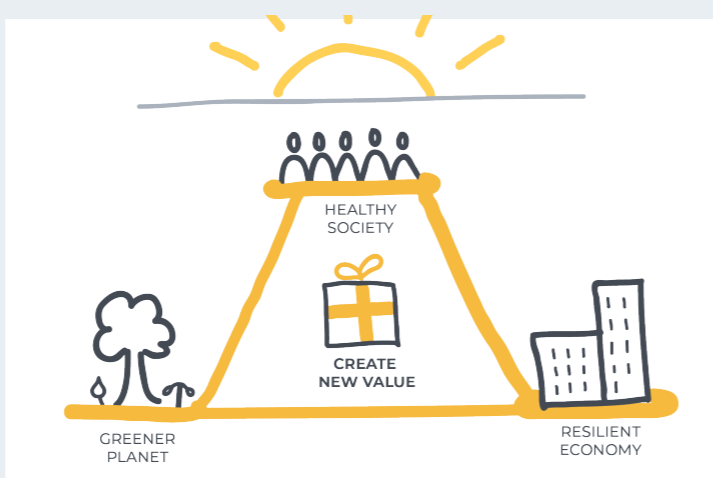


*This change will also be an opportunity for new growth markets. (Food and land use coalition, 2019) Action is needed today to ensure a sustainable food system in the future.*

Figure 1 - Framing of the project

# SYSTEM PERSPECTIVE
## CHAPTER 06

As a start of this project, a system analysis focussed on food consumption is examined. The context of the Dutch food system is explored to have knowledge of the complexity and co-evolutionary character of the system.

### 6.1 LITERATURE BACKGROUND

The challenge to change consumption takes place within the context of the socio-environmental system of food. A sustainable transition refers to large-scale societal changes that solve grand societal challenges (Loorbach et al., 2017). A system transition would mean that the current system changes towards another state and leads to sustainable consumption. Throughout this thesis, the definition of transition from Loorbach & Rotmans (2010) is used. The definition states: 'transition is the fundamental change of structure, culture and practises' (Loorbach & Rotmans, 2010). A deep understanding of the system and the system dynamics are needed to develop a valuable intervention. This report uses the transition theory (Loorbach, et al., 2017), the multi-level perspective (Geels, 2011), transition design (Irwin, 2018), strategic niche management (Loorback & Rotmans, 2010) and system analysis (Hekkert, et al., 2011) to establish insights about the structure and functioning of the system.

The behaviour of a system transition can be described according to the multi-level perspective theory. This theory is used to define insights at different levels and different domains that interact and reinforce (Loorbach et al., 2017). The multi-level perspective framework contains three levels; landscape, regime and niches. The landscape

developments are external to the context and encounter slow-changing trends. The regime is characterised by the system and niche innovations are novel emergencies that illustrate an alternative to the system. Even though a transition can not be controlled, there are possibilities to accelerate the shift and take advantage of the window of opportunity to increase momentum. As a consequence, the system is destabilised and lock-ins are eliminated. The transition of a regime is explained in figure 2. External landscape factors, pressures, niche innovations and interventions destabilise the regime and shock-wise systemic reconfiguration occurs (Loorback et al, 2017).

### 6.2 STRUCUTRE OF THE SYSTEM

The context of the system is explored in-depth with a structural analysis of the system The structure of the system illustrates all components that shape the system (Hekkert, 2011). It is relatively stable over time and shows how actors and relationships ascribe consumption behaviour.
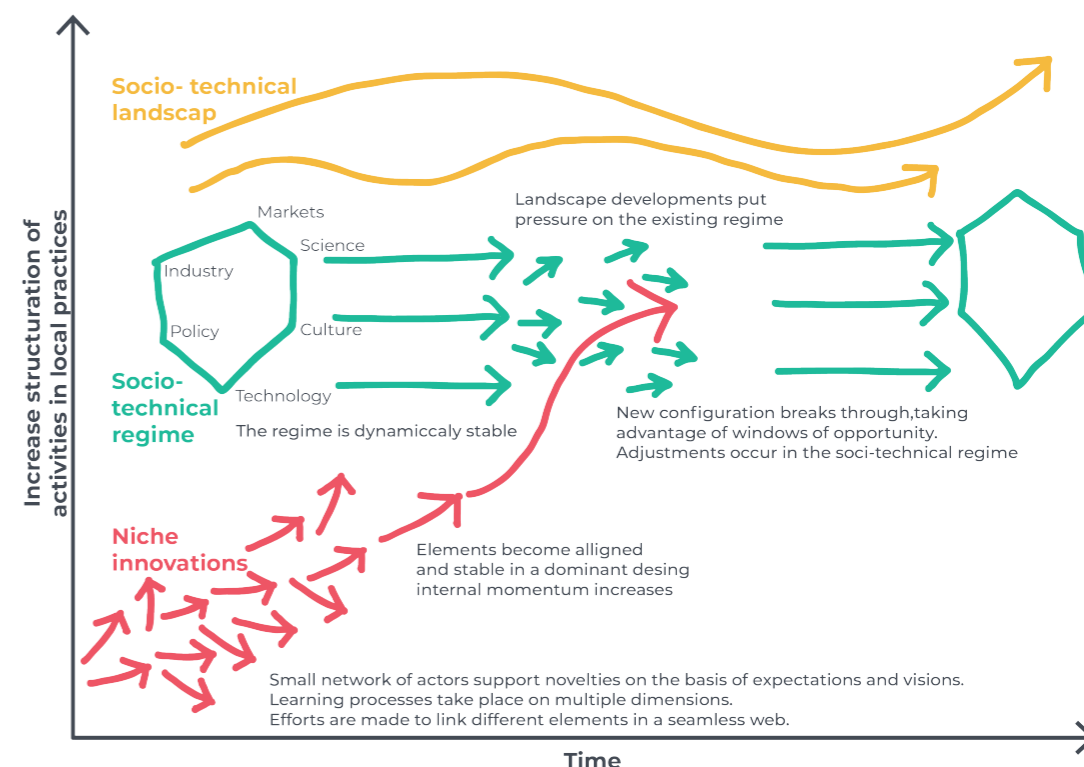


*Figure 2 - Multi-level perspective of system change (Loorbach et al., 2017)*

Important components of the system are the involved actors, who create multi-actor dynamics. Every actor has a specific role and a unique relation with food consumption. In this thesis, actors with similar characteristics are grouped into one environment. An overview of all the environments, the actors and the main role is explained below. This overview is created based on multiple research studies (Geurts et al., 2015, Cruwys et al., 2015, Muilwijk et al., 2019, European Union, 2020, Schulte et al., 2020 & Zantinge et al., 2017). This is a simplification of reality, however veracious conclusions and insights can be drawn from this.

## Home environment

The key actor in this environment is the consumer. The Dutch consumer consumes about 80% of their food intake at home (Geurts et al., 2017). Nuance in this environment is that the consumer does not have to be the end-user. In this environment, other actors like friends, families and peers influence the behaviour of the consumer, because eating takes place in the presence of other people and is perceived as a part of cultural experience (Cruwys et al., 2015).

### HOME ENVIRONMENT
CONSUMER     FAMILY
FRIENDS

## The retail environment

This environment has a great influence on the consumer's purchase decisions. The actors in this environment are supermarkets and its food purchasers, local markets and meal box delivery businesses. The supermarkets gain the most dominant position in this environment (Geurts et al., 2017). In addition, food purchasers define the inventory of products. Their power has substantial value to the availability and affordability of the products acquired by consumers.

### RETAIL ENVIRONMENT
FOOD PURCHASER     LOCAL MARKET
MEAL BOX DELIVERY  SUPERMARKET

## Foodservice environment

Actors in this field, like home delivery companies, restaurants and on to go shops, prepare the food for the consumer. The only task of the consumer is to choose which food to take in. The environment eliminates a lot of choices and skills concerning the consumption process compared to the home environment. As a result, the power of the foodservice increases and allows consumers to eat something they would not have prepared themselves. The availability of food services increases and the utilization of the service is growing (Muilwijk et al., 2019).

### FOODSERVICE ENVIRONMENT
RESTAURANT          FOOD DELIVERY
PICK-UP GROCHERIES

## Producing environment

This environment takes the responsibility to produce end products for consumption. In this environment, the food processor and food supplier process raw materials to marketable products. In this process, they define the composition of the products. This composition must be measured p with the policies and regulations regarding nutritions. Most food processors and suppliers are a brand producing a certain food category or product. The producing environment acts according to the demand of the purchasers.

### PRODUCING ENVIRONMENT
FOOD PROCESSOR     FOOD SUPPLIER

## Production environment

The food stream starts with the production environment, where farmers are growing and harvesting food to produce raw materials. The materials are stored and food manufacturers perform the first steps of processing.

### PRODUCTION ENVIRONMENT
FARMERS     FOOD MANUFACTURERS

## Health environment

Health actors play a role in the treatment of diseases related to consumer food consumption. Different medical institutions witness the effects of an unhealthy diet for personal health. The health environment advises consumers about the cause of the disease; the consumption.

### HEALTH ENVIRONMENT
DENTIST     GP     DOCTOR
HOSPITAL EMPLOYEES

## Research environment

The knowledge development related to food and consumption is accomplished in the research environment. The research environment consists of knowledge and research institutes that publish scientific reports to advise other institutions. Some knowledge institutes also have governmental roots such as 'Plan Bureau Leefomgeving' (PBL) or 'Rijksinstituut voor Volksgezondheid en Milieu' (RIVM).

### RESEARCH ENVIRONMENT
KNOWLEDGE INSITUTES  UNIVERSITIES
RESEARCH INSITUTES

## Educational environment

To inform other actors about the current state of knowledge, education is needed. Active actors are schools and the 'voedingscentrum'. This environment has a connection with the consumer to teach (scientific) knowledge and provide guidelines on behaviour.

### EDUCATION ENVIRONMENT
SCHOOL          DIETICIAN
VOEDINGSCENTRUM

## Media environment

The media environment influences, inspires and seduces consumers to buy certain products or diets. Digital as well as physical channels frame consumers with information about food and sustainability. The marketing agencies and business departments tell a story about food producers and their products to create meaning for the consumers. Other active actors in this environment are influencers, the news and cooking programs.

### MEDIA ENVIRONMENT
MARKETEERS   INFLUENCERS   NEWS
SOCIAL MEDIA

## Interest environment

A strong societal focus defines the position of the interest environment. They expose trustful information and gain the trust of society. People within the interest organisations share a mindset. Some of these organisations conduct research that substantiates this mindset, others create awareness with successful campaigns. All their activities increase the urgency to act upon societal problems and shift towards sustainable consumption.

### INTEREST ENVIRONMENT
LABOR UNIONS     NGO'S
CONSUMER ORGANISATIONS
PATIENT ORGANISATIONS

## Supportive environment

Governmental actors can be specified by local authorities, national government and European government. Another actor belonging to this environment are investors since their financial capabilities can support other actors and environments in the system. The role of the governmental actors is to define the direction of the consumption system of the future. This direction is supported by regulations and policies that raise standards, in order to avoid externalisation of unsustainable practises (European Union, 2020).

Every national government operates according to National Determined Contributions (NDC) to meet the goals of the UN Sustainable Development Goals and the Paris Agreement. An analysis conducted by WWF illustrates the elements mentioned in NDCs see figure 3 (Schulte et al., 2020).

Figure 3 confirms that policies and regulations regarding sustainable diets are lacking. Currently, European policies focus on food safety and production criteria in the production process (Zantinge et al., 2017). Policies could safeguard promising alternatives to the current regime. These are needed because alternatives encounter difficulties to compete in the established food system and need time for experimentation and development (Hoes et al., 2019). However, the Dutch government is more reserved with price policies such as taxes supporting healthy diets (Zantinge et al., 2017).
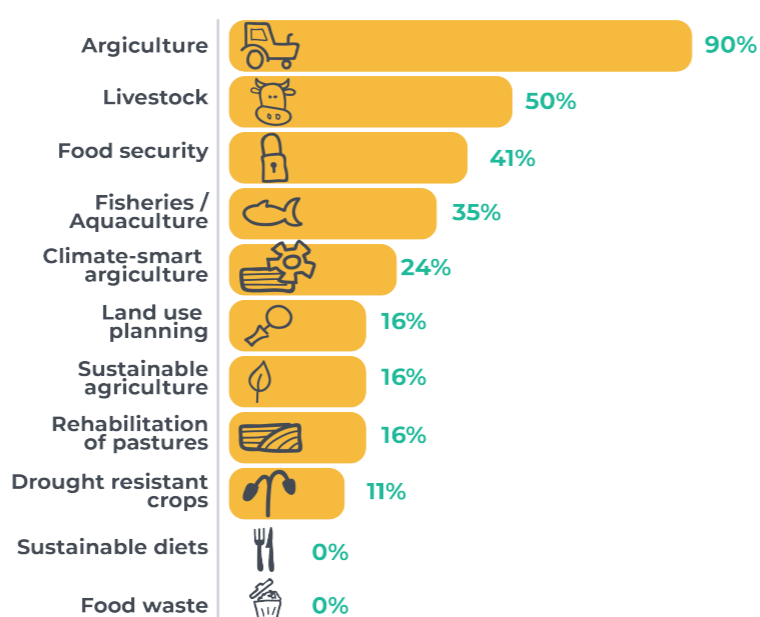
**SUPPORTIVE ENVIRONMENT**

LOCAL GOVERNMENT      INVESTORS

NATIONAL GOVERNMENT

EUROPSE GOVERNMENT



| | |
|---|---|
| Argiculture | 90% |
| Livestock | 50% |
| Food security | 41% |
| Fisheries / Aquaculture | 35% |
| Climate-smart agriculture | 24% |
| Land use planning | 16% |
| Sustainable agriculture | 16% |
| Rehabilitation of pastures | 16% |
| Drought resistant crops | 11% |
| Sustainable diets | 0% |
| Food waste | 0% |

*Figure 3 - Food system elements mentioned in NDCs (Schulte et al., 2020)*



Pro development   Development   Take-off   Acceleration   Stabilization

Working prototype?   Commercial application?   Fast market increase?   Market saturation?

*Figure 5- Phase of development for systems (Hekkert, 2011)*

## RELATIONSHIPS

A single actor is not capable of performing all activities resulting in value delivery to the end-consumer (Hekkert et al. 2011). Therefore the food system consists of interrelationships between the stakeholders that exchange values. This suggests that actors are dependent on each other and need to collaborate. The visualization in figure 4 summarises the key-value exchange between the stakeholders. In appendix B, research is converged into a more detailed matrix to illustrate all the relationships.



*Figure 4 - Key-value exchange between stakeholders.*

## PHASE OF DEVELOPMENT

The development phase of the system is subordinated to time. The development is divided into five phases; predevelopment, development, take-off, acceleration and stabilization. The S-curve describes the process of the development application and diffusion of the change see figure 5 (Hekkert et al., 2011). In the pre-development and development phase, innovations underperform in the mainstream market. A turbulent period with chaotic changes starts at the take-off phase where outcomes are uncertain (Loorbach et al, 2017). This phase also indicates which system functions are more relevant. More details of the functioning of the system are described in the section 6.3. The analysis of the current market showcases a lot of local initiatives supporting the transition. These local initiatives show the commercial application in the market and confirm the move onwards the pre-development phase and development phase. This suggests that the transition is currently located at the take-off phase and is preparing itself for rapid market growth and diffusion.

## 6.3 FUNCTION OF THE SYSTEM

The functioning of the system shows how all components work together and explains the performance of the system. Complex system changes are not linear processes. Therefore, a better view on the underlying patterns and dynamics could be used as a base for future patterns and dynamics (Loorbach et al, 2017). Interviews with multiple stakeholders in the system are conducted and the results are used in the explanation of the system's functioning.

## STAKEHOLDER EXPLORATION INTERVIEWS

The functioning of the system is assessed by active stakeholders (Hekkert, 2011). Semi-structured interviews with ten stakeholders of the dutch food system are conducted to understand multiple perspectives. Incorporation of different perspectives leads to a deeper layer of understanding the obstacles, whereas transitions cannot be identified with one simple causality, but is rather complex (Geels, 2011). The participated stakeholders are influential employees and players in the food system. The goal of the interviews is to find out the functioning of the system. The participants are briefly explained.

P1-   Director marketing and innovation of a dutch vegetable producer

P2-   Consumer insight specialist at sustainable market research institute

P3-   CEO of an international distributor of organic fruit and vegetables

P4-   Director at a dutch start-up for organic food and farming

P5-   Director marketing & concepts at a Dutch caterer in the foodservice industry

P6-   Director of a non-profit organization supporting teenagers with a healthy lifestyle

P7-   Policy advisor on sustainable agriculture at a province in the Netherlands

P8-   CMO of a European brand for conventional and organic meat alternatives

P9-   CEO of a European brand for conventional and organic meat alternatives

P10-  CMO at a collective of plant-based heritage and start-up brands.

Data is collected in interviews of approximately 30 minutes due to demanding agendas. The interviews were conducted in Dutch so the quotes used in the thesis are a (free) translation. The insightful quotes are clustered into categories based on recurring themes. A complete overview of all the clusters can be found in appendix C. Valuable insights are drawn from those categories and the following section elaborate on those insights. To enrich the insights quotes and additional desk research is used. The issues addressed to explain the system's functioning are network and key players, barriers, drivers to change, the fundamental feedback loop and tensions.

## NETWORK AND KEY PAYERS

Every player in the system has a different role and all the participants highlight different parties that should play a key role in the transition. They agree on the crucial role played by the government and supermarkets. However, some also see an important role of NGOs or the financial market.

*NGOs are important because they enjoy the trust of the consumer. - P3*
*Big instruments to make the difference are in the financial market because they are implementing the SDGs with sustainability indicators. - P2*

### Role of the consumer

A common view amongst participants is the key role of the consumer. The power of the consumer is visible in purchasing because consumers choose for a certain world when buying a certain product (P4). However, the consumer is not the only one responsible for the transition. The industry is highly framing and influencing consumers or even taking away freedom of choice with smart marketing. For the consumers, it could be more difficult to act against this framing by the industry and to feel motivated to change.

However, some participants see a young generation that is open towards a sustainable food system. This generation is called the early adopters and are seen as an impactful target group. Changing the whole society seems rather difficult whereas changing a target group makes the challenges manageable. The young target group is looking for new value and is aware of the impact consumption has on the environment. This target group will create small steps to accelerate the transition.

*The young generation is aware and trendy. Older generations are more problem seekers than problem solvers - P9*

### Governmental interventions

According to all participants, the government has an important role in the transition that becomes visible in different configurations. Participants agree on a positive outcome of governmental interference to actually change

behaviour because for example regulations regarding plastic bags turned out to be successful (P1). The first role of the government is related to regulations because they have the authority to stimulate consumers as well as the industry to make particular choices. Mentioned regulations are; a sugar tax, a meat tax, ending subsidies for cattle breeding and introducing subsidies for research and professionalisation of the alternative market. However governmental interference also has its drawbacks. Sustainability choices are by nature political (P5) and repeatedly discussed (P6) causing slow implementation.

The participants stress the importance of policy interventions to diffuse the behaviour shift, however, it is important to add some nuances. Policies do not guarantee success and environmental policies result in a lack of incentives for the industry to reduce beyond what is legally required (Kemp, 2011). In addition, the government does not want to intervene too much leading to restricting the industry and losing the value of the free market (P3). It can be advantageous for the government to take a stand and start an open discussion in society on this topic (P6). Changing consumer behaviour needs the right balance of imposing and stimulating desired behaviour by a third party. Increasing (personal) urgency leads to actions and governmental policies and regulations impose a fixed direction for those actions. Company action needs guidance from regulations but also support for development.

*You are not able to prohibit or capture everything in policies and regulations, because you also need the demand of the consumer. - P7*

### Marketing

In addition, marketing plays an important role when it comes to consumer action. Marketers create value and frame a product. Marketing is a communication tool but companies can do more than great marketing campaigns. Marketers should execute the right strategy to guide consumers in their choices and involve them.

*Marketing needs to follow the river by putting rocks in the river and slowly change it, but there is no point in standing in the river saying it needs to go another direction. The river (Consumer behaviour) is stronger than that - P8*



## BARRIERS

The system's function includes obstacles for the progress of the transition and block market diffusion (Hekkert et al, 2011). Designating lock-ins requires the establishment of the ways stakeholders operate, think and are at different levels (Lachman, 2013).

### Consumer behaviour barriers

The challenges related to a dietary shift are accompanied by behavioural change (Food and land use coalition, 2019). There are a lot of barriers for the consumer that obstruct changing behaviour. Understanding these barriers plays a role in removing or minimizing them. In the current situation, the consumer needs a lot of resources, energy and power to change behaviour (P5). The current strategy to help consumers is convincing and providing them with more knowledge (P4).

An important barrier endorsed by multiple participants is the high price for sustainable products affecting the affordability of a sustainable meal. Even though the price barrier is just the perception of the consumer (Bosma, 2019) it is crucial to create a diet that fits everybody's wallet (P1).

Another barrier is the embodiment of culture and routine in consumer behaviour. Consumers think and act systematic and therefore repeat the same behaviour without consideration (P5).

*The average consumer eats 10 different meals which can be slightly twisted - P8*

Consumers also feel friction towards a change and like to keep things as they were. The most difficult part of changing behaviour is that people do not want to be told to change.

*People revolt because they believe others can not interfere in their lifestyle - P6*

For the average consumer, the discussion around the consumption transition is too complex. The consumer faces difficulties in understanding and acting accordingly. The knowledge about sustainable consumption is confusing and contradictory (Ocké et al., 2017). Additionally, current norms make it too easy to have an unsustainable and unhealthy diet. Consumers buy easy, attractive and common products around them (Muñoz et al., 2016). Currently, the Dutch society supports unhealthy and unsustainable consumption, in other words, it creates an obesogenic society.

*We accept that it is logical to eat unhealthy because we created an obesogenic society in the last decades. - P6*

### Business barriers

Today's business's strategies focus on growth and profit maximization. Profit is seen as something in addition to people and the planet. However, for the transition to more sustainable consumption, they need to be combined (P3). This means that there is a need for a new definition of profit, based on the true value considering the impact on the environment and society. Alongside this definition, companies need to take social responsibility to operate accordingly.

*People, Planet, Profit does not work until you define profit dependent on planet and people instead of at the expense of people and planet. - P3*

Some participants see the transition as an opportunity for the strategic positioning of its business. However, not everybody agrees on this. Opponents say that 'the business case for junk is still better than for vegetables and fruit' (P3). Therefore companies must see the transition as something they could leverage. Research should show commercial interest in sustainable products and illustrate a sustainable business case to make money. Companies need guidance from others to take them by the hand and show the benefits to lower the barriers.

*There needs to be a functioning alternative to move majority towards a certain direction - P3*

### Network barriers

Fruitful collaboration needs transparency of all the actors, but for a company putting all cards on the table can be tricky and could result in a weak position in the market. Resistance towards transparency comes from the mindset of businesses to maximise their own profit and do not want to share it with others.

*Some companies are in a squeeze of interests and that makes it more difficult to act transparently because they aren't straightforward and radical to achieve that goal - P1*

Collaborative parties could have a conflict of interest because sustainability does not have a straightforward definition. Companies reproach other companies for misuse of sustainability as a marketing tool. In addition, they point a finger to all the unsustainable activities instead of looking to the positive actions. Moreover, a returning tradeoff between health and economy makes some companies choose for the economy because they do not benefit from a sustainable diet.

*In practice: conversations with private parties become quid pro quo which result in a flat conversation and losses sight of the desired effect -P6*

## DRIVERS FOR CHANGE

To change the system a long breath and many small steps are needed. Every stakeholder needs drivers that motivate themselves to take action.

