# Plant-based before boarding

Designing an intervention to support passengers in confidently choosing a plant-based sandwich at Schiphol Airport.

**Master thesis**

MSc. Strategic Product Design
Maxine Grobbink
20/03/2026

*“It is often the small steps, not the giant leaps, that bring about the most lasting change.”*

- Queen Elizabeth II

**Master thesis**
MSc. Strategic Product Design
Faculty of Industrial Design Engineering
Delft University of Technology
20-03-2026

**In collaboration with**
Royal Schiphol Group

**Author**
Maxine Grobbink
5002125

**Graduation committee**
Prof. Mr. Dr. Ir. S. Santema
Faculty of Industrial Design Engineering
Department Design, Organisation and Strategy (DOS)

Ir. S. Persaud
Faculty of Industrial Design Engineering
Department Sustainable Design Engineering (SDE)

**Company mentor**
Ir. M. Dijkhuizen
Healthy Environments Innovator
Innovation Hub, Royal Schiphol Group

# Preface

Dear reader,

This thesis report is the result of six months of working on a topic that, at first glance, might seem straightforward: getting people to choose a plant-based sandwich at the airport. ''*Just lower the price*'' is a comment I often got when explaining my topic. In practice, it turned out to be anything but that simple.

The project started with a broad brief and a lot of freedom, which made it both interesting and a challenge. Finding the right focus took time, as did learning how to navigate a complex organisation like Schiphol, essentially a city of its own. Besides the stakeholder management, this project gave me the chance to dive into behavioural psychology applied to travelling and food. Three topics I am genuinely passionate about. It turned out to be indeed very fascinating and it kept me motivated throughout the entire process.

This thesis was completed as part of the MSc Strategic Product Design programme at Delft University of Technology, in collaboration with the Innovation Hub of Royal Schiphol Group. It explores how design can influence food choices in the airport context, not through persuasion or sustainability messaging, but by making it feel like the best option.

I hope this report shows that meaningful change does not always require big systemic redesign. It can start with cutting a sandwich in half.

Enjoy reading!

Maxine Grobbink

Delft, March 2026

# Acknowledgements

This project would have been a completely different story without all the support, help and coaching from others.

First and foremost I want to thank my graduation team who gave me wisdom and direction throughout the project.

Stefan, thank you for being my mentor throughout this process. I always came out of our meetings with clarity and confidence. You gave me the personal motivation needed to push this project to something that I am proud of.

Sicco, thank you for being so involved and the discussions that challenged my vision on this project. You made me see the value of thinking small and 'plat Rotterdams', which resulted in a directly workable final design.

Micha, thank you for always trying to challenge me and connecting me with everyone. Your feedback has been nothing but useful and pragmatic, which was exactly what I needed during this academic rollercoaster.

I want to thank the whole team of the Innovation Hub who have made me feel very welcome from the start and made it fun to go to the office. You were always eager to help or brainstorm along, which really contributed to the quality of my final results. Also I want to thank all stakeholders who have been involved and who were open to co-operate and see the potential in my idea.

To my parents, I want to thank you for always supporting me and even participating in my research.

Thank you to my friends, who cheered me on and especially Julie, Femke and Imme who always made sure there was dinner waiting for me after the long days. Lastly, I want to thank Justus for supporting me and making it all feel a bit lighter.

# Glossary

| | |
|---|---|
| **F&B** | Food & Beverage |
| **RSG** | Royal Schiphol Group |
| **PSAT** | Passenger Satisfaction |
| **DC** | Design criterion |
| **MVP** | Minimum Viable Product |

**Choice environment**

The physical, informational and social context in which people make decisions.

**Nudging**

Subtly changing the choice environment to steer people towards a desired behaviour without restricting their freedom.

**Design intervention**

A deliberate design of a system, environment or interaction intended to influence how people behave, decide or experience a situation.

**Plant-based food**

Food products made entirely from plant-derived ingredients.

**Protein transition**

The societal shift away from animal-based proteins toward more sustainable plant-based and alternative protein sources, driven by environmental, health, and food security concerns.

**COM-B Model**

A behavioural framework stating that behaviour results from the interaction of Capability, Opportunity and Motivation.

**Minimum Viable Product (MVP)**

A simplified version of a concept or solution that includes only the essential features required to test its value and functionality with users.

**Co-creation**

A collaborative design process in which stakeholders, users or participants actively contribute ideas, experiences and insights to the development of solutions.

# Executive summary

Global food systems are under mounting pressure. Livestock production accounts for a disproportionate share of greenhouse gas emissions, driving an urgent societal shift toward more sustainable protein sources (Aiking et al., 2018). Airports, as high-volume food consumption environments, are both part of this problem and a meaningful opportunity for change. Royal Schiphol Group has committed to a 50% reduction in F&B-related $CO_2$ emissions by 2030, shifting its food assortment to 60% plant-based ingredients (RSG Sustainable Food Route, 2024). At the same time, Schiphol is working to improve its passenger satisfaction scores, which currently rank below comparable international hubs, with F&B experience scoring particularly low (Schiphol internal data, 2024). These two ambitions are in tension: plant-based options introduced so far have been largely rejected by passengers, risking both sustainability targets and commercial viability (Farrar et al., 2024). This project set out to answer:

*"How can a design intervention at Schiphol Airport nudge passengers towards sustainable food options?"*

The project followed a Human-Centered Design approach structured around the Double Diamond framework, combining desk research — covering protein transition literature, consumer behaviour theory including the COM-B model and nudging theory, and airport F&B trend analysis — with qualitative user research through travel diaries (n=5), semi-structured interviews (n=14) and terminal interviews (n=6). Findings were synthesised into an empathy map and a choosing mechanism model. A co-creation session with passengers surfaced and validated decision-making barriers.

Research revealed that passengers rely on familiar food as a coping strategy to make a confident choice during a stressful and uncertain travel day. The research insights identified three must have design criteria: familiar positioning, guidance and enabling imagination of taste. This created the following design challenge:

*"Design a guiding intervention that enables imagination of taste and builds familiarity around a plant-based sandwich at Loaf."*

After ideation, four distinct concepts were evaluated in a co-creation session and conversations with stakeholders. Further iterations were made and evaluated by an experiment with Schiphol employees (n=9) and through a between-subjects survey with passengers (n=27).

This led to the final design, *Your Schiphol Mix*. To build familiarity and reduce the cognitive load of choosing, Schiphol acts as a guiding selector — presenting a small, pre-selected set of sandwiches framed as reliable, travel-appropriate options, without explicitly referencing their plant-based nature. To enable imagination of taste and lower the perceived risk of trying something unfamiliar, a Mix & Match format allows passengers to combine two half sandwiches at no extra cost, letting them experience two flavours in one purchase with limited commitment. Finally, to address the anonymous nature of the airport environment, a personalised interaction is introduced in which the employee writes the passenger's name on the plate and uses it to wish them a nice flight, adding a small but meaningful hospitality gesture to the decision moment (ACI, 2025).

A terminal test validated the Mix & Match format: plant-based share rose from 16% to 21% — a 31% relative increase and an approximate 5% shift from animal-based choices — without explicitly promoting sustainability. Evaluation of the design was further done through on-site observations and passenger interviews (n=20), and stakeholder validation with HMSHost, counter staff, and Schiphol Commercial F&B. A lifecycle assessment shows this 5% shift alone could reduce emissions by roughly 44,500 kg $CO_2$eq per year at Loaf (RIVM, 2024; The Big Climate Database, 2024).

The concept fits within the existing Schiphol–HMSHost partnership and shows potential for scalability, although operational constraints during peak hours and the need to test the full concept in an integrated way mean that a phased approach is recommended, starting with Loaf as a pilot hub. Accelerating plant-based food in airports is not a matter of persuading sustainable communication, but of a smarter choice environment that adresses the passengers needs.

# Your Schiphol Mix

An intervention that supports passengers in confidently choosing a plant-based sandwich in the terminal.

## The project driver

Food production, particularly livestock farming, contributes significantly to global greenhouse gas emissions. At Schiphol Airport, this has led to an ambition to reduce the emissions of Food & Beverage (F&B) operations by shifting the assortment toward 60% plant-based ingredients by 2030.

However, in practice many passengers still choose animal-based options. The context of a travel day amplifies the need for familiar and predictable choices. Plant-based options often feel uncertain in taste and satisfaction, making them a riskier choice.

## Intervention elements

**1**

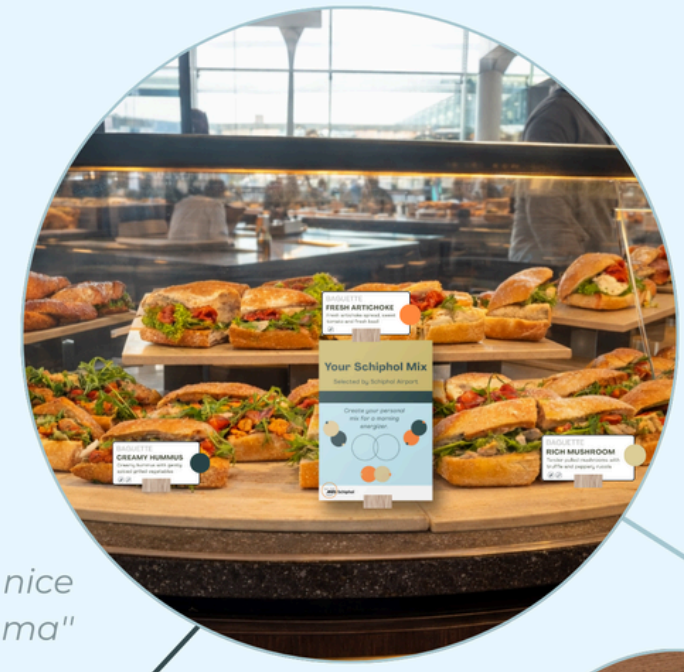
**Schiphol as guiding selector**
The mixes are presented as selections for your travel day, selected by Schiphol. This positions the airport as a more human and guiding presence, helping passengers feel supported in making a choice.

**2**

**Mix & Match format**
Passengers can **combine two half sandwiches**, allowing them to experience two flavours for the price of one in an engaging way. This increases the perceived value and lowers risk of choosing for one flavour. The sandwich is described by a fitting moment and sensory elements of the ingredients, helping passengers imagine the taste and satisfaction before choosing.

**3**

**Personal interaction**
The **passenger's name is written** on the plate and used to wish them a nice flight at checkout, creating a brief moment of human interaction and personal recognition in the otherwise anonymous airport environment.




*"Have a nice flight, Emma"*





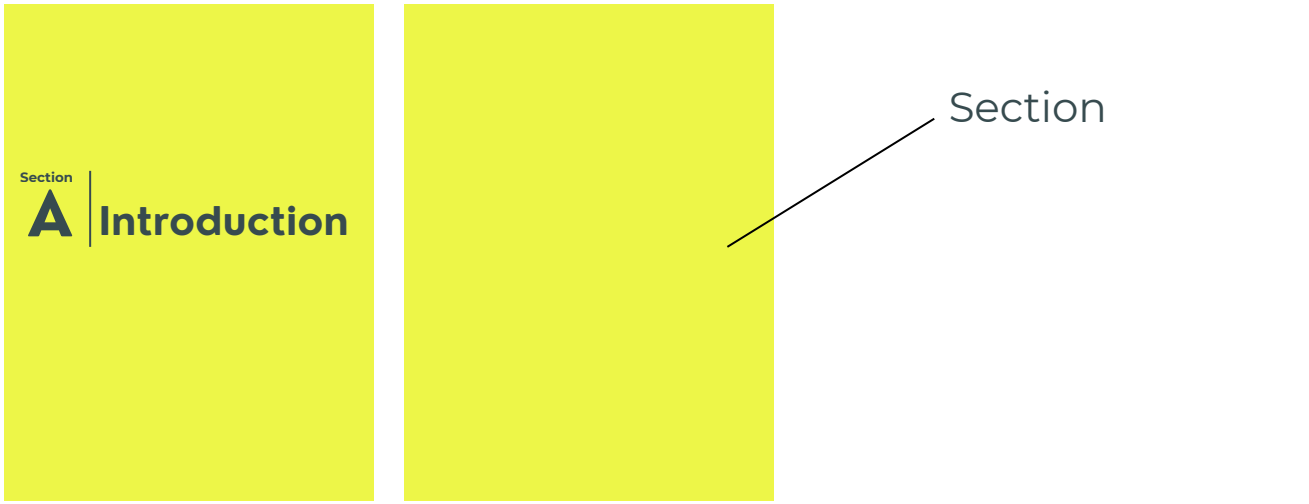
HMSHost ByAvolta
F&B Business partner

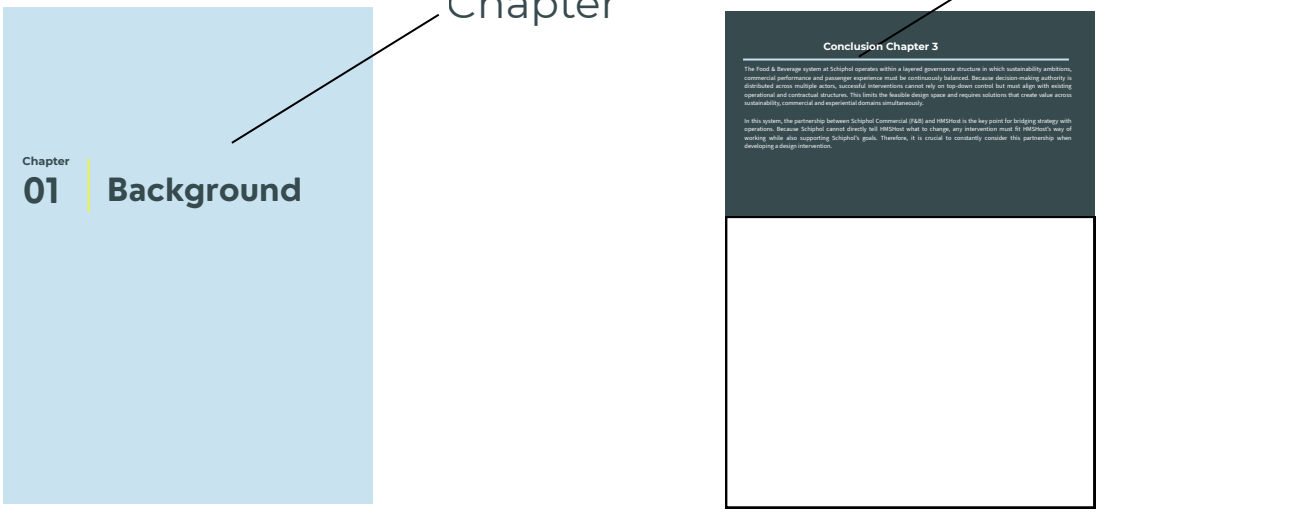
AMS Schiphol
Commercial

## Stakeholder fit

Your Schiphol Mix fosters collaboration within Schiphol's complex stakeholder partnership by offering a lightweight, testable intervention that fits HMSHost's existing operations while supporting Schiphol's plant-based ambitions.

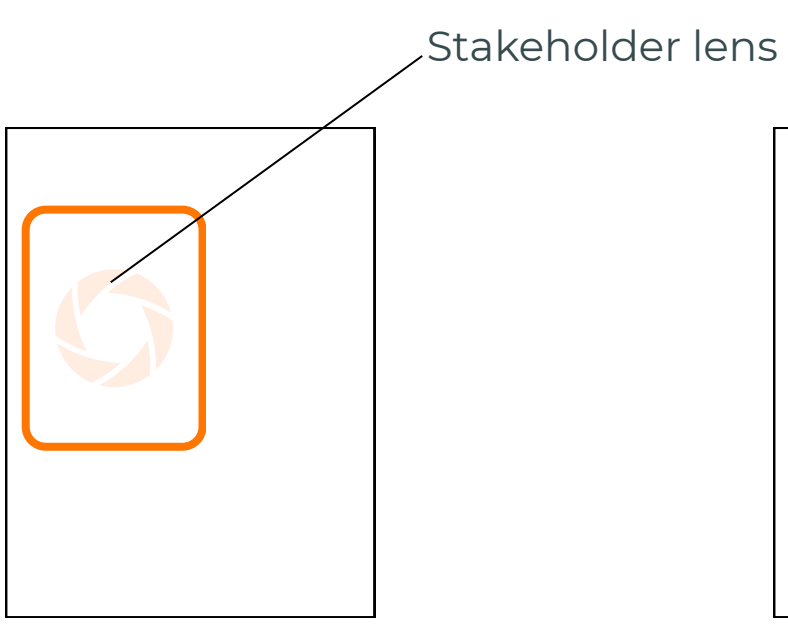
# Reading guide

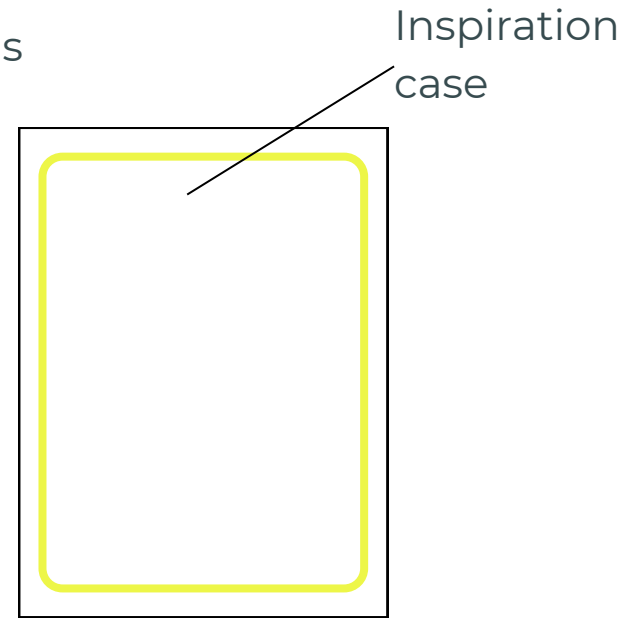








# Table of contents

## 12 Discussion and conclusion

Section

# A | Introduction

Airports are complex ecosystems where sustainability, passenger experience and commercial interests meet. As global mobility increases and air travel remains an integral part of modern life, airports are no longer perceived solely as transit infrastructures, but as experiential environments where passengers eat, shop, rest and spend significant amounts of time. Within this context, food and beverage (F&B) services play an increasingly important role, both as a contributor to passenger satisfaction and as a main source of non-aeronautical revenue for airports (ACI, 2025).

Royal Schiphol Group (RSG) has positioned sustainability as a core strategic priority and has committed to ambitious sustainability goals: emission-free and a 70% recycle rate by 2030 and climate-neutral by 2050. To support these ambitions, the Schiphol Innovation Hub (Healthy environments team) focuses on exploring, piloting and scaling innovations that reduce the environmental footprint of the terminal while maintaining a positive passenger experience.

While infrastructural and technological interventions are essential, achieving Schiphol's sustainability goals cannot rely on system-level changes alone. A significant portion of the airport's environmental impact is directly influenced by passenger behaviour. This is particularly the case within the Food & Beverage domain, where consumption collectively contributes to emissions (RSG Sustainable Food Route, 2024).

In this context, Schiphol has formulated a concrete sustainability ambition together with its F&B business partners: a 50% reduction in $CO_2$ emissions across total F&B practices by 2030. The road to this goal is called *The Sustainable Food Route*. In addition to certification, responsible sourcing and packaging reduction, a key strategy of *The Sustainable Food Route* is a gradual shift in the food assortment toward 60% plant-based ingredients (RSG Sustainable Food Route, 2024).

However, translating these sustainability ambitions into actual consumption behaviour remains challenging. Research shows that many consumers still perceive plant-based products as less attractive than meat-based alternatives. Simply adding plant-based options to the assortment does not automatically result in behavioural change. This creates a clear tension between system-level sustainability goals and passenger-level food choices (Farrar et al., 2024).

Achieving the intended environmental impact therefore depends not only on offering alternatives, but on how these options are positioned within decision-making patterns (Aiking & de Boer, 2018).

At the same time, many studies have explored how to encourage sustainable food choices in everyday settings such as supermarkets, cafeterias and workplaces. These studies do not only look at what people know or intend, but at how the environment influences their decisions. This approach is known as *nudging*, a theory by Thaler and Sustein. Nudging means adjusting the choice environment in small ways to steer behaviour, without removing options or changing prices. However the research on encouraging environmentally sustainable choices in complex environments such as airports remains limited (Blackford, 2021).

This project therefore aims to nudge passengers to plant-based food in the context of the airport through a design intervention.

Chapter

# 01 Background

The following chapter will further highlight the relevance of the project. The most important project domains and their relations will be explained: sustainability, commercial viability and passenger experience. Following that, the problem statement and assignment are introduced.

# 1.1 The protein transition and adoption

## Drivers for transition

In response to rising emissions from livestock production, a societal shift toward more sustainable protein sources is underway. This protein transition refers to the movement from animal-based proteins toward alternatives such as plant-based and more novel proteins (for example: micro biotics, cultured meat, seaweed and insects). Livestock production requires large amounts of land, water and energy, making alternative proteins essential for reducing environmental impact and ensuring long-term food security (Aiking et al., 2018). Figure 1 shows the significant difference in greenhouse gas emissions between livestock products and plant-based products.

$CO_2$eq represents the combined climate impact of carbon dioxide and other greenhouse gases such as methane that contribute to global warming, to create a holistic comparison (Our World In Data, 2020).

Beyond environmental urgency, the transition is also market-driven. Plant-based proteins are steadily growing in popularity on a global scale, with increasing investment from major food corporations and rising global demand for resource-efficient protein sources (Langyan et al., 2022; Mylan et al., 2023; Pyett et al., 2019).