### Consumer drivers

Participants reported multiple starting points to change consumer behaviour that positively support the transition. It is important to not try to convince or push consumers to change. This pushing or attempts to convince consumers is a strategy that comes from the assumption that consumers are against sustainable behaviour, which is not necessarily true (P5). It is crucial to explain to them the value of their change and the reason the change is needed. What consumers eat should become meaningful again (P4).
An important driver is creating awareness. Transparent communication and conscious behaviour reflection increase awareness. Awareness has a positive effect on the consumer's ability to judge and compare different food choices.
*Create an equal playing field where the consumer can make informed decisions - P3*

The health aspect of consumption correlates with sustainability and illustrates a personal benefit for the consumer. Therefore health benefits are an example of concrete and tangible arguments to persuade consumers to change behaviour (Bosma, 2019). Sustainability is often negatively framed which appeals to human fears and emphasises a negative consequence. This message causes a boomerang effect leading to consumer actions as opposed to the message's intentions (Hart et al., 2011).
*Sustainability is one side of the message, but consumers are selfish referring to an important role of the health aspect of the diet - P9*

To reach consumers a deeper understanding and personal targeting is essential. This can be achieved by market segmentation which retains the message of being too generalizable, so nobody feels addressed (P2). Communication strategies should use the right tone of voice to approach a specific target group. Reaching to a new target group requires a different message otherwise the ones that are already engaged are reached again (Muñoz et al., 2016).
*There are a lot of different people that need to be inspired by different brands and different messages - P10*

Several participants use another strategy to unconsciously change consumer behaviour instead of consciously. The strategy adjusts the norm, meaning that the sustainable option is the standard even if consumers are not aware of this. Behaviour can be changed with smart interventions

that create a new norm consumers acknowledge (P10). The new norm implies tasty food without telling all the details because consumers are not always interested in this information(P5).
*Develop products that do not disappoint people when they try it, professionalise the market so people are positively surprised - P10*
Creating a new norm makes it easier for consumers to act accordingly because consumers behave like herd animals. All actors together should define this new norm and capture value for everybody.
*If we create something that is part of the current routine then we don't need to influence behaviour that much - P5*

Changing consumer behaviour does not imply a radical transition. Small adjustments could result in high impacts on the consumer lifestyle (P10). Besides, people are more likely to continue with the same routine that is slightly adjusted than a routine that is radically changed.
*Create different behaviour within the current routine and tell consumers the benefits - P5*

### Business drivers

The transition can be accelerated because competition may force the industry to act.
'If a market leader changes and your business does not, your competitors take a lead in the market and you lose' (P2). However, to be ahead of the competition, businesses need to take risks and put themselves in an uncertain position. The participants active in the meat-alternative industry see the market as a great opportunity to step in, where competition is moderate and includes the potential for growth (P10).
*You need to take the risk and focus on the early adopters to prepare a new norm, which can be upscaled later - P3*

The market related to the sustainable diet is still young compared to the traditional food market that operates in the same way for at least 50 years (P10). The market captures a lot of growth potential and with Wageningen seen as the epicentre of food innovation this growth lies within reach.
*The market is going to grow and everybody can benefit from this and that is why everybody is positive about it - P10*

Most of the participants already play an active role in the food transition and aim to reduce the impact of consumption on the planet. The general goal could be described as 'maximizing commercial success while adding an extra dimension to do good for the planet'(P9). Business employees feel the commitment to work according to this goal. As consequence sustainability defeats the marketing purpose and is visible throughout the entire company operation (P6). Those companies are believers of the positive effects and want to share their vision with other players in the market.

*I want that companies implement this in all the policies, which means health in all policies so it always contributes to a healthy lifestyle - P6*

An important nuance for the believers is the 'green bubble' of like-minded people they are locked in. Nevertheless, a part of society identifies their actions as nonsense. The believers could be classified as highly educated people who do not understand why others neglect the urgency of the problem (P5).
*The society isn't there yet and that is a good wake-up call. I belong to a network of believer however there is a big group of people that think my job is unnecessary - P6*

### Network drivers

The collaboration of different stakeholders is needed because systemic problems are deeply engaged in society and make it almost impossible for one party to solve (P10). There is a collective responsibility for the complete network of stakeholders to move into the same direction. A downside of the network is the dependability of each other. Stakeholders support each other however this obstructs new (sustainable) connections (P7).

It is difficult to grasp and control the transition, on top of that convulsive effort could even lead towards the opposite direction. However, it is possible to guide the transition towards the desired direction and accelerate it. In recent years the awareness about the inefficiencies of our food system became noticeable (P9). Awareness is an important driving factor speeding up the transition. The easiest and fastest way to do this is to mobilise people to replace animal protein with plant proteins (P8).
*You can't control a transition, but we can see opportunities how to accelerate it - P7*

The pressure on a system grows when the urgency becomes realistic and tangible. Some say a wake-up call is needed, so consumers start to understand the urgency of the problem. However, not everybody is sensible for the urgency created (P5). In general, the awareness of consumption impact has never been this high (P10).
*An example of urgency can be seen in the COVID crisis, where people make fundamental steps and the government and awareness play a crucial role. -P9*

## FEEDBACK LOOP

One of the most simple but crucial conditions of the system is the feedback loop between producers and consumers because it clearly illustrates the interplay between food consumption and production. The feedback loop is fundamental for the supply and demand of the food system. Demand is affected by the consumption behaviour of consumers. On the one hand, consumers buy what is available. On the other hand, consumer buying power influences production (Muilwijk et al., 2019). The participants illustrate issues related to breaking this feedback loop and who is the responsible actor to take the first step. Figure 6 shows the feedback loop and the dependability of the different aspects. Realization of a change implies breaking through this feedback loop. This could be demand change, production change or any other external factor interrupting the loop. The feedback loop imprisons stakeholders causing inactivity of the system. According to most participants, 'the consumer demand needs to change so the industry can anticipate' (P6).
*Concluding the sustainable production is driven by sustainable consumption. It is the chicken and the egg story -P5*
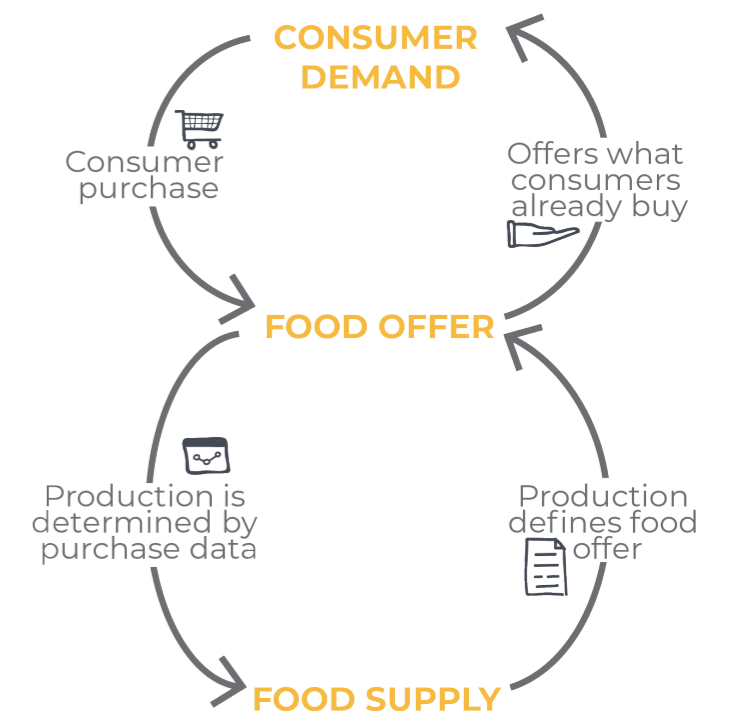


*Figure 6 - The feedback loop of the food system*

## TENSIONS

The multi-actor dynamics emphasise a diverse network including different values and drivers. This raises possible tensions. Consciousness on those tensions is useful when designing a transition strategy. The tensions are briefly discussed in this paragraph.

### Individual action vs collective success
The change in consumer behaviour asks for a change on a personal level. However, success depends on the collective level (Schifferstein, 2020). This increases the effort to change because the impact of one individual does not seem to add value to contribute to the collective success.

### Short term action vs. long term benefit
Changing behaviour to obtain long-term benefits forms another tension (see figure 7). The challenge is the nescience of consumers about what short term actions are needed to achieve the end goal (Schifferstein, 2020).
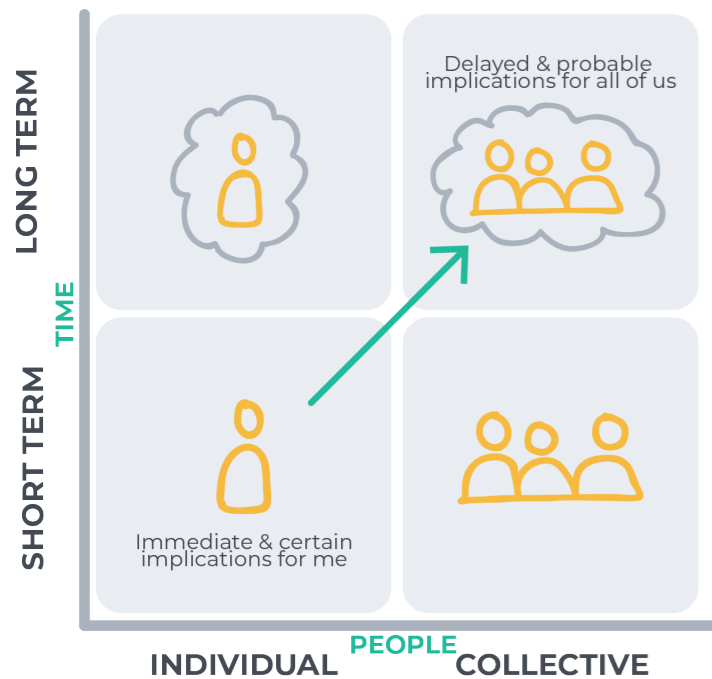


*Figure 8 - Intervention ladder (Nuffield council on bioethics, 2007)*

### Impactful regulations vs. decrease of obligations
The last tension is the interconnection between the demand for policy restrictions, the consumer perception of freedom of choice and the free market of the industry. Governmental intervention could increase impact but would lead to obligations for the industry and the consumer (see figure 8).



*Figure 7 - Matrix moving towards societal impact (Tromp & Hekkert, 2018)*

### Economical growth vs. societal degrowth
The business world is addicted to economic growth because growth leads to an increase in profit. However, economic growth does not necessarily suggest benefits for the planet. Degrowth would ask for a radical change in the business model of many organisations to create a new definition of profit.

## 6.4 TAKEAWAYS

• The consumption system is locked in a feedback loop where all actors wait for someone else to take action.

• The transition aims to break the feedback loop. This could be a change in supply, a change in demand or external circumstances interrupting the loop.

• Most important barriers for consumers to change consumption are high prices, unconscious behaviour and the options that require minimal effort are unsustainable.

• The industry needs proof of commercial success to encourage active participation in sustainable consumption.

• Collaboration between multiple actors of the system will accelerate the transition and increase the impact.

• The consumer is connected to many actors in the system. Therefore they have significant influence to change the system and the feedback loop.

• The foodservice industry could be a fruitful option to influence consumers to eat differently, because they have a close connection and simplify the consumption process.

# CONSUMPTION
## CHAPTER 07

The transition requires a change in the current menu of the Dutch consumer. This chapter analyses how the average consumption of today differentiates from the ideal menu of the future.

### 7.1 TODAY'S MENU

To better understand what the consumption change requires the current consumption is analysed. Figure 9 shows the average menu of a dutch citizen according to the research of PBL in 2019 (Muilwijk et al., 2019). The Dutch intake of protein consists of 60% animal-based and 40% plant-based products (Ocké et al., 2017). This means that Dutch consumers take too much red meat, too little fish, too many saturated fats related to the recommended guidelines of the Dutch government (Kramer & Blonk, 2015).

increase costs and sicken society.

Another issue regarding current consumption is the impact on the planet. Sustainability is expressed in different values relating to biodiversity, greenhouse gas emission (GHG), land use, resource-intense production, animal welfare, deforestation, waste, water usage, fair trade production and many more. This project approaches the environmental impact of consumption using the indicators addressing land use and GHG emission. Figure 11 shows the environmental impact of consumption. To illustrate this the land use per consumer in the Netherlands eating one year is comparable to a quarter soccer field) (Thema sites
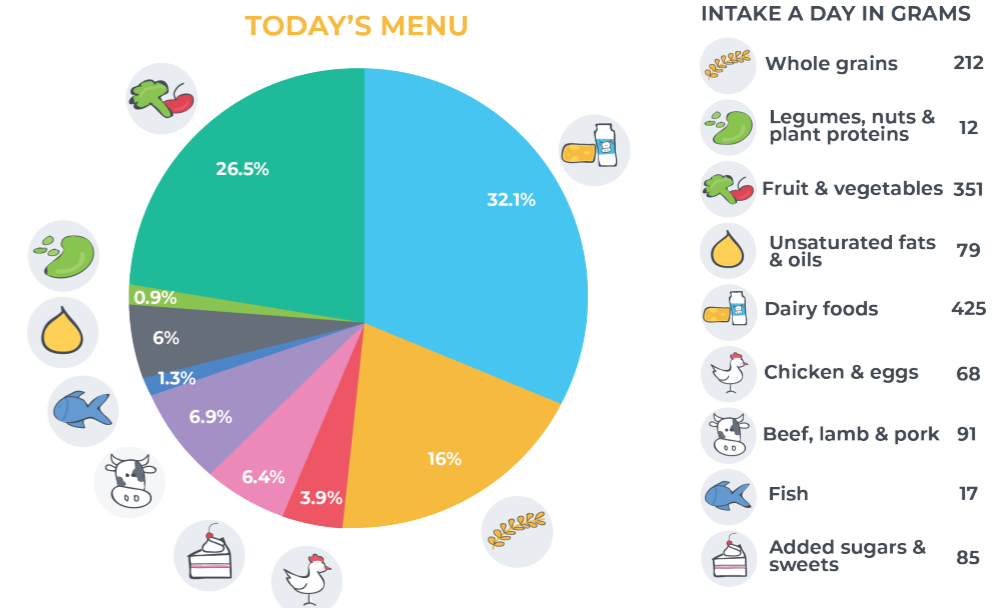


*Figure 9 - Current consumption of the dutch average consumer (Muilwijk et al., 2019)*

### IMPACT OF CURRENT CONSUMPTION

Underlying issues correlated to the diet impose concerns related to the health of consumers and the planet in the future. For example, 50% of Dutch citizens are overweight and a rise of chronic diseases is observed (Ocké et al., 2017). The pressure on societal health is rising because of consumption. The pressure will also increase the health care costs of unhealthy consumption. These costs are already estimated at 8,8 billion euros per year (Transitie coalitie voedsel, n.d.). To strengthen this statement; at this moment unhealthy diets suggest a greater risk of morbidity and mortality than does alcohol, drugs and tobacco combined (Loken, n.d). Consuming too many calories leads to health disorders such as obesity, diabetes and cardiovascular disease (Food and land use coalition, 2019). Continuing the consumption as it is now will further

PBL, 2020). Subsequently, a dutch consumer produces 4 to 5 kg of greenhouse gases every day (Zantinge et al., 2017). The planet does not have enough capacity to feed society in the future when the consumption pattern stays the same.

### 7.2 MENU OF THE FUTURE

The goal of the transition is to shift food consumption towards a sustainable and healthy diet. Nonetheless, it is important to define exactly what this means since there can be a lot of confusion about the definitions of sustainability and health. A sustainable food diet, therefore, defines a 'diet protective and respectful of biodiversity and ecosystems, culturally acceptable, economically

## MENU OF THE FUTURE



### INTAKE A DAY IN GRAMS

| | | |
|---|---|---|
| Whole grains | | 232 |
| Legumes, nuts & plant proteins | | 125 |
| Fruit & vegetables | | 500 |
| Unsaturated fats & oils | | 40 |
| Dairy foods | | 250 |
| Chicken & eggs | | 42 |
| Beef, lamb & pork | | 14 |
| Fish | | 28 |
| Added sugars & sweets | | 31 |

*Figure 10 - The planetary healthy diet (Loken, n.d.)*

affordable, accessible and healthy while optimizing natural and human resources' (Burlingame & Dernini, 2012). The guidelines of Lancet provide a complete list of food intake related to a sustainable and healthy diet. (See figure 10).  Another important aspect is minimizing the waste of food and eating appropriate portion sizes. Besides, eating seasonal and locally produced products reduce the environmental impact. Lastly, minimizing the usage of packaging is considered impactful (Bosma, 2019).

### IMPACT OF FUTURE CONSUMPTION

A healthier society resulting from a healthy diet decreases the risk of early death with 20 %. (Ocké et al., 2017). The lively society is a place for people to flourish and decrease the pre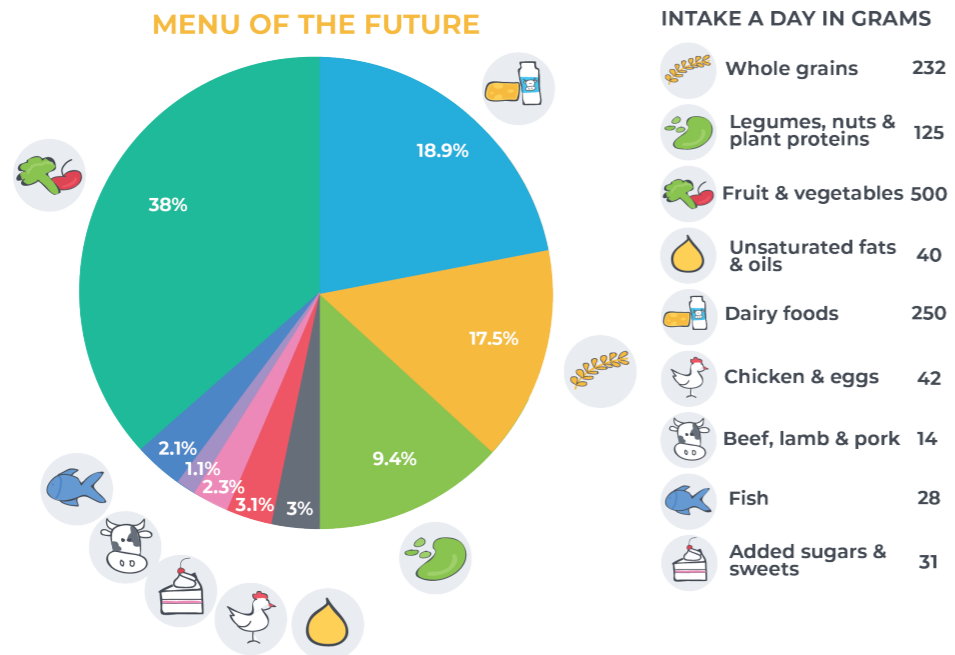ssure on health systems (Schulte et al., 2020). According to Professor Dr Hanno Pijl lifestyle interventions are the most powerful way to treat illnesses such as diabetes, because it takes away the root cause of the disease and not cure the symptoms with drugs.

A sustainable and healthy diet could reduce the carbon footprint with ⅓ and positively impact climate change (See figure 11). Freeing of land can be restored to nature while protecting remaining natural ecosystems and enabling

more sustainable, secure food production (Food and land use coalition, 2019).

The transformation will also result in business opportunities. According to SystemIQ, incorporating a healthy diet will create a 2035 billion dollar opportunity covered for new markets (Food and land use coalition, 2019). This potential is a stepping stone for businesses to grow and relate to the consumer of the future. A business that speedily adapts to this change is more likely to thrive in the long term and enjoy strategic benefits (Banerjee et al., 2003). However, even better is to be a frontrunner of the change and direct consumer towards your sustainable business.

### 7.3 TAKEAWAYS

•Current consumption causes lifestyle diseases that harm consumer's health.

• The planet is not able to feed society in the future based on today's consumption patterns.

•Changing consumption results in benefits for the planet, the industry and the consumers.

•The reduction of animal products and the expansion of plant products is the most significant change in the menu.

### IMPACT OF CONSUMPTION FOR ONE PERSON A YEAR

**Menu of today**
Average consumption

1805 m$^2$ | 1515 CO2

**Menu of the future**
Sustainable consumption

1197 m$^2$ | 1008 CO2

Landuse per person per year in m2

Greenhouse gas emision per person per year in kg CO2 equivalents

*Figure 11 - Comparison of the impact of the current menu and the future menu (Muilwijk et al., 2019)*

# CONSUMER BEHAVIOUR
## CHAPTER 08

To bring the future menu on the plates of the consumer, they need to behave differently. Literature research into the behaviour and more specifically into consumption behaviour helps to understand how consumer behaviour can be changed.

### 8.1 LITERATURE BACKGROUND

Behaviour is a complicated psychological phenomenon that is influenced by a complex interplay of factors. To change behaviour, it is essential to design an intervention that enables this change. This behavioural intervention changes the underlying structure and conditions that define the desired behaviour (Muñoz et al., 2016). However, changing behaviour is a challenging and complex task to complete (Schifferstein, 2020). Behaviour can be defined as the action related to a certain antecedent resulting in a consequence (Miltenberger, 2011). Also known as the Fogg behaviour Model, where behaviour is substantiated by motivations, prompts and ability converging at the same moment (Toxboe, 2018). Figure 12 shows how those elements relate to each other.
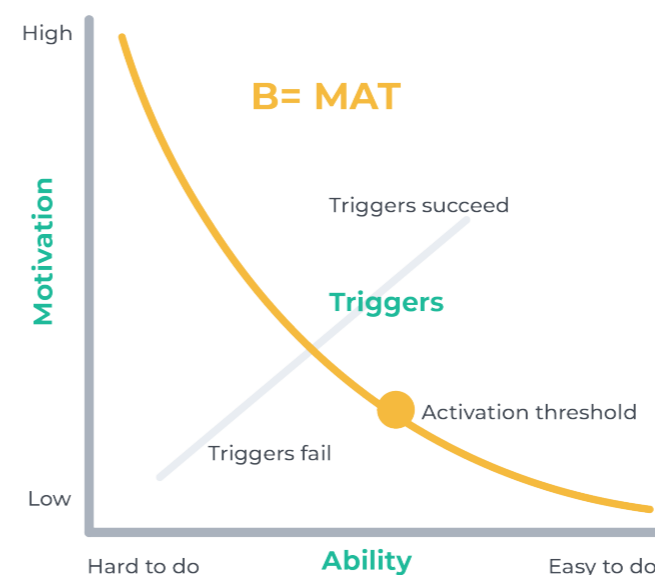


*Figure 12- Fogg behaviour model (Toxboe, 2018)*

To perform a certain action a complex interplay of multiple factors needs to be substantiating the desired behaviour. Before detailing all the factors a general model describes the process of the behavioural cycle (see figure 13). The cycle starts with information and triggers reaching the consumer,  but a significant amount is filtered and will not impact the cycle anymore (Muñoz et al., 2016). The information is processed according to two complementary systems, the central and peripheral. Processing results in attitudes and intentions, but those attitudes and intentions do not guarantee actions because of the phenomenon called the attitude behaviour gap (Krom, 2020). Successful goal striving is dependent on psychological resources,

attention and self-control, however, those resources are limited resulting in an attitude behaviour gap (Adriaanse et al., 2011). The attitude behaviour gap could turn good intentions into failing behaviour. However, when behaviour is successfully performed the consumer receives feedback enounced as an experience which will either lead to a reinforcement of reconsideration of the action.
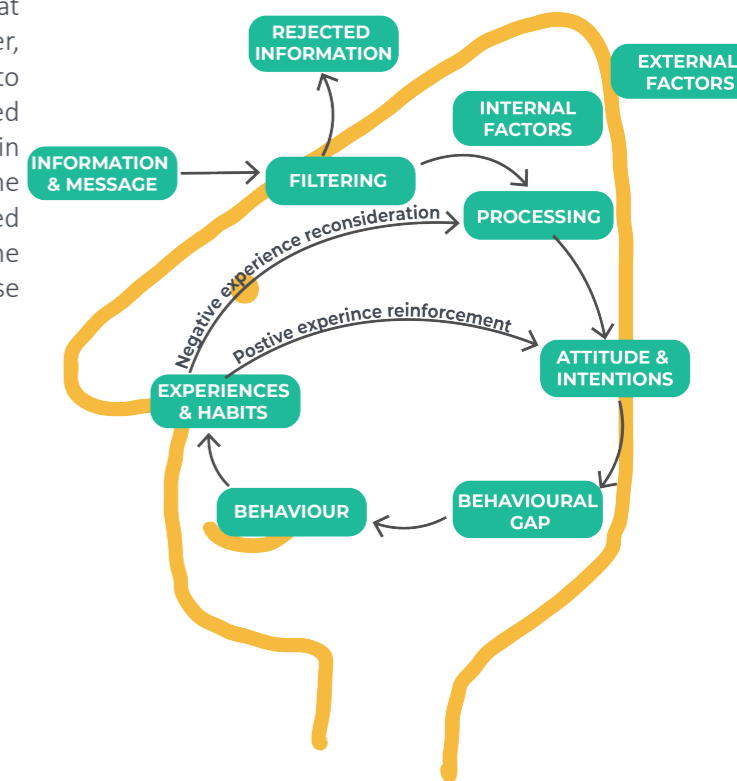


*Figure 13 - Fogg behaviour model (Toxboe, 2018)*

### 8.2 CONSUMPTION ROUTINE

The term consumption behaviour refers to a process containing different elements. According to White et al., the process of consumption includes information search, decision making, product or behaviour adoption, product usage and disposal (White et al., 2019). As a result of regularly encountered contextual cues, information search and decision making become unconscious over time (Kurz et al., 2014). This unconscious behaviour relates to low involvement of reflectiveness and information processing (Muñoz et al., 2016) The consumer makes 200 food choices a day, while 70% is unconscious (Transitie coalitie voedsel, n.d.). This is a result of the peripheral processing dominant in food consumption behaviour (Muñoz et al., 2016) (see figure 14).

The repetition of action and the unconscious mind make
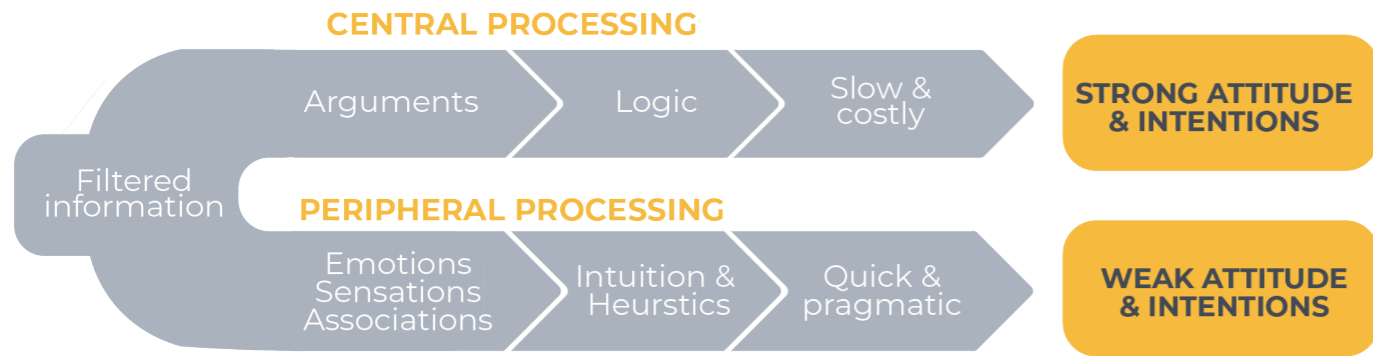
*Figure 14 - Peripheral processing (Muñoz et al., 2016)*

consumption prone to social-cultural routine behaviour. Habit or routine patterns are best described as automatic behaviour that occurs without any conscious thoughts as a learnt automatic response to contextual cues (Muñoz et al., 2016). A challenge to realise sustainable food consumption behaviour is the repetition of the action to form a habit (McKenzie-Mohr,2011). Besides, the routine should relate to a context, setting and personal interest because food consumption cannot be covered with one unifying routine.

Consumption routines have a cultural meaning where specific skills and materials are needed as illustrated in figure 15. The meaning of food consumption is defined by practical, symbolic and cultural factors (Krom, 2020) Food behaviour is particularly normative and deeply embedded in cultural norms. This is often defined by expectations in a social context. (Muñoz et al., 2016). Routine skills provide the consumer with the knowledge and expertise to perform the behaviour (Krom, 2020). Physical aspects and the food context are the materials related to the routines (Krom, 2020). The food inventory is an important determinant of the routine materials.



*Figure 15 - Elements of food consumption routines (Krom, 2020)*

## 8.3 CHANGING BEHAVIOUR

Changing behaviour implies that the current behaviour is not desired to reach a certain goal. To change behaviour it is important to apply a two-pronged approach target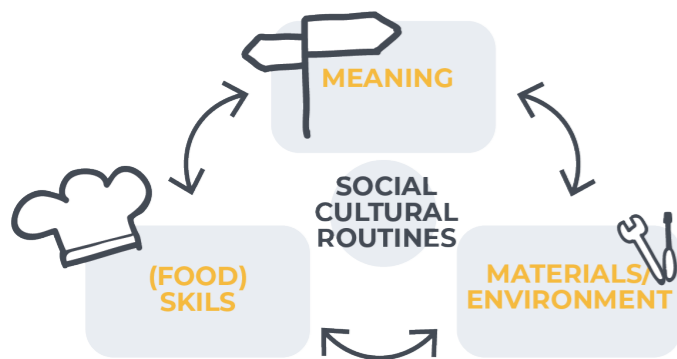ing the current and desired behaviour simultaneously (McKenzie-Mohr,2011). The desired behaviour needs to be encouraged through reducing the barriers and increasing the benefits while the current behaviour is discouraged doing the opposite (McKenzie-Mohr,2011). An interplay of factors coherently promote the behaviour since focussing only on a single factor is unlikely to result in long term effects (Schifferstein, 2020). A literature study explored different frameworks and models to change behaviour and creates an overview of possibilities.

A consumer encounters different stages when changing behaviour and it is therefore extermely difficult to completely change someone's behaviour from one day to the next. The transtheoretical model of behaviour change (TTM) demonstrates the stages of behaviour change (see figure 16). When people change their behaviour they move along all the stages in their own peace. The first three stages emphasize the motivation to change and in the last two stages, people act accordingly (Prochaska et al., 1992).

• Pre-contemplation: no intention to change
• Contemplation: Raise awareness for the consumer about his/her problematic behaviour. The consumer is aware that they want to change something
• Preparation: enable the consumer to make the right choices. At this point, the consumer has the right intention to change their behaviour
• Action: the actual performance of the behaviour
• Maintenance: Motivation to maintain changes and support habit formation



*Figure 16 - Process of change (Ludden & Hekkert, 2014)*

## FRAMEWORK

White et al. (2019) developed the SHIFT framework that includes factors influencing sustainable behaviour. The acronym SHIFT stands for Social influence, Habit formation, Individual self, Feelings and cognition & Tangibility and is discussed in this paragraph.

### Social influence

Consumers are often influenced by the presence, behaviours and expectations of others (White et al., 2019) Motivation is defined by social norms, social identities and social desirability. Consumers are motivated to show socially appropriate behaviour causing dependence on the social environment. Social influence can even happen unconsciously through modelling (Cruwys et al., 2015). Social desirability leads to consumer engagement because they aim to make a positive impression in a public context (White et al., 2019).

### Habit formation

Consumption behaviour is classified as habitual behaviour since it requires repetition. Actions that encourage repetition such as using prompts or incentives and feedback strengthen habit formation (White et al., 2019). Context is an important element to change a habit because changing a context 'awakes' the consumer to reflect and choose consciously. Disruption of the context can also embody change of lifestyle (Muilwijk et al., 2019).

### The individual self

Consumers desire a positive self-view and avoid to feel a tension between their (sustainable) intention and the (unsustainable) action. This is called cognitive dissonance and makes consumers feel uncomfortable. Consumers resolve the conflict between action and intention by changing their intentions so the dissonance is reduced (Lockton et al., 2013). Self-interest benefits also promotes a positive self view (Bosma, 2019).

### Feelings & Cognition

Emotions give personal feedback on behaviour. Negative emotions could lead to either positive or negative change, however positive emotions lead to positive change (White et al., 2019). Communication about how a consumer should feel will be less influential because the consumer does not experience it first hand (White et al., 2019). Cognition of sustainable behaviour related to the problem, action and consequences is needed to practise the behaviour.

### Tangibility

Sustainable consumption has the drawback that outcomes seem rather abstract, vague and distanced from an individual (White et al., 2019). This leads to inaction in the short term because consumers experience the benefits in the future (Schifferstein, 2020). Increasing tangibility creates a stronger connection with the consumer's understanding and improves drivers for change.

## STRATEGIES

Behaviour change can be tackled in different stages using different strategies. Ludden and Hekkert define four categories of design strategies. Those categories are detailed with intervention strategies from McKenzie-Mohr, (2011), White et al. (2019), Muñoz et al. (2016), Eyal (2014) & Lubben and Hekkert (2014). The intervention strategies illustrate how to realise a behaviour change. The strategies and categories are connected to the stages of change as illustrated in figure 17. A brief explanation about the categories and the related strategies represent possibilities to intervene and change consumer behaviour.
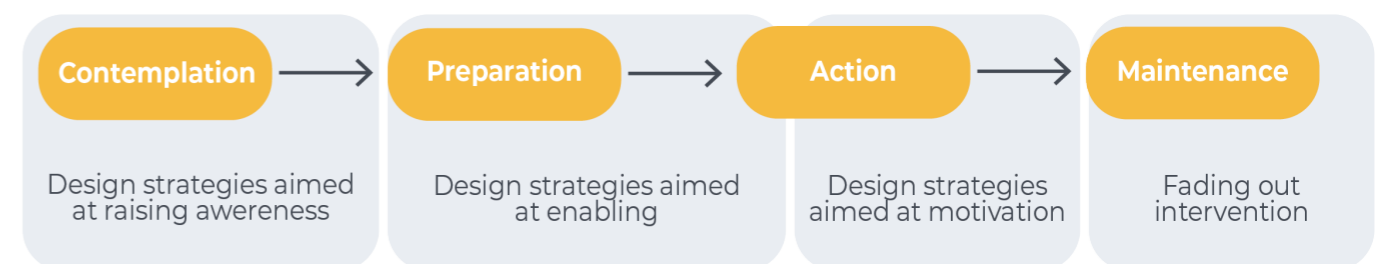


*Figure 17 - Stages of change matched with design strategies for interventions (Ludden & Hekkert, 2014).*

## Raising awareness

Consumers evaluate their choices made so far and form a new perspective (Ludden & Hekkert, 2014).

*Consciousness-raising strategy*: Increase awareness of the desired behaviour and shows the consequences of problematic behaviour (Ludden & Hekkert, 2014). Important to notice is that only the ones that are already engaged in the topic receive the information (Muñoz et al., 2016).

*Normative strategies*: Norms highly influence consumer behaviour, because consumers act out of insecurity about 'normal' behaviour and copy others. New norms will provide valid information about appropriate behaviour and illustrate explicitly what to do (Eyal, 2014).

*Communication strategies*: Communication spreads a message that persuades consumers to act differently. Communication should guide consumers in their action rather than explaining why they should execute it. (White et al., 2019). Another success factor of communication is a credible messenger that tells a story that is easy to remember (McKenzie-Mohr,2011).

## Enabling

Empower consumers in making the right choices related to the desired behaviour and fitting the personal situation and preferences (Ludden & Hekkert, 2014).

*Stimulus control strategy*: Remove a cue for undesirable behaviour and add a prompt for the desirable behaviour (Ludden & Hekkert, 2014). An unconscious form of this strategy is nudging, where consumers are stimulated towards the desired choice without restricting their freedom (Muñoz et al., 2016).

*Self-reevaluation strategies*: Represent someone's behaviour and reflect on the consequences of it. It can also be used to compare and evaluate one's behaviour with others (Ludden & Hekkert, 2014).

*Commitment strategies*: If a consumer agrees to a small request they are more likely to agree to a subsequent larger request (McKenzie-Mohr,2011). Consumers tend to agree to the second request because of the internal pressure to act consistent (White et al., 2019). This strategy becomes even stronger when this commitment is made public and consumers care how they are viewed by others. (McKenzie-Mohr,2011).

*Doubt assuaging strategy*: Consumers doubt in terms of risk and uncertain outcomes. Offering guarantees and guiding the choice makes consumers less doubtful. Examples are labelling and certification (Muñoz et al., 2016).

*Simplification strategy*: The required actions should be as simple as possible requiring minimal effort. Simplifying actions minimise the time or money needed and require minimal brain cycles (Eyal, 2014).

## Motivating

Consumers should maintain the change and repeat the same action multiple times (Ludden & Hekkert, 2014).

*Prompt strategy*: Help to remind consumers to engage in the behaviour they already predisposed to do (McKenzie-Mohr, 2011). To remind the consumer the prompt should be as close to the space and time of the performance of the behaviour.

*Incentive strategy*: To motivate consumer engagement incentives are placed at the moment the behaviour is performed (McKenzie-Mohr,2011). When incentives are visible and reward positive behaviour they are most successful(McKenzie-Mohr,2011).

*Convenient strategy*: This strategy simplifies the behaviour(White et al., 2019). An impactful way to increase convenience is to make sustainable behaviour the default option (White et al., 2019).

## Fading out

This is the last step before durable behaviour change is realized. Strategies help consumers to act independent and similar when personal design interventions are withdrawn (Ludden & Hekkert, 2014).

*Diffusion strategies*: When a minority of people adopt sustainable behaviour they play a key role for broad adaptation of that behaviour (McKenzie-Mohr,2011). Adaptation by a small group also helps to provide others with social proof of the behaviour (Muñoz et al., 2016).

*Feedback strategies*: This strategy provides information about performance (White et al., 2019). If a consumer encounters a negative experience he/she reconsiders the behaviour, while a positive experience confirms the attitude and intentions and may lead to habit formation (Muñoz et al., 2016)

*Investment strategies*: The consumer should be hooked to form a new habit. When actions store consumer value, consumers are more likely to return and repeat (Eyal, 2014). The investment of time and effort increase the value of the behaviour and hooks consumers (Eyal, 2014).

## 8.4 DUTCH CONSUMER

For the scope of this thesis, the Dutch society is fragmented in five consumer segments using the mentality model and consumer research conducted by the Future of Food Institute (Bosma, 2019) and research from Motivaction (Hoekstra et al., nd).
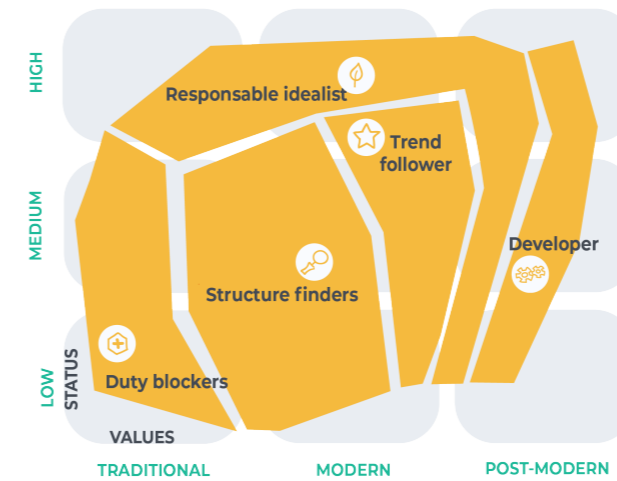


*Figure 18 - mentality model including the consumer segments. (Hoekstra et al., n.d.)*

### Structure finders

**Cor Conservative structure finder**

Cor does not acknowledge the urgency to engage in sustainable behaviour and behaves consistent (Bosma, 2019). Cor is penny wise and associates sustainable behaviour with expensive behaviour. Cor has a practical education and an income below average. He is a family man that enjoys life and would like to continue his pleasures. (Hoekstra et al., n.d.)

### Responsable idealist

**Rachel Responsable idealist**

Rachel has an academic educational background and she is conscious of her influence as a consumer in a global world. She has the intentions to change her behaviour and worries about it (Bosma, 2019). Rachel can be seen as an ambassador of sustainability with a critical mindset towards governmental interventions (Hoekstra et al., n.d.).

### Trend followers

**Sven Trend follower**

Sven does not encounter a lot of barriers for sustainable behaviour, however he misses the internal motivation to engage in sustainable behaviour (Bosma, 2019). He is not worried about climate issues because Sven is an egocentric person that desires to have a successful professional and private life.

### Duty blockers

**Daisy Duty blocker**

Daisy is aware of the problem related to climate change and desires to behave sustainable however she experiences a lot of barriers (Bosma, 2019). Daisy feels connected to a society driven by a sense of duty. Daisy has an average income and feels the internal pressure to act consistently (Hoekstra et al., n.d.).

### Structure finders

**Danny Developer**

Danny is an adventurous person that values his freedom. He wants to differentiate himself from others and career plays an important role. Danny wants to be independent which also means living a minimalist life(Hoekstra et al., nd). He does not actively engage in sustainable behaviour however he does not encounter many barriers.

### 8.5 TAKEAWAYS

• Food consumption behaviour is unconscious and prone to routine behaviour.

• Routines, cognitive dissonance and the desire to behave consistently explains why consumers perform unsustainable consumption behaviour.

• The true value of changing behaviour lies in habit formation because repetition leads to a significant impact.
• The SHIFT framework illustrates the complex interplay of factors supporting sustainable behaviour.

• Behaviour change strategies and models can be used as inspiration to design for behaviour change.

• Every consumer behaves differently and a change in behaviour is also different for every target consumer.

# PUTTING PIECES TOGETHER
## CHAPTER 09

The system dynamics are formed by a complex interplay of multiple actors and the transition requires a socio-cultural change. This chapter recaps the development phases and identifies key elements needed to realise the transition.

### System dilemma

The feedback loops identify multiple starting points. The principle behind this feedback loop is the prisoner's dilemma, where actors keep each other caught resulting in a locked system. The food producers and retailers offer food products and the consumer can only buy products that the industry offers. This project focuses on consumer demand as a starting point to break the loop since consumers are considered highly influential.

*Figure 19 - Prisoners dilemma*

### Consumption

The transition of the consumption system proposes a sustainable menu. The guidelines for the menu are defined by Lancet and change the food pattern into a sustainable and healthy diet. The replacement of animal proteins with plant proteins is the most impactful change on personal and planet health. This new diet means something different for every individual. Focussing on one target group would result in more impact compared to trying to reach everybody.

*Figure 21 - Diet shift*

### Consumer behaviour

A change in consumer demand means a change in consumer behaviour (see figure 20). Behaviour changes result in new consumer purchases and increase the pressure on the industry to anticipate. Consumer behaviour is dependent on a lot of different drivers and factors influenced by context, culture and personal routine.

CONSUMER BEHAVIOUR

Drivers influence consumption

Individual self

CONSUMER DEMAND

Social & physical environment

Consumer purchase

Offers what consumers already buy

FOOD OFFER

Tangability & availability

Production is determined by purchase data

Production defines food offer

FOOD SUPPLY
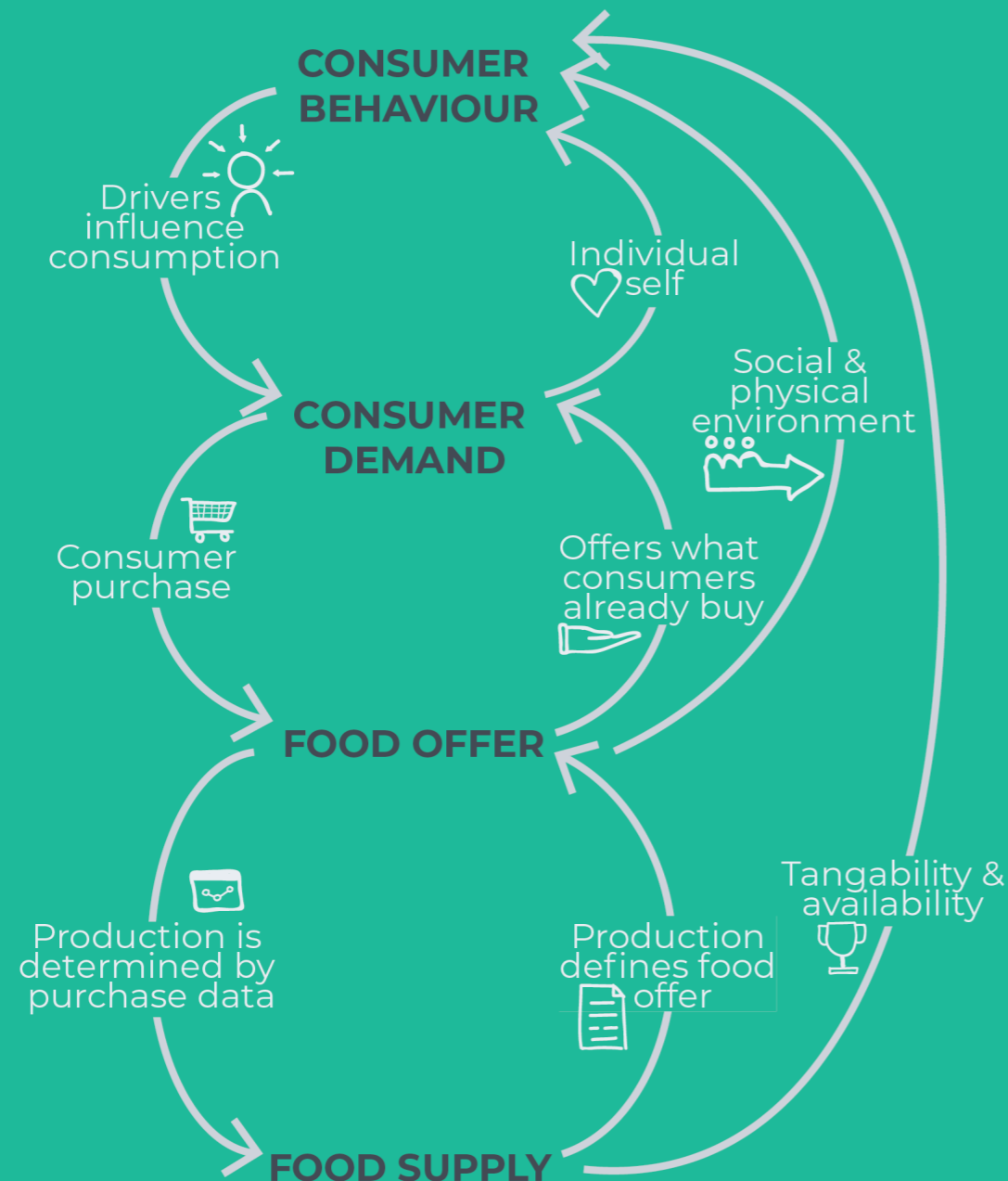
*Figure 20 - Feedback loop including consumer behaviour*

### Behavioural change

To successfully change behaviour different behaviour changing strategies should be applied in one intervention. A correct interplay of behaviour influencing factors will encourage the consumer to consume a sustainable diet. This complex interplay of factors is influenced by multiple actors. Those actors need to take responsibility for the factors they influence and bundle forces to encourage sustainable behaviour.

**S** SOCIAL INFLUENCE

**H** HABIT FORMATION

**I** INDIVIDUAL SELF

**F** FEELINGS & COGNITION

**T** TANGABILITY

*Figure 22 - SHIFT framework*

## PHASE 02 - DEFINE

The system perspective is summarised in a future vision and the bottom up strategy asks for a context specific intervention. Knowledge generated in the previous phase guides the decision in this phase. The decisions specify a design challenge used for the second diamond.

DISCOVER | DEFINE | DEVELOP | DELIVER

# FUTURE VISION
## CHAPTER 10

The outcome of the desired transition is represented in a future vision. In this chapter, the research of the previous phase is structured according to an analogy and the future vision illustrates the goal of the transition.

### 10.1 ANALOGY

The structure of the project is compared to the analogy of baking a pie. The previous phase is used to explore all elements needed to change the system. The research offers a lot of possibilities however it is compressed into one recipe. This recipe defines the boundary conditions to bake the pie. The pie is a representative of the future vision for sustainable consumption and defines on an abstract level how an ideal system could look like.

The occasion where the consumer eats the pie defines the case study of this project. The case study is one of many possible directions to accomplish behaviour change. The criteria to select the case study will be further explained in chapter 11.

### 10.2 FUTURE PIE

Previous research defines the boundary conditions on a system level to develop a normative vision. This future vision is divided into multiple layers and each layer describes an environment of actors. Every actor is locked in a current mindset and encounters barriers that obstruct change but is motivated by triggers to encourage change. The ba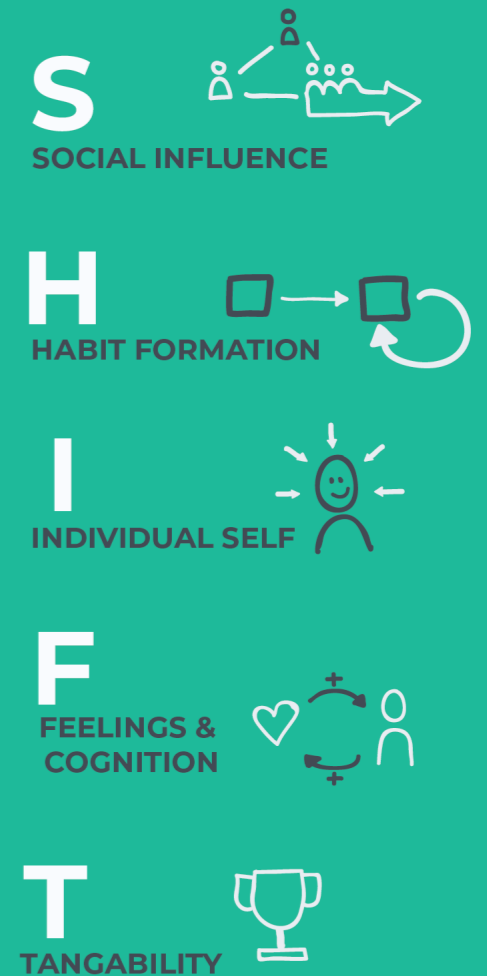rriers and triggers for every actor can be found in appendix D. In the future vision every actor shifts to a new mindset. The future vision aims to support, perform and facilitate the consumption of sustainable food.
The top layer represents the consumer and the layers visualise the connection with the consumer. For clarification, the foodservice layer is closest to the consumer whereas farmers are most distanced from the consumer.

### PIECES OF THE PIE
In the consumer layer, the actor is empowered to make the right choices. The consumer is internally motivated to change and understands why his/ her behaviour change is important. A simple and easy message is used to strengthen motivation. To help the consumer to make the right choices he/ she has tools available to help assess their choices. Those tools create an equal playing field to compare choices and also provide the consumer with feedback about the food intake. The consumer is surrounded by friends who support his/her decisions and inspire him or her.

The foodservice industry becomes popular among consumers leading to the growth of sales. However, the mindset of the foodservice industry has shifted from a sales-driven to a purpose-driven mindset because they deliver culinary pleasure and hospitality. Consumers are able to express real needs and restaurants prepare for those needs. The chef can translate needs into tasteful meals because he holds the right skills and knowledge in esteem. Those new tasteful meals are valued by the consumer and increase their popularity. The meals complete the circle and motivate the foodservice industry to focus on consumer needs.