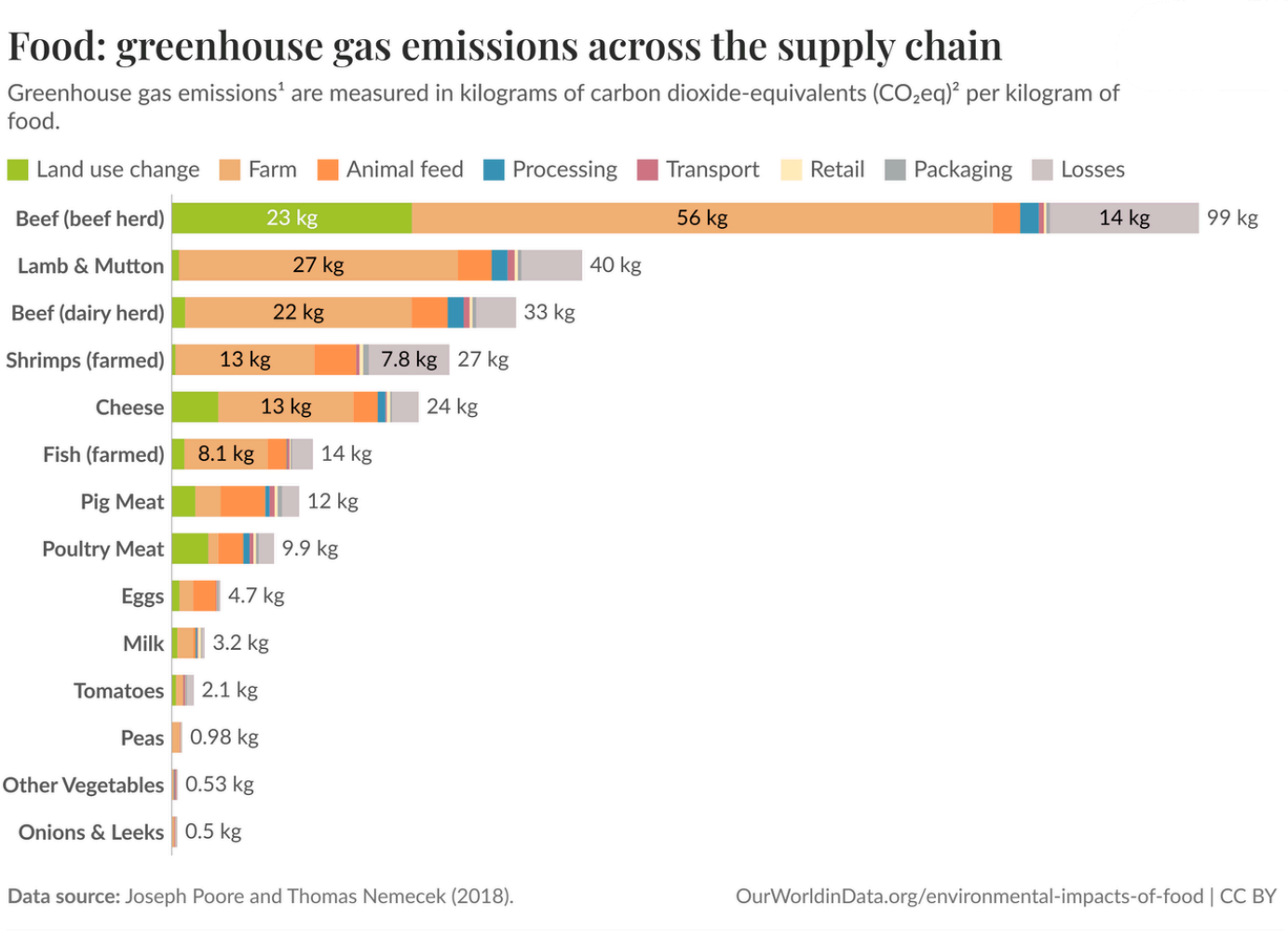



*Figure 1: Greenhouse gas emissions across the supply chain in $CO_2$eq (Our World In Data, 2020)*

## Adoption of protein alternatives

To assess which protein alternatives are relevant for the scope of this project, different protein types were positioned on the Gartner Hype Cycle in Figure 2 (Mohamed El-Had et al., 2023) and the Innovation Adoption Curve in Figure 3 (Onwezen et al., 2020; Wang et al., 2024). This analysis shows that plant-based proteins are currently the most mature and widely accepted alternative. They have moved beyond early hype and are increasingly adopted by mainstream consumers. In contrast, more novel proteins are still in earlier stages of development and acceptance, making them less suitable for short-term implementation. While the future of novel proteins is interesting, plant-based proteins offer a more short-term opportunity: they are mature enough to implement operationally, while still holding potential to shift consumption patterns.

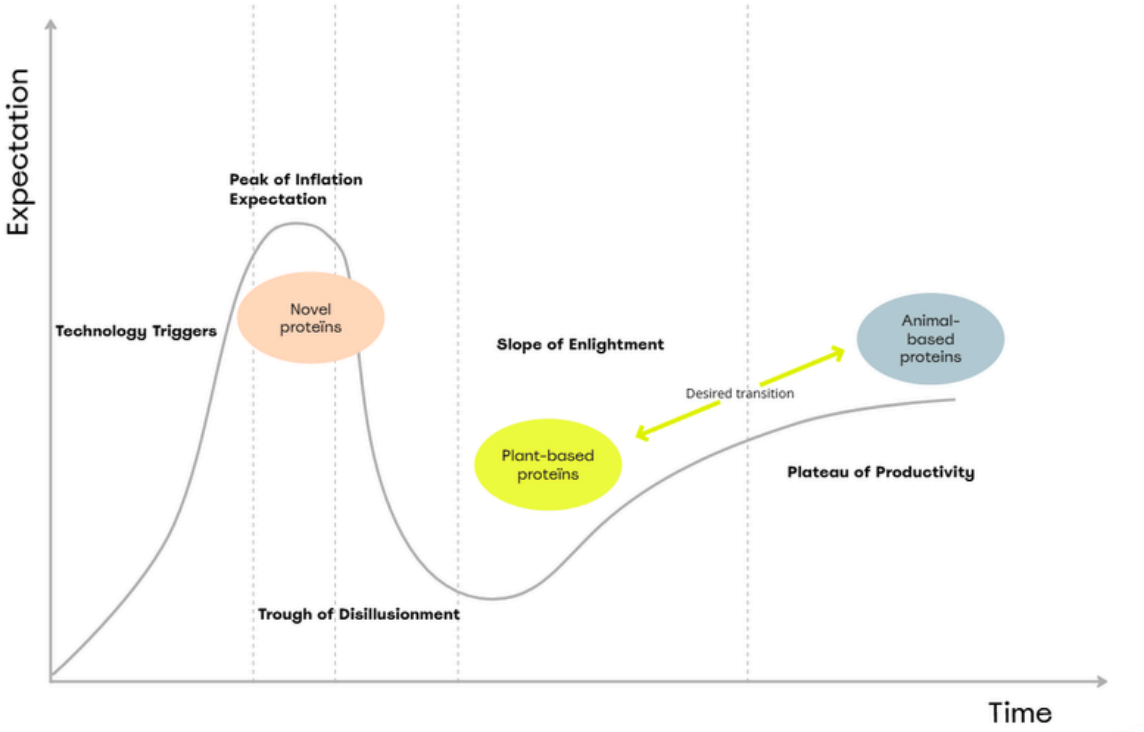



*Figure 2: Gartner Hype Cycle (validated by Rick Schifferstein, Professor of Food Design and Human–Product Interaction at TU Delft)*

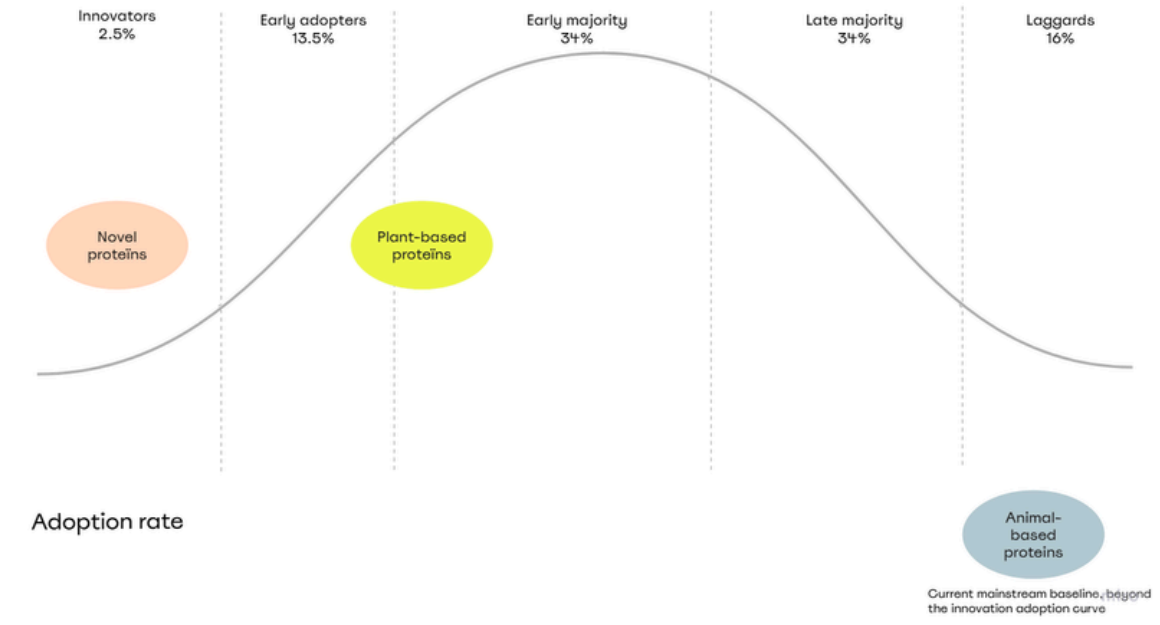



*Figure 3: Innovation adoption curve (validated by Rick Schifferstein, Professor of Food Design and Human–Product Interaction at TU Delft)*

## 1.2 Commercial driver

The commercial importance of F&B within airports continues to grow. Airport F&B is a multi-billion-dollar global market, with estimates valuing the sector at approximately USD 10 billion and serving billions of passengers annually. Non-aeronautical revenues, including F&B services, often outperform traditional aviation-related income streams and are crucial to the financial viability of airports.

At Schiphol, the airport operation itself does not generate profit because it operates in a regulated monopoly position within the Dutch airport network. As the main international airport in the Netherlands, aviation tariffs such as landing fees and passenger charges are regulated by the government to prevent excessive pricing. Because of this, Schiphol cannot generate significant profit from its core airport operations. Commercial activities such as Food & Beverage, retail and other non-aeronautical services therefore play an important role as sources of revenue.From a business perspective, sustainable food offerings must therefore not only reduce environmental impact but also remain attractive, profitable and aligned with passenger expectations (Pinna & Del Chiappa, 2011; Schiphol internal research, n.d.).

## 1.3 Passenger experience

Parallel to these developments, food experiences have become an increasingly influential factor in overall passenger satisfaction. Research from Schiphol shows that around 50% of the Schiphol passengers consume food or beverages at the airport (Schiphol internal data, 2024). A majority of global passengers considers dining an important part of their travel experience. Over 60% of Millennial and Gen Z travellers now associate airport quality with its F&B offering (Airport World, 2025). Lounges and terminal dining areas are no longer only functional spaces, but contribute to the emotional experience of the journey (Airport Dimensions, n.d.). Schiphol has been receiving low passenger satisfaction scores (PSAT) compared to comparable Airport Hubs. With an average PSAT-score of 3,84 (out of 5) and 3,00 for the F&B experience (overall + value for money). As Schiphol wants to retain their passenger satisfaction status, they are developing new concepts for a better passenger experience. However, the introduction of the plant-based offerings has upon till now been rejected by the majority of passengers, which conflicts with the ambition to improve the F&B experience scores (Sustainable Food Route event, 2025). Research on airport dining has mainly focused on commercial results, service quality and passenger satisfaction. The role of sustainability in food choices at airports has received far less attention.

This positions this project scope as a powerful, but underexplored point for shaping both experience and behaviour.

# 1.4 Problem statement and assignment

The transition toward more sustainable food offerings at Schiphol Airport faces a fundamental challenge: environmental impact depends not on availability alone, but on passenger choice. Despite the economic and experiential relevance of airport F&B, research into sustainable consumer behaviour within this specific context remains limited.

Despite ongoing efforts by Schiphol and its F&B partners to adapt assortments and operational practices, passenger acceptance and decision-making remain a bottleneck. When this bottleneck is not addressed, sustainable offerings risk underperforming commercially, weakening the business case for F&B business partners and constraining the scale and impact of sustainability initiatives.

This creates a reinforcing cycle: if sustainable options are chosen less frequently, their profitability declines, limiting their impact on emissions reduction and. Conversely, plant-based assortments that fail to respect passenger needs may feel forced or moralizing, negatively affecting the overall airport experience (Figure 4).

The core problem addressed in this report is the mismatch between how sustainable food options are presented in the terminal and how passengers perceive, evaluate and choose food under airport conditions.

To address this problem, design interventions can be used to influence behaviour. A **design intervention** refers to a deliberate design change intended to influence how people behave, decide or interact within that context. Such interventions can take many forms, including adjustments to the physical environment, the way information is presented, or the sequence of actions in a user journey (Boffi & Halse, 2020). One approach to implementing such interventions is **nudging**, a strategy that subtly steers choices by adjusting how options are presented without restricting freedom of choice (Rauscher and Zielke, 2019).

From this context, the following assignment is derived:

*"Design an intervention that nudges the passenger towards the plant-based food option in the Schiphol terminal"*

(a) Mutual influence: if PX improves, sales may rise. If passengers perceive poor value or quality, sales fall. Commercial choices (pricing, offer quality) shape PX too

(b) What's available and how it's priced/positioned affects the ease of making sustainable choices

(c) (Feedback) If passengers increasingly choose sustainable options, it can improve profitability of those items, reinforcing the commercial case

(d) The emotional and perceptual quality of the experience influences whether passengers are open to sustainable options

(e) (Feedback) If choosing sustainable food feels good, experience improves; if it feels "forced" or inferior, experience decreases

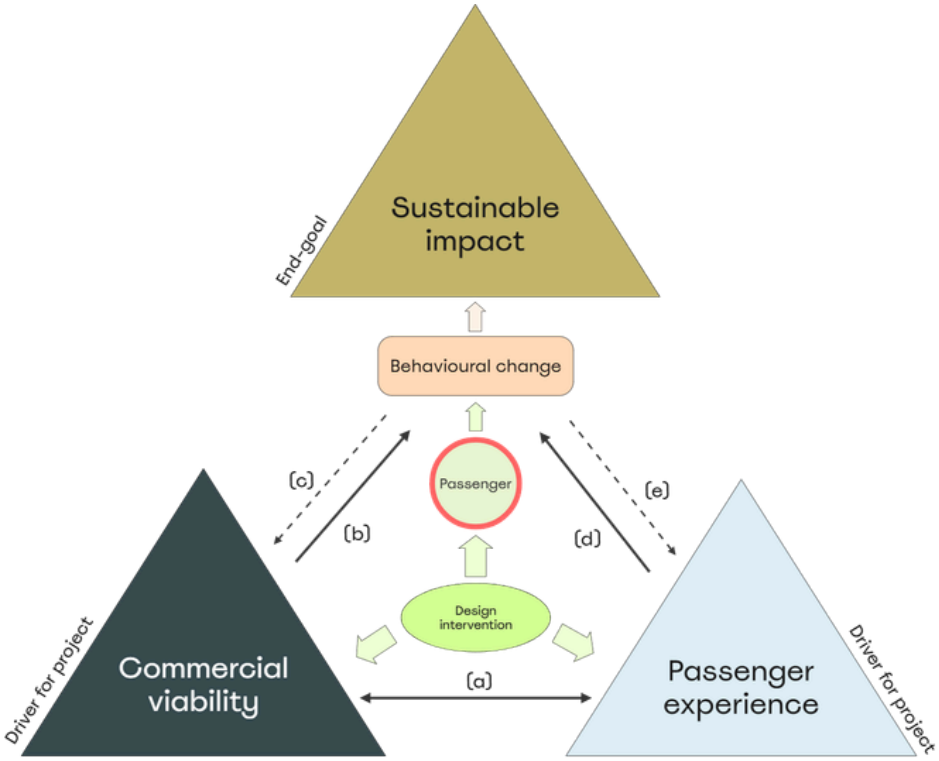



*Figure 4: Project domains and interrelations*

Chapter

# 02 Approach

The second chapter will give an overview of the research design and approach for the project.

# 2.1 Research questions

This project follows a qualitative, exploratory research approach aimed at understanding passenger food choice within the specific context of Schiphol Airport. The main research question leading the discover phase is:

> *"**How** can a design intervention at Schiphol Airport nudge passengers towards sustainable food options?"*

Sub questions:

1. Where in the Schiphol F&B environment do opportunities arise for intervening?
2. What are current consumer behaviours towards plant-based food?
3. How can you influence consumer behaviour?
4. How does the food decision making process of the passenger at Schiphol look like?

# 2.2 Methodology

### Human-Centered Design

This project is approached from a systems design perspective and is grounded in Human-Centered Design (HCD). Human-Centered Design puts people at the center of the design process and focuses on four key aspects (Interaction Design Foundation, 2021):

- understanding people and the context they are in
- understanding and solving underlying problems
- recognizing that you design in a complex system with interconnected parts
- translating insights into interventions

At its core, HCD is about building empathy and continuously considering the needs and experiences of users throughout the design process. This approach is especially relevant in the context of food, as food is not only a basic necessity but also closely linked to culture, habits and daily routines. By creating user-centric solutions, design is more likely to be relevant and desirable.

### Generative design research

This study applied generative design research, a method to access users' tacit and latent experiences by involving them in the design process. Generative methods position users as active contributors and provide creative tools that enable them to express experiences, associations and ideas. The design process using generative design is illustrated in Figure 5, where you can see how you move from data, information, knowledge back and forth to the creation process. This implies that this design process uses insights as input to co-creation and where the co-creation feeds insights back again (Sanders & Stappers, 2012).

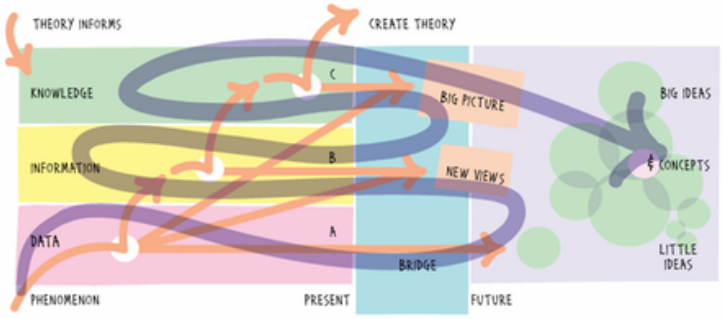



*Figure 5: Conceptual framework between generative research and design (Sanders & Stappers, 2012)*

In this project two co-creation sessions were conducted: one during the Define phase to prioritize the user's needs and wishes, and one during the Develop phase to test and refine intervention concepts. Through structured "make" exercises, participants externalized their sensory imagination and meanings around plant-based sandwiches. These insights all informed the final design of this project.

## Kumar's framework

In line with Kumar's description of applied research as a stepwise process for clarifying complex, real-world problems, the study is structured through four lenses: context, stakeholders, knowledge, and users (Figure 6) (Kumar, 1999). This supports a gradual narrowing from the broader system setting toward the lived experience of passengers.

The research first adopts a **context lens** to identify the boundaries of the project within the passenger journey and airport Food & Beverage environment. Schiphol internal research is used to detect relevant food outlets and food types.

As a part of defining the context a **stakeholder lens** examines the actors shaping sustainable F&B practices. Stakeholder interviews and mapping are used to clarify roles, objectives and areas of tension that influence how sustainable food is offered and evaluated.

Next, a **knowledge lens** gives the theoretical and empirical foundation by reviewing existing literature on passenger experience trends, consumer behaviour towards plant-based food and behavioural change.

Finally, a **user lens** forms the empirical core of the study, focusing on how passengers experience, interpret and act upon food choices in the terminal. In line with Creswell's emphasis on qualitative methods for capturing meaning and decision-making in context, diary studies, interviews, questionnaires and co-creation are used to reveal tacit and latent needs related to airport dining.

Together, this allows the project to move from situational understanding, theoretical grounding and in-depth user insight, providing a robust basis for defining passenger-centered design opportunities.
The selection of research methods in this project is guided by the level of insight needed to understand how passengers choose food. Drawing on qualitative research perspectives, the approach distinguishes between surface-level insights and deeper forms of user understanding (Figure 7).