In the business environment, two businesses are identified. The orange businesses produce products containing animal proteins. In the future vision, those companies deal with an overstock of their products because sales are decreasing. Therefore they critically reflect on their business operation. They empower the right employees to solve complex problems and set a new strategic position that incorporates sustainability. In this new positioning, they anticipate future environmental needs and tailor the consumer to connect to those needs. Those businesses
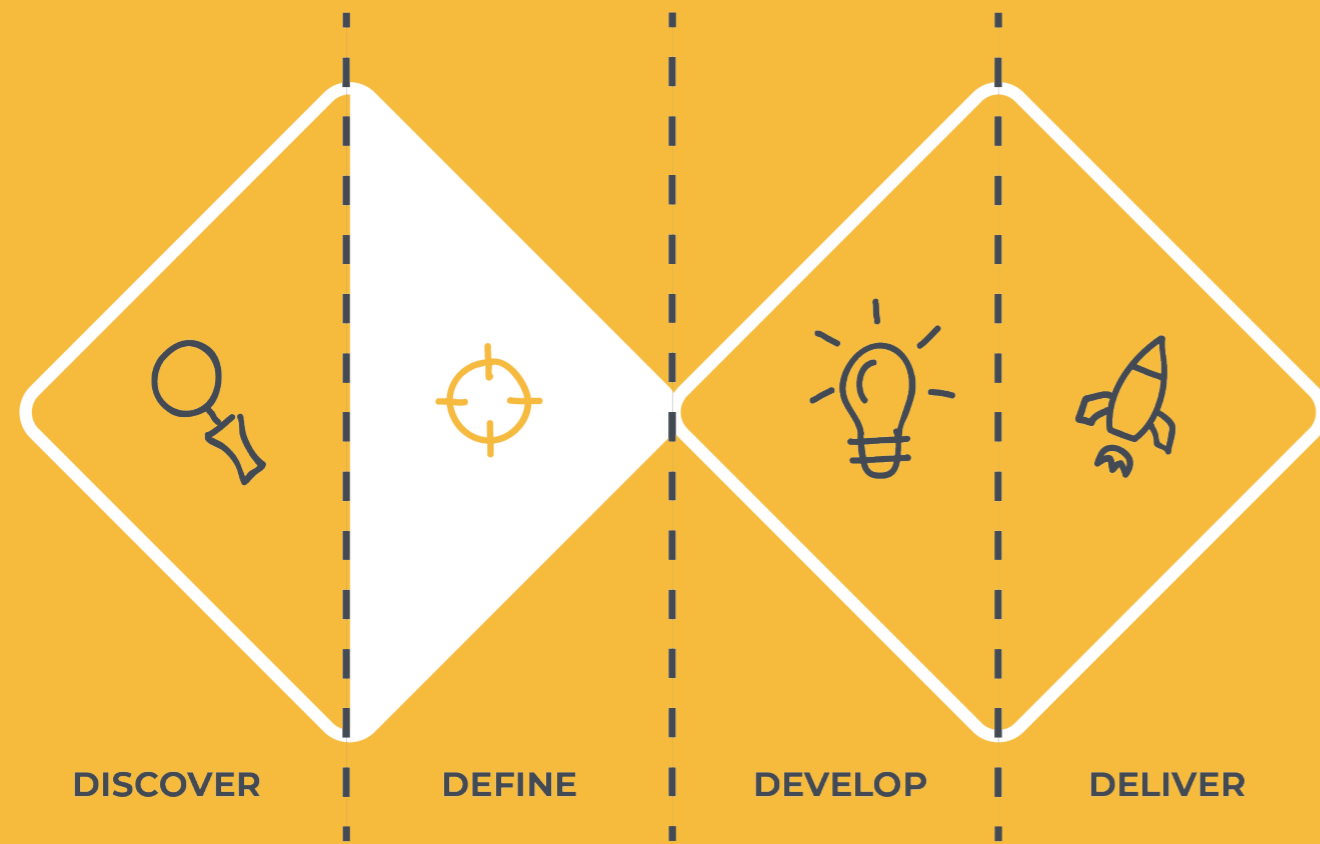


SYSTEM RESEARCH     FUTURE VISION     CASE STUDY

*Figure 23 - visual of the project analogy.*

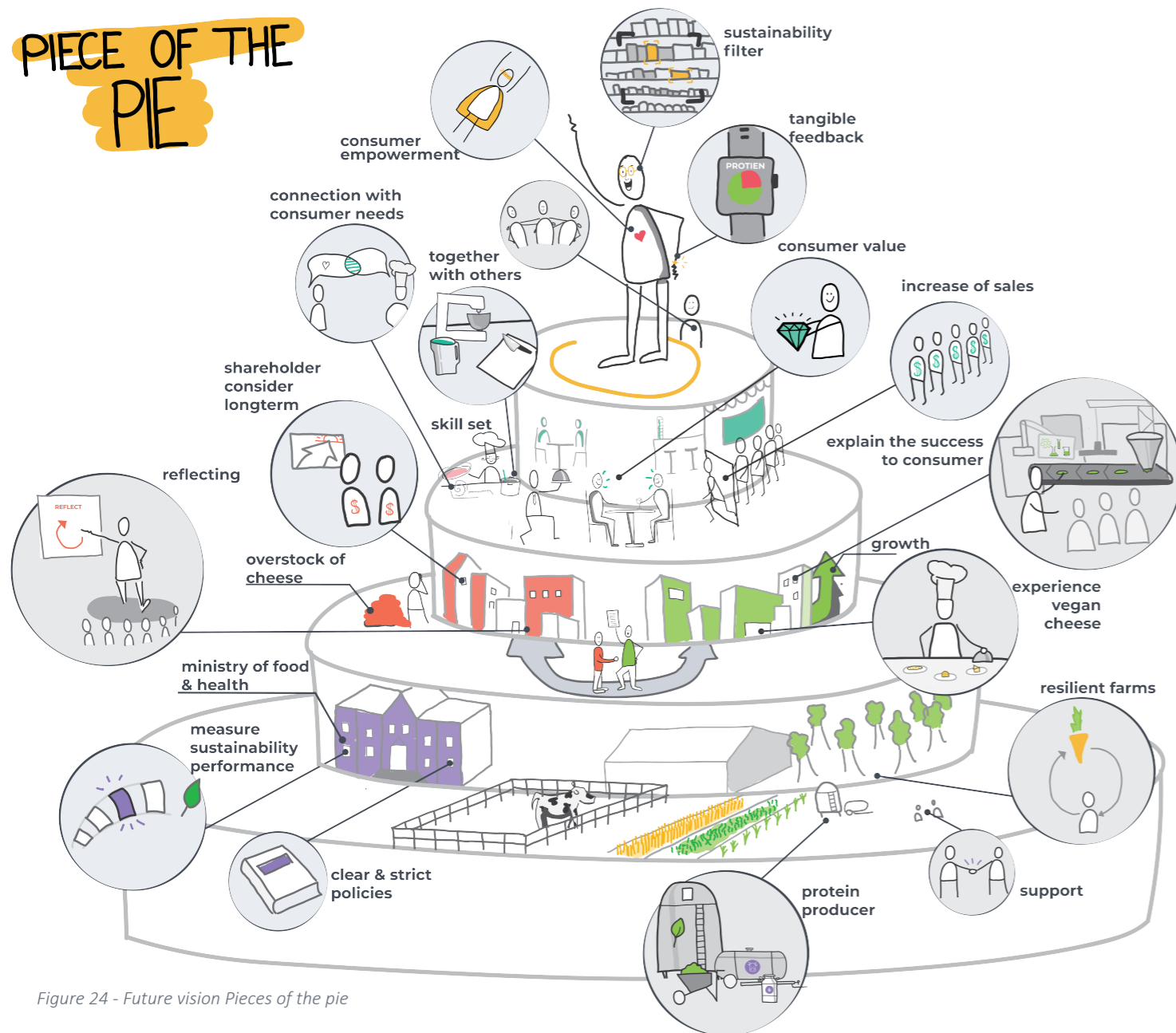*Figure 24 - Future vision Pieces of the pie*

become purposeful and shareholders consider long term results instead of the short term financial advantages. To achieve this shift orange companies start collaborating with green companies and help them to scale up the production of plant alternatives.

The green companies explain their success because their goal is to familiarise others with plant-based products. They have an open culture where employees share their success story. They show others the possibilities and advantages of using plant-based products.

The bottom layer describes the agricultural sector and the role of the government. In the future vision, the government actively measures the sustainability performance of all the actors to create an overview of the performance. Clear policies help actors to meet the expectations and requirements of the UN sustainability goals and the Paris Agreement. In the future vision, the national government takes the role as an objective overview keeper. The national government takes the lead because it makes the

Netherlands a pioneer in food innovation.
The farms adjust their production, instead of only producing milk or meat, they produce all kinds of proteins. This makes the work of farmers more diverse but does not harm the farm. Farmers are mainly supported by multiple actors to change their production. This support is financial, operational and social. The diverse farms are resilient and less vulnerable to changes in society.

### 10.3 TAKEAWAYS

• All actors need to shift their current mindset and overcome barriers to realise the future vision.

• Every actor deals with a piece of the pie because every actor is partly responsible for the transition.

• The transition requires an open and honest playing field to share knowledge, equally compare products and recognize performance of the system.

## DIRECTION
### CHAPTER 11

The future vision is accompanied by consumer behaviour changes. However, to change behaviour it is important to be as specific as possible about the desired behaviour. Therefore the project is specified with a case study illustrating context-specific behaviour. This forms the design direction. The direction selection is based on a diet shift for a specific audience at a certain moment. The selection of all those different elements is discussed.

### 11.1 SELECTION ON DIET SHIFTS

To maximise the impact of this project, an analysis is conducted to select a diet shift with high impacts. A sustainable diet contains intake of different products, minimise waste, minimise packaging, and eat local and seasonal food. The difference between the current menu and the guidelines framed by Lancet show all possible shifts. The biggest impact emerges when consumers lower the intake of animal proteins and replace this with plant proteins (Zantinge et al., 2017). The protein shift aims to consume 40% of animal proteins and 60% plant proteins. At this moment the average consumption of a dutch consumer is the other way around (Muilwijk et al., 2019). The aim of the design direction should be to reduce the consumption of animal proteins. To increase the willingness to experiment, the animal proteins should not be the main ingredient of the meal. Pizzas are used as an example product because the proteins are processed in the pizza.



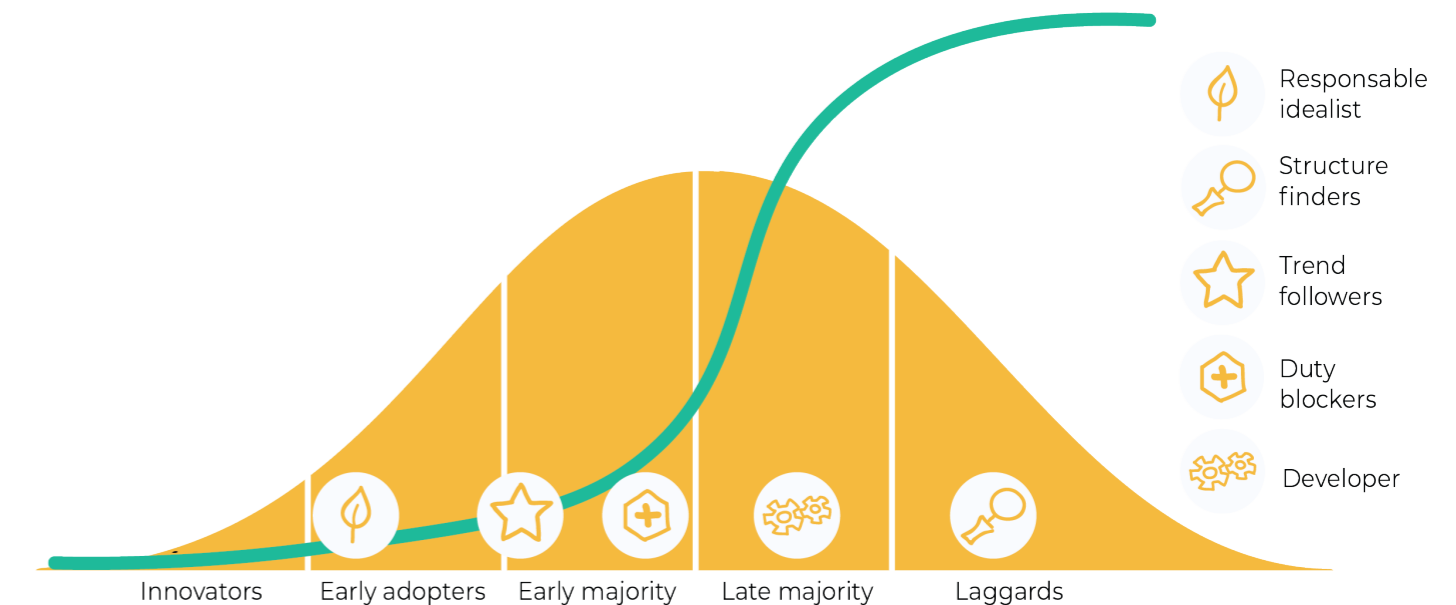*Figure 25 - Diet shift*



Responsable idealist

Structure finders

Trend followers

Duty blockers

Developer

Innovators    Early adopters    Early majority    Late majority    Laggards

*Figure 26 - Consumer actor segments related to market diffusion*

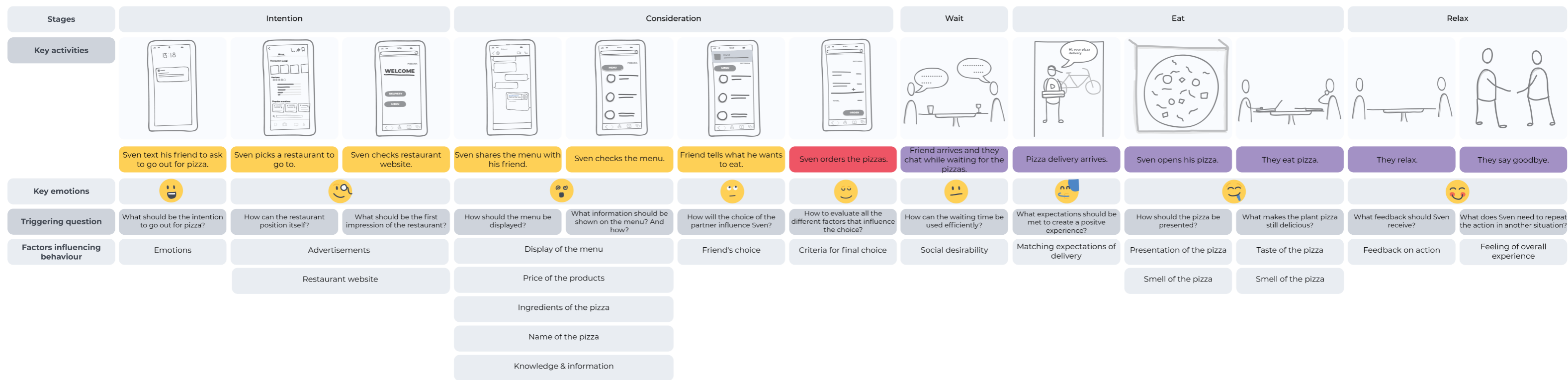| Stages | Intention | | | Consideration | | | | | Wait | Eat | | | Relax | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Key activities | Sven text his friend to ask to go out for pizza. | Sven picks a restaurant to go to. | Sven checks restaurant website. | Sven shares the menu with his friend. | Sven checks the menu. | Friend tells what he wants to eat. | Sven orders the pizzas. | Friend arrives and they chat while waiting for the pizzas. | Pizza delivery arrives. | Sven opens his pizza. | They eat pizza. | They relax. | They say goodbye. |
| Key emotions | 😀 | 😋 | | 😮 | | 🙂 | 😊 | 😐 | 😃 | | 😌 | | 😊 |
| Triggering question | What should be the intention to go out for pizza? | How can the restaurant position itself? | What should be the first impression of the restaurant? | How should the menu be displayed? | What information should be shown on the menu? And how? | How will the choice of the partner influence Sven? | How to evaluate all the different factors that influence the choice? | How can the waiting time be used efficiently? | What expectations should be met to create a positve experience? | How should the pizza be presented? | What makes the plant pizza still delicious? | What feedback should Sven receive? | What does Sven need to repeat the action in another situation? |
| Factors influencing behaviour | Emotions | Advertisements | | Display of the menu | | Friend's choice | Criteria for final choice | Social desirability | Matching expectations of delivery | Presentation of the pizza | Taste of the pizza | Feedback on action | Feeling of overall experience |
| | | Restaurant website | | Price of the products | | | | | | Smell of the pizza | Smell of the pizza | | |
| | | | | Ingredients of the pizza | | | | | | | | | |
| | | | | Name of the pizza | | | | | | | | | |
| | | | | Knowledge & information | | | | | | | | | |

*Figure 27 - Actor journey ordering food*

## 11.2 SELECTION ON CONTEXT

Reducing the intake of animal proteins is still a broad change and depends on the contexts. To increase the willingness to experiment the food delivery context is selected. In this situation, it is easier to inspire people and introduce a new food experience (Krom, 2020). Another advantage is the elimination of the cooking aspect related to the consumption process. This simplifies the steps of consumption into food selection and eating and does not bother the consumer with necessary cooking skills (Muilwijk et al., 2019). Considering the COVID-19 situation this situation is accurate and currently the only option to generate revenue. As a starting point for ideation, the situation of pizza delivery is used.

An actor journey for the food delivery context results in a deeper understanding of the consumers' thoughts, feelings and actions. The journey exposes multiple moments for interventions. Figure 27 shows the journey considering the COVID-19 situation including actions, emotions and factors influencing consumer behaviour. The triggering questions are used for ideation in chapter 13. The questions indicate how every step could add to the achievement of the goal. The goal is to reduce the intake of animal proteins and increase the intake of plant proteins.



**WHO**
·Trendfollowers

**DESIRED ACTION**
·Choose the sustainable dish
·Resist temptations
·Choose what they are going to eat

**SEE**
·Healthy& sportly influencers
·Sharing the experience of eating out
·Picture perfect insta stories of delicious food

**THINK & FEEL**

PAINS
·Group pressure
·Loneliness
·Social rejection
·Fear of missing out FOMO

GAINS
·Status
·Comfort
·Recognition
·Desire to belong

**HEAR**
·Recommendations & tips from friends
·Benefits of a healthy lifestyle
·Updates about the latstes trends

**SAY**
·I keep things as easy as possible
·I want to focus on my personal development
·I don't have a lot of time but we can go for a quick dinner

**DO**
·I buy the latest gadgets
·I work at least 45 hours a week
·I order food delivery or meal boxes
·I go on a spontanious trip to Barcelona

*Figure 28- Empathy map*

## 11.3 SELECTION OF ACTORS

Besides the food service actors, the consumer is a crucial player in the context. However different consumers respond in another way to this journey. Therefore the actor selection focuses on a target consumer based on the consumer segmentation described in chapter 8.4. The analysis of the system development revealed that the take-off phase is reached and the segmentation of the Dutch society could be linked to those development phases of the system (see figure 26). It could be stated that the most promising consumer segments are the trend followers and duty blockers. Those segments play a vital role in upscaling the transition. The trend followers are more frequent users of food delivery and therefore relate to the context of the case study.

To design impactful interventions for the trend follower a deeper understanding of the consumer is required. An empathy map is created to better understand the consumer (see figure 28). The empathy map generates several insights that should be taken into account when designing an intervention. The target consumer seeks comfort and avoids being alone. Another important need is the desire for status to realise social acceptance and recognition by others. Those needs relate to the egocentric focus.

## 11.4 DESIGN GOAL

To summarise all the choices made for the behaviour change a design goal is created. The design goal of this project is to **design an intervention that supports the trend follower to replace the intake of animal proteins with plant proteins when ordering pizza.**

### 11.5 TAKEAWAYS

• In the plant pizza all animal proteins are replaced with plant proteins.

• The actor journey includes the stages of the hooked model such as triggers, motivation and habit formation (Eyal, 2014) The consumer actor is defined as the trend follower consumer, because they are open to change and could cause significant impact.

• The target consumer desires to belong and act according to social desirable behaviour because of social recognition.

# PUTTING PIECES TOGETHER

## CHAPTER 12

Important activities and insights during a break in the project are mentioned in this recap chapter. The break highlights the essential elements needed for the development phase.

## Time to structure

A break because of corona illness created room for reflection, recovery and relaxation. Activities performed during the break helped to structure the overload of information explored in the previous phase.

### READING BOOKS
- Hooked of Nir Eyal (Eyal, 2014)
- Het grote gevecht of Jeroen Smit (Smit, 2019)

### WALKING

### JOINING WEBINARS
- Food environment by Transitie Coalitie Voedsel
- Visueel communiceren by Public Cinema
- Eco design by Ladies that UX

### LISTENING TO PODCASTS
- Het voedselkabinet
- Faces of Food
- De universiteit van Nederland

## CONSUMER'S VOICE

### Consumer's voice

The consumer should have more influence in the feedback loop. The consumer should decide what the menu should be. There are multiple ways to be sustainable and there is a way for every consumer to do this. You ca not put them all in the same position and multiple paths are leading to the same result.

### Different paths same result

The consumer should choose the path of their likings. Having the ability to choose gives consumers a feeling of ownership. When a consumer can choose their own path they feel more connected and are still able to realize the impact.

## LOWER THE PRESSURE TO CREATE ROOM FOR CREATIVITY

why did you change your diet?

what was the difficult part?

what would halve helped you?
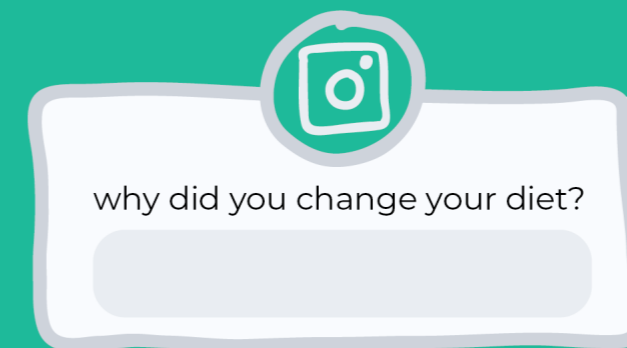
### Conveniences vs goal striving

It is essential to understand the consumer and the meaning of food because food has a strong emotional role in daily life. Understanding why consumers want to change food habits and connect this to drivers and emotions is helpful to uncover desires. Small Instagram surveys result in more insights about motivation and drivers to change diet and order pizza. , Consumers have a goal when changing their diet however, this could be a challenging task. On the other hand, ordering pizza is convenient. This uncovers interesting tradeoff to take into account for ideation.

## PHASE 03 - DEVELOP

Ideation and creative problems solving explore possible solutions to solve the design challenge. Those possibilities are concrete and tangible solutions to support and motivate the consumer to behave differently. Aspects of the solutions are connected to consumer characteristics.

# CONCEPTUALIZATION
## CHAPTER 13

The development of the design goal is done with co-creation. For the co-creation, the theory of change and customer journey are starting points for ideation. During the conceptualization, many solutions are developed.

### 13.1 LITERATURE BACKGROUND

To create a bridge between the system's future vision and the design goal, the theory of change framework is constructed in figure 29 A future vision incorporates long-term outcomes and makes it difficult to know what actions need to happen in the short term to meet outcomes in the future. The framework related to the theory of change fills in the 'missing middle' between what is happening today and how it leads to the realization of the desired vision (The center of theory of change, 2020). The theory of change brings together pieces of previous research and structure ideas at different levels. The output layer of the framework uses the stages of the hook model founded by Eyal (Eyal, 2014). The outputs from left to right describe the steps needed to hook consumers and form a habit. The actions show how those outputs are achieved based on characteristics of the target consumer.



What lifts us up?

What keeps us down?