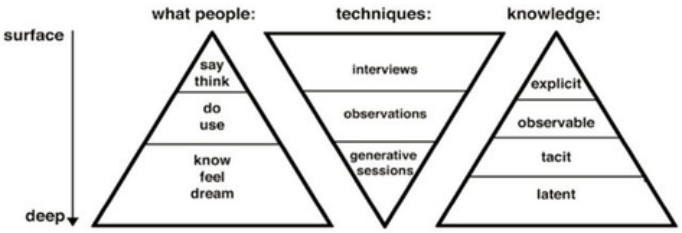



*Figure 7: Levels of user insight and corresponding research techniques, distinguishing between surface and deep knowledge (Sanders & Stappers, 2012)*

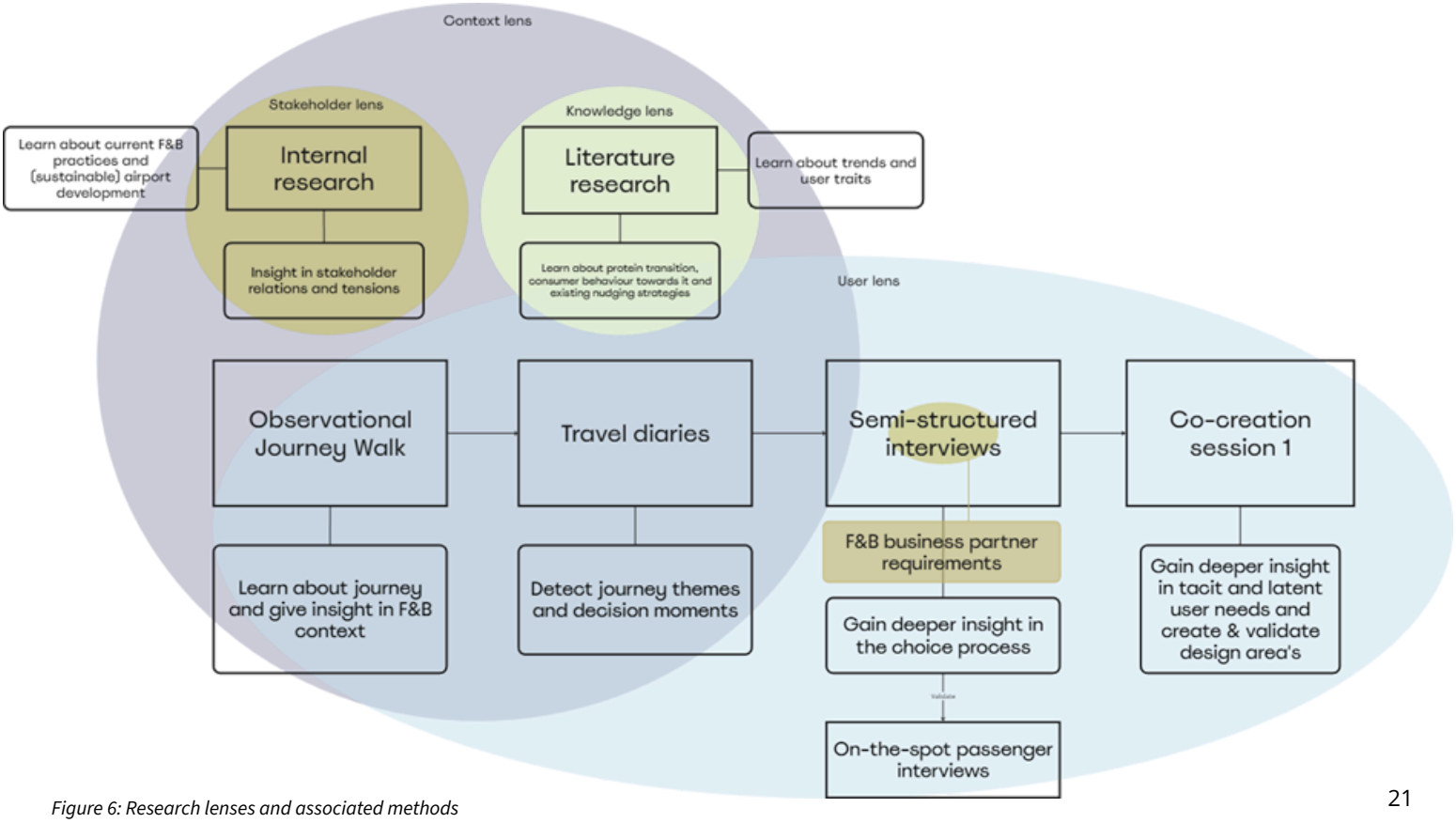
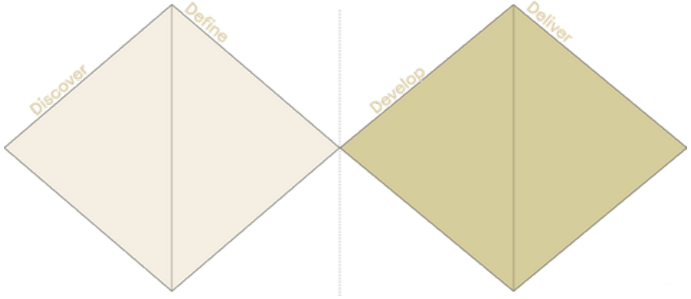



*Figure 6: Research lenses and associated methods*

# 2.3 Double diamond process




This project follows the double-diamond, a framework developed by Design Council (2004) where you go from diverging to converging two times. It consists of four phases in total:

**Discover** forms the foundation of the project and covers the largest part of the research. In this phase, the problem space is explored broadly through literature review, context analysis and user research in the terminal. The aim is to understand passenger behaviour, decision-making patterns and the specific dynamics of the Schiphol context.

To make the link between research insights and the design outcome clear, derived design criteria are indicated throughout the **Discover** section. In the conclusion of each chapter, insights are translated into preliminary **design criteria (DC.1, DC.2, etc.)**, which together form the basis for the final design criteria presented later in the report. An **overview** can be found on page 62.

**Define** synthesizes the insights gathered during the Discover phase. Key patterns, tensions and opportunity areas are identified and translated into a clear design direction and criteria. This phase narrows the problem space and formulates the central design challenge guiding the second diamond.

**Develop** focuses on exploring possible solutions through iterative prototyping. Concepts are generated, visualised and tested. Each iteration is evaluated against the design criteria to refine and sharpen the intervention (Figure 8).

**Deliver** translates the refined concept into a presentable and testable final design. The intervention is validated and evaluated in the real terminal environment as the ground for the further recommendations.

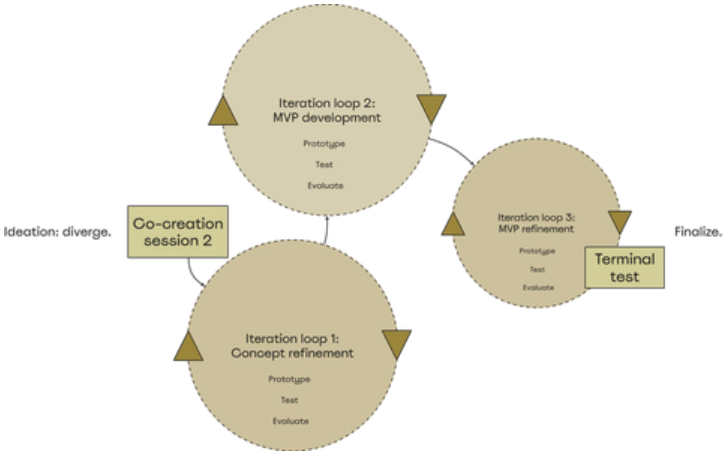



*Figure 8: Iteration loops of Develop and Deliver phase*

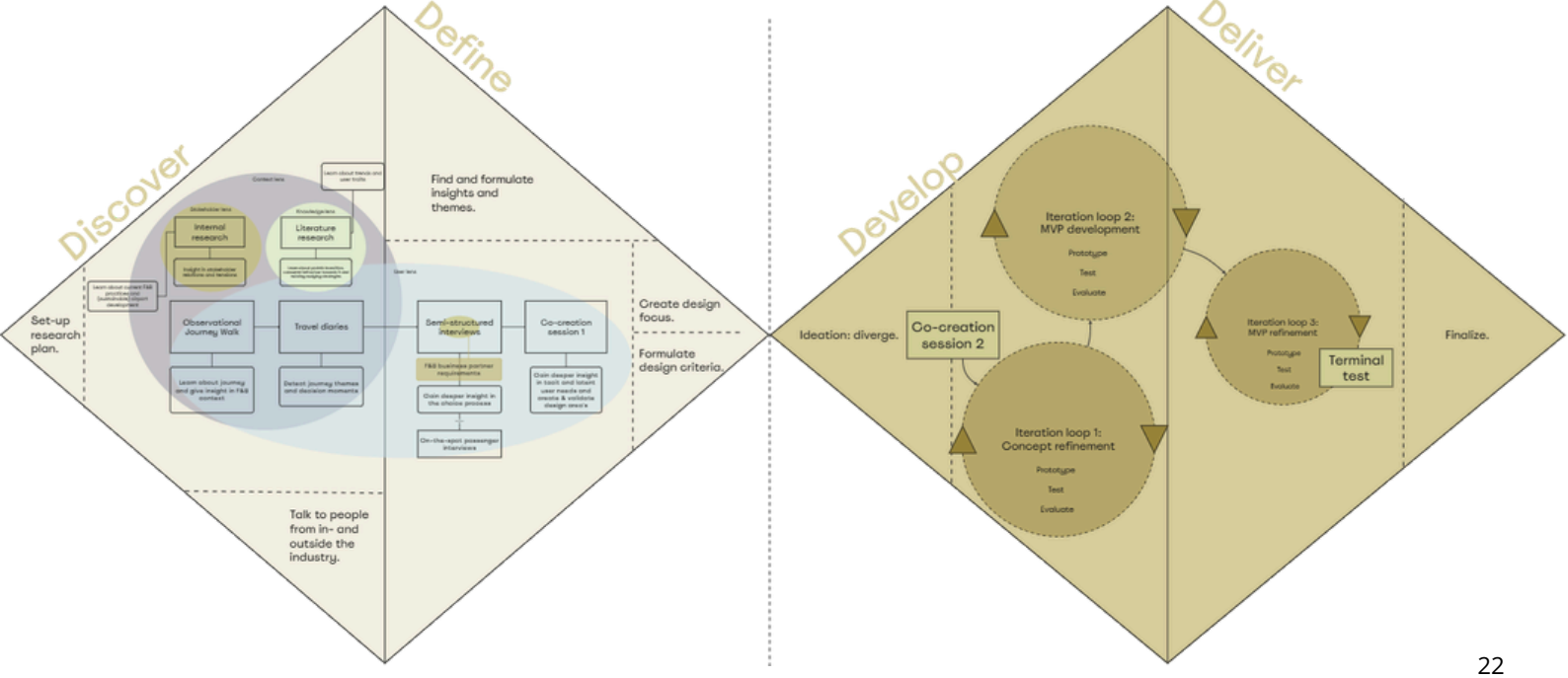



*Figure 9: Complete design process of the project*

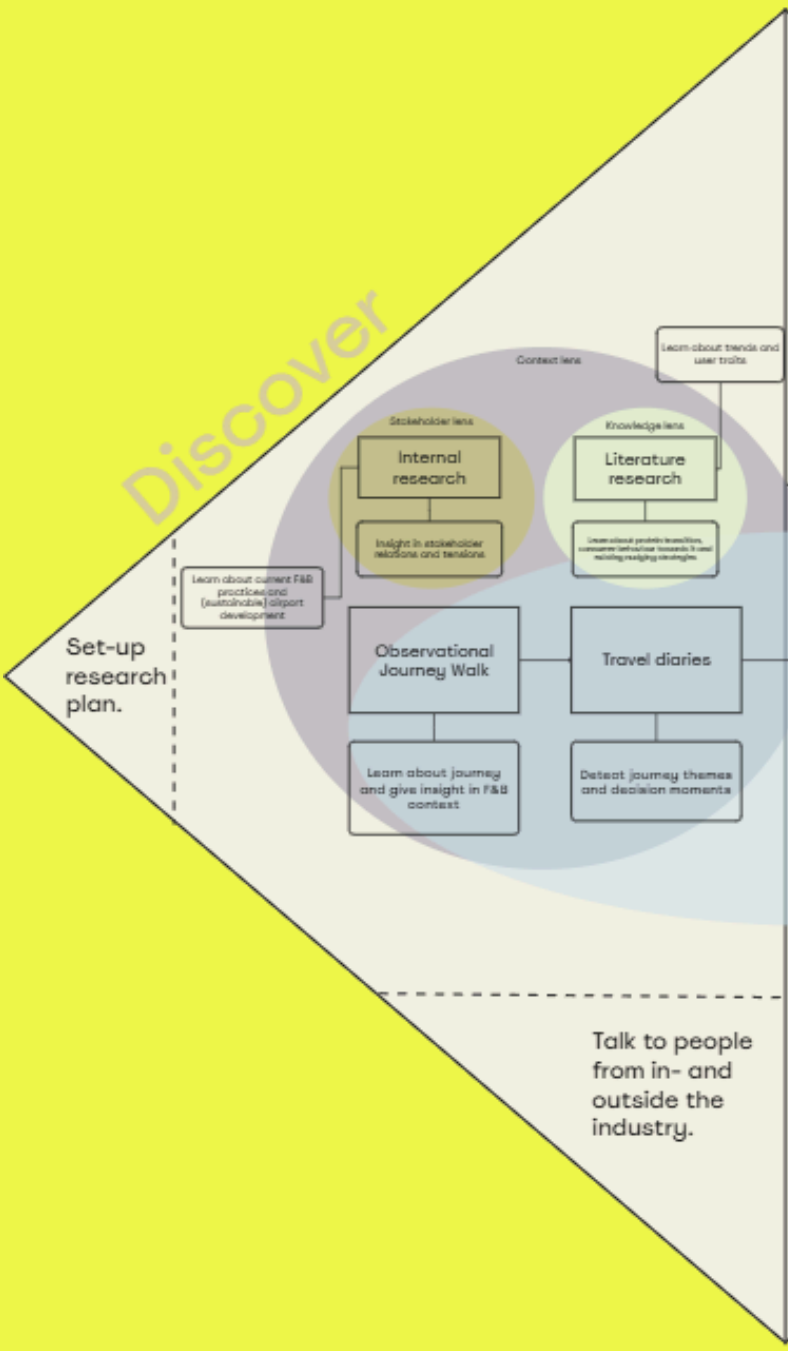
Section

# B | Discover

The Discover phase aims to build a systemic and behavioural understanding of the context in which plant-based food choices take place at Schiphol. This phase maps the structural, commercial and psychological conditions that shape food decision-making in the terminal and clarifies the boundaries within which an intervention can operate.

First, the Food & Beverage system is examined to identify governance structures, stakeholder dynamics and implementation boundaries. Second, behavioural science literature is reviewed to understand how food choices are shaped in retail environments, how plant-based products are perceived and how design interventions can influence choice in an airport setting. Third, the findings from the literature are placed in the real context of an airport by an extensive four-layered user research.

Together, these insights define the constraints and opportunity space for a design intervention.


Discover
Learn about trends and user traits
Context lens
Stakeholder lens
Knowledge lens
Internal research
Literature research
Insight in stakeholder relations and tensions
Learn about current F&B practices and (sustainable) airport development
Observational Journey Walk
Travel diaries
Learn about journey and give insight in F&B context
Detect journey themes and decision moments
Set-up research plan.
Talk to people from in- and outside the industry.

Chapter

# 03 Food & Beverage landscape

To understand where behavioural change can realistically take place, it is first necessary to examine the broader Food & Beverage landscape at Schiphol. This chapter therefore moves from the overall F&B system toward a scoping of the project. By mapping stakeholders, identifying decision-making boundaries and analyzing outlet types, the design space is progressively narrowed down to a feasible and relevant use-case.

# 3.1 Food & Beverage system at Schiphol

## Stakeholder overview

As described in the problem definition, interventions in the terminal take place at the intersection of sustainability ambitions, commercial performance and passenger experience. The stakeholder overview in Figure 10 shows the complexity of the governance of these value systems (for complete tension map of the value systems see Appendix B). It illustrates a distributed power structure in which strategic targets, commercial responsibilities and operational control are separated across organizational levels. Stakeholders higher in the hierarchy define sustainability ambitions, but have no involvement in the decisions that are being taken at the F&B level and are therefore not the primary stakeholders. Stakeholders closer to the outlet floor have the influence over implementation but operate under commercial performance pressures.

Additional stakeholders further shape the design space. Airlines take over the second phase of the passenger journey once boarding begins, meaning that influencing food choices in the terminal may indirectly affect in-flight consumption patterns and vice versa.

The Schiphol Architect holds formal mandate over terminal interventions through a veto right to all primary stakeholders, with a primary criterion of preventing visual clutter and preserving spatial coherence. This introduces explicit spatial and aesthetic constraints for any proposed pilot.

Branded concepts such as Starbucks, La Place and McDonald's operate as non-bespoke formats. These brands are organizationally connected to the business partners and not directly to Schiphol, which increases the distance between strategic sustainability ambitions and operational execution. Because Schiphol does not have direct influence over changes within these branded outlets, intervening in their outlets introduces additional contractual and organizational complexity. For this reason, non-bespoke branded outlets are not considered within the scope of this project.

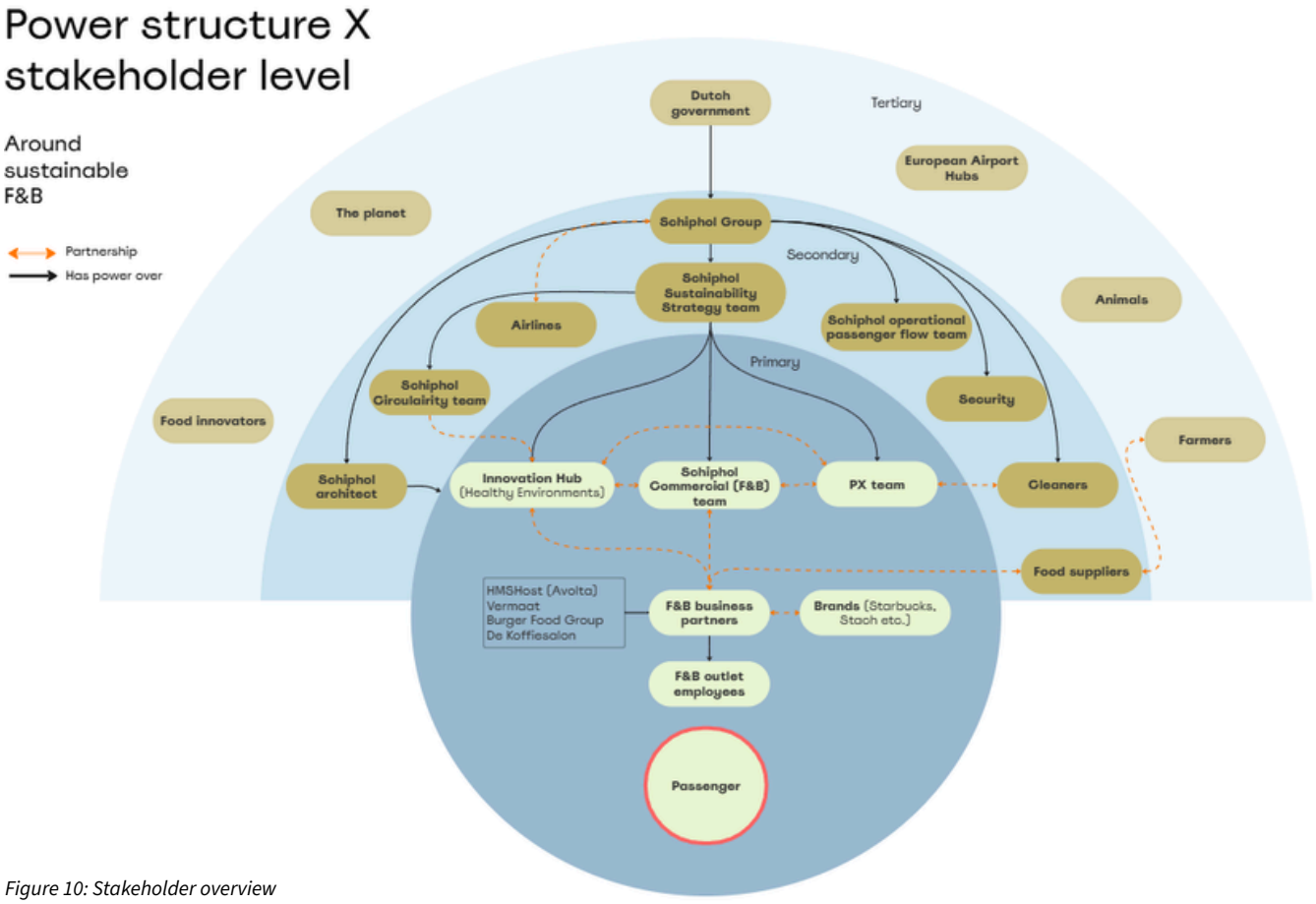



*Figure 10: Stakeholder overview*

## Zoom in on crucial partnership

Within the broader stakeholder landscape at Schiphol, multiple Food & Beverage partners operate outlets in the terminal, such as Vermaat, Burger Food Group and De Koffiesalon. However, for the scope of this project the partnership between Schiphol Commercial (F&B) and HMSHost (by Avolta) is taken as the primary focus. HMSHost is the largest F&B operator in the terminal and manages a significant share of the outlets. The partnership between Schiphol Commercial (F&B) and HMSHost (by Avolta) is therefore considered the most crucial partnership within the primary stakeholders as it is the bridge between Schiphol and most of the F&B outlets in the terminal.

Zooming in on this partnership in Figure 11 shows that each party has a separate role: spaces in the terminal are leased by Schiphol Commercial (F&B) to HMSHost. HMSHost is responsible for all the day-to-day operations in the outlets and Schiphol Commercial (F&B) for managing the Schiphol sustainability and commercial targets. They both have a collective role in overseeing performance in terms of quality of food, a suitable assortment and customer satisfaction.

However, Schiphol Commercial has no final mandate over the execution of HMSHost and can only express and discuss their needs and wishes. This collective role and form of partnership creates a grey zone where both parties need continuous alignment to ensure that the Schiphol targets are translated into operational practice without undermining HMSHost's autonomy.

This structure directly affects what is realistically possible in the design. Because Schiphol Commercial (F&B) cannot directly instruct HMSHost to implement changes, any intervention must fit within HMSHost's existing operations and business model. Change therefore depends on finding solutions that both parties see as beneficial. For this reason, this partnership is the key leverage point in the system.

The Sustainable Food Route (SFR) is a collaborative initiative from both parties within the grey zone regarding sustainability. An intervention that fits within this initiative could therefore foster the collaboration around sustainability (Schiphol internal research, 2025).