*Figure 30 - First assignment in creative session*

### 13.2 APPROACH CREATIVE SESSION

To spark inspiration and generate a lot of different ideas, three creative sessions are performed. In groups of four to five master design students down to earth solutions supporting the target audience to consume sustainable food are designed. The aim of the sessions is to help the designer overcome design fixation and develop as many ideas as possible. The participants were introduced to the project with an online sensitizing booklet (see appendix E). Every creative session used the same set-up based on the Lightning Decision Jam process (Miro, 2020). In appendix F the set-up of the creative session is demonstrated. After onboarding, the problem and design goal are explained and participants are asked to write down initial obstacles and advantages (Figure 30).
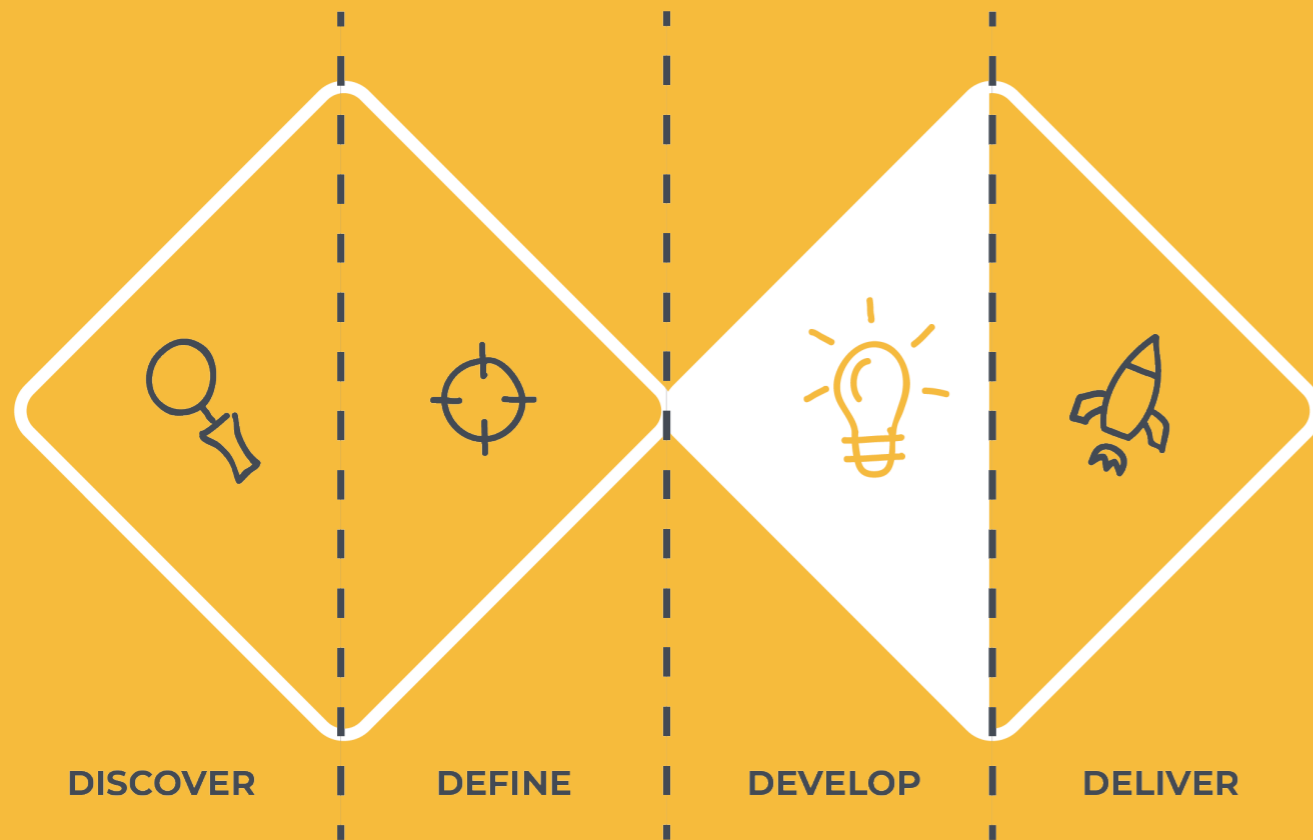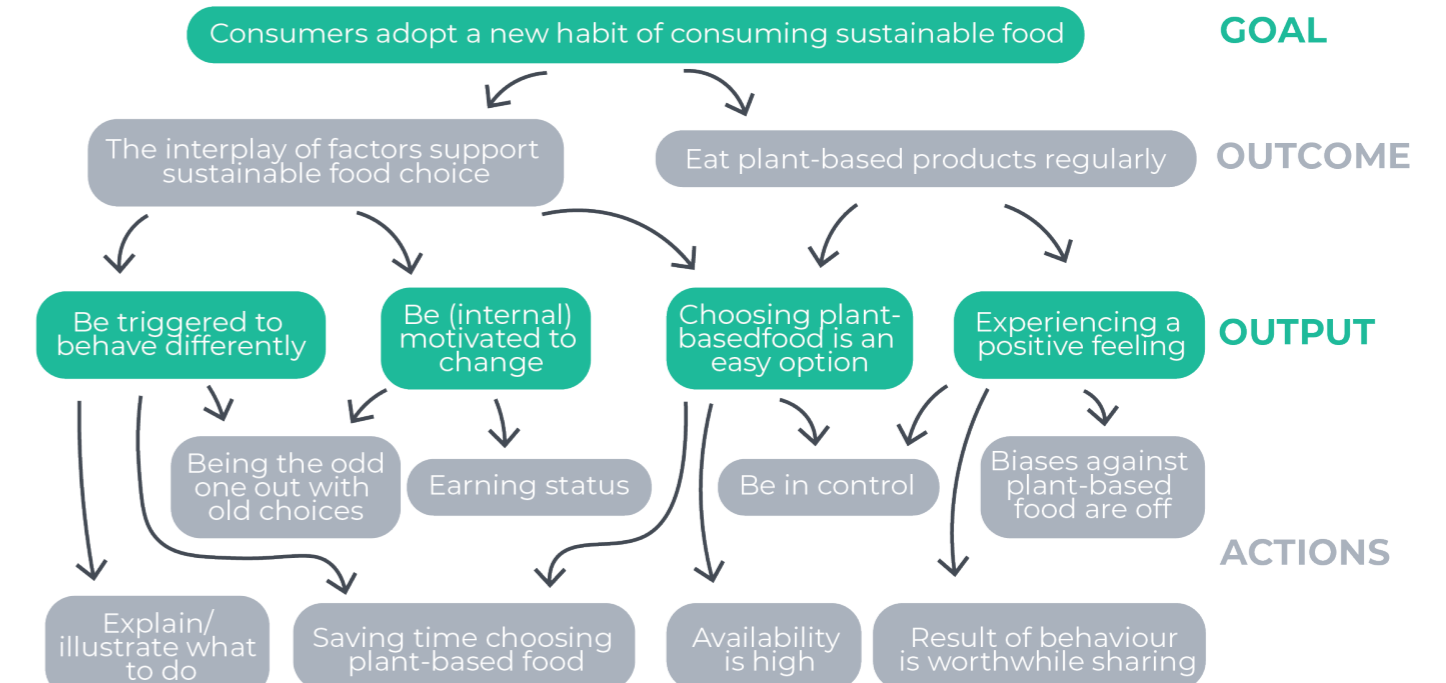


*Figure 29 - Theory of change*

As a next step, the theory of change framework is accompanied by a consumer storyline of ordering pizza, thereafter the participants individually brainstorm on solutions to solve three questions.
- •How might we trigger the consumer to choose the plant-based pizza?
- •How might we create an internal trigger that motivates the consumer to choose sustainable?
- •How might we use the restaurant experience to support habit formation?

The session ends with a discussion about the ideas and further development about the most promising ideas.

## 13.3 RESULTS

The results of the creative sessions led to new insights and perspectives regarding the problem and potential solutions. New obstacles mentioned by the participants are the temptations and cravings related to unsustainable food. The brainstorms produced a lot of promising ideas. All the results of the creative sessions can be found in appendix G. The key insights are summarised in visual 31 and highlights are explained in this section.
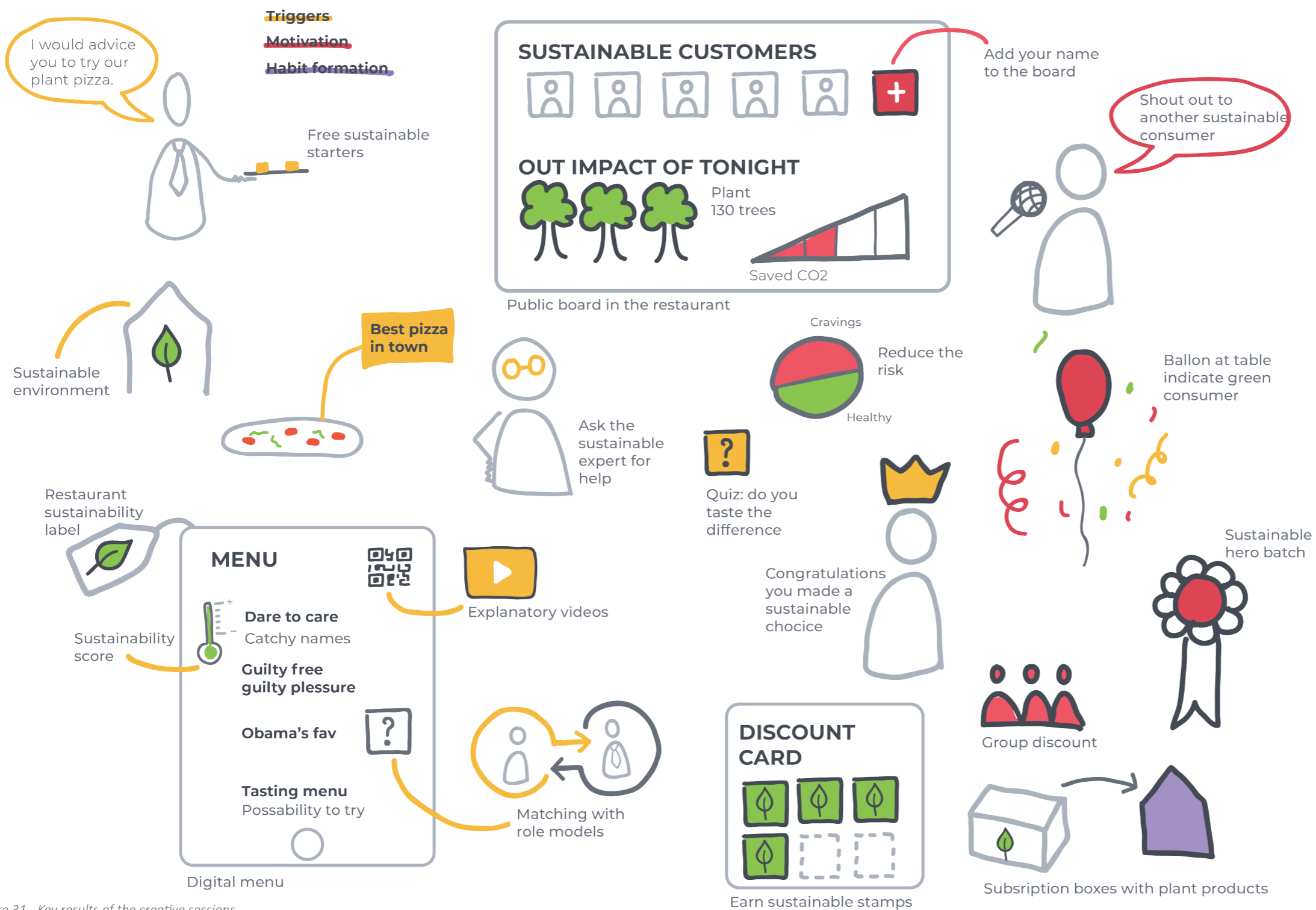
When sustainability is visible in every aspect it brings the consumer in the right mood. On the other hand, a non-sustainable environment could tempt the consumer to make a sustainable choice without knowing it.

The consumer should feel connected with the available options the restaurant offers. It should meet their values or it should represent a role model they would like to be identified with. Therefore communication of the menu should be sharp and imaginative.
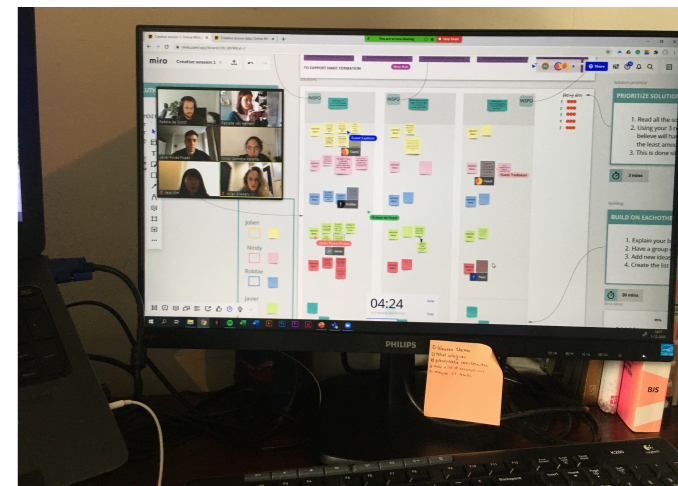

*Figure 32 - Photo of the online creative session*

Transparency is also a recurring theme during the creative sessions. Many participants believe that showing the consumer the ingredients and the sources of ingredients would help to choose sustainable. Also, transparency shows the consumer is not 'fighting' alone, because they can see how others behave.

The reward aspect is noticed in every session. The reward should be made public so the consumer is able to show and share it. Rewards could take many different forms to trigger different motivations.

The consumer should gain more knowledge about sustainability to choose between different levels of sustainability. The different levels allow the consumer to make small steps instead of choosing between everything or nothing. The levels of sustainability also increase clarity for the consumer since the consumer can compare the impact of different choices.


*Figure 31 - Key results of the creative sessions*

## 13.4 TAKEAWAYS

The creative session sparked the mind of the designer to develop a concept. The most important insights for concept development are:

•The choice of the consumer defines the impact, so the consumer should be guided in the decision process to change behaviour. The decision moment should be the starting point of intervention.

• Radically changing sustainability is difficult so the concept should help the consumer to make small steps.

• The concept should design an experience instead of one intervention.

• The concept should match with the values and identities of the consumer to increase consumer engagement.

• The impact should be labelled to make it tangible.

# PUTTING PIECES TOGETHER
## CHAPTER 14

In this recap chapter, all pieces are put together to design an intervention. Important insights, solution aspects and choices illustrate key elements used for the concept development.

### Beyond pizza

A solution for eating a plant pizza can be applied in other food categories and will support sustainable consumption behaviour more broadly. Therefore the concept should focus on food delivery of different food categories that reduce the intake of animal proteins.

### Represented values

The food choices describe who you are as a person. Consumer values should relate to the food they consume. Match consumer characteristics with a desirable meal to find the perfect match, just like tinder.
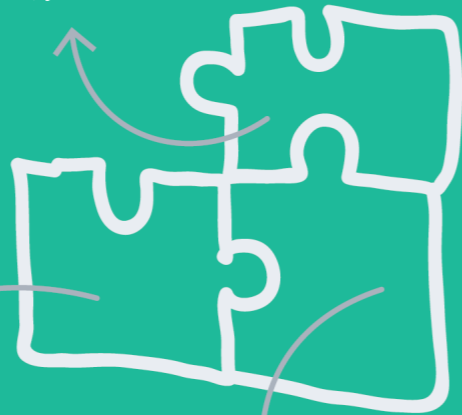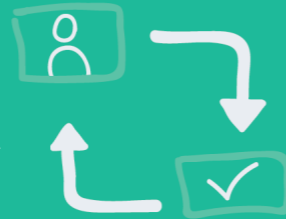
### Decision

The decision moment is key. The consumer should be in charge however it is possible to steer them towards the desired direction. The sustainable choice is the only way to realise the impact and successfully complete the consumption process.

### Empowerment

The consumer should feel empowered during different phases in the consumer journey to make the right choice. They should feel confident but have the opportunity to ask for help when needed.

Positioning of the solution should be
# EASY. TASTY & HEALTHY

The value proposition canvas connects consumer needs, problems and goals with concept characteristics.



Eating tasty food

Having a nutrional meal

Status

Comfort

Social recognition

(Long) cooking

Being afraid of the unknown

Not knowing what to eat

Matching food based on values

Different levels to step in

Share experience

Offering comfort food

Technology understanding the user

Food suggestions

Food delivery

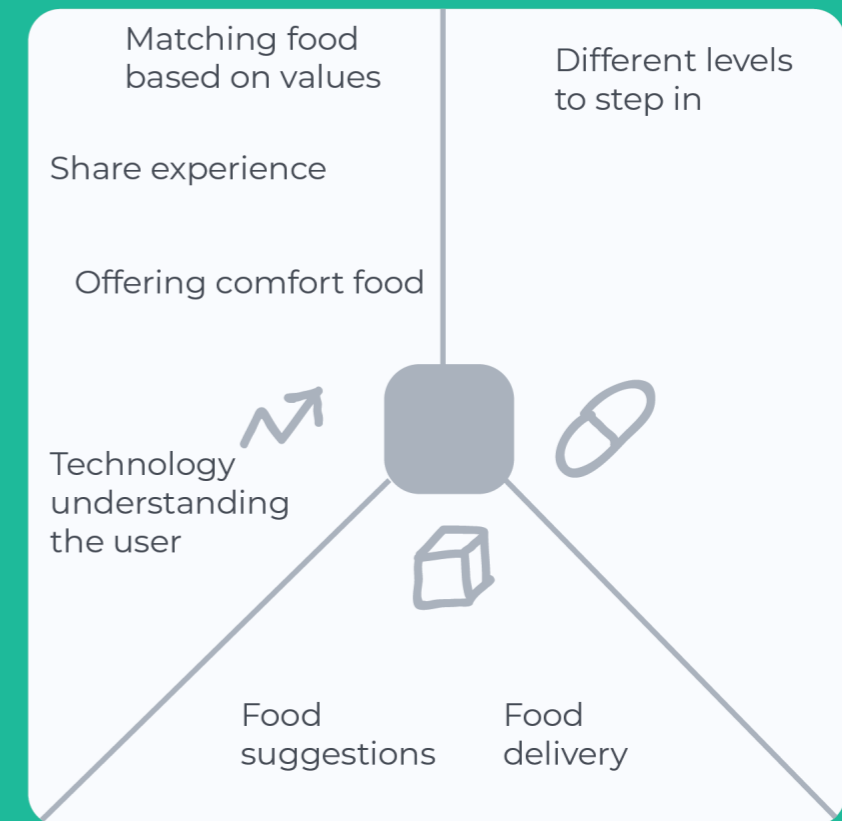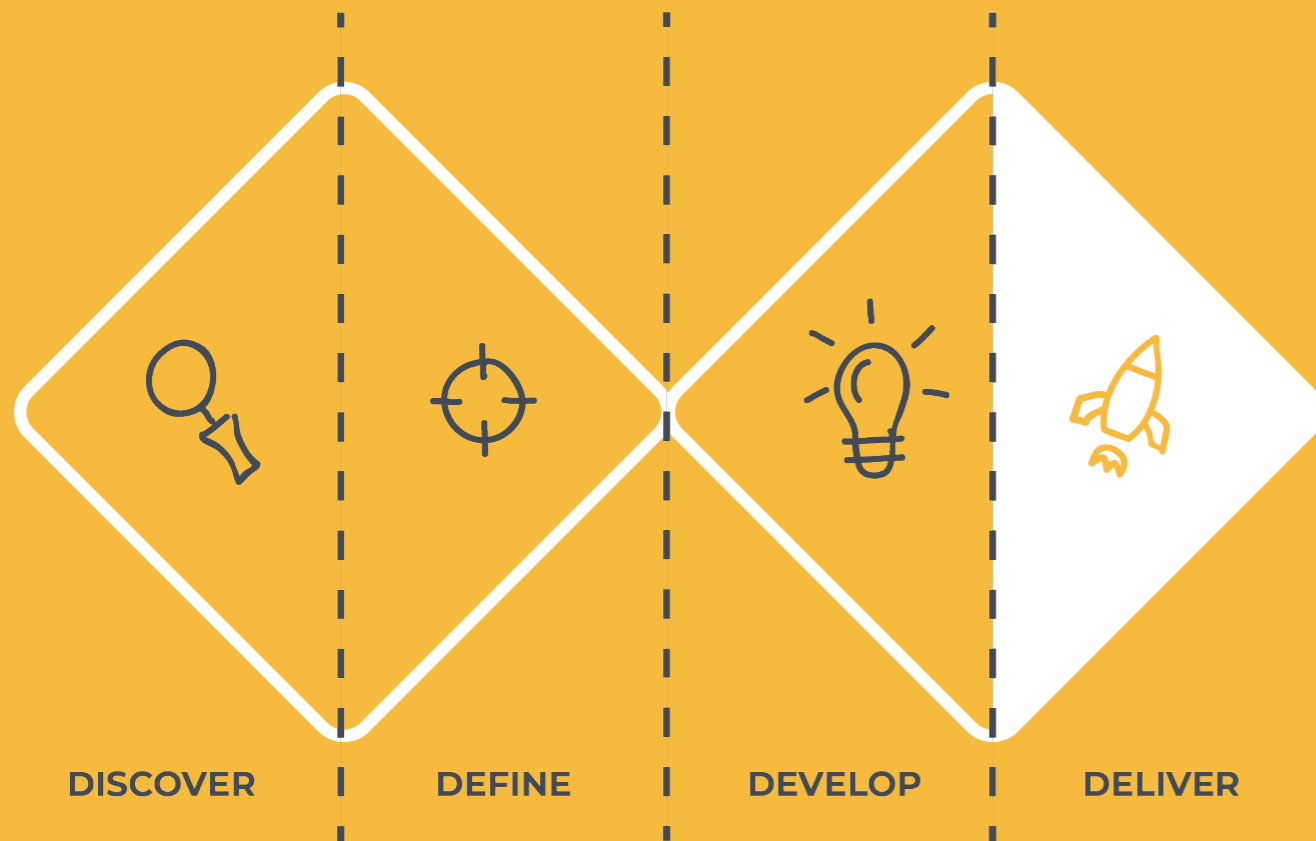*Figure 33 - Value proposition canvas*

**DISCOVER** | **DEFINE** | **DEVELOP** | **DELIVER**

# PHASE 04 - DELIVER

The final concept called Meal Matchers is explained in detail in this phase. The philosophy is validated with several actors to strengthen the positioning. The business operation is explained in detail to ensure complete understanding of the concept.

# CONCEPT

## CHAPTER 15

This chapter describes the final concept of this project. This chapter aims to examine the philosophy behind Meal Matchers and explain the design choices. The concept presented in this chapter is the final concept and incorporates the iterations based on the validation in the next chapter.

## 15.1 ROOTS

Previous research indicates the importance of the consumer's choice to realise the impact. Even though the variety of sustainable food products, the consumer needs to acknowledge, accept and consume those products. The right choice makes or breaks the sustainable consumption process because the next steps of the process follow automatically. Decision moments are re-occurring throughout the day and could be wearisome for the consumer. It is desired to eat a diverse menu, so choices need to be reconsidered from time to time to compose a diverse menu. The concept helps consumers to make the right choice and find a meal that matches the consumer taste. The match seeks to be as sustainable as possible within the acceptable range of the consumer. The concept is called Meal Matchers.



*Figure 35- Meal suggestions*

The goal of Meal Matchers is to support consumers to adopt sustainable food consumption behaviour. This support is visible in two aspects of the platform.
- Support the consumer in making the right choice
- Support the consumer with a simplified consumption process

Another important step to adopt a new behaviour is repetition. The application of Meal Matchers offers consumers the possibility to share their experiences on a personal page. The small effort of the consumer is an investment but also stores the value of the food experiences. This increases consumer engagement and encourages repetitive usage of the application.
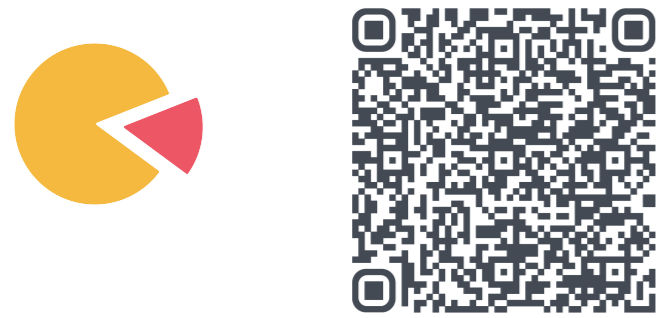
The unique selling points for the consumer are
Convenience to prepare according to consumer wishes and skills

Customized inspiration for new meals

Collect and save the local food experience

**EASY. TASTY. HEALTHY. FOOD**



*Figure 34 - Consumer choice*

## 15.2 MEAL MATCHERS

After a match consumers are given different options of engagement related to the food preparation. The consumer can choose the level of effort for meal preparation, defined by the skills needed to prepare the meal.

Meal Matchers involves local restaurants to provide fair and tasty food. The chefs connected to Meal Matchers have a passion for tasty and sustainable food and like to share their knowledge with the platform.

Consumers use a mobile phone application of Meal Matchers. A prototype is designed and can be viewed in this link. Multiple elements of behaviour changing strategies are used for the design of the interfaces. A combination of strategies has a higher impact on changing behaviour in the long term (Muñoz et al., 2016). The application offers the potential to add other features in the future however, this section explains the essential features. The showcase gives more details about the other interfaces.



*QR code application prototype*

### 2 SWIPE

Swipe right or left to make a match. The AI technology analyses the taste profile and match this with the meal database. Appealing communication and pictures nudge the consumers to a more sustainable match then they would choose themselves.

Check the details about your meal. A score for sustainability makes the rather abstract concept tangible so users can relate (White et al., 2019). The reviews on this page show normative behaviour and help the consumer to feel recognised.