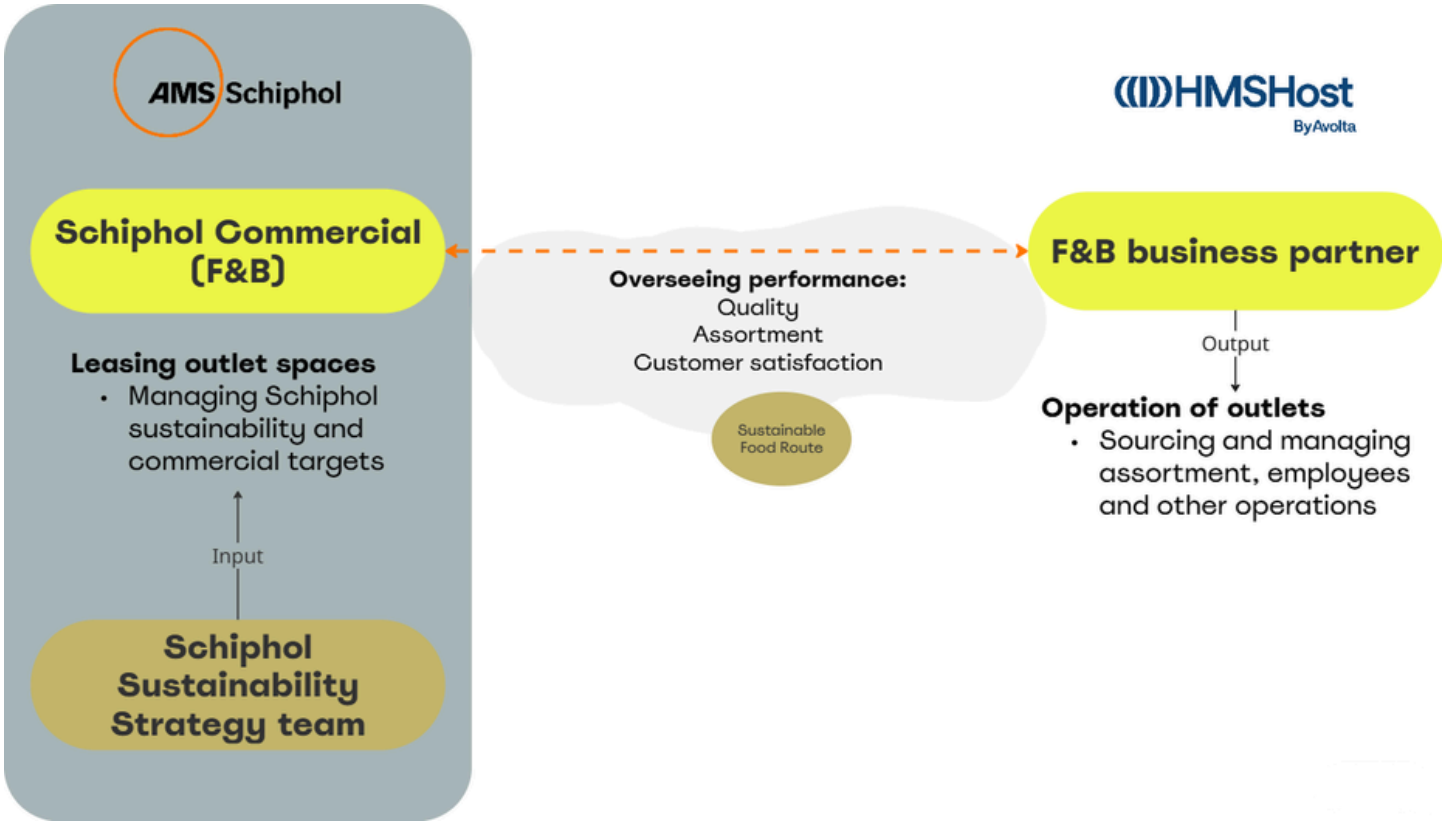



*Figure 11: Partnership Schiphol Commercial (F&B) and HMSHost*

# 3.2 Use-case: Sandwiches at Loaf

Schiphol's F&B offering consists of several outlet types such as coffee stands, fast fuel kiosks, quick service fast food chains and full service restaurants. These outlet types differ in transaction volume and type of buying interaction (Figure 12).

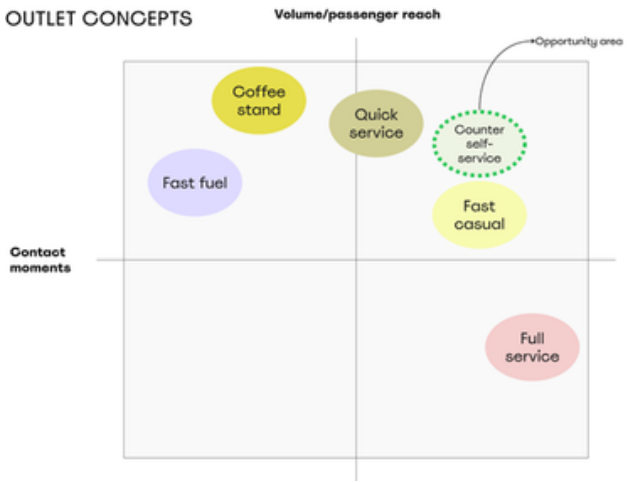



*Figure 12: Contact moments versus Volume/passenger reach matrix*

For this project, the focus is on counter self-service outlets. This outlet type combines a high volume of transactions with multiple moments of interaction during food selection, such as browsing the assortment, walking along the counter with a tray and selecting products. Compared to fast casual outlets, counter self-service outlets involve limited open-kitchen cooking activity. This reduces strong sensory stimuli (such as smell, heat, movement, and sound) that could otherwise dominate attention and complicate the observation of food choice behaviour (Arroyo et al., 2002).

Concluding from the stakeholder overview and partnership, this project focuses on bespoke counter self-service outlets with HMSHost as the operator. Within this category, the highest transaction volumes are generated by Loaf (Schiphol internal data, 2025). Loaf is a bespoke counter self-service concept with a high transaction volume and a spatial layout that allows observation of passenger interaction with the food offering.

Sandwiches form the core of Loaf's offering and represent a relatively neutral eating moment within the airport journey as it is one of the most sold food type at Schiphol. Within Loaf, sandwiches are offered in multiple directly comparable variants, including both plant-based and animal-based fillings with similar format. This together creates a suitable context for testing food choice behaviour and therefore this project focuses on sandwiches at Loaf as a use-case (Figure 13).


*Figure 13: Sandwiches at Loaf in Lounge 1*

# 3.3 Current sustainable position of Loaf

There are three phases where all concepts can be categorized in: Entry Phase, Conscious Realists and Implementors. Entry phase outlets are still in the early stages of transition, Conscious Realists are outlets that have taken initial steps to actively contribute to sustainability and Implementors are further along and have implemented a sustainable offer already (RSG Sustainable Food Route, 2024). Loaf is placed in the Conscious Realist phase and needs to make the shift to the Implementor phase (see Figure 14). This shows that some sustainability measures have been taken, but there is still a transition needed. At Loaf, this means that some plant-based options are included in the assortment. Pricing and product placement have also been adjusted to support these options.

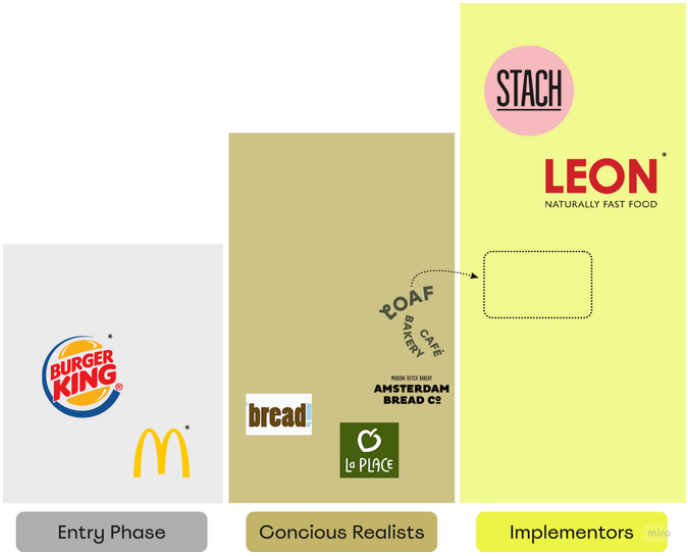



*Figure 14: Sustainable phases and Loaf's needed transition*

Loaf's current assortment consists of approximately 80% animal-based sandwiches and 20% plant-based sandwiches, with the plant-based options currently being Vegan Cream Cheese and Hummus Ratatouille (Figure 15). When comparing the sales performance of these plant-based sandwiches to the average of the animal-based assortment, a clear difference emerges.

When looking at the plant-based options together, their average sales volume is approximately five times lower than the average animal-based sandwich in the assortment.

As a result, despite representing 20% of the assortment, plant-based sandwiches account for only around 5% of total sandwich sales. This indicates that the plant-based options currently perform substantially below the category norm within the existing offering (Schiphol data, 2025).

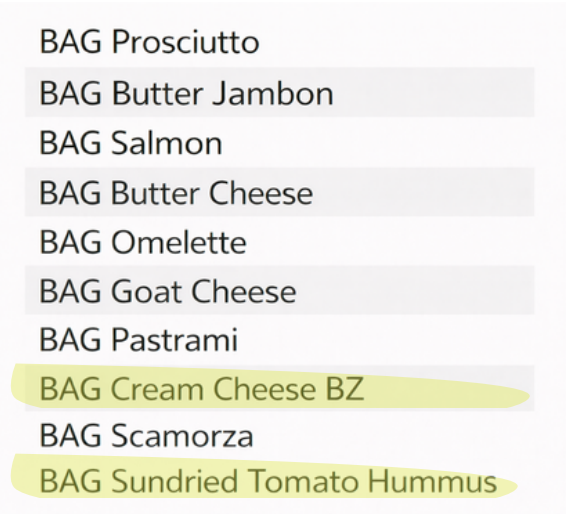



*Figure 15: Loaf's assortment in order of sales quantity (Schiphol data, n.d.)*

# Conclusion Chapter 3

The Food & Beverage system at Schiphol operates within a layered governance structure in which sustainability ambitions, commercial performance and passenger experience must be continuously balanced. Because decision-making authority is distributed across multiple actors, successful interventions cannot rely on top-down control but must align with existing operational and contractual structures. This limits the feasible design space and requires solutions that create value across sustainability, commercial and experiential domains simultaneously.

In this system, the partnership between Schiphol Commercial (F&B) and HMSHost is the key point for bridging strategy with operations. Because Schiphol cannot directly tell HMSHost what to change, any intervention must fit HMSHost's way of working while also supporting Schiphol's goals. Therefore, it is crucial to constantly consider this partnership when developing a design intervention.

Loaf, as a high-volume bespoke concept, provides both operational feasibility and a suitable product context. Sandwiches form a central, comparable product category where plant-based and animal-based options coexist in similar formats, making behavioural differences observable.

Despite Loaf being positioned in the "Conscious Realist" phase of the Sustainable Food Route, current sales data show that plant-based sandwiches significantly underperform compared to animal-based alternatives. Although plant-based options are present and supported through pricing and placement adjustments, they remain substantially below category averages.

Scoping to plant-based sandwiches at Loaf leads to the following adjustment of the assignment:

*"Design an intervention that nudges the passenger towards the plant-based food option in the Schiphol terminal"*

*"Design an intervention that nudges the passenger towards the **plant-based sandwich at Loaf**"*

Design criteria (partially) derived from this chapter:

- DC.6
- DC.9

Chapter

# 04 Consumer behaviour

To design an effective intervention, it is essential to understand how food choices are shaped by consumer behaviour. This chapter uses existing literature to explore the contextual and psychological factors that influence decision-making in the airport setting. By examining passenger trends, attitudes toward plant-based food and behaviour change frameworks, this chapter builds a theoretical foundation for understanding how food choices are made and how to change them with design interventions.

# 4.1 Passenger trends

This paragraph presents current passenger trends relevant to food and/or the airport experience. These trends describe broader developments in traveler expectations, experiences and decision-making during the airport journey. Understanding these contextual shifts provides background for how food choices may be approached within the terminal.

## Continuing need for human interaction

Although airports continue to implement automation and self-service technologies to increase efficiency, passengers consistently express a strong need for authentic human presence and reassurance. According to the ACI report, human interaction remains “at the heart of the customer experience,” as travellers value trust, empathy and emotional support during moments perceived as stressful. Understanding travellers as whole human beings, beyond touchpoints, requires designing for emotional engagement, authenticity and memorable interactions (Airports Council International, 2025).

## Need for personalization and a streamlined journey

The report shows that travellers increasingly expect experiences, products and services tailored to their individual preferences and behaviours. This expectation mirrors broader consumer trends across industries. ACI notes that personalisation is becoming progressively enabled through digital identities, biometric systems and pre-arrival processes (Airports Council International, 2025).

## Wellbeing support during airport journey

Wellbeing has emerged as a “defining priority” for travellers, shaping how they select services and engage with airport environments. ACI emphasises that solutions which shorten waiting times, reduce stress and simplify processes allow passengers to enjoy airport amenities more fully and contribute to a more positive journey experience. Airports increasingly employ dynamic wayfinding, biometric systems for families and automated baggage processes to support comfort and psychological ease (Airports Council International, 2025).

## Demand for meaningful experiences

Figure 16 shows a broad consumer shift from functional consumption toward experiences that offer emotional or personal value, including air travel and food consumption away from home (McKinsey & Company, 2024).

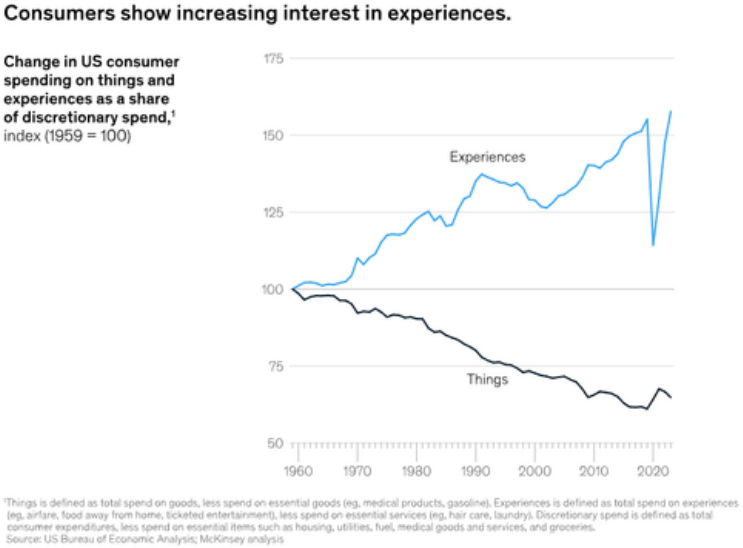



*Figure 16: Experience demand over time (McKinsey & Company, 2024)*

## Willingness to pre-order inflight meals

Research indicates a strong and growing willingness among passengers to pre-order inflight meals, reflecting the earlier mentioned shift towards personalization in air travel. Over 70% of the passengers in this study prefer to reserve meals online, particularly during the booking flow around seat selection, highlighting early decision-making as the preferred moment rather than at airport check-in. The respondents were most likely to choose inflight meals when a variety of menu options were provided and they valued the option of receiving what they wanted to eat as the second highest. Importantly, pre-ordering also delivers clear environmental and economic benefits: by aligning meal loading with actual demand, airlines can reduce food waste, lower costs, and decrease carbon footprint. The findings also confirm passenger readiness for digital meal reservation systems (Hwang et al., 2023).

# Inspiration case:
# Food delivery robot at Shenzhen Airport

At Shenzhen Bao'an International Airport, an in-terminal autonomous food delivery service has been introduced in partnership with Meituan, making it the first airport in China to offer gate-to-gate food delivery by robots. Passengers can order food from participating outlets via the Meituan app and have their meal delivered directly to their boarding gate by an autonomous delivery robot, known as the Little Yellow Bee (Figure 17).

The service currently includes well-known chain brands such as Starbucks, KFC, HEYTEA, Burger King and 7-Eleven, with more merchants expected to join. The core value of the service lies in reducing time pressure and physical effort for passengers: instead of navigating a large terminal or risking a last-minute rush before boarding, travelers can remain near their gate while food comes to them. Early user reactions highlight the emotional impact as well, describing the robot delivery as convenient and reassuring. The case highlights how service design can be adapted to the specific conditions of air travel, by integrating food access directly into the passenger journey.


*Figure 17: "Little Bee" Food Delivery Robot at Shenzhen Airport*

# 4.2 The consumer and (plant-based) food

Understanding passenger behaviour at the airport requires insight into how consumers make food choices in the broader sense and how they relate to plant-based products. Previous research on purchasing behaviour in supermarkets reveals patterns in how consumers evaluate food options and which factors influence their decisions.

## Drivers in general foodchoice

There are several core drivers that guide consumer decisions. These are referred to as foundational drivers, as they fulfil immediate personal needs. Other motivations, such as health, sustainability and animal welfare, are often described as evolving drivers, but these generally play a secondary role in actual food choice behaviour.

### *1. Taste*

Across multiple studies, taste remains the most important determinant of food choice. Consumers prioritize products that are enjoyable, satisfying and familiar in flavor (Szejda et al., 2020).

### *2. Price*

Price is the second strongest driver, particularly in categories perceived as substitutable, such as plant-based alternatives. (Szejda et al., 2020).

### *3. Convenience*

Convenience, including ease of preparation, availability and clarity of choice, also strongly influences purchasing decisions (Szejda et al., 2020).

### *Evolving drivers: health, sustainability and welfare*

In addition to these foundational motivations, consumers may also consider broader aspirational factors when choosing food. Health considerations, environmental impact and animal welfare can influence attitudes toward food choices and reflect longer-term personal or societal values.

However, these factors typically function as reinforcing motivations and are less likely to act as primary triggers for purchase. Adding to that, when consumers face limited time, sensory overload or cost considerations, food choices tend to become less aspirational. Under these conditions, decisions are even more guided by foundational drivers (Szejda et al., 2020).

This suggests that interventions should focus more on foundational drivers instead of evolving drivers such as sustainability or health.

## Barriers towards plant-based

Despite the growing availability of plant-based options, several barriers continue to limit openness and can even trigger resistance. These barriers are not only practical, but also emotional, cultural and habitual in nature. Understanding these obstacles is essential for recognizing why plant-based products are often approached with hesitation.

### *Consumer skepticism*

There is a general distrust toward plant-based products, often related to doubts about their taste, quality, level of processing or the credibility of sustainability and health claims (Szejda et al., 2020).

### *Perceived lack of nutrition*

Plant-based options are perceived as providing insufficient protein, energy or satiety compared to meat-based products (Szejda et al., 2020).

### *Unfamiliarity with product*

Limited exposure to or experience with plant-based foods leads to uncertainty about expected taste, texture, portion size or overall satisfaction (Szejda et al., 2020).

### *"Meat attachment" and enjoyment of meat taste*

There is a strong emotional, habitual and sensory attachment among consumers, that causes taste enjoyment and learned food preferences to reinforce repeated meat-based choices (Szejda et al., 2020).

### *Food neophobia*

"The fear of trying new foods" results in avoidance of novel or alternative food options, including plant-based products (Szejda et al., 2020).

### *Men and meat*

Meat consumption has been culturally and commercially associated with strength and masculinity, reinforced through marketing and media representations (Figure 18). These social norms can make plant-based or vegan choices feel less socially acceptable for some male consumers (Szejda et al., 2020).


*Figure 18: Men and Meat marketing strategy*

## Consumer segments in meat consumption

Consumers can broadly be divided into three segments, that can later be used for segmenting participants in user research:

- **Traditional meat consumers**: primarily motivated by taste and cost, with low openness to plant-based substitution.
- **Meat reducers (flexitarians)**: motivated by health and environmental concerns, while still valuing taste and familiarity
- **Meat avoiders**: ethically driven vegetarians and vegans who represent a smaller market share (Szejda et al., 2020).

# 4.3 Behavioural change by design interventions

Understanding what drives consumer behaviour does not automatically reveal how behaviour can be changed. Behavioural science therefore offers theories and frameworks that explain how behaviour emerges from the interaction between individual motivations, capabilities and environmental conditions. The following section introduces key behavioural change theories and models that inform the development of the intervention in this project.

## The COM-B Model

The COM-B model in Figure 19 is a foundational framework in behavioural science that explains behaviour as the result of three interacting components: Capability, Opportunity and Motivation (West & Michie, 2020).

**Capability** refers to whether a person has the knowledge, skills and ability to perform a behaviour. This includes psychological capability, such as understanding and mental skills, as well as physical capability, meaning the physical ability to carry out the action. For example, training or guidance can increase people's knowledge and confidence, making them feel more capable of performing a behaviour.

**Motivation** refers to the internal processes that influence decision-making and behavior. According to the model, two main components are reflective motivation (the reflective process involved in making plans) and automatic motivation (automatic processes such as impulses and inhibition).

**Opportunity** refers to the external conditions that make a behaviour possible. This includes physical opportunity, such as the availability of products or resources in the environment, and social opportunity, such as social norms or support from others. For instance, if healthier food options are made more visible and accessible, the environment creates more opportunity for people to choose them (Pilat & Krastev, 2024).

According to this model, behaviour emerges from a dynamic system in which these components influence one another through positive and negative feedback loops over time. Due to its holistic approach to understanding behavioural determinants at multiple levels, the COM-B framework has become widely used in designing interventions. The COM-B model provides a structured way to identify leverage points for behaviour change. By targeting the most relevant behavioural determinants, interventions grounded in the COM-B model increase the likelihood of achieving meaningful and sustained behaviour change (Nagyova, 2020).

This model will therefore function as the main principle when mapping factors that influence passenger behaviour throughout this project.

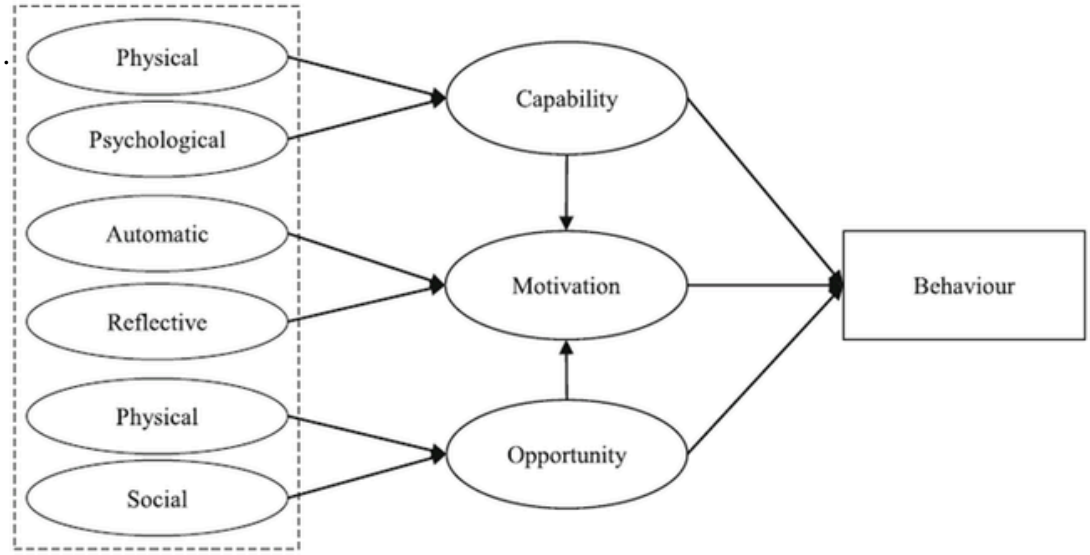



*Figure 19: COM-B Model of behaviour (Willmott et al., 2021)*

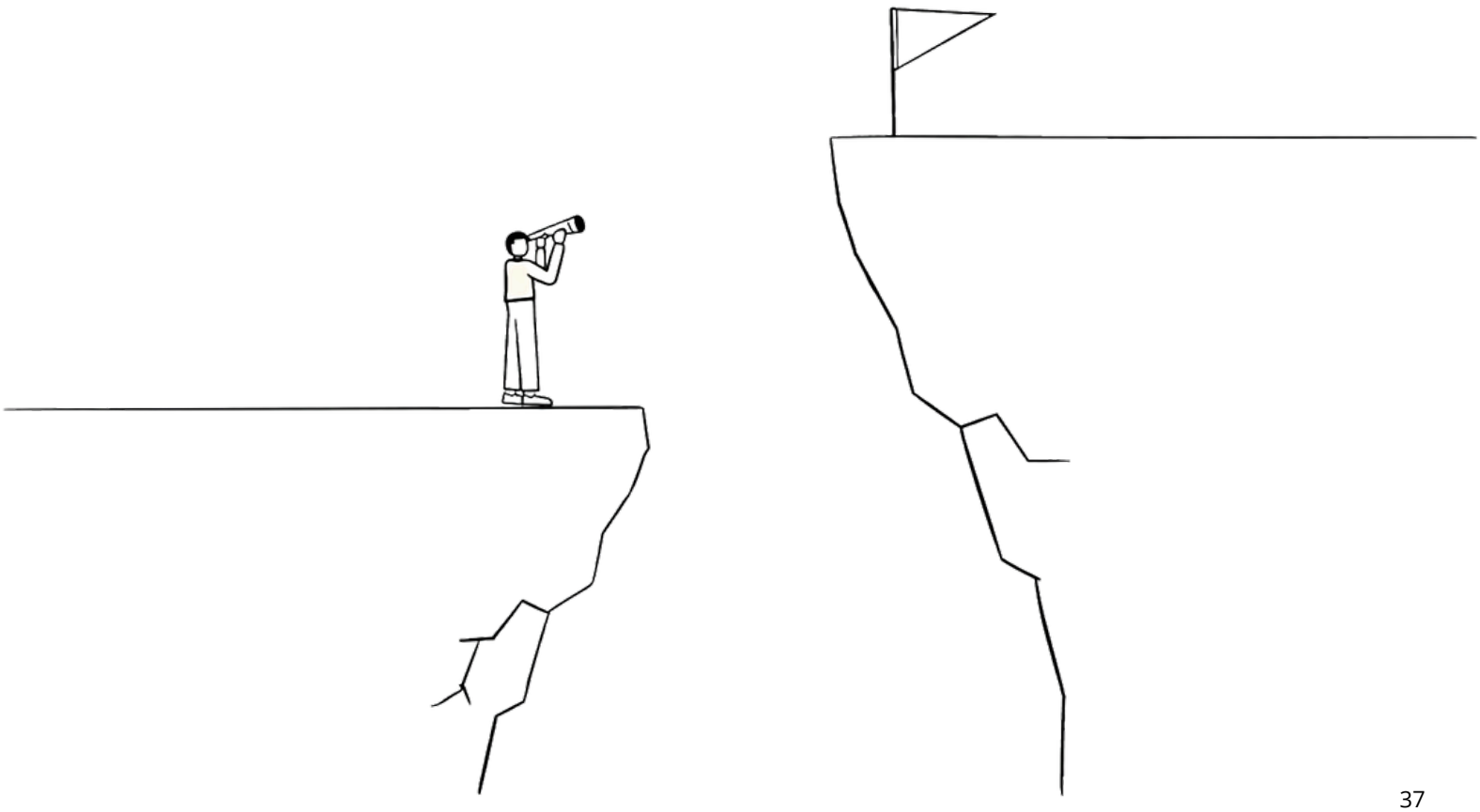
## Intention-behaviour gap

Following the COM-B framework, it is important to recognize that positive intentions alone are often insufficient to produce behaviour change. This is known as the intention–behaviour gap, a phenomenon in which individuals fail to act on their stated intentions, particularly in the context of sustainable and healthy consumption.

This gap also helps explain why the earlier described evolving drivers, often do not drive actual food choices.

Research shows a significant gap between consumers' intentions and actual purchasing behaviour, with sustainability-related choices showing an even larger discrepancy than health-related ones (Blanke et al., 2022). This gap can be explained by factors that align closely with the COM-B components. While consumers may hold positive attitudes toward sustainable products (reflective motivation), their behaviour is often constrained by limited perceived availability, weak social norms, time pressure or doubts about the impact of individual choices (Tél et al., 2004).

This suggests that even passengers with sustainability intentions are unlikely to choose plant-based options if the decision environment does not support this behaviour. Therefore, interventions should focus on shaping the conditions under which choices are made, as persuasion through sustainability arguments alone is unlikely to influence behaviour (Loy et al., 2016). The rest of the chapter will dive deeper into how this can be achieved.



## Choice architecture

Choice architecture refers to the design of the environment in which people make decisions: the way options are organised, framed and presented to consumers (Demkura & Markovych, 2022).

This environment always influences behaviour, whether it is intentionally designed or not. For example, the arrangement of items on a cafeteria shelf can guide choices simply through spatial placement (Congiu & Moscati, 2020). By shaping how options appear and are encountered, choice architecture can steer decision-making.

## Nudging

Nudging is a targeted intervention within choice architecture. It is a behavioural economics strategy that subtly influences decision-making by adjusting how options are presented, without restricting freedom of choice (Rauscher & Zielke, 2019).

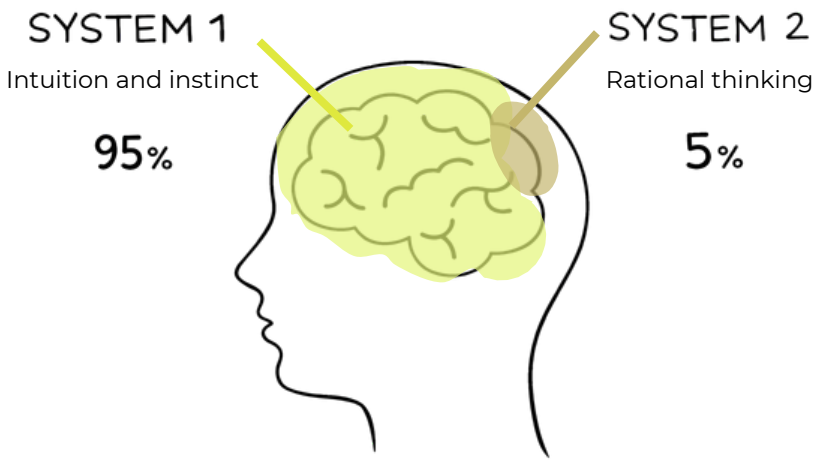
Nudging is often explained through dual-system theories of cognition. Human thinking operates through System 1, which is fast and automatic, and System 2, which is slower and more reflective. Research suggests that the vast majority of everyday decisions are made through System 1 processes, with only a small proportion involving deliberate System 2 reasoning. Estimates indicate that around 95% of decisions are driven by automatic processes, while roughly 5% involve reflective thinking (Kahneman, 2011). Type 1 nudges influence System 1 by using cues such as spatial placement or visual prompts, while Type 2 nudges engage System 2 through reminders, labels or informational prompts.

Research shows that several nudges can encourage more sustainable food choices, including:

- offering plant-based meals as the default option
- placing plant-based items in prominent locations
- using appealing visual presentation
- using appealing naming

(Szejda et al., 2020).

This project focuses on System 1-oriented interventions. In the airport environment, passengers often make food choices under time pressure and cognitive load, making intuitive and effortless decision-making more likely than reflective evaluation.



## The Theory of Desire

The Grounded Cognition Theory of Desire explains how food becomes attractive in the mind. This theory explains why and how the nudging strategies of appealing visual presentation and naming work.

According to this theory, eating experiences are stored in memory as rich representations that include sensory experiences (such as taste and texture), emotions (enjoyment or satisfaction), bodily states (fullness or energy), motor actions (holding or biting), and contextual elements (time, place or social setting).

When a person later encounters a cue related to that food, such as seeing it or reading a description, parts of these memories are reactivated. The person mentally simulates the act of eating, imagining the taste, texture and experience of consumption. The more vivid this simulation, the stronger the desire to eat the product. Importantly, desire does not only arise from hunger but from how rewarding and imaginable the eating experience feels (Papies et al., 2020; Farrar et al., 2024). Imagining food consumption can even activate the same brain areas involved in actual eating, including taste, reward and motor regions (Papies et al., 2020).

So how can this be applied to a design intervention?

**Sensory elements** play an important role in triggering these simulations. Words that describe taste, texture and enjoyment, such as “creamy”, “rich” or “crispy”, activate stronger desire than abstract qualities. Research shows that identical foods can even be experienced differently depending on how they are described. This can be applied to the language used on signing and menu's as shown in Figure 20.

**Contextual cues** can further strengthen this effect. Presenting food within a familiar or appealing situation, such as a quick lunch before boarding or a relaxed moment during travel, helps people imagine the eating experience more easily and increases its attractiveness.

**Motor elements** also contribute to desire. When food appears easy to hold, bite or consume, people can more easily imagine the physical act of eating. Even subtle cues that suggest how the food is handled can increase purchase intention (Papies et al., 2020; Farrar et al., 2024).

Understanding that taste is known to be a predictor of food choice emphasizes the importance of actual taste and sensory experience alongside marketing and nudging strategies (Muñoz-Vilches et al., 2020). Therefore desirable recipe development remains a crucial part in the intervention system.

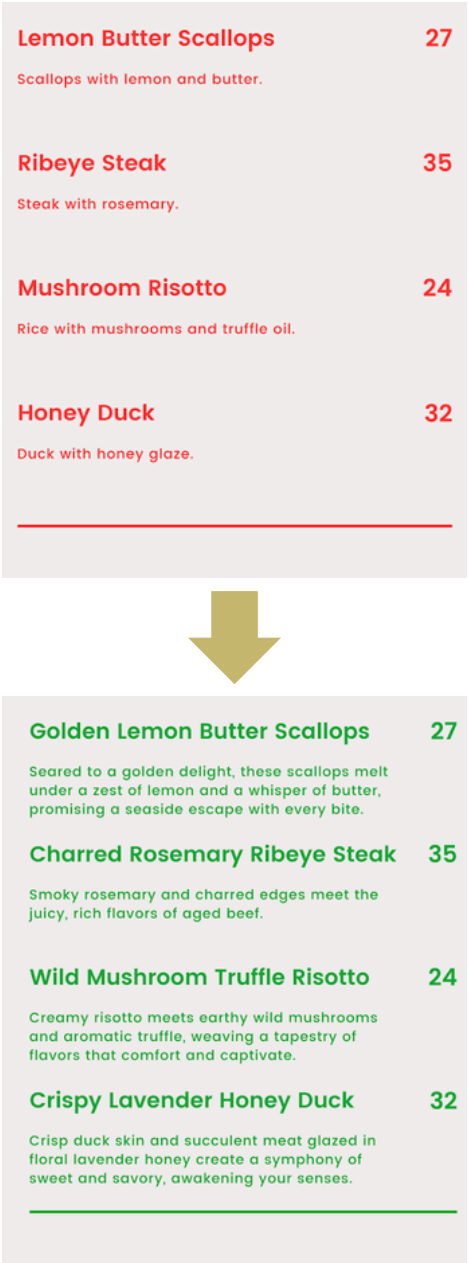



*Figure 20: Impact of sensory elements on a menu*

# Inspiration case:
# Human Food Interaction (HFI)

As food-related challenges such as obesity, malnutrition and environmental impact become increasingly urgent, Human–Food Interaction (HFI) is an emerging interdisciplinary field that explores how technology can shape the way people interact with food. Originating from research in Human–Computer Interaction, the field positions food as a design space in which digital technologies can influence how people discover, select and experience food (Khot et al., 2019).

Within this field, researchers investigate how interactive technologies can support behaviour change across different stages of the food experience, including food selection, preparation and disposal (Engelbutzeder et al., 2020). Examples include digital food tracking systems, interactive displays and community platforms that encourage healthier and more sustainable food practices. One particularly relevant area within HFI is the use of technologies that enhance the visualization and perception of food during the decision moment

Augmented reality, projection technologies and interactive displays can change how consumers perceive food products before purchase by shaping expectations and increasing engagement with the food offering (Petit et al., 2021; Velasco et al., 2018; Toet et al., 2017).

See examples in Figure 21:

(a) “Virtual Tasty”: exploring VR and food
(b) Desktop hydroponic garden
(c) Space food experiences
(d) “Logic Bonbon”: food as computational artifact
(e) Board game teaching gut interactions
(f) Edible capacitive sensor
(g) Cover of FoodInno 2019
(h) Speculative catalog of play-food technology futures
(i) Playful tangibles to explore food interactions
(j) Artificial commensal companion
(k) “iScream”: playful gustosonic ice cream experiences

(Mueller et al., 2023)

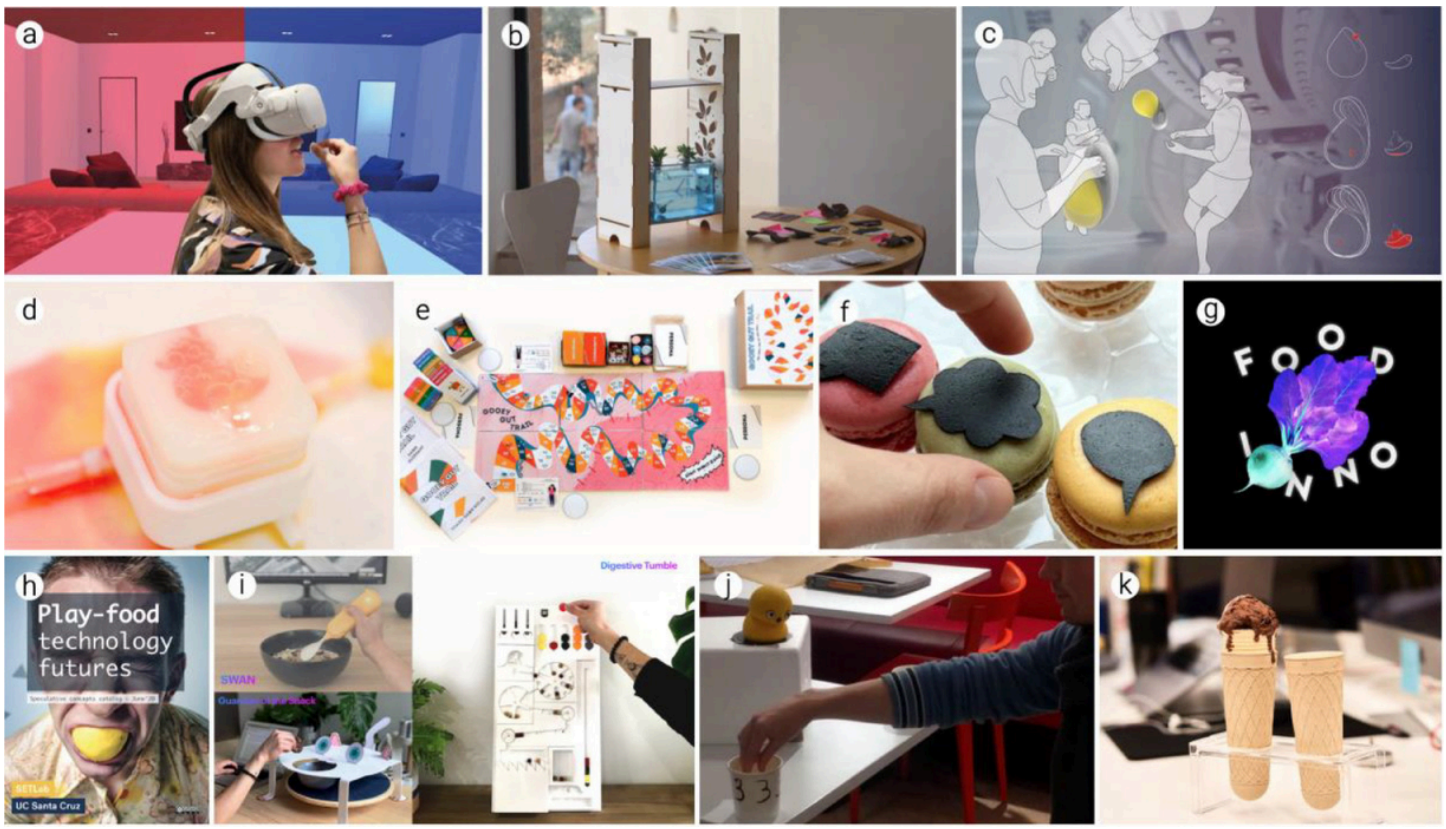



*Figure 21: A collage of HFI works (Mueller et al., 2023)*

# Conclusion Chapter 4

The literature shows that food decisions are shaped by emotional, contextual and experiential factors. Passenger trends indicate increasing need for human interaction, personalization and wellbeing at airports. At the same time, research on plant-based consumption demonstrates that taste, familiarity, price and convenience dominate decision-making, while sustainability and ethical concerns typically function as secondary justifications.

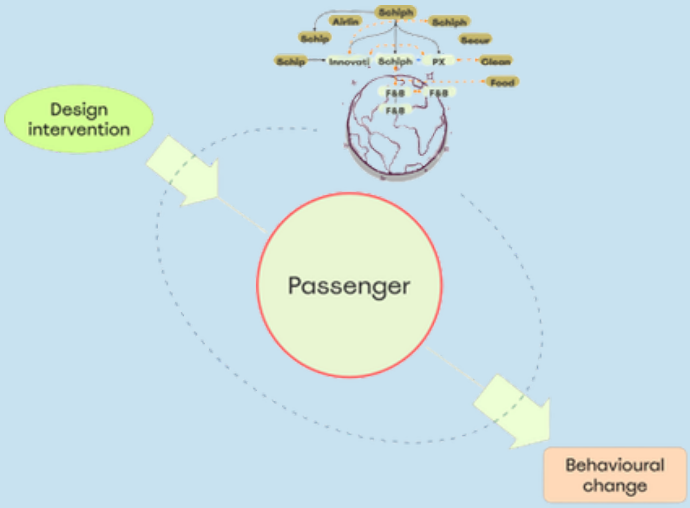
Behavioural science further explains that positive intentions toward sustainable eating often fail to translate into action due to the intention–behaviour gap, especially in contexts characterized by time pressure and cognitive load. n such environments, decision-making is largely driven by System 1 processes, which are fast, intuitive and automatic, while reflective System 2 reasoning plays a smaller role.

Choice architecture, nudging and the Theory of Desire show that behaviour is more effectively influenced by reshaping the decision environment and activating sensory, contextual and motor elements.

Together, these insights suggest that promoting plant-based choices in the airport context requires designing for ease, reassurance and desirability at the moment of choice.

Design criteria (partially) derived from this chapter:

- DC.1
- DC.5
- DC.7
- DC.8




Chapter

# 05 User research: The passenger

Moving from the Schiphol system to the core of the project, the passenger, this chapter explores the behavioural context in which food choices are made at Schiphol Airport. The research investigates how passengers actually experience the airport environment and how food decisions unfold in real time.

As visualized in Figure 22, the research design follows a layered approach from contextual observation to deeper behavioural analysis. First, an observational journey walk mapped the rhythm of the airport and identified key decision moments within the F&B environment. Based on these insights, travel diaries captured in-the-moment thoughts during the passenger journey. To understand underlying motivations, semi-structured interviews explored reflections on past travel days. Finally, on-the-spot terminal interviews validated whether identified patterns were visible in real-life decision moments at Loaf. The chapter concludes with a co-creation session, translating behavioural insights into design opportunities. For sample demographics see Appendix C.

Together, these methods move from observing behaviour to understanding the mechanisms behind it, forming the behavioural foundation for the Define phase.