Every match includes scores related to sustainability and cooking. The scores serve as self-reevaluation (Ludden & Hekkert, 2014). The scores add an element of gamification.
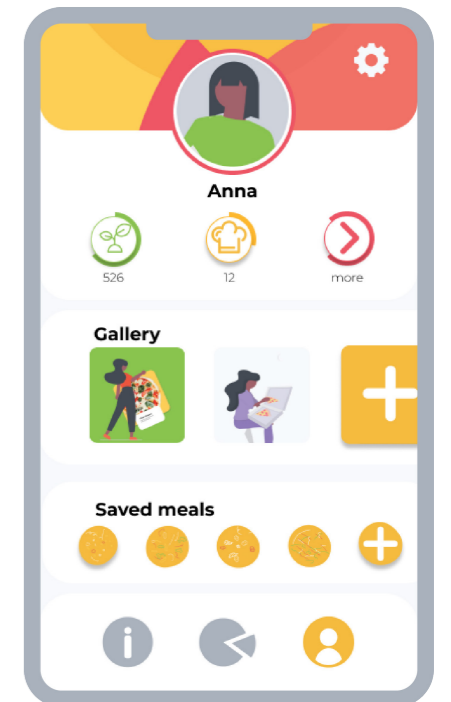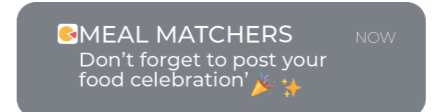
### 6 COLLECT

The personal page demonstrates the performance of the user with the app. Here you can find your saved meals, badges and view your gallery.
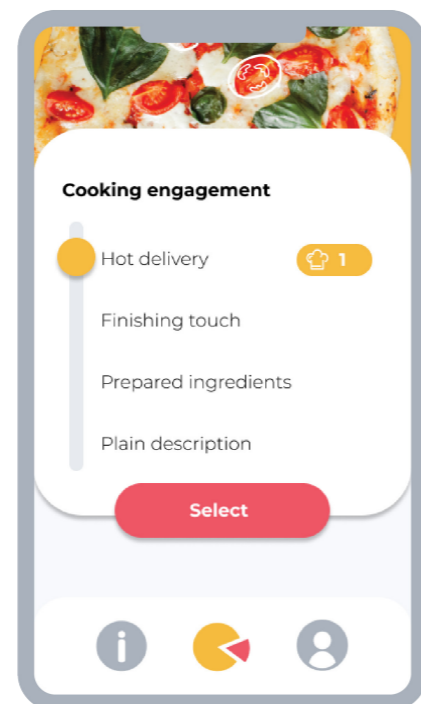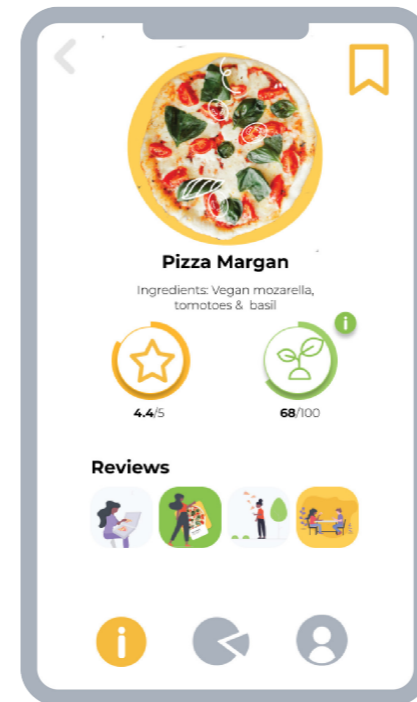
### 1 CREATE

Create your tasting profile by filling in the questionnaire. The tasting profile personifies the user based on creative and fun questions. Some of the questions use the commitment strategy. Committing sustainability will result in more sustainable matches. (McKenzie-Mohr, 2011).
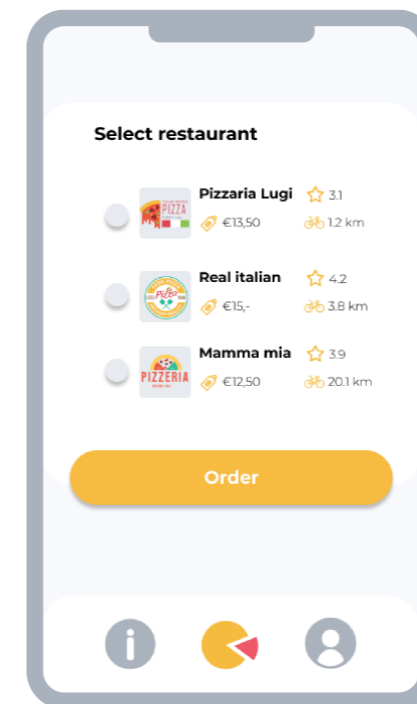
### 3 SELECT

Select the level of cooking and collect cooking points. Users can simplify the cooking process and order a hot meal. The action could require minimal effort so consumers are more likely to perform the desired behaviour (Eyal, 2014).

### 4 ORDER

Finalise the order and choose a restaurant to deliver your meal. Apply the choosing criteria covering delivery distance, price and rating. Pay for the order and wait for the food to arrive.

Open the notification and capture your food celebration. Choose whether you want to save it on your private or public account.

### 5 SAVE

Save food celebrations. The users put little time and effort to make the gallery. This small investment stores value and hook them to the application (Eyal, 2014).

## MACHINE LEARNING

The matching process uses smart Artificial Intelligence (AI) to help the consumer make better and faster decisions. The AI advises the consumer by showing options and empower the consumer to make the right choice.

The AI system is able to learn and reason based on data, feedback and historical patterns (Deloitte, 2018). The system utilises machine learning to independently solve complex problems and improve self-learning. Training the system with knowledge about which food preferences match a certain meal and understanding the user is the essence of the AI. Meal Matchers generate a feedback loop because swipes left (mistake) or right (match) tells the system how to improve for next time.

The AI used for Meal Matchers uses similar technology as Netflix recommendations, Tinder or Zalando's Zalon shopping advice. All those examples use previous user data to advise the user. However, Meal Matchers adds a more unconscious strategy that nudges the consumer choice towards the desired direction and surprises the consumer. The system knows that meals with a high sustainability score are desired in the backend and therefore nudges the user to become as sustainable as possible. The system looks for the boundary of the consumer related to the taste preferences but improves on sustainability.

*Figure 37 - Meal Matchers' fundamental eco-system*

*Figure 36 - Meal Matchers home screen*

### 15.4 ECOSYSTEM

The most important stakeholders in the ecosystem are the local restaurants, chefs and consumers. This ecosystem includes multiple value streams, leading to a system of value exchange. The main value stream controls the food prepared by the restaurant, delivered via Meal Matchers and consumed by the consumer.

However, this ecosystem also includes other value streams. When consumers connect to Meal Matchers they produce data about their taste preferences and purchases. This data is a valuable income source of Meal Matchers and can be exchanged with restaurants and chefs. With this information, they are able to better understand the consumer's wishes which could serve as a new inspiration for new recipes.

The design of the ecosystem captures all elements of food consumption in a new logic with new relationships. Every stakeholder obtains value and the platform of

Meal Matchers connects the value streams. The ecosystem in figure 37 explains the fundamental value exchanges, however, in different development phases, the value exchange changes over time and other relevant stakeholders are included. Those details are further explained in chapter 17.5.

### 15.5 TAKEAWAYS

• Meal Matchers is a digital meal generator connecting consumer needs with meals.

• Meal Matchers wants to normalise sustainable food consumption by simplifying action and personalisation.

• Meal Matchers offers an inspirational and educational platform about sustainable food consumption for multiple stakeholders.

# VALIDATION

## CHAPTER 16

The concept idea of Meal Matchers is validated with experts in the field and consumers. One on one interviews with experts and the 'aan onze keukentafel' community discussions derive new insights regarding the concept. During the validation process iterations and improvement on the details of the concept are applied.

### 16.1 EXPERT APPROACH

Product concept evaluation is used to validate the value of Meal Matchers. The validation aims to identify aspects from the concept that should be optimised. (Boeijen et al., 2013). The concept is evaluated by eight experts active in the Dutch food system. Every validation session starts with a pitch about the concept (the pitch slides are found in appendix H). Subsequently, the expert is asked to address their first reaction including feedback and questions. This illustrates unclarities and test viability and desirability. Every expert shares his knowledge and during the interview, feasibility aspects are discussed in more detail. Appendix I includes all insights of the expert interviews.

E1-     Strategist on Food & Health for a producer of innovative, creative and tasteful micro-vegetables.
E2-     Behavioural psychologist & implementation coach at Greendish
E3-     Program manager at stichting Voedsel Verbindt
E4-     Consumer insight specialist at the Future of Food institute
E5-     Co-founder of Dutch Cuisine and board member communication and culture
E6-     Concept developer at Albron and owner of the GreenHouse restaurant
E7-     Executive Chef at Hotelschool The Hague
E8-     Lecturer and researcher in marketing at the Hotelschool The Hague

### 16.2 EXPERT RESULTS

The interviews with eight experts result in multiple new insights. The insights are classified for strong and weak elements of the concept, possibilities and unclarities.

### EXPERT 1

*'I find it really innovative that you involve restaurants in your consumer personalized proposition.'*

Strong elements:
• Innovative that you use restaurants in your proposition.
• The concept is promising and includes a lot of potentials.

Weaker elements:
•Meal Matchers only works when the platform operates with large volumes.

Possibilities:
• Indicate how you are going to make an impact. After all, it opens up the conversation with the restaurants because it is tangible. Also, it will help to find financial support if you have clear numbers.
• The advice for implementation is to focus on one area at the beginning and ensure the right volumes of involved restaurants. After that reach out to consumers living in the area.

Unclarities:
• Select the right segment of restaurants to involve, since not every segment matches with the personality of Meal Matchers. Also, the segment should be willing to adapt according to consumer wishes.

### EXPERT 2

*'When you don't focus on sustainability you reach a broader audience.'*

Strong elements:
• Rewarding people for a sustainable choice clearly shows a positive side and diminishes resistance.
• With the concept, you serve both stakeholders the consumer and the foodservice by educating them and making sustainability more actionable.

Weaker elements:
• Make sure that Meal Matchers is still unique and beneficial for restaurants related to other delivery platforms while neglecting the sustainability aspect.

Possibilities:
• Ask the consumer, in the beginning, some general information so the AI directly anticipates.

Unclarities:
• Elaborate on the interactions with the restaurant and specify details. Make sure that it is easy and efficient for them to join.
• Explain how the restaurant receives value when the consumer chooses the recipe instead of the hot delivery.

### EXPERT 3

*'Connecting with local restaurants is the right starting point since they attract the right target group.'*

Strong elements:
• The personalised meal options make Meal Matchers stand out in the market.
• The community aspect act as an incentive for new matches between meals and consumers.

Weaker elements:
• Since the concept offers a lot of potential, make sure that you do not become the middle road because then you will lose your uniqueness.

Possibilities:
• Meal Matchers should be one step ahead of the consumer by sending the right triggers to increase engagement and ensure the influence on behaviour. Use the right notifications for this at the right moment.
• Make sure the consumer can compare meals based on the same criteria.

Unclarities:
• Illustrate the value of the restaurant for all the different engagement levels.
• Detail your revenue model and show how the stakeholders contribute to this.

### EXPERT 4

*'The nice thing about this concept is that you took all the elements that you need for a normal food experience, but you shuffled them and created a new combination that is still logic and offers a lot of possibilities.'*

Strong elements:
• Meal Matchers is educating and inspiring for all stakeholders.
• All the components of creating, making and eating are disconnected which creates a new window of opportunities.

Possibilities:
• Meal Matcher can use trial and error to test which nudges succeed.
• Passionate consumers can also take the role of a chef and receive a reward for their contribution.

Unclarities:
• Nudging is something different than matching. The goal of the AI should be to look for the acceptable boundaries of the consumer that is the most sustainable one.
Use the sustainable driver of Meal Matchers at the backend because sustainability is too abstract for consumers to understand the (personal) benefit.
• Detail your revenue model and show how the stakeholders contribute to this.

### EXPERT 5

*'The knowledge of the chef is invaluable.'*

Strong elements:
• The feedback loop inside Meal Matchers helps to motivate people because they receive the right information and are more engaged.
• Offering a meal is a unique way to serve and influence the consumer because other delivery platforms focus on a certain kitchen, location or opening hours.

Weaker elements:
• Make sure you do not break privacy regarding the consumer data.

Possibilities:
• The sustainability aspect needs to classify every meal with a score to make it understandable for all stakeholders.
• Make sure you do not interrupt the payment journey because that would be a reason why restaurants do not join Meal Matchers.
• Meal Matchers could also be a white label that is sold to big delivery platforms because then you use the volumes they already established.

Unclarities:
• For the restaurants, you need to make sure they can manage a changing menu and give them enough preparation time.
• The impact Meal Matchers is making should be tangible because it illustrates how to be sustainable instead of only informing.

### EXPERT 6

*'Adding personal input increases the engagement and internal motivation of the consumer.'*

Strong elements:
• Matchmaking between preferences and offer is a common principle used in the foodservice however the technology used at Meal Matchers makes it refreshing.
• The consumer is okay with sharing data because it creates a benefit. Meal Matchers is able to serve the consumer and the consumer likes to be served this way.
• Restaurants are willing to pay for the data, however, it is important to validate the value of the data from their perspective.

Weaker elements:
• It can be difficult to bring consumers to the platform and ensure a long term relationship with them. The application should stay relevant. Therefore the advice would be to have a free app consumer can easily join.
• Creating matches is the most difficult part because the consumer demand and the recipes should use the same classifications.

Possibilities:
• Using nutrients could be a possibility for classification.
• Other business also make use of a similar technology this ensures the feasibility of Meal Matchers.

Unclarities:
• Meal Matchers should be honourable to increase the quality of matches. Not every restaurant should try to meet all consumer preferences, because consumers lose trust in the platform and the quality of matches will be lower.

## EXPERT 7

*'Sustainability always sounds ideal on paper, however, my first-hand experience is that reality is more complicated.'*

Strong elements:
• Meal Matchers brings parties together where there is a lot of fragmentation in the market.
• Takeaway food is framed as unhealthy food, so you are unique when you can position this as healthy for the consumer and the planet.

Weaker elements:
• Do not underestimate the development of recipes. As a chef myself I also need some time to have new recipes and inspiration for a sustainable meal.
• Ensure a clear boundary about sustainability. There are a lot of possibilities but could also cause ambiguity.

Unclarities:
• If Meal Matchers wants to be a frontrunner, you need to be a frontrunner in sustainability as well, so create different steps that classify different levels of sustainability.

## EXPERT 8

*'I love the AI part, I believe this is what makes Meal Matchers unique!'*

Strong elements:
• The translation of the data into something actionable is what the restaurants need. If they experience it themselves it becomes easier to take action.

Possibilities:
• Make sure an average restaurant can use your data. Currently, restaurants do not use data, so they are not aware of the possibilities. The onboarding process should be as easy as possible.
• Use ambassadors as a market positioning and diffusion strategy.

Unclarities:
• The multisided platform of Meal Matchers involves a lot of possibilities however, make sure that you pick a focus and position this strong in the market.

## 16.3 CONSUMER APPROACH

Consumer validation is performed with the 'aan onze keukentafel' community of Future of Food Institute. In this community, consumers are asked to fill in questionnaires, do challenges and respond to fora on the website. The validation of Meal Matchers consists of three elements generating qualitative data and aims to test the clarity and relevance of the concept. The first element researches the value of food delivery. The second element tests the desirability of the matchmaking. The last element validates the need to share food celebrations in the community. The set-up of the consumer validation can be found in appendix J. The responses of the consumers are clustered in categories demonstrated in appendix K. The community does not reflect the target audience because most of them like to cook every day and not order meals. Besides they are not frequent users of social media platforms to share their experiences. Nonetheless, the discussions with the community addressed valuable insights.

## 16.4 CONSUMER RESULTS

The important insights of consumer validation are summarised in this chapter. Categories are explained and substantiated with fora responses of the community members. Responses are kept anonymous because of privacy.

### FOOD DELIVERY

Multiple community members mention the importance to support local restaurants when ordering food. Using their website is prefered so the consumer knows the restaurant does not pay a margin to the bigger platform.
*We are increasingly choosing to order directly at a local restaurant so we can support them in COVID times. This helps the restaurant to not pay money to bigger platforms.*

When ordering food, consumers know beforehand what they are going to eat (12/14) and an app is not influencing their choice. However, some consumers mention they know which cuisine they want and check the menu for the final choice. Only a few (2/14) use a delivery app as a source of inspiration.

Reviews or recommendations of peers are influencing food choices and help consumers to evaluate a choice.
*For me, the only thing what convinces me is the experiences of others, preferably people I know with a clear description of the meal, so I know what to expect.*

### MATCHMAKING

Consumers see Meal Matchers as a platform they can use to find inspiration when you have troubles deciding what to eat every day.
*I do not dislike cooking, I even like to cook, however deciding what to eat is somewhat a difficult task.*
Another benefit mentioned by consumers is the intermediate forms between delivery and cooking. It helps them to indicate time or offers a solution for difficult cooking techniques.
*I see it as an intermediate form between cooking everything myself, preparing and ready to use meals.*
The personal aspect is the biggest benefit according to the community because consumers can choose according to their needs without obligations.
*What I like is that I can change meals according to my needs and I can choose how it is delivered. Really nice and broad options.*

There are also reasons for a consumer to not use Meal Matchers. Some consumers do not need another source of inspiration and are satisfied with the current offer.
*When I need inspiration I have a shelf with cookbooks and magazines.*
Others see the suggestions of Meal Matchers as a threat to their own choice. They do not want to be told what to eat and believe the app is forcing a choice and take away the room to improvise.
*I am able to make my own good choices.*
Some people also do not acknowledge the unique advantage because there are many other places to search for new recipes.
*There are already many places where you can share and find recipes, for me, there is not any added value.*

For almost everyone the philosophy behind Meal Matchers is clear, only 1/10 consumer is confused about the matching aspect. 6/10 people raised questions about clarification on details of the application. Most frequently asked questions are about the possibility to save matches, subscription and financial obligations to use the application and the diversity of meals based on cuisine, ingredients and preferences.

### SHARING

The community is not a frequent user of social media platforms in their daily lives and does not feel the need to share food celebrations with others. Ten out of 16 community members mention they do not share experiences on social media.
*It feels like an obligation but I just want to enjoy it with my loved ones instead of with everybody.*

Some consumers keep food celebrations intimate and enjoy the moment and do not want strangers to interrupt.
*Food is meant to be enjoyed at home, alone or with others, but not with strangers in an application.*

Besides sharing information raises questions regarding privacy. Consumers want to know if their data is used and what the intentions are of Meal Matchers.

Reasons to share photos according to the consumers is when you are proud of your performance, to support the company with a good review or to capture details about preparation.
*I sometimes share a picture of a meal on Facebook when I am happy with the result because I am proud that I was able to make it.*

# BUSINESS DEVELOPMENT

## CHAPTER 17

In the paragraphs that follow, more details are given about the operation of Meal Matchers. The business model canvas shows an overview of the business operation, see figure 38.
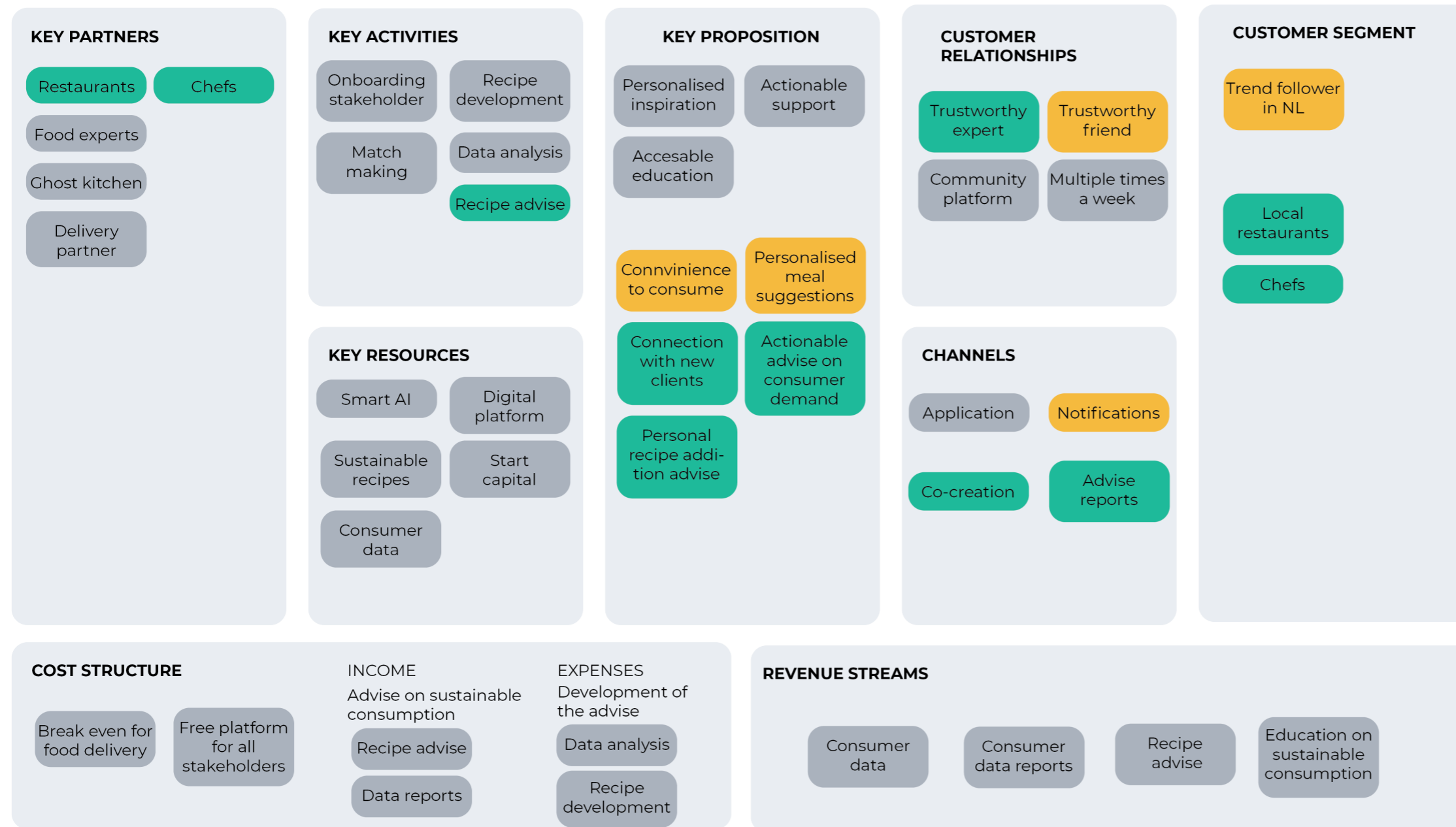
**KEY PARTNERS**
- Restaurants
- Chefs
- Food experts
- Ghost kitchen
- Delivery partner

**KEY ACTIVITIES**
- Onboarding stakeholder
- Recipe development
- Match making
- Data analysis
- Recipe advise

**KEY RESOURCES**
- Smart AI
- Digital platform
- Sustainable recipes
- Start capital
- Consumer data

**KEY PROPOSITION**
- Personalised inspiration
- Actionable support
- Accesable education
- Connvinience to consume
- Personalised meal suggestions
- Connection with new clients
- Actionable advise on consumer demand
- Personal recipe addition advise

**CUSTOMER RELATIONSHIPS**
- Trustworthy expert
- Trustworthy friend
- Community platform
- Multiple times a week

**CHANNELS**
- Application
- Notifications
- Co-creation
- Advise reports

**CUSTOMER SEGMENT**
- Trend follower in NL
- Local restaurants
- Chefs

**COST STRUCTURE**
- Break even for food delivery
- Free platform for all stakeholders

**INCOME**
Advise on sustainable consumption
- Recipe advise
- Data reports

**EXPENSES**
Development of the advise
- Data analysis
- Recipe development

**REVENUE STREAMS**
- Consumer data
- Consumer data reports
- Recipe advise
- Education on sustainable consumption

*Figure 38- Meal Matchers' fundamental eco-system*

## 17.1 STAKEHOLDERS

Meal Matchers includes four key stakeholders who will briefly be described in the paragraph.

The consumer is a trend follower who is looking for efficiency and convenience. The consumer is aged between 18-35 and enjoys the prime of his life full of social and professional activities, more details about the target consumer can be found in chapter 11.3.

The sustainable local restaurant is internally motivated to lower its impact. The restaurant offers meals that minimise the carbon footprint and value hospitality. The restaurant struggles to connect with consumers and aims to have a loyal customer base.

The local restaurant does not focus on sustainability and has a fixed customer base. The restaurants are less innovative but attempt to anticipate consumer demand. The local restaurant has little manpower increasing the work pressure, therefore they could use inspiration.

The chef has a passion for good and tasty food. He/ she would like to share his/her passion and has a lot of great ideas for recipes. The chef wants to be surrounded by like minded people. The mission of the chef is to make sustainability accessible.

## 17.2 IMPLEMENTATION

In the validation interviews, expert 5 and expert 1 correctly mention that the business model of Meal Matchers only actualises impact when the ecosystem carries large volumes. To realise those volumes a clear implementation strategy is crucial.

For the implementation, Meal Matchers starts small and focuses on a specific area because all stakeholders depend on the involvement of each other. For the restaurants, Meal Matchers needs to guarantee a number of purchases, alongside the consumers want a diverse offer of meals. Focussing on one city at the time allows Meal Matchers to meet both demands of the restaurants and the consumer.

The first step for implementation is to involve the restaurants and integrate their recipes into the platform. A collaboration with Stichting Duurzame horeca Leiden en omstreken helps to find the right restaurants and involve them. Stichting Duurzame horeca Leiden en omstreken is building a platform for consumers to compare sustainable restaurants, therefore they have close contacts with the foodservice industry.
The development of the sustainable recipe database needs to check and assess recipes based on a sustainability classification. For these assessments, Meal Matchers will collaborate with Dutch Cuisine. Dutch cuisine is currently developing a sustainability classification and this knowledge could be used for the recipe assessment of Meal Matcher. Another collaboration could be with Frank from Forkrangers. He has created a recipe book that teaches consumers about climate change and turns knowledge into action with recipes (Forkranger, n.d.).
The team of Meal Matchers needs to develop the mobile application including key features. The most important features are the development of the algorithm, recipe integration and matchmaking. Meal Matchers also need to set up a delivery system and payment system or find a partner for this. Meal Matchers needs financial support from investors for platform development.

After integration of all the recipes Meal Matchers is ready for market implementation. Marketing campaigns should connect consumers to the platform and the search for the ideal match is ready for take-off. When implementation steps are accomplished Meal Matchers develops according to the roadmap described in chapter 17.5.

## 17.3 GOALS

For explicit business development Meal Matchers aims to accomplish smart goals. Those goals are estimated guesses and need additional validation during concept development in later stages.

To market Meal Matchers the platform focuses only on one location and builds a solid ecosystem before entering another location. Meal Matchers starts in Leiden and cooperates with the 'Stichting Duurzame horeca Leiden en omstreken' to involve sustainable restaurants. At this moment circa 30 restaurants are the frontrunners of 'Stichting Duurzame horeca Leiden en omstreken' (Duurzaamuiteten, n.d.).
Meal Matchers wants to include 30 restaurants at the start.

Based on the menu of those restaurants it is estimated that a menu consists of at least five different recipes. In collaboration with Dutch Cuisine, Fork rangers and Hoge Hotel school Meal Matchers is able to check and classify all those recipes and fill a diverse database.
**Meal Matchers wants to have a sustainable recipe database of 150 different recipes at the start.**

Leiden has 125 000 citizens of which 37 000 are between the age of 25-45 (Alle Cijfers, 2020). The number of citizens is a predictive factor to estimate the possible consumers of Meal Matchers. The target consumer of Meal Matchers is aged between 25-40 however, other specifications are not included, so not everybody is a potential consumer. For market entry, Meal Matchers wants to involve around five per cent of citizens between 25-45 years old.
**Meal Matchers wants to include 2000 consumer members at the start.**

The food delivery and takeaway industry is growing in recent years and is expected to double the profit between 2014 and 2016 (Muilwijk et al., 2019). Research from 2016 estimated that an average Dutch consumer orders food once a week (NOS, 2016). The target audience is expected to order above average and the assumption is made that the average number of food orders has grown since 2016.
**Meal Matchers wants to receive 1.5 matches of every member every week on average.**

The involved sustainable restaurants are expected to review their menu together with Meal Matchers. Since the restaurant needs some time to prepare a new menu (interview E5). Menu change is estimated at two times a year.
**Meal Matchers wants to sell 2 recipe addition counsels to every restaurant every year.**

## 17.4 BUSINESS ACTIVITIES

Meal Matchers performs several activities during the platform operation. Those activities create value exchange between Meal Matchers and its stakeholder. In this paragraph, the activities are explained.

### ONBOARDING

Scouts from Meal Matchers reach out to potential restaurants to ask them to join the Meal Matchers platform. A restaurant gains access to the platform when they share their entire menu and recipes. When the restaurant isn't internally driven to be sustainable Meal Matchers demand them to add at least two sustainable recipes. However, Meal Matchers includes the entire menu even the non-sustainable recipes in the database. When the restaurant is on board they wait for matches.

Consumers download the application and create a taste profile. The taste profile is created based on an initial questionnaire but the taste profile updates based on previous matches and new questions. Consumers are willing to create a taste profile and share their data because the benefits of a better match are valued.

### MATCH MAKING

The AI technology classifies consumer taste preferences and recipes according to the same criteria. With objective criteria, Meal Matchers connects a consumer to a recipe and creates a match. The restaurant receives a match and prepares the meal ready for pick-up conformable the engagement level.

### RECIPE DEVELOPMENT

Co-creation sessions develop sustainable recipes. Meal Matchers host the co-creation sessions and participants co-create new recipes based on consumer data. The chefs us the co-creation results to finalise the recipe development. Meal Matchers assess every recipe and classify a sustainability score before adding it to the database.

### RECIPE ADDITION COUNSEL

Meal Matcher analyses the consumer data every month and creates a report with valuable insights. The data report states which meals are most popular and which matches include the lowest cooking engagement. Additionally, the report explains the
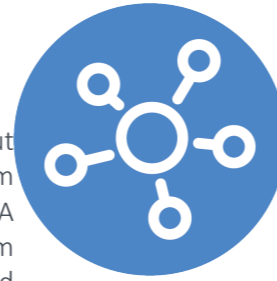
nudge strategy of Meal Matchers to illustrate the potential matches for the upcoming months. The indicators mentioned above form valuable knowledge for the restaurant to increase the number of matches and sales. The advice can be expanded with recipe suggestions.

### SUSTAINABLE CONSUMPTION EDUCATION

Meal Matchers has collected enough data about sustainable consumption to become an expert. Meal Matchers is going to use this knowledge and sell it to other interested stakeholders who need education or inspiration about sustainable consumption. This education could be data reports, webinars and creative sessions.

## 17.5 ROADMAP

The roadmap illustrates the development of Meal Matchers for the upcoming years, see figure 39.  The roadmap is divided into three horizons and every horizon has a specific focus.

### INVOLVE

In the first horizons, only chefs join the co-creation sessions. During those sessions, chefs analyse the consumer data and create at least five new recipes to be added to the database. In return, they receive a financial reward.

### CREATE

Sustainable restaurants have the opportunity to educate their employees during a co-creation session in the second horizon. Employees collaborate with chefs to develop recipes.

The community of Meal Matchers is growing and consumers can view activities of others and respond on the community page.

Meal Matchers is a learning platform that uses trial and error to test which nudges convince consumers to make a match. Those tests uncover the right strategy to enlarge the consumer boundary regarding sustainability and results in more sustainable matches.

### SPREAD

Chefs transform towards a digital restaurant. Those digital restaurants make use of a new collaboration with ghost kitchens. The chefs still develop recipes and approved recipes lead to more exposure to the digital restaurant. However, other stakeholders such as consumers with enough chef points and restaurants can also develop recipes. As a return, they will receive exposure to the restaurant or earn status in the community.

When a successful ecosystem is built in Leiden, Meal Matchers is going to expand to another city in the Netherlands.

In 2025 the consumers will increase the number of orders. An average member will use the platform twice a week leading to 104 orders every year.
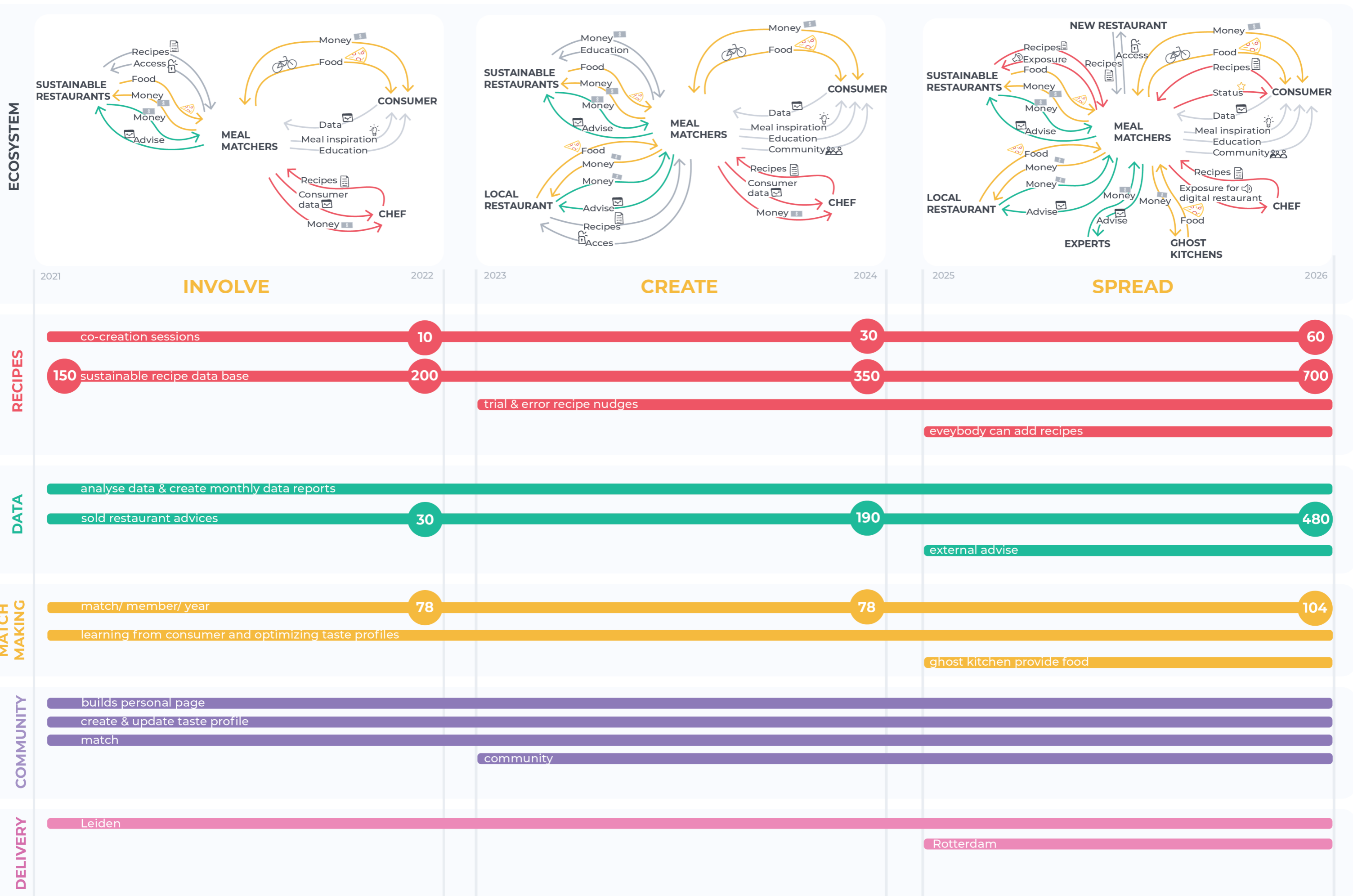
Figure 39 - Roadmap Meal Matchers

**ECOSYSTEM**

Panel 1 (INVOLVE):
- Recipes, Access, Food, Money, Money, Advise — SUSTAINABLE RESTAURANTS
- Money, Food — CONSUMER
- MEAL MATCHERS
- Data, Meal inspiration, Education
- Recipes, Consumer data, Money — CHEF

Panel 2 (CREATE):
- Money, Education, Food, Money, Money, Advise — SUSTAINABLE RESTAURANTS
- Money, Food — CONSUMER
- MEAL MATCHERS
- Data, Meal inspiration, Education, Community
- Food, Money, Money, Advise, Recipes, Acces — LOCAL RESTAURANT
- Recipes, Consumer data, Money — CHEF

Panel 3 (SPREAD):
- NEW RESTAURANT
- Recipes, Exposure, Food, Money, Money, Advise — SUSTAINABLE RESTAURANTS
- Access, Recipes
- Money, Food, Recipes, Status — CONSUMER
- MEAL MATCHERS
- Data, Meal inspiration, Education, Community
- Food, Money, Money, Advise — LOCAL RESTAURANT
- Money, Money, Advise, Food — EXPERTS
- GHOST KITCHENS
- Recipes, Exposure for digital restaurant — CHEF

**Timeline**

| 2021 | INVOLVE | 2022 | 2023 | CREATE | 2024 | 2025 | SPREAD | 2026 |

**RECIPES**
- co-creation sessions: 10 — 30 — 60
- sustainable recipe data base: 150 — 200 — 350 — 700
- trial & error recipe nudges
- eveybody can add recipes

**DATA**
- analyse data & create monthly data reports
- sold restaurant advices: 30 — 190 — 480
- external advise

**MATCH MAKING**
- match/ member/ year: 78 — 78 — 104
- learning from consumer and optimizing taste profiles
- ghost kitchen provide food

**COMMUNITY**
- builds personal page
- create & update taste profile
- match
- community

**DELIVERY**
- Leiden
- Rotterdam

## 17.6 REVENUE MODEL

Every activity is arranged with other stakeholders and therefore results in a specific cash flow. In this paragraph, the revenue model is explained.

### ONBOARDING

Meal Matchers should be a platform that is freely accessible for all stakeholders, otherwise, the money barrier would already stop them from joining.

### MATCHMAKING

Meal Matchers wants to have a break-even revenue model for the matchmaking and food value exchange. This means Meal Matchers is not generating profit based on the matches, but also not having unpaid expenses. This makes the platform attractive for the foodservice actors and gives Meal Matchers a unique positioning in the market compared to other delivery platforms.

### RECIPE DEVELOPMENT

Multiple stakeholders could develop a recipe in the horizons of the roadmap, however, the reward is dependent on time and stakeholder. In the first two horizons, the chefs are financially rewarded and this is an investment of Meal Matchers. However, in last horizons recipe development is rewarded with exposure. The incentive of exposure for the restaurants is a form of advertisement.

To make sure not everybody delivers recipes with poor quality, Meal Matchers checks the recipe and the recipes should pass a certain sustainability level. When this is not the case the recipe developer pays a fine.

### RECIPE ADDITION COUNSEL

The main revenue stream of Meal Matchers is the sale of consumer data. Meal Matchers creates the data report and sells recipe addition counsels. In future horizons, Meal Matchers sell their knowledge and expertise regarding sustainable consumption to other third parties as well.



*Figure 40 - Roadmap Meal Matchers*

## 17.7 IMPACT

The mission of Meal Matchers is to normalise the choice for sustainable food and adopt a new consumption behaviour that is better for the planet and better for consumers. For the consumer, the impact of consumption could feel rather abstract. Because of this, Meal Matchers calculates the impact of every match.

Sustainability can be measured in terms of multiple factors and could be complicated to understand. Meal Matchers want to keep things as simple as possible and that is why the impact is measured according to three factors related to the ingredients of the meals. By means of choosing sustainable, consumers replace animal proteins with plant proteins. Every meal that reduces animal protein intake has a positive impact on the environment. An average meal aims to meet the diet guidelines of 40% animal and 60% plant proteins (Muilwijk et al., 2019).

The detailed calculations regarding the impact are found in appendix L. The average impact of eating 1 Meal Matchers meal reduces 52 kg of CO2 emission, saves 944 litres of water and saves 4.5 square meters of land (Environmental Protection Agency [EPA], 2020).
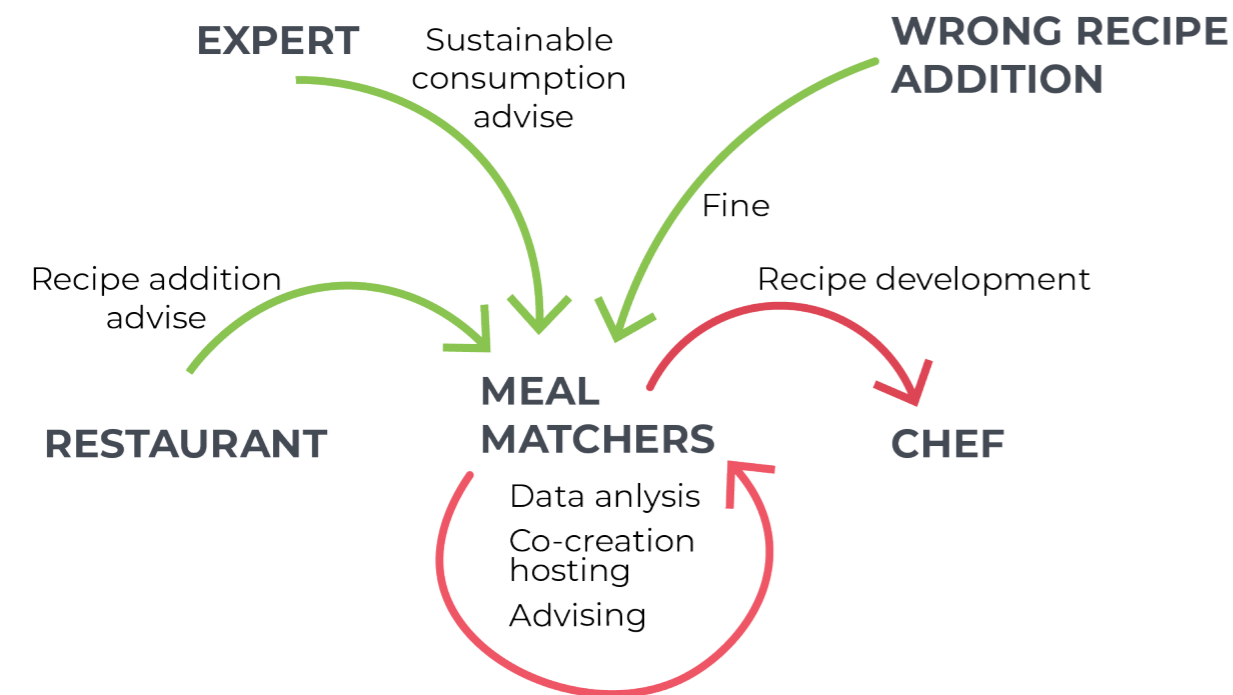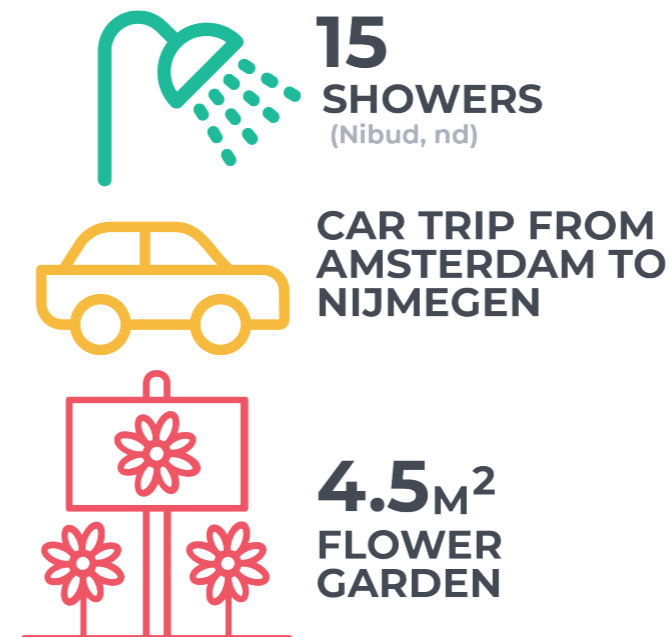


*Figure 41 - Visual representation of the impact of an average match.*

In the first year Meal Matchers estimated to have 156 000 orders. The estimated impact of Meal Matchers would then be a reduction of 8 million kg of CO2, saving 147 million litres of water and saving 700 000 square meters of land (Environmental Protection Agency [EPA], 2020).

In addition Meal Matchers could also result in other impacts. When the restaurant uses the Meal Matchers recipes they can also sell those meals without Meal Matchers. Restaurants could see the benefits of sustainability and start implementing other sustainable aspects such as reducing waste and using seasonal and local ingredients. The consumer is inspired by Meal Matchers and could make small changes in their lifestyle that represent sustainable food consumption behaviour. Another positive result would be a higher reduction of animal proteins compared to an average meal.



*Figure 42 - Visual representation of the impact of an average match.*

### 17.8 TAKEAWAYS

• The implementation strategy of Meal Matchers focuses on one area at the time.

• The key business activities of Meal Matchers are recipe classification, matchmaking and analysing consumer data.

• The recipe development is supported in the beginning but becomes self-sufficient in the future.

• The business model is a double-sided platform model and captures value for all stakeholders.

• The consumer data and actionable knowledge provide a viable way of making money.

• The average meal contributes to a sustainable planet and sustainable consumption system.

# POSITIONING

## CHAPTER 18

Strong positioning of Meal Matchers in the market is needed to attract the stakeholders. Analysis of the market shows the competitive advantage of Meal Matchers and a communication strategy indicates how to position these advantages.

### 18.1 COMPETITOR ANALYSIS

Meal Matchers functionality competes with the food delivery industry. Active competitors in the markets are Thuisbezorgd, UberEats, Deliveroo and the restaurant's delivery service.

The competitors differentiate themselves in different ways to attract new consumers.

**Uber Eats** Focuses on fast delivery and convenient character of food delivery (Cashback, 2020).

**Thuisbezorgd.nl** Offers multi-dimensional options and includes many possibilities (Cashback, 2020).

**deliveroo** Offers quality meals consumers would normally eat in a restaurant (Cashback, 2020)

Offers the authenticity of a restaurant and includes the local mindset.

Meal Matchers attracts consumers because it supports consumers in the decision process using smart technologies. Meal Matchers is more than a delivery app and therefore creates a unique position. The approach of Meal Matchers is unique because it starts with a meal instead of focussing on location, price or opening hours and therefore truly focuses on consumer convenience and guidance.

For the restaurants, Meal Matchers offers a unique advantage compared to competitors. Meal Matchers guides and educates the restaurant about consumer demand utilising data. Joining Meal Matcher gives a restaurant the possibility to better understand the consumer and become a data-driven organisation. Another advantage of Meal Matchers is the possibility to receive recipe advice. This feature inspires restaurants and makes the anticipation of consumer demand actionable.

The back-end focus on sustainability attracts a new target consumer compared the current customer base of local restaurants. Another benefit for the sustainable restaurant is the growth of exposure when developing recipes. For non-sustainable restaurants, Meal Matchers offers an easy entrance to sustainability. The trend about sustainable consumption is growing and restaurants feel the need to step in.

During the expert validation, some of the experts (E2 and E5) mention, to sell the technology of Meal Matchers to the big delivery platforms. They see a lot of potential in the technology however, the current market is already fragmented. Adding another delivery service would therefore miss unique features to compete. The unique features Meal Matchers offers compared to other delivery platforms are mentioned in previous paragraphs. Another reason is to not sell the technology, is control the achievement of the human and local mission of Meal Matchers. This does not match with the big delivery platforms because they focus on profit maximization.

### 18.2 COMMUNICATION STRATEGY

Meal Matchers covers a specific brand DNA and this should be communicated to all the stakeholders. To tell the brand story, a communication strategy is developed.

Most importantly, Meal Matchers should be a credible messenger that tells a story that is easy to remember (McKenzie-Mohr,2011). Stakeholders should trust Meal Matchers and value the advice given. Meal Matchers should illustrate their expertise in the field without disconnecting. It is important to educate the stakeholders when needed but not use difficult jargon or impose a choice. In addition, Meal Matchers communicates openly about their intentions and usage of data, so stakeholders know their privacy is guaranteed. Communication of Meal Matchers should be practical, positive and with a personal connection. This would help to shift behaviour because the communication relates to positive emotions, tangible outcomes and sympathetic support (White et al., 2019).

The communication with foodservice stakeholders is taken one step further. Meal Matchers is seen as a caregiver that showcases how to incorporate sustainability in daily operations. Sharing nudging strategies in data reports is an example of open and honest communication. The goal of this communication is to truly serve the stakeholder.

The consumer relates to the convenient aspect of food


*Figure 43 - Consumer journey with notification interruptions*


*Figure 44 - Notification when eating*

delivery. The convenience should be evident in the usage of the application with easy steps and accessible language. Communication should be fun and hook the consumer into the application. To increase consumer engagement with Meal Matcher the application uses notifications during the consumer journey, see figure 43.


*Figure 45 - Notifications to trigger application usage*

The communication strategy is also used for market diffusion. Users of Meal Matchers are able to share their food celebrations on existing social media channels to increase online visibility. Higher visibility supports rapid growth. In addition, it lowers the threshold to share food celebrations on existing social media accounts.


*Figure 46 -Instagram hightlight*

### 18.3 TAKEAWAYS

• The key value proposition is to offer personal inspiration, actionable support and accessible education for the stakeholders to realise sustainable food consumption.

• The stakeholder centred perspective provides Meal Matchers with a unique positioning in the market.

• Serving the stakeholders helps to build a trustful relationship. This relationship supports the identification of future needs to guarantee relevance in the future.

• The credibility and integrity of Meal Matchers are visible in all communication channels.

The final concept is evaluated according to desirability, feasibility and viability to demonstrate a clear overview of the current state of the concept. Key aspects of the concept are mentioned to explain what makes the concept desirable, feasible and viable.
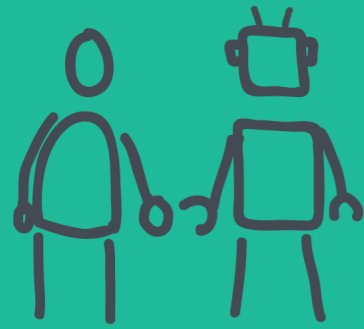
**AI FUTURE FRIEND**

### AI intertwined in daily life

The AI advice is trusted and accepted by the consumer. Usage of AI and data in the foodservice is disruptive innovation.

### Platform model

The system includes values for all stakeholders. Expert interviews already highlight the possibilities for future partnerships.

### Classification of sustainability

Research by multiple parties demonstrates that sustainability can be measured according to consumption patterns.

**Feasibility**

Can we do it?

**Viability**

Should we do it?