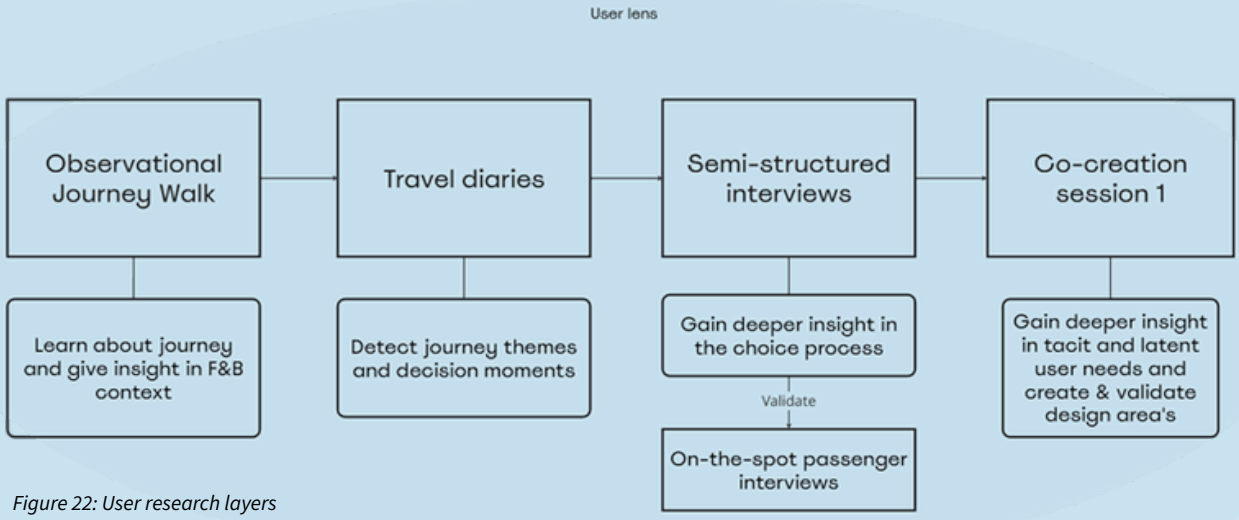
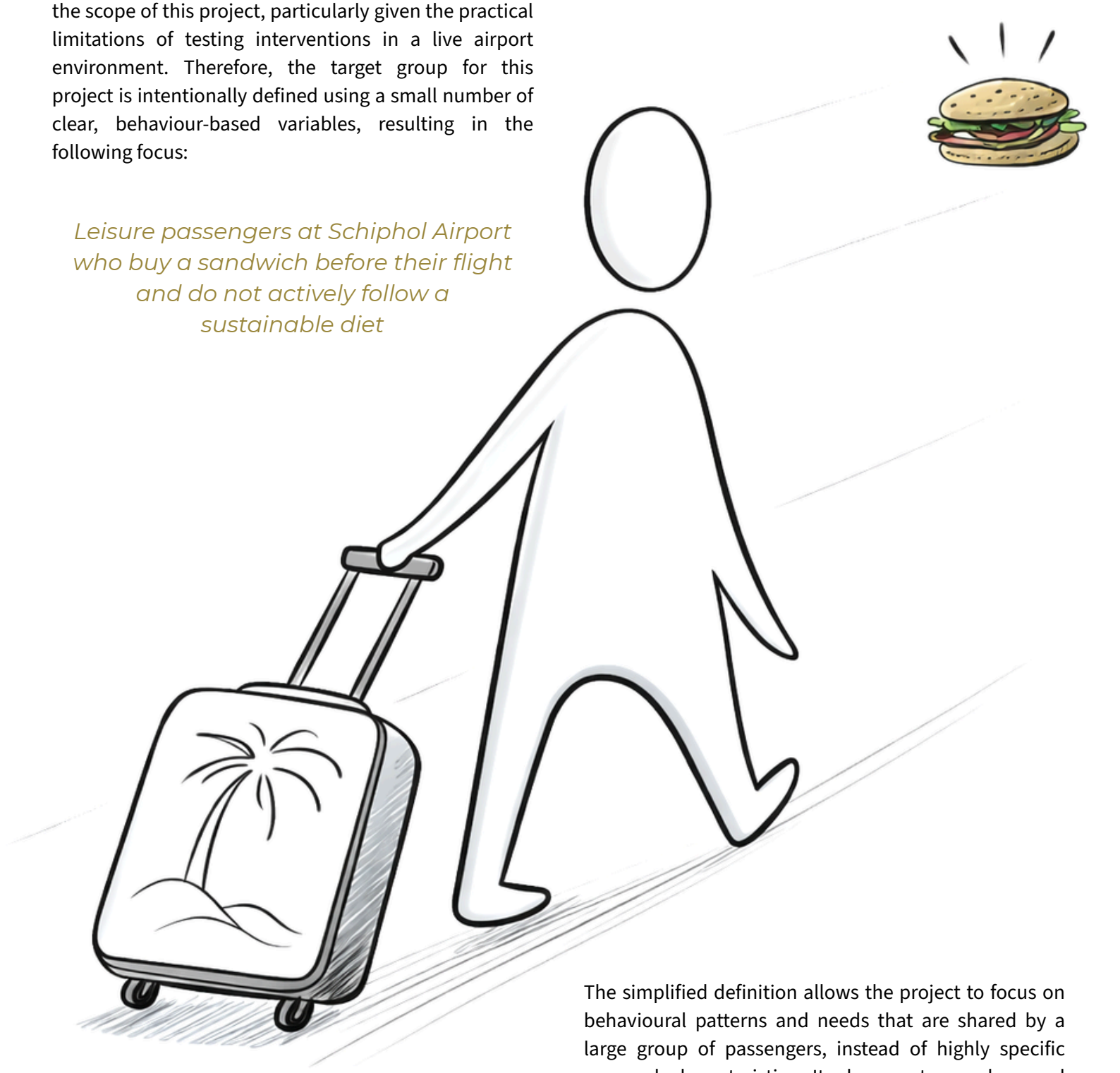



*Figure 22: User research layers*

# 5.1 Who am I designing for?

Schiphol has developed an extensive passenger segmentation based on motivations and attitudes during the travel journey. While this segmentation provides valuable strategic insight, it is too complex for the scope of this project, particularly given the practical limitations of testing interventions in a live airport environment. Therefore, the target group for this project is intentionally defined using a small number of clear, behaviour-based variables, resulting in the following focus:

*Leisure passengers at Schiphol Airport who buy a sandwich before their flight and do not actively follow a sustainable diet*



The simplified definition allows the project to focus on behavioural patterns and needs that are shared by a large group of passengers, instead of highly specific personal characteristics. It also creates a clear and relevant research challenge: identifying common decision drivers.

From a quantitative perspective, leisure travellers represent the majority of Schiphol's passenger population, accounting for approximately 72% of all travellers, whereas business travellers make up around 28% as seen in Figure 23. Taking into account that around 50% of both these groups (leisure: 16.3 mln, business: 6.5 mln) use the F&B services, focusing on leisure travellers offers a substantially larger potential impact in terms of reach. A large part of the business travellers has a privium membership where they often wait in the premium lounges, and travel more routine-based which is less optimal for nudging (Schiphol data, 2024).

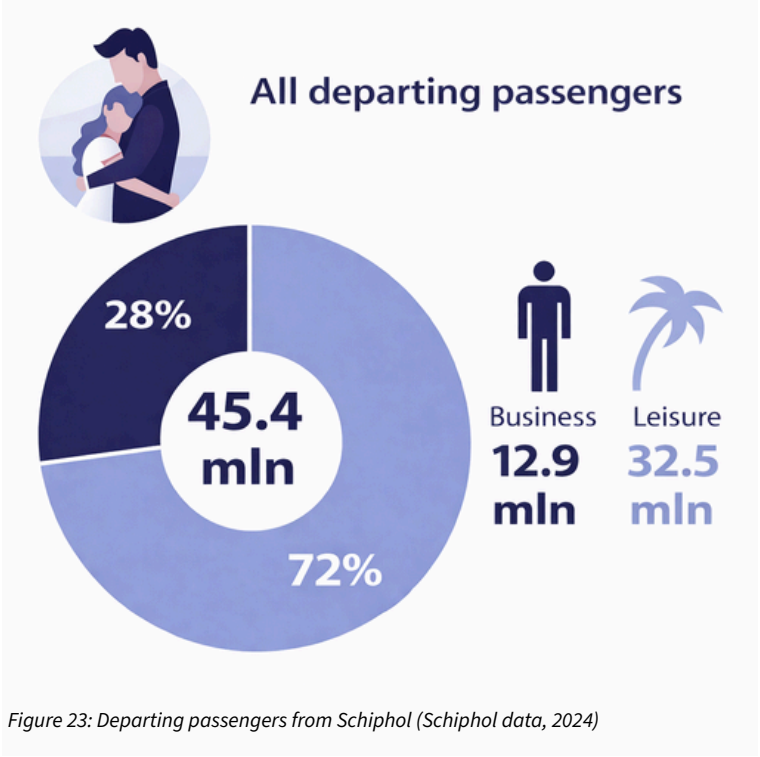



*Figure 23: Departing passengers from Schiphol (Schiphol data, 2024)*

Within the group of leisure travellers, this project specifically focuses on passengers who do not actively follow a sustainable or plant-based diet. The terminology from the theory describes these as traditional meat-eater or meat-reducers. This choice is intentional. Designing for passengers who already follow a plant-based diet would not cause an impact, but targeting the more average Schiphol passenger, representing a flying population associated with a relatively high $CO_2$ footprint for whom sustainability is often not the primary concern during travel, addresses the segment where behavioural change is both most challenging and most meaningful (Schiphol internal research, 2025).

This does not mean that more specific passenger groups cannot be addressed in future iterations. In further development of sustainable food nudging strategies, it can be valuable to design tailored interventions for more narrowly defined groups, such as younger travellers (see Appendix D for research on this group). However, for this project, a broad and behaviour-driven target group provides the most realistic and impactful foundation.


*Figure 24: Passenger journey of department a nd moments of sending prompt questions (Schiphol data, 2024)*

# 5.2 Behaviour in context: travel diaries

To empathize with the target group and develop an early understanding of the passenger journey related to food, an observational journey walk was conducted from arrival at Plaza to purchasing a plant-based snack. This observation provided insight into the rhythm of the airport experience: when passengers wait, when they move, when they scan their surroundings and when food decisions become relevant. Based on this observation, the travel diaries were designed to capture behaviour as close to the moment of action as possible.

Five travel diaries were carried out using prompt questions via WhatsApp (Appendix D). WhatsApp was chosen because it fits naturally into travelers' behaviour and allowed participants to respond in real time without disrupting their journey.

The prompts were structured around the different phases of the passenger journey shown in Figure 24. The timing of each message was informed by the earlier observation: at moments such as before commuting to the airport, arriving and go to security, moment of browsing food and after eating. Participants, mostly young adult leisure travelers, documented their thinking steps and choices in the form of a message. After extracting the WhatsApp conversations, the transcriptions were read and reviewed manually to identify recurring themes.

### Themes

Across the diaries, five themes emerged:

#### *Lack of overview*

Several participants described Schiphol's F&B landscape as confusing or cluttered. One traveller noted: "It felt messy and disorienting… I wish there was one place to see everything" . Another only discovered the option she actually preferred after she had already bought her food: "I later saw there was also a option with hummus… If actually would have preferred that". This could indicate that there lays opportunity in improving the overview of food options.

#### *Sustainability almost entirely absent in choice*

A participant who was otherwise environmentally conscious noted that it was *"not something I think about here"* or simply *"never considered".*

#### *High prices*

Across all participants the high prices of the food was worth mentioning. It was seen as a frustration *"Always the same with airports".*

#### *Different moods, different needs*

Some wanted something small or easy to eat. As one traveller put it: *"I choose under stress, so I choose the easiest thing".* Others desire a treat or comfort item instead. This duality could be explained by time of day (meal moment or not), mood and craving of the moment (moment-fit).

#### *Thinking of food starts after security*

The decision process starts after security when browsing for options in the terminal.

## 5.3 Underlying decision drivers

To gain deeper understanding of why passengers choose what they choose, the next step was to conduct semi-structured interviews. 14 people were interviewed in a reflective manner where they looked back at their last travel day(s). The interview guide was iterated on after feedback on the first transcript to create an optimal structure that allowed deeper exploration of the detected themes (Appendix E) (Creswell, 2009) (Kumar, 2011).

To account for differences in dietary disposition, a short four-item version of the Meat Attachment Questionnaire (Graça et al., 2015) was included. This allowed participants to be categorized as meat consumers, reducers or avoiders, ensuring that findings were interpreted in relation to their underlying attachment to meat.

After transcription, AI was used to identify recurring topics and concepts. This helped detect themes such as familiarity, hunger management, price sensitivity and the limited role of sustainability. The deeper analysis was conducted manually by reviewing the transcripts to interpret relations and causalities. The final patterns were therefore based on repeated reading, notetaking and comparison across participants, with AI used to support the initial overview.

After detecting clear patterns, six in-the-moment interviews were conducted in the terminal, directly before or after passengers ordered food at Loaf. These conversations functioned as validation of the patterns in the real-life environment.

## Patterns

The following seven patterns were detected:

### *1.Familiarity as a coping mechanism for the travel day*

Across the interviews, familiarity emerged as a central strategy passengers use to cope with the uncertainty of travelling. Even participants who described themselves as adventurous or experimental eaters in everyday life reported relying on familiar food choices at the airport.

Familiar brands, known products or previously tried items reduced the mental effort required to decide and offered reassurance in a context where many aspects of the journey, such as security, delays or gate changes, are outside the traveller's control. For example, some participants described always choosing the same sandwich or coffee chain because they *"know what you get,"* especially when prices are high and there is no easy way to correct a disappointing choice due to time constraints. Importantly, this reliance on familiarity was not always linked to feeling emotionally stressed. Some travellers explicitly stated they did not experience stress when flying, yet still preferred predictable food options.

A possible counterargument is that familiarity may simply reflect habit. However, participants often contrasted their airport behaviour with their everyday eating habits, indicating that this pattern is airport context-specific.

Familiarity also functioned as a way to secure indulgence. Participants framed the start of a holiday and "o*vercoming security*'' as a reason to treat themselves. In these cases, familiar options, often animal-based, were perceived as a reliable source of indulgence. Instead of experimenting, participants preferred foods they trusted to be satisfying, indulgent and filling.

One participant explicitly said she chose ham because *"you can't really ruin that,"* while describing plant-based options as harder to judge visually. Even participants who were open to vegan food in daily life defaulted to meat/animal-based sandwiches.

### *2. Hunger management during travel*

Participants consistently described the flight day as unpredictable, with long waiting times, delays and unclear moments for eating. As a result, many actively plan their food intake at the airport. Eating before boarding was often framed as a way to prepare for the journey ahead, ensuring they would not become hungry later on the plane, where the food is perceived lower quality. Food choices were therefore not only about immediate appetite, but about anticipating future needs.

This finding varies by flight length. Schengen passengers rather not eat on the plane as you usually need to pay and the food has a perceived lower quality. Non-Schengen passengers are okay with airplane food as they get free meals that are usually filling enough. However, within this sample, planning behaviour appeared consistently across different travel frequencies.

Loaf is in the Schengen Lounge and the terminal interviews passengers also mentioned that they were actively managing hunger at that moment.

### *3. Overview supports decision-confidence*

Participants repeatedly expressed the desire to first see what options were available before making a decision. Being able to scan options helped participants feel that they had made an informed decision and had not missed something better. When overview was lacking, due to unclear layouts, scattered outlets or limited visibility, participants described feelings of doubt or regret after purchasing food. This indicates that overview supports decision confidence, not just usability.

A potential limitation of this need is that some travellers may prioritise speed over overview. While this is true for some situations, the interviews suggest that when people do stop to eat, confidence in the choice becomes more important than speed alone.
In the terminal interviews it became clear that passengers relied heavily on what they could immediately see.

### *4. Imagining how the food would taste increases confidence*

Product images, visible fillings and recognisable ingredients helped people imagine eating the product and decide more confidently. In contrast, unclear naming or abstract labels caused hesitation. One couple explicitly explained that seeing clear pictures or seeing the inside of the filling of a sandwich made it easier because *"you can imagine yourself eating it".* This adds to the earlier findings in the literature about the Theory of Desire.

### *5. Need for moment of relaxation or comfort before their flight*

Passengers value food as a moment of comfort or calm before the next phase of travel, such as walking to the gate or boarding. Participants described the terminal as busy and mentally demanding and positioned eating not only as hunger management, but as a pause within that environment. This was reflected in preferences for places that feel calmer or more contained. This need was expressed not only by stressed or infrequent travellers, but also by experienced flyers, suggesting that seeking comfort is less about stress alone and more about the context of the airport.

### *6. Price increases hesitation, but rarely determines choice*

High prices were noticed by nearly all participants, but their influence varied. For some, high prices led to avoidance or bringing food from home, but for most, they were accepted as part of the journey. Importantly, price rarely acted as a sole decision factor, but it increased hesitation when combined with unfamiliar options.

For plant-based food, this meant that an unfamiliar option priced the same or higher than a familiar meat-based one was often perceived as not worth the risk. Price therefore functioned as a multiplier of doubt, rather than a decisive barrier on its own. Lowering prices would not automatically solve this issue. Participants indicated that even cheaper unfamiliar options would still need to feel appealing and trustworthy to be chosen.

### *6. Sustainability does not play a positive role in plant-based choices*

While participants differed in their attachment to meat, sustainability was rarely mentioned as a direct motivator for choosing plant-based food at the airport. Even participants who expressed concern about sustainability in general did not prioritise it in this context. Instead, plant-based options were considered when they felt familiar, filling, healthy, visually appealing and appropriately priced. Even participants with lower meat attachment required less reassurance, but still did not frame their choices in sustainability terms. This shows the reality of the intention-behaviour gap.

During terminal interviews, several passengers did consider plant-based or vegetarian options in the moment, but only when they felt clearly understandable, filling and familiar in composition. When plant-based dishes were perceived as vague, lightly filled or hard to assess, they were quickly rejected.

# Conclusion Chapter 5

This chapter shows that food choices at Schiphol are shaped by the travel experience itself. A travel day often includes waiting, uncertainty and many small decisions. In that context, passengers look for something that feels safe.

Passengers are not searching for the “most sustainable” option. Sustainability is rarely part of this decision moment. Even passengers who care about sustainability in daily life do not prioritize it at the airport. The travel context changes what feels important. They are looking for something that will work. Something filling, enjoyable and unlikely to disappoint. Because prices are high and time is limited, the risk of making a wrong choice feels bigger. As a result, choosing for familiar options works as a coping mechanism for the uncontrollable factors of a travel day.

Passengers gain a sense of control when they have a clear overview of the available options, which helps them feel confident in their decision. Visible ingredients and clear descriptions help them imagine how the sandwich will taste. This makes the choice feel more certain. Hunger also plays a role: passengers often eat not only because they are hungry now, but because they want to avoid being hungry later in the plane or after landing.

Design criteria (partially) derived from this chapter:

- DC.1
- DC.2
- DC.3
- DC.10

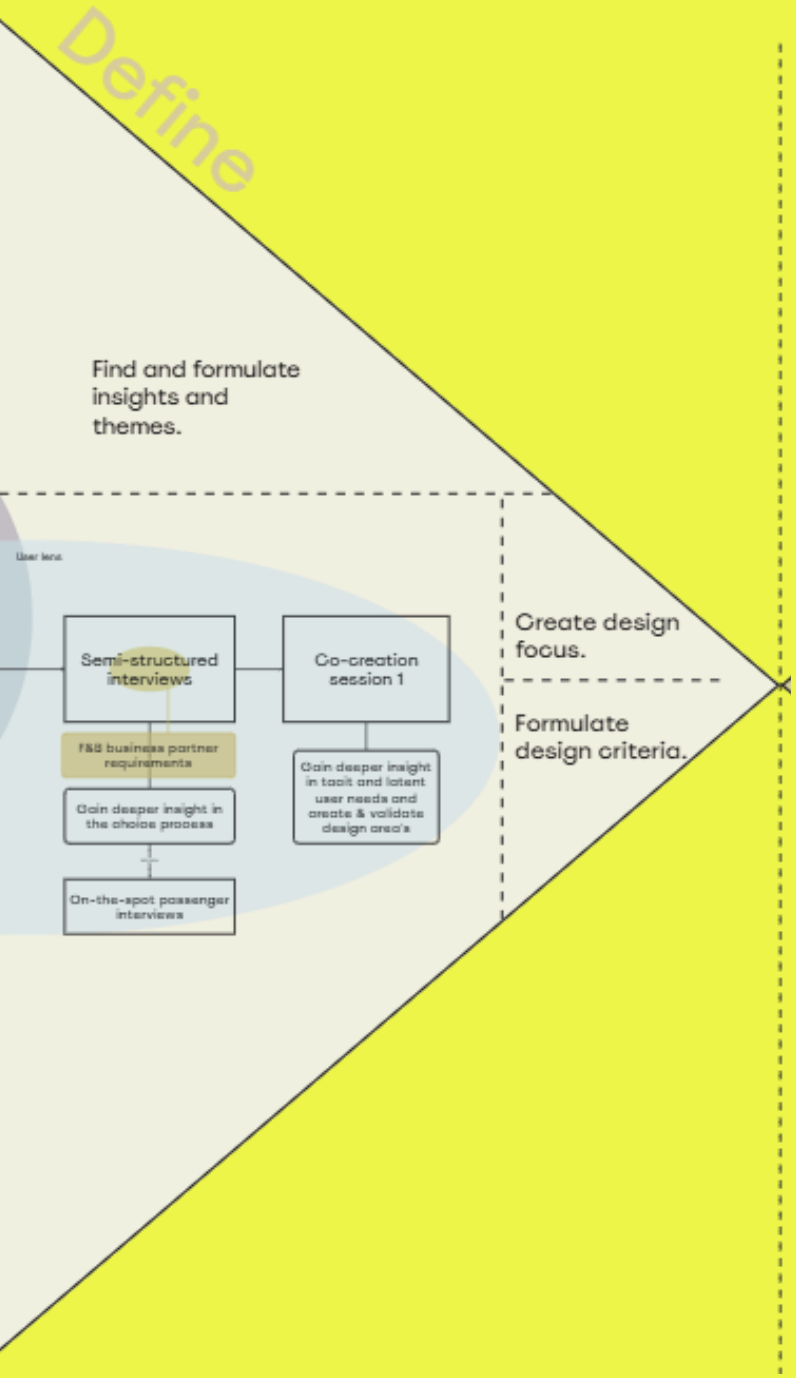
Section

# C | Define

The Discover phase revealed how passengers make food choices at Schiphol and which behavioural patterns shape those decisions. The Define phase builds on these insights by sharpening the focus and translating research into a clear strategic direction.

This phase structures and synthesizes the behavioural findings, clarifies the core mechanism behind the current behaviour, and identifies where intervention can create meaningful impact. Through visualization, co-creation and prioritization, the insights are distilled into a focused design challenge and concrete design criteria.

The purpose of this phase is to move from understanding the passenger to defining how a design intervention can effectively influence their behaviour.


Define
Find and formulate insights and themes.
User lens
Semi-structured interviews
Co-creation session 1
F&B business partner requirements
Gain deeper insight in the choice process
On-the-spot passenger interviews
Gain deeper insight in tacit and latent user needs and create & validate design area's
Create design focus.
Formulate design criteria.

Chapter

# 06 Synthesis

This chapter brings together the key insights from the Discover phase and translates them into a structured understanding of the decision mechanism behind airport food choices.

# 6.1 Passenger empathy map

The empathy map in Figure 25 translates the research findings into the lived experience of the passenger. It shows what passengers see, think, feel and do during the food decision moment.

Passengers arrive at the browsing moment after navigating security, queues and waiting times. Even when they are not consciously stressed, the environment demands mental energy. At this point, passengers are not rationally looking for the most sustainable option. They are looking for something that will “work out”. Something filling enough. Something enjoyable. Something predictable. Having control in the outcome becomes important.

This empathy map makes visible that the food choice is embedded in a broader emotional and situational context.