**Desirability**

Do others want it?
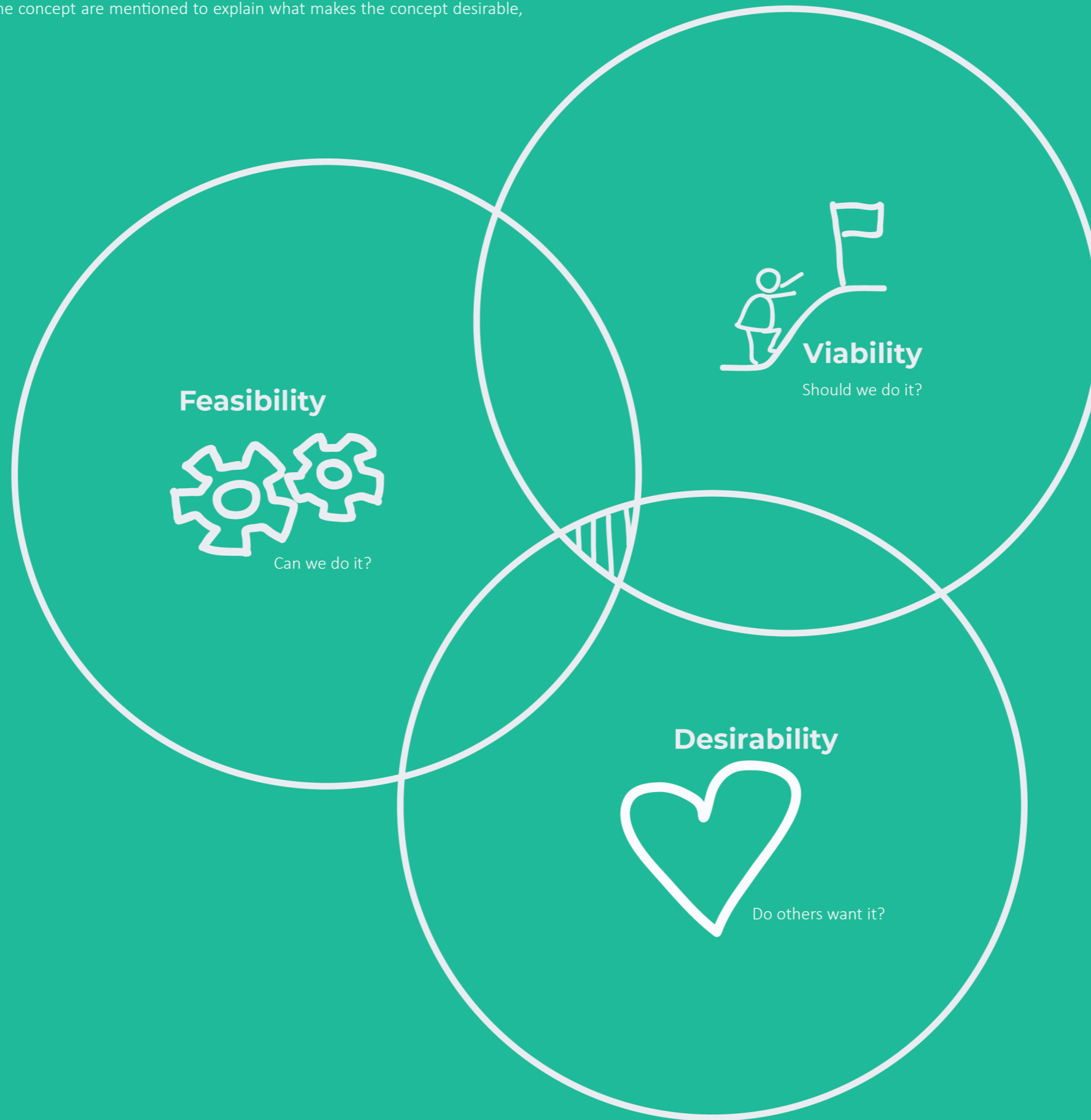
**CONTINIOUS LEARNING**

### Self-learning platform

There will be a continuous flow of new data and insights, the changing character is self-sufficient and stays relevant in the future.

### Consumer investment

The long term engagement results in a meaningful change in consumption behaviour and contributes to sustainable consumer demand.

### Value of data

The value of data increases in today's digital world. Meal Matchers analyses data and translates it into profitable insights.

**ACTION**

**KNOWLEDGE IN PRACTISE**

### Tangibility

Stakeholders know what to do and are supported to do it, instead of telling them why they should improve.

### Personal touch

A continuous flow of personal inspiration connects with the stakeholder instead of spreading a general message.

### Freedom of choice

Meal Matchers helps the stakeholders without pushing, the final decision lies within the power of the consumer.

# RECOMMENDATIONS

## CHAPTER 20

This chapter provides recommendations for Meal Matchers on how to implement and improve. Those recommendations are written in the perspective that Meal Matchers is a new start-up that enters the market because this is in line with future expectations of the project.

## 20.1 DESIRABLE MARKET POSITIONING

The final concept described in this thesis needs further validation and iterations before market implementation. The validation is needed to test the desirability of Meal Matchers and sharpen its market position for both sides of the platform.

### FOODSERVICE VALUE

Meal Matchers uses consumer data to advise the food industry. However, the data should be presented in the right way, so the foodservice stakeholders can work with it. Meal Matchers should explore, in the field, which insights and knowledge are needed. The translation of rough data into insights and actionable implementation is crucial. However, only foodservice stakeholders can explain which insights are useful. The advice would be to do research in the field and identify what an average chef in a local restaurant would need in order to be convinced of using the data reports of Meal Matchers.

### CONSUMER VALUE

Meal Matchers should use trial and error to find an attractive communication strategy. It is recommended to launch a beta version of the application. In this version of the application, the meal matching without food delivery can be used to test which meals appeal to the consumer and which triggers guide the consumer towards sustainable consumption. Besides, Meal Matchers can collect the first consumer data. More validation is needed to clarify the sharing aspect of Meal Matchers. The added value to share food celebrations in the application should be extra powerful. Analysis of existing social media platforms could guide the validation and uncover added value.

## 20.2 VIABLE REVENUE MODEL

The proposed revenue model generates income from data analysis. However, data analysis should be valuable for the buyer. As described in chapter 20.1 those reports should match the needs of the foodservice. An additional step in the validation process is to identify the financial value of those data reports and identify the urgency for advice. The urgency indicates the sales frequency of recipe addition counsels. Those insights confirm the information needed for financial planning.



*Figure 47 - Validation data reports*

## 20.3 FEASIBLE TECHNOLOGY

The matchmaking technology makes Meal Matchers unique. It is recommended to materialize the elements, matchmaking criteria and sustainability criteria, needed for the technology.

### MATCHMAKING CRITERIA

The first element is defining objective criteria that can be applied to consumer taste profiles as well as the recipes. If both aspects are classified with the same criteria, it is possible to make matches. The advice would be to use nutrients as criteria and estimate the taste profiles and recipes conforming to the criteria.
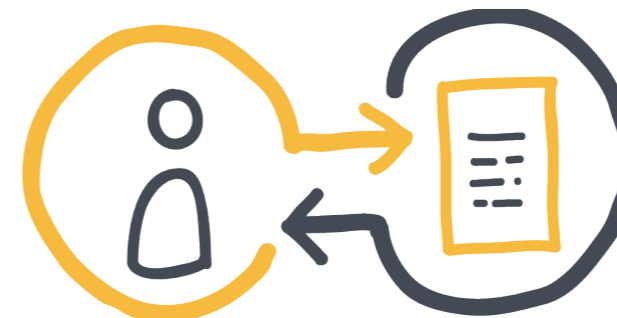


*Figure 48 - Matchmakig*

### SUSTAINABILITY CRITERIA

The other aspect of the technology is to classify and define sustainability. An algorithm needs to indicate a sustainability score for every recipe. The advice would be to collaborate with other parties and use their classification. It is recommended to start with a sustainability classification based on the reduction of animal proteins. However, in later stages, other aspects of sustainability, such as local and seasonal ingredients,  should be included as well. Important to notice is that communication towards the consumer about sustainability should be captured in one unifying score. However, the determination of the score should be visible for interested consumers.



*Figure 49 - Sustainability labelling*

## 20.4 FUTURE COLLABORATIONS

Meal Matchers is going to collaborate with multiple parties. Some of those collaboration options were suggested in the validation interviews and for other collaborations, a right partner still needs to be founded.

A collaboration with the Future of Food Institute is used to validate the consumer desirability of the application. Their consumer community is used for qualitative research. The next step is to improve communication and start quantitative consumer research.

For the next collaboration, multiple partners could be approached. The goal of the collaboration is to develop sustainable recipes as the start of the recipe database. For the creation of those recipes the Hoge Hotelschool Den Haag, Fork Ranger or Dutch Cuisine are potential partners.

To identify the needs regarding data insights in the kitchen with chefs, the network of Hoge Hotelschool Den Haag, Dutch Cuisine and stichting Duurzame horeca Leiden en omstreken is used.

Meal Matchers is going to reach out to potential investors, to generate a starting capital for the platform development. Investors can be found within the network of Flow Impact Fund.

For the technological aspects, Meal Matchers needs to find the right partner. This partner should be able to develop and maintain the platform and design the algorithms.

## 20.5 TAKEAWAYS

• Sharpen the market position and concretise the value proposition for consumer and foodservice stakeholders.

• Validate the financial value of consumer data with chefs.

• Research and define criteria for the matchmaking activities.

•Collaborate with partners to accelerate concept development & market implementation.

# CONCLUSION
## CHAPTER 21

The project started with a system perspective on food consumption in the Netherlands. A recap of the project briefs has shown how the change in consumer behaviour contributes to the transition. The design guidelines developed in this project are setting the direction for other interventions to be part of the food consumption transitions.
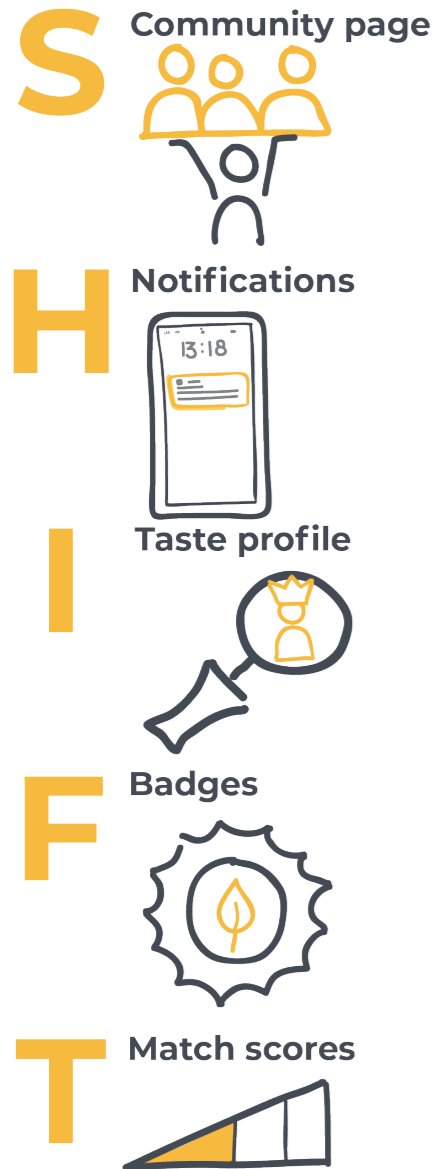


**S** Community page

**H** Notifications

**I** Taste profile

**F** Badges

**T** Match scores

*Figure 50 - SHIFT evaluation*

## 21.1 EVALUATION BEHAVIOUR CHANGE

Meal Matchers aims to change consumption behaviour of consumers, leading to a reduced intake of animal proteins and animal proteins being replaced by plant proteins. The SHIFT framework of White et al. evaluates which factors are applied for the design of Meal Matchers to change consumer behaviour (White et al., 2019). The SHIFT framework was used to assess the potential of the app to effectuate consumption behaviour change and the creation of a new habit.

### SOCIAL INFLUENCE

The community element of Meal Matchers defines social desirable behaviour. The favourable meals from the community represent a social norm. The personal account of a consumer defines their identity as a cook and sustainable user.

### HABIT FORMATION

The engagement of consumers results in frequent usage of the application. For habit formation, consumers should increase their usage. Notifications trigger the consumer to use the app frequently. In addition Meal Machters' community and personal gallery increase the relevance of the application.

### INDIVIDUAL SELF

The personal page reflects the behaviour of the consumer and therefore represents the consumer's identity. The taste profile also embodies the individual self. The meal suggestions are personalised advice and guide the individual consumer in the decision process to achieve consumption goals.

### FEELINGS AND COGNITIONS

The collected badges communicate a positive story towards the consumer and raise awareness about their behaviour. This feedback on the behaviour is communicated in a positive and personal language. Meal Matchers is supporting the cognitive process on decision making and provides additional knowledge when needed.

### TANGIBILITY

The meals of Meal Matchers are defined with one score about sustainable impact. Using a general classification for meals helps the consumer compare and choose. In addition, Meal Matchers focuses on the performance of the new behaviour, namely eating sustainably. Every action is made as concrete as possible in terms of impact and food experience.

Taken together, the evaluation of the SHIFT model suggests that Meal Matchers is able to change consumer behaviour. All factors that influence behaviour are covered in one or more elements of the concept. Therefore the concept includes all aspects to influence sustainable behaviour. However, implementation is needed to guarantee the success of Meal Matchers.

## 21.2 SYSTEM CHANGE

Meal Matchers has a positive influence on multiple aspects of the consumption system. For example, consumers using Meal Matchers perform new behaviour resulting in more sustainable purchases. Besides, the foodservice industry will anticipate with a new menu. The change of both actors suggests that the consumer demand changes towards a more sustainable direction. Considering the feedback loop related to the consumption system, a new demand requires a reaction of offer and supply (Geels et al., 2017). When Meal Matchers succeeds to scale up, this will lead to a change in the behaviour of the actors responsible for offer and supply. As a consequence, the feedback loop will become more sustainable. Another aspect to drive other actors is the commercial proof of sustainable consumption provided by Meal Matchers.
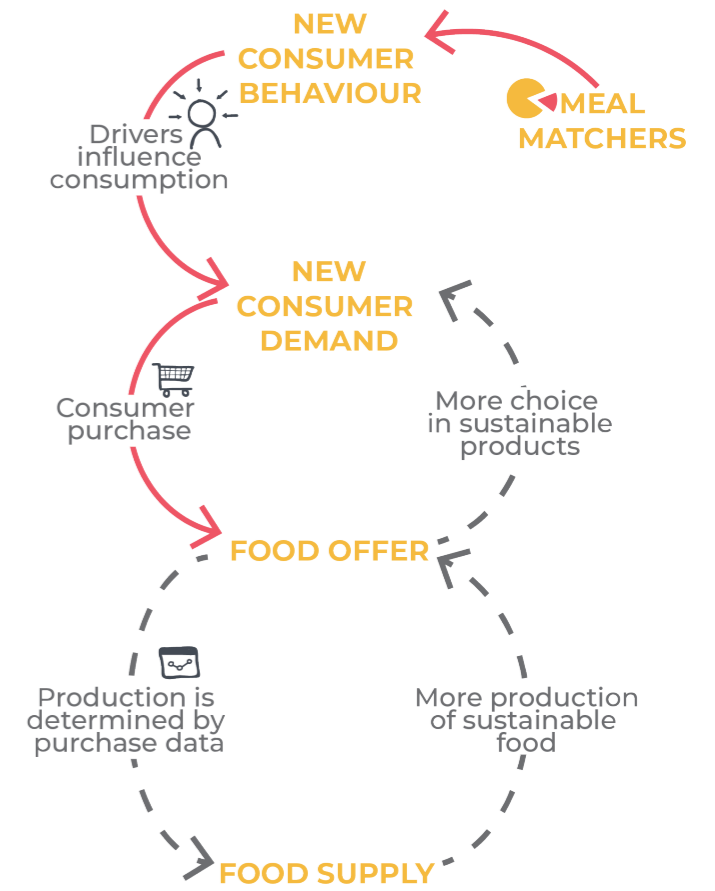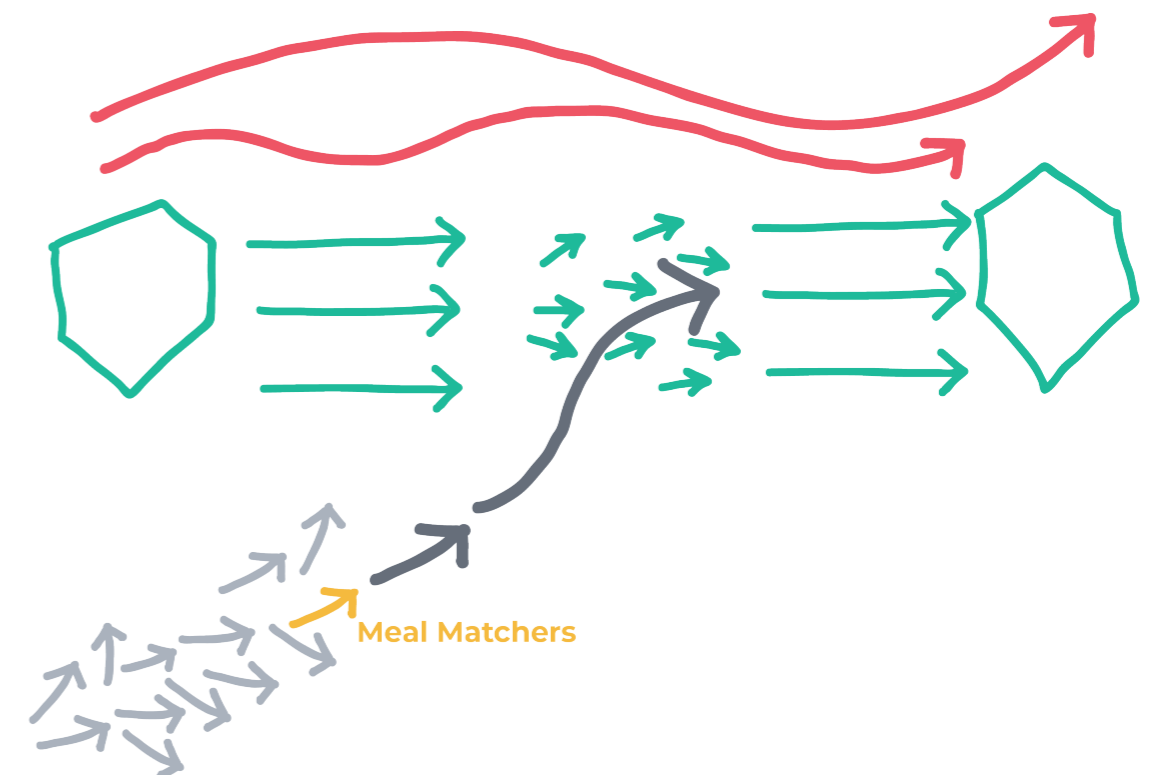


*Figure 51 - A sustainable feedback loop*



*Figure 52 - Multi-level perspective including the Meal Matchers innovation*

## 21.3 INTERVENTION DESIGN GUIDELINES

The transition of the consumption system can only be realised when momentum is created. This momentum grows when multiple innovations are linked together and are acting in combination to reconfigure systems (Geels et al., 2017). The alignment of those niche innovations is called a bottom-up strategy to change the existing regime. Meal Matchers was analysed and as a conclusion design guidelines were defined. Those guidelines are a helpful tool to create a coherent strategy for the consumption industry and set the direction for future innovations.

### EMPOWER THE CONSUMER
Support and guide the consumer to perform new behaviour. However, make this new behaviour as easy as possible without forcing them to do it.

### PUT FOOD IN THE CONTEXT
Use the experience around the consumption behaviour and place it in a case-specific context.

### CONSCIOUS VS UNCONSCIOUS
Find the balance between conscious behaviour changes and unconscious nudging strategies.

### CONNECT TO THE CONSUMER
Deeply understand your consumer and connect on the same level of knowledge with positive feedback.

### PROOF OF CONCEPT
Measure the change and indicate the consequences, so others can see the impact of the intervention based on commercial success.

### COLLABORATE
Bring actors together in a new ecosystem that includes equal value for every actor with shared responsibility.

### TRANSPARENCY
Be open about the definition and implications of sustainability. Besides, use honest communication about the goal and mission of the intervention.

### BE BOLD
Be aware of the systems' functions but also challenge them. Do not forget the bigger picture and be creative.

### 21.4 TAKEAWAYS

• All elements of the SHIFT model are covered in the application of Meal Matchers and show the potential to change consumer behaviour.

• Changing the behaviour of consumers as well as the foodservice actors illustrate the potential to break the feedback loop of the consumption system.

• Design guidelines reveal how other innovations can align to increase momentum for the transition of the consumption system.

## PERSONAL REFLECTION
### CHAPTER 22

Reflecting on my graduation journey, I can see a steep learning curve in professional and personal ambitions.

During my project I experienced first hand what systemic design contains. I value the abstract vision and thorough analysis of a problem, but also the tangible level with concrete propositions should not be forgotten. During my project I experienced that it is necessary to continuously switch between those different levels. Otherwise insights become messy. During my project I experienced that visualizing information helped to structure my thoughts and communicate with others.
Using my holistic and broad knowledge to design a tangible solution sometimes felt as impossible, because how could a small solution realise a big impact. I would advise others to take time to let your (research) knowledge sink in and put your thoughts in order. For me cleaning, reading, talking about my project with non designers were helpful activities to translate from holistic to concrete. When I was able to put my thoughts into first ideas, I needed to be careful to not design a solution that ends up in the middle of the road and could solve everything. My validation and chats with peers and friends helped me to pitch my idea and define a focus.

I am very grateful for the inspiring interviews during my project. This helped me to see the profession of design in another perspective and broaden my network. Together with my company coach I have the ambition to continue with this project and at the same time starting my professional career. The combination feels as a gift and according to me this would be a great start to my professional career.
The interviews with multiple participants showed me the value of visualizations. I enjoyed using a drawing pad for the first time and started a new hobby of sketching. My visuals were of most support during my interviews, it helped to converge a lot of information and is a good conversation starter. Visualizing as a designer can be a difficult task because visuals are never perfect, but I experienced that unfinished visuals are of great use throughout my entire project.

Graduating in corona times is a challenging task for everyone, but also strengthens my learning journey. Looking back at my project I can say that I am more resilient than I would have expected beforehand. As my project progressed I felt more empowered and confident with what I was doing. Losing my company coach and getting hit by corona in one week was definitely the biggest challenge of my project. However, reflection showed my deep embedded positive mindset. I believe that this mindset is not only thanks to

me. It also shows that I am blessed with people around me who trigger me and unconditionally support me. This period has taught me that I am confident in working alone and that I can trust myself and the process to bring it to a successful end. On the other hand the value of a sparring partner or a team becomes more visible if you are quarantined with yourself. Check-ups with peers, the opportunity to go to the faculty and open conversations with my coaches helped me to not feel alone in my project.

Graduating in uncertain times emphasises that a design process is uncertain and co-evolutionary. Even Though I am a quite organised and structured person, I experienced that design is not linear. For me a co-evolutionary design process is a design process where there is room to learn and not only perform. This also means that not all hours should be productive. My project helped me to accept this and see the value of conceptual hours where I did not produce tangible results, but made a lot of intangible progress.
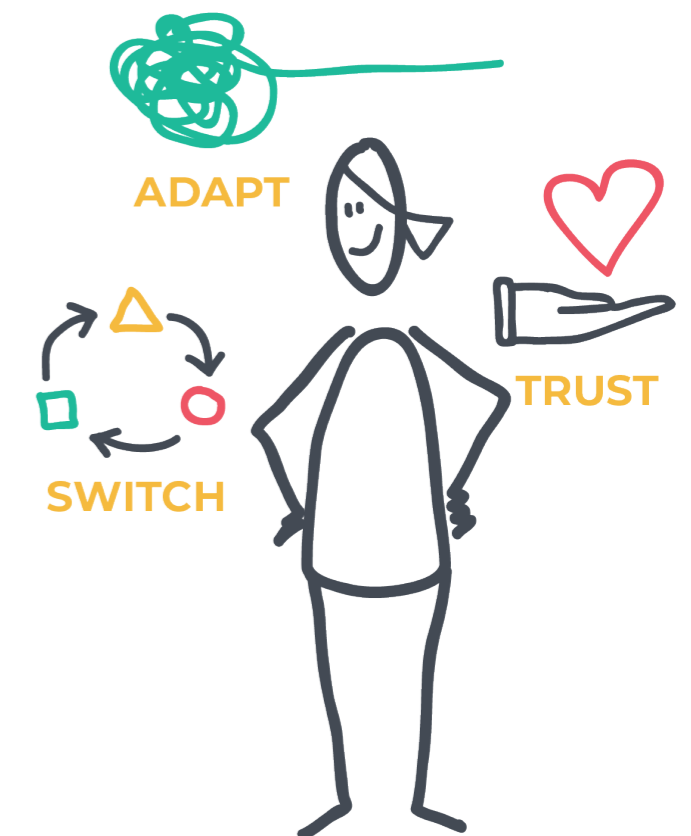
*Figure 53 - Personal reflection*

## APPENDICES

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