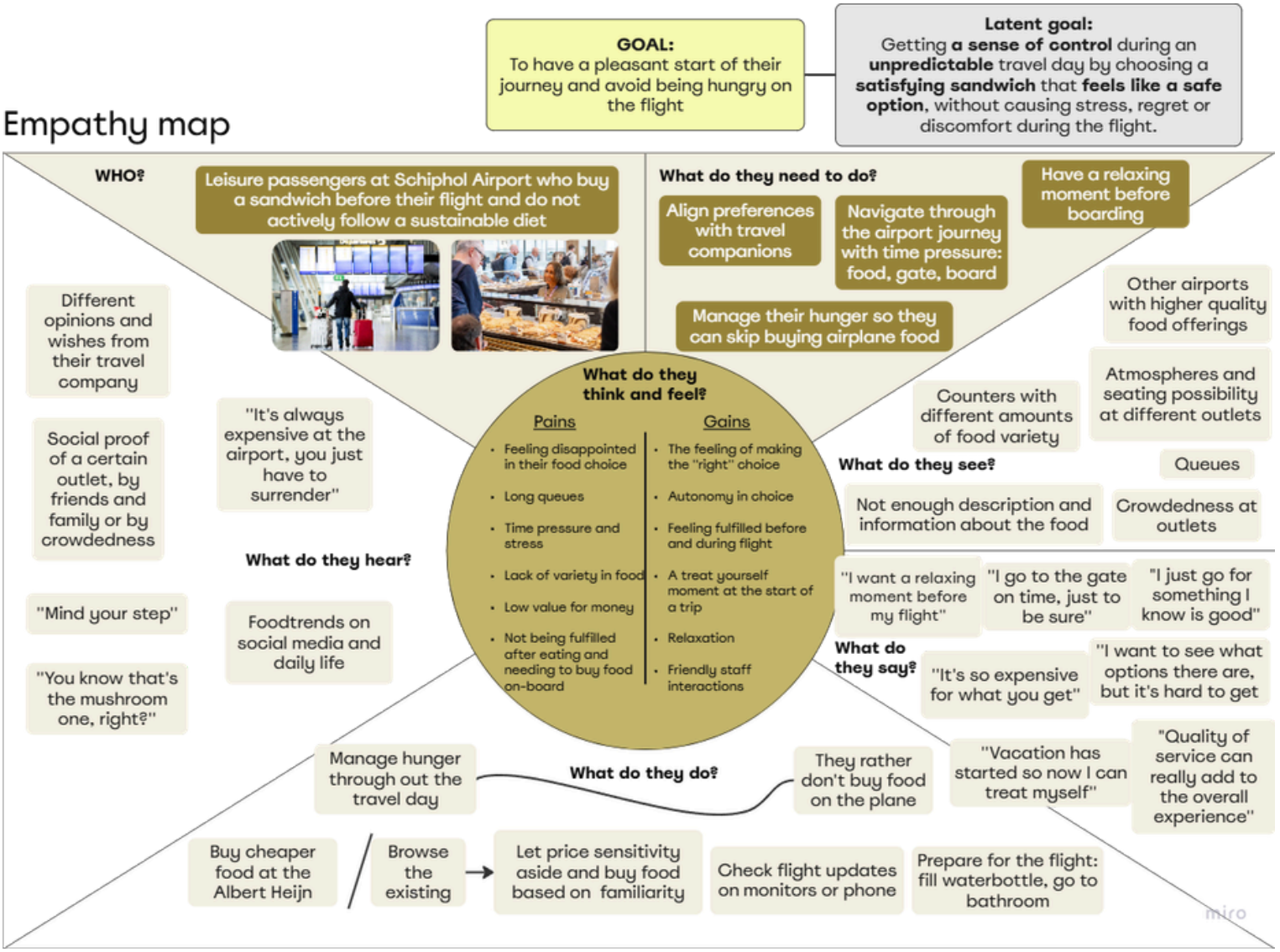



*Figure 25: Passenger empathy map*

# 6.2 The choosing mechanism

After combining the insights around choosing a plant-based sandwich from chapter 4 and 5 in the empathy map, a choosing mechanism evolved (Figure 26).

An unpredictable travel day, the avoidance of airplane food and a desire for comfort or indulgence increase passengers' need for certainty and control in their food choices.

In this context, choosing familiar food functions as a coping strategy: familiar options are perceived as safe, reliable and predictable in terms of satiety, enjoyment and overall satisfaction.

Plant-based sandwiches, however, often fail to meet this coping need. Due to expectations that plant-based options are less filling, less indulgent or less well-curated.

Limited ingredient visibility and existing meat-related habits make it harder to imagine the eating experience, which increases the perceived risk of disappointment. This perceived risk is further amplified by high prices and long queues. The X-symbols in the diagram indicate the clashes in the decision process. These clashing points are a part of the reason to grab towards an 'familiar' animal-based sandwich.

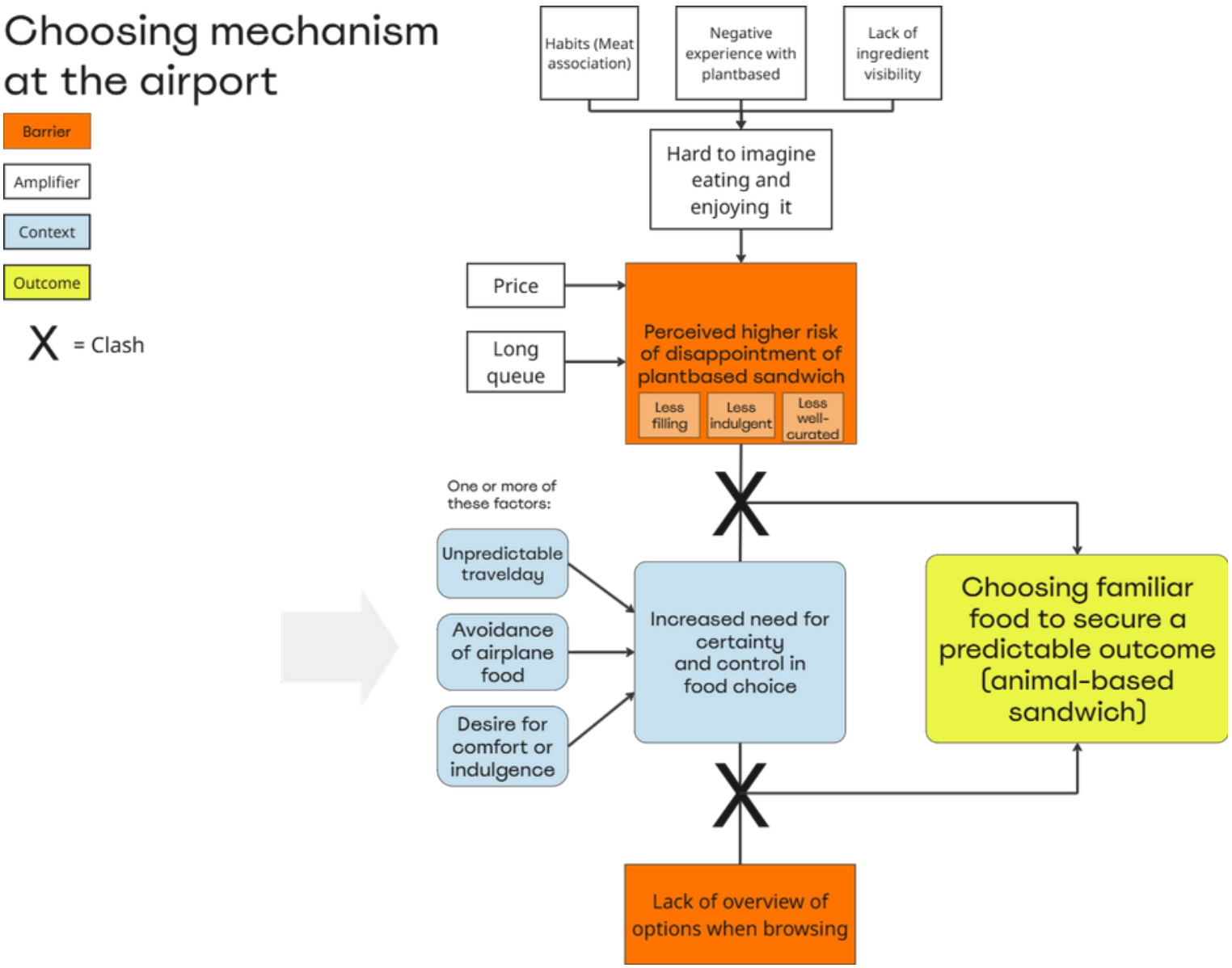



*Figure 26: Visual of choosing mechanism at the airport based on literature and user research*

Plotting the mechanism on the COM-B model shows that the current behaviour is not the result of conscious rejection of plant-based food (Figure 27). It is the logical outcome of a more irrational system in which:

- Psychological capability for evaluating unfamiliar options is limited
- Automatic motivation toward certainty is increased
- The opportunity structure amplifies perceived risk

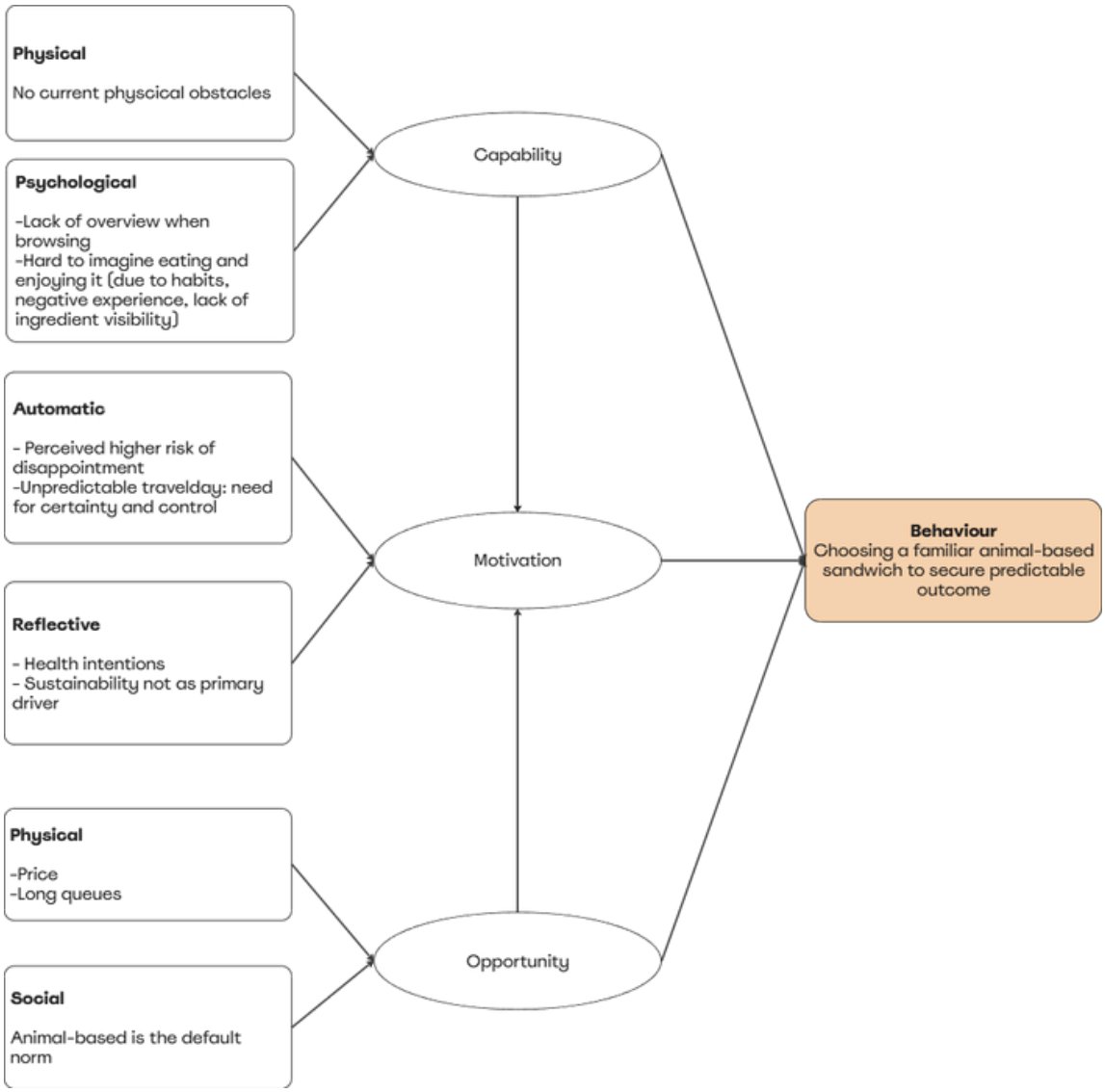



*Figure 27: COM-B model of current behavior*

# 6.3 Co-creation session 1

The goal of this generative co-creation was to prioritize and define the most important criteria for the design intervention. Figure 28 shows this position of the session in the field of user-centered design, in-between the analysis and the design phase. The 5 participants from the target group (leisure passengers who do not follow a plant-based diet) were asked to prioritize a set of 11 possible motivators in making a food choice that were derived from the discover phase:

*1. More overview over which sandwiches there are*
*2. A better imagining ability of how the sandwich taste will be*
*3. More clarity about what is exactly on the sandwich*
*4. Possibility for earlier orientation*
*5. Being able to curate own sandwich*
*6. Help/advice with choosing sandwich*
*7. Add something meaningful to the travel experience*
*8. Insight in what sandwich fits best at the moment*
*9. Being informed about health implications*
*10. See how many people bought the sandwich before you*
*11. Pay prior to your moment of ordering (included in airport day)*

After a discussion they were asked to envision their ideal versions of making a food choice when travelling (Figure 29). By emphasizing their 'ideal' version it became clear what mattered most to them as a passenger. This session shifted the passengers from "informers" to co-creators who helped shaping the opportunity space (Sanders & Stappers, 2012).

Pre-session: As a sensitizing probe participants where asked to do a small preparing assignment where they wrote down an experience where they bought something to eat on-the go in diary style.

For the full set-up of the session see Appendix E.

*Figure 29: Participants envisioning their ideal version of different motivators*

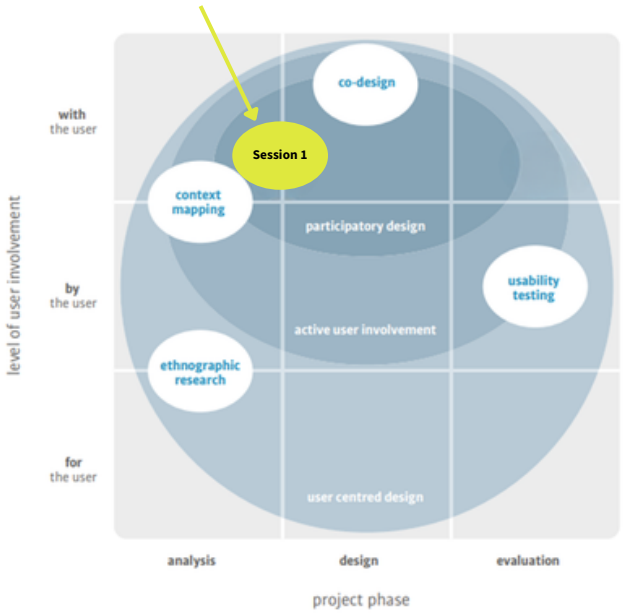



*Figure 28: Session 1 mapped on the field of user-centered design (Harris et al., 2014)*

## Results

Analyzing the visions of the participants and the transcription of the discussions during the session the following conclusion was derived:

## Ultimate goal

### *Confidence in decision*

Participants described wanting to feel reassured that their food choice would be satisfying and would “work out” within the context of their travel day. As one participant noted, it does not have to be the objectively best choice, as long as the passenger feels that it is. Uncertainty about taste, fullness or quality was described as the main source of discomfort during the choice moment. When this uncertainty was reduced, participants experienced the decision as easier, more pleasant, and easier to commit to.

## Main drivers

### *Familiarity*

During the session, participants suggested that familiarity can be strengthened by connecting plant-based options to existing taste preferences. Instead of presenting plant-based as something fundamentally different, it can be positioned in relation to flavours, textures or formats that passengers already enjoy. In this way, familiarity is translated through similarity in sensory expectations, not through direct comparison to meat. One participant compared this to recommendation type used in fashion platforms, where preferences and past choices are used to estimate fit and taste.

### *Guidance*

Participants repeatedly described an ideal experience as one where the airport “takes care of you” during a hectic travel day. Guidance was not about being told what to choose, but about reducing uncertainty and mental load. Knowing where to go, what to expect, and that the choice will “work out” reduced stress and hesitation. One participant explained that already having clarity before moving through the terminal made the experience calmer.

### *Desire through imagination*

Participants described wanting to feel reassured that their food choice would be satisfying and would “work out” within the context of their travel day. As one participant noted, it does not have to be the objectively best choice, as long as the passenger feels that it is. Uncertainty about taste, fullness or quality was described as the main source of discomfort during the choice moment. When this uncertainty was reduced, participants experienced the decision as easier, more pleasant, and easier to commit to.

## Extra opportunities

### *Social proof*

Reviews, ratings, familiar references (chefs, popular figures, “others like you”) made plant-based options feel more seriously recognized as a safe choice, instead of an experiment.

### *Waiting time*

Waiting at check-in, security or customs was consistently reframed as a moment of latent stress mixed with boredom. People felt they had not yet “progressed” in their journey. Participants saw these moments as opportunities to regain control by already orienting themselves. Early orientation was described as relieving: it turns waiting into more enjoyable and gives a sense of progress (“the road to my sandwich”). This explains why earlier orientation scored so high as a motivator.

## No-go's

### *Moral education*

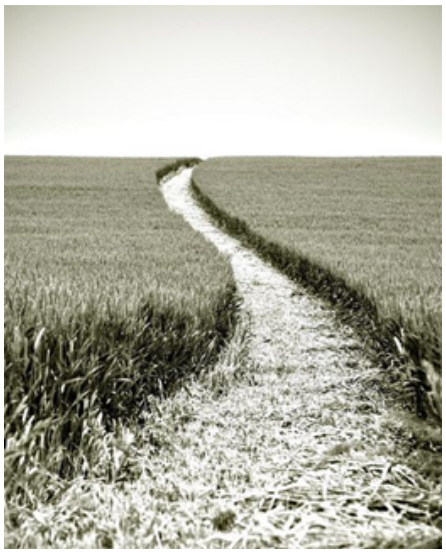
Across the discussion, participants repeatedly emphasised that they do not want to feel educated, corrected, or morally addressed at the moment of choosing food at the airport. Explicit sustainability framing or messaging that felt instructional was described as uncomfortable and, in some cases, counterproductive.

### *Loss of choice autonomy*

Participants indicated that they value maintaining freedom of choice during the food selection moment. Interventions that feel too directive or overly steering could work counterproductive.

# 6.4 Design focus

To reach the ultimate goal three key levers are used as the core design focus. These levers directly respond to the underlying decision mechanism observed in the research and form the foundation of the intervention.

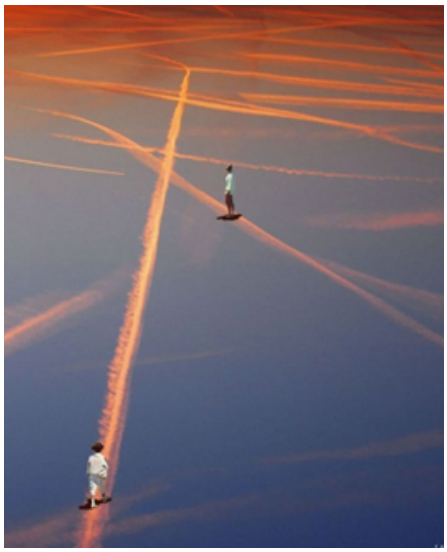


### Familiarity

*Metaphor: A safe, predictable and reliable path, although you have never walked it before*

Official definition: *"A form of remembering in which a situation, event, place, person, or the like provokes a subjective feeling of recognition and is therefore believed to be in memory, although it is not specifically recalled"* (APA Dictionary of Psychology, n.d.).

In the context of this research, the definition of familiarity is expanded with: the perception that a choice is safe, predictable and reliable. In this way the project looks at familiarity in a broader sense: not only as recognition based on memory, but as creating the perception that a choice will lead to the same effect as familiarity. Therefore this project speaks of 'building' familiarity.



### Guidance when browsing

*Metaphor: Walking on light support in the air, while seeing other pathways around you*

Guidance refers to subtle support that helps passengers navigate their choice confidently. This can include functional overview, but also creating a sense of being supported by Schiphol in the choice process.

### Enabling imagination of taste

*Metaphor: Imagining a cloud as ice-cream through form and composition*

By imagining the sensory experience of the food, the food becomes more desirable. Concretely this means visual and lingual cues that are focused on the sensory experience, instead of the functional ingredients of a sandwich.

Although distinct, the three levers strengthen each other. Guidance and imagination of taste both contribute to building familiarity, as they reduce uncertainty and make the outcome of the choice feel more predictable. At the same time, they create additional meaning: guidance enhances the feeling of being supported by Schiphol and imagination of taste enhances desirability.

This reinforcing relationship becomes visible when the levers are plotted on the COM-B model (Figure 30). The arrows in the model illustrate how guidance and imagination of taste primarily strengthen Psychological Capability by making the option easier to understand and evaluate. Increased capability reduces perceived risk, which in turn reinforces Automatic Motivation toward the plant-based option.

Automatic motivation is the most important lever in this project, because food choices at the airport are largely made on an intuitive level (system-1 thinking), but as the arrows show in Figure 30, the levers have impact on eachother simultaneously within the behavioural system.

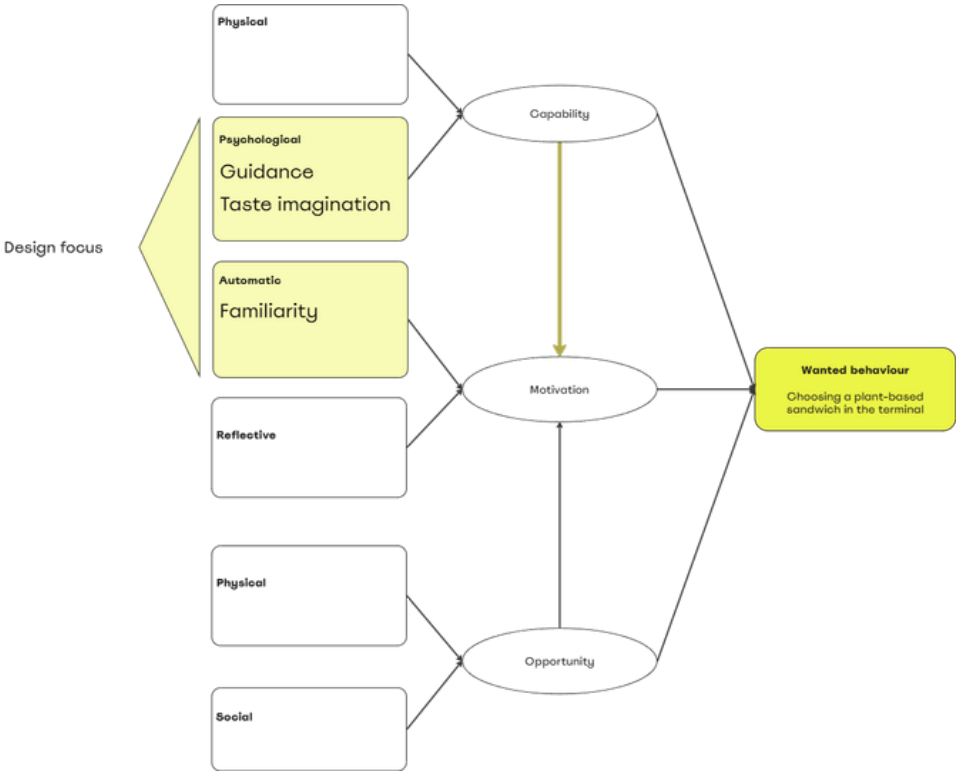



*Figure 30: COM-B model with design focus on Psychological Capability and Automatic Motivation*

*“Design a **guiding** intervention that **enables imagination of taste** and builds **familiarity** around a plant-based sandwich at Loaf.”*

# 6.4 Design criteria

Based on the synthesis of the user research and literature, this chapter translates the identified decision drivers into concrete design criteria using the COM-B model. These criteria form the foundation for the Develop phase. Plotting the wanted behaviour within the COM-B model clarifies the main criteria and some of the strategic design boundaries of this project seen in Figure 31.

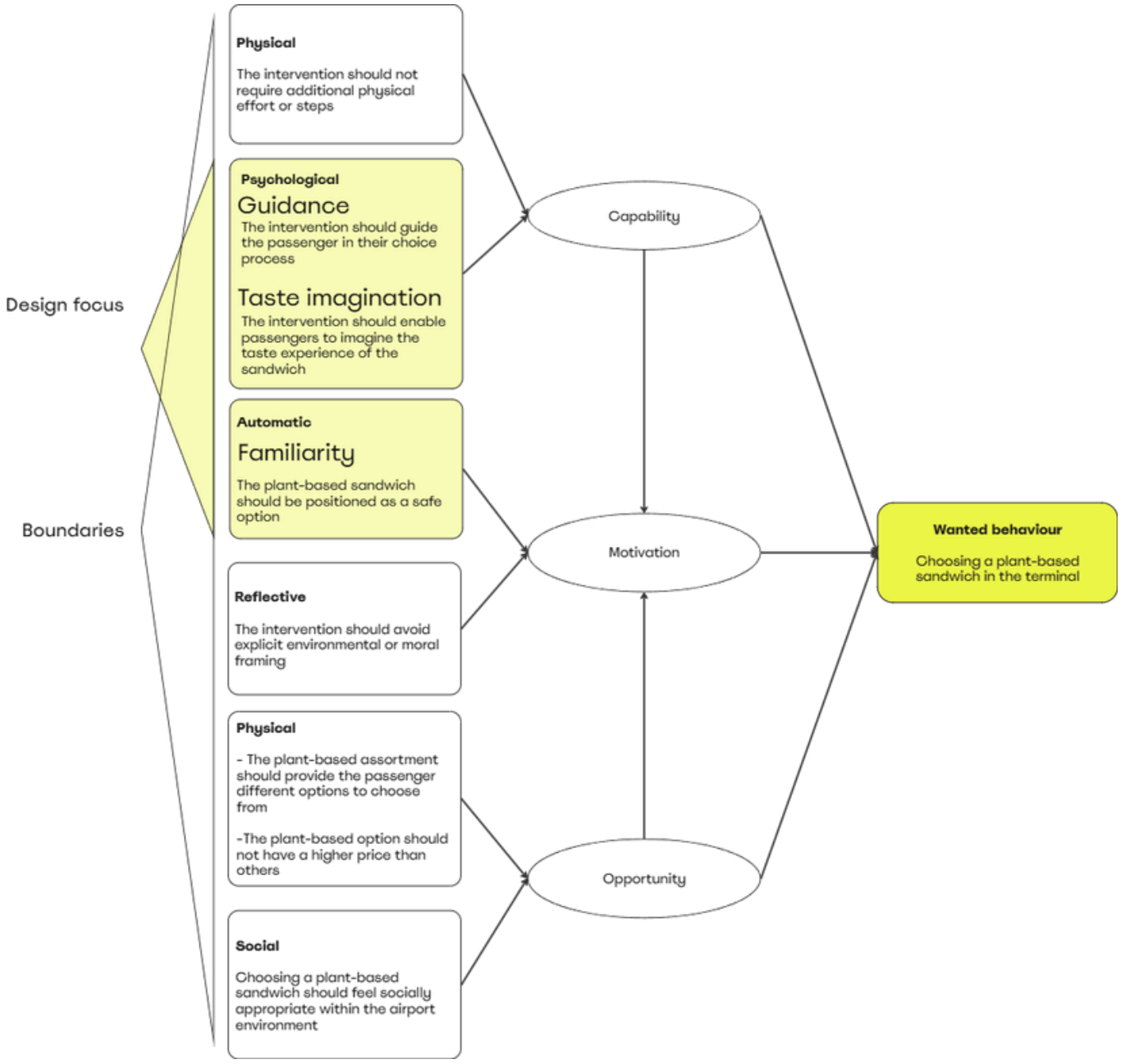



*Figure 31: COM-B model with design criteria*

## Must haves

### *DC.1 Familiar positioning*

The intervention must position the plant-based sandwich as a safe, predictable and reliable choice. This can be done concretely in the following ways:

- Communicating satiety of the sandwich
- Reduce ambiguity in naming (avoid abstract or vague titles)
- Use cues that suggest reliability or low risk
- Avoid framing it as a substitute to meat, instead highlight intrinsic strengths
- DC.2 and DC.3

*(Consumer and plant-based, User research)*

### *DC.2 Guidance*

The intervention must subtly guide passengers in their decision-making process and making it feel like Schiphol takes care of you. This can be done concretely in the following ways:

- Provide clear orientation of the assortment
- Reduce decision effort
- Communicate reassurance


*(Passenger trends, User research)*

### *DC.3 Imagination of taste*

The intervention must enable passengers to mentally simulate the sensory taste experience of the plant-based sandwich before purchase. This can be done concretely in the following ways:

- Make ingredients visually clear
- Use sensory language
- Include motor elements to imagine physical act of eating

*(Theory of Desire, User research)*

## Supporting criteria

### DC.4 Choice autonomy

The plant-based assortment at Loaf should provide the passenger more than 1 option to choose from *(User research, COM-B model).*

### DC.5 Social risk

The plant-based option should feel like a socially accepted choice to make and not get the passenger in a socially uncomfortable situation *(COM-B model).*

### DC.6 Practical testability

The concept should be designed in a way that allows pilot testing within the available project period, to ensure implementation potential *(Schiphol internal research).*

### DC.7 Positive passenger experience

The intervention should contribute to a positive passenger experience by improving the perceived value of the food experience *(Schiphol internal research, Passenger trends).*

## Avoid

### DC.8 Moral sustainability framing

The intervention should avoid explicit sustainability messaging or environmental persuasion at the point of choice *(Consumer and plant-based, User research).*

### DC.9 Spatial disruption

The intervention should avoid adding visual clutter and should not require additional physical effort for the passenger *(Schiphol internal research, COM-B model).*

### DC.10 Price disadvantage

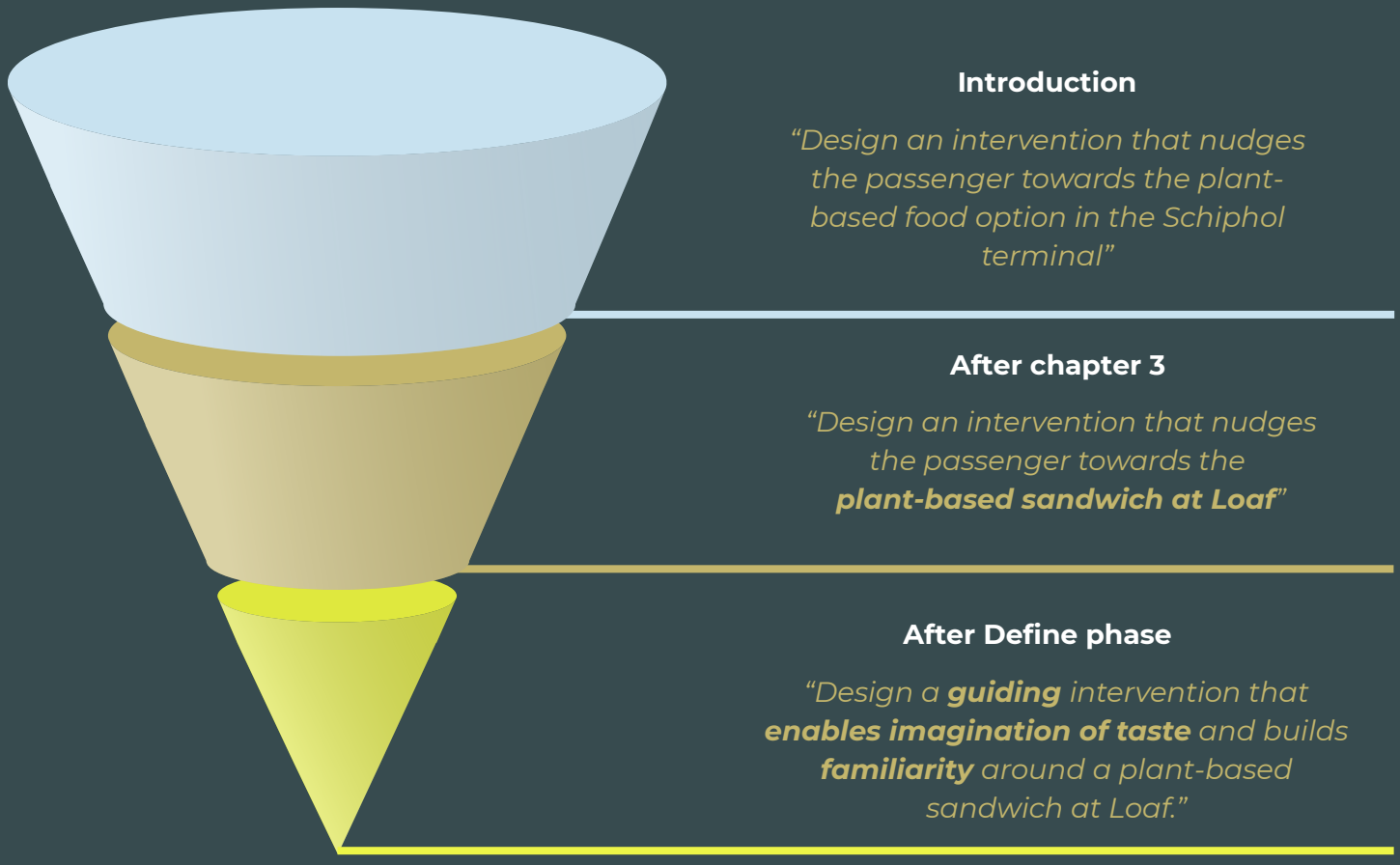
The intervention should avoid increasing the price of the plant-based option relative to other sandwiches *(Consumer and plant-based & COM-B model, User research)*

# Conclusion Chapter 6

This chapter translated the research insights into a clear design focus. By synthesizing the findings, the core mechanism behind airport food choices became visible: passengers want to make a confident choice. The empathy map and choosing mechanism showed the broader context and relations of this. Plant-based options are not avoided because of strong resistance,  but because they often feel less predictable. In a travel context shaped by time pressure, high prices and mental load, these small uncertainties matter.

The co-creation session made this concrete. Passengers want confidence in their choice. Familiarity, subtle guidance and the ability to imagine taste emerged as the strongest levers to create that confidence. In this project, familiarity goes beyond simple recognition. It refers to the feeling that a choice is safe, predictable and likely to work out. Guidance and imagination of taste also contribute to this. Grounded in the research findings and using the COM-B model, ten design criteria were derived to guide the Develop phase. In COM-B terms this means a focus on Psychological Capability and Automatic Motivation.

This gives the following design challenge evolution:




Design criteria (partially) derived from this chapter:

- DC.1
- DC.2
- DC.3
- DC.4
- DC.8

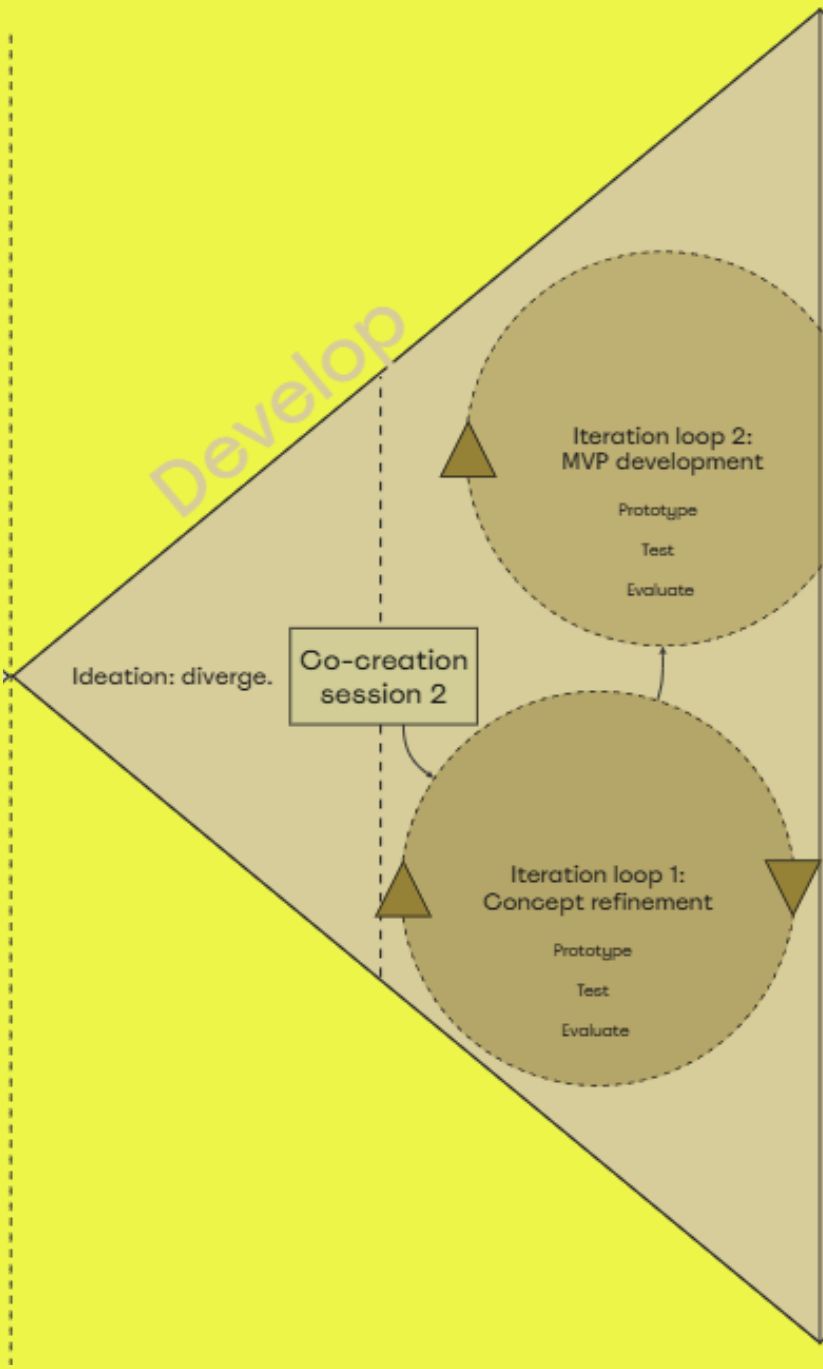
Section

# C | Develop

Following the Define phase, the project shifts from analyzing behaviour to shaping it through design. Where the previous phase clarified the underlying decision mechanism and established a strategic direction, the Develop phase explores how this mechanism can be influenced in practice through a concrete intervention.

In this phase, multiple solution directions are generated, tested and refined. Ideas are evaluated against the behavioural levers and the practical constraints of the Schiphol context. Through iteration, co-creation and validation, the process moves from fragmented ideas to coherent concepts and ultimately toward a concrete, testable intervention.

The Develop phase follows Sanders & Stappers' analysis–conceptualization framework (Figure X). The behavioural insights synthesized in the earlier phases form the analytical foundation. These insights act as a bridge into future embodiments, guiding the transformation of research findings into tangible design directions. In this project, that bridge is formed by the defined behavioural mechanism and the design criteria, ensuring that conceptual exploration remains grounded in the passenger context while opening space for innovation.


Develop
Iteration loop 2:
MVP development
Prototype
Test
Evaluate
Ideation: diverge.
Co-creation
session 2
Iteration loop 1:
Concept refinement
Prototype
Test
Evaluate

Chapter

07

# From design challenge to concepts

This chapter explores how the defined challenge is translated into possible interventions. Starting from broad ideation, multiple directions are generated and gradually shaped into coherent concepts by clustering ideas, iterating and co-creating.

# 7.1 Initial ideation

To support divergence, ideation started with broad "How might we" questions:

- HMW make the passenger mentally taste the sandwich?
- HMW guide the passenger in their food choice?
- HMW make something feel familiar?

These questions were intentionally broad in order to stimulate divergence and allow for both practical and intuitive design ideas to emerge. The aim of this phase was to generate a rich idea space from which underlying patterns could later be identified. Over 40 ideas were generated.

# 7.2 Concepts

When comparing the ideas, similarities in the way of addressing the design challenge became visible. Clusters were developed through iteration: ideas were grouped, moved and regrouped until there were four distinct directions. To get another perspective on this interpretation, the same idea set was later clustered using AI. Without being given predefined categories, it generated almost similar groupings with slightly different naming, which validated that the patterns were quite obvious.

The transition from directions to concepts was a design step where the strongest and most promising ideas in each direction were selected, strengthened and combined into one coherent intervention that could be integrated in the passenger journey at Schiphol.

Importantly, the resulting concepts operate at different scales within the passenger journey. Some focus on a specific moment of choice at the counter, while others intervene earlier in the travel journey or across multiple touchpoints in the airport environment. Together, they represent different ways of approaching the design challenge, ranging from focused interventions to broader concepts.

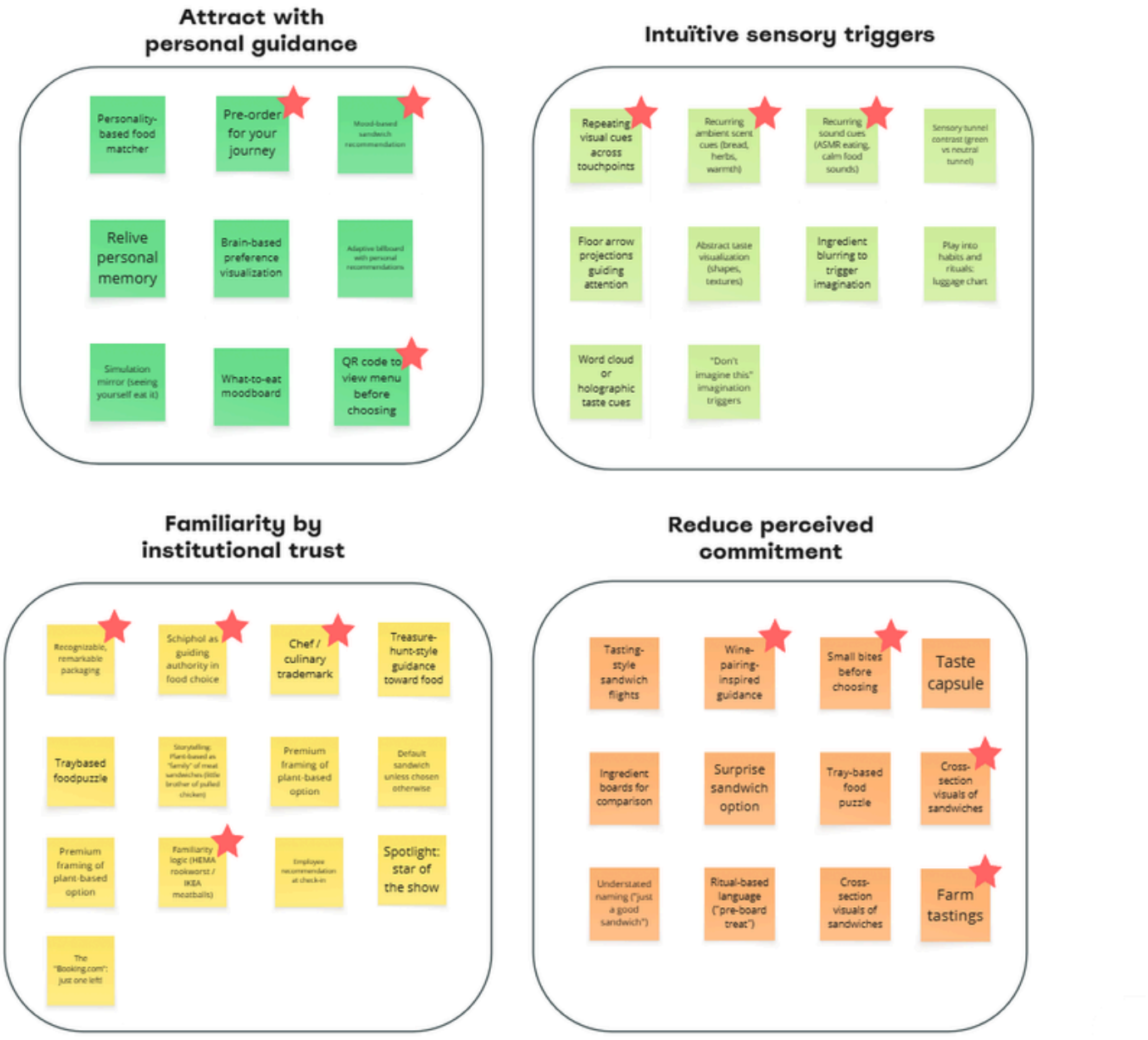



*Figure 32: Clustering of ideas into directions*

### Attract with personal guidance

This cluster contains ideas that make the choice process more explicit and supportive. The focus lies on helping passengers understand what they are choosing and how it fits their moment. Examples include previews of the sandwich, ingredient boards, mood- or travel-based suggestions and a pre-order. The idea behind this is that personal relevance and convenience attracts passengers towards the intervention.

The ideas in this cluster were focused on previewing options and personal recommendations based on and the willingness to pre-order (Hwang et al., 2023). Together with the opportunity of targeting passengers during waiting time in mind the ideas in this cluster were combined to a service-oriented concept.

# 1. Preview and order

The Preview and order concept allows passengers to preview and pre-order plant-based sandwiches during moments of waiting in the airport, such as at the gate or while queuing. By scanning an NFC chip, passengers access a mobile interface where plant-based sandwiches are presented through appealing visualizations. Within this interface, they can select what they normally like, what kind of flight they have and will get personalized suggestions. They can place a take-away order, after which the system calculates an optimal food pick-up route that is on their way to the gate, removing waiting time at the outlet and contributing to a streamlined journey.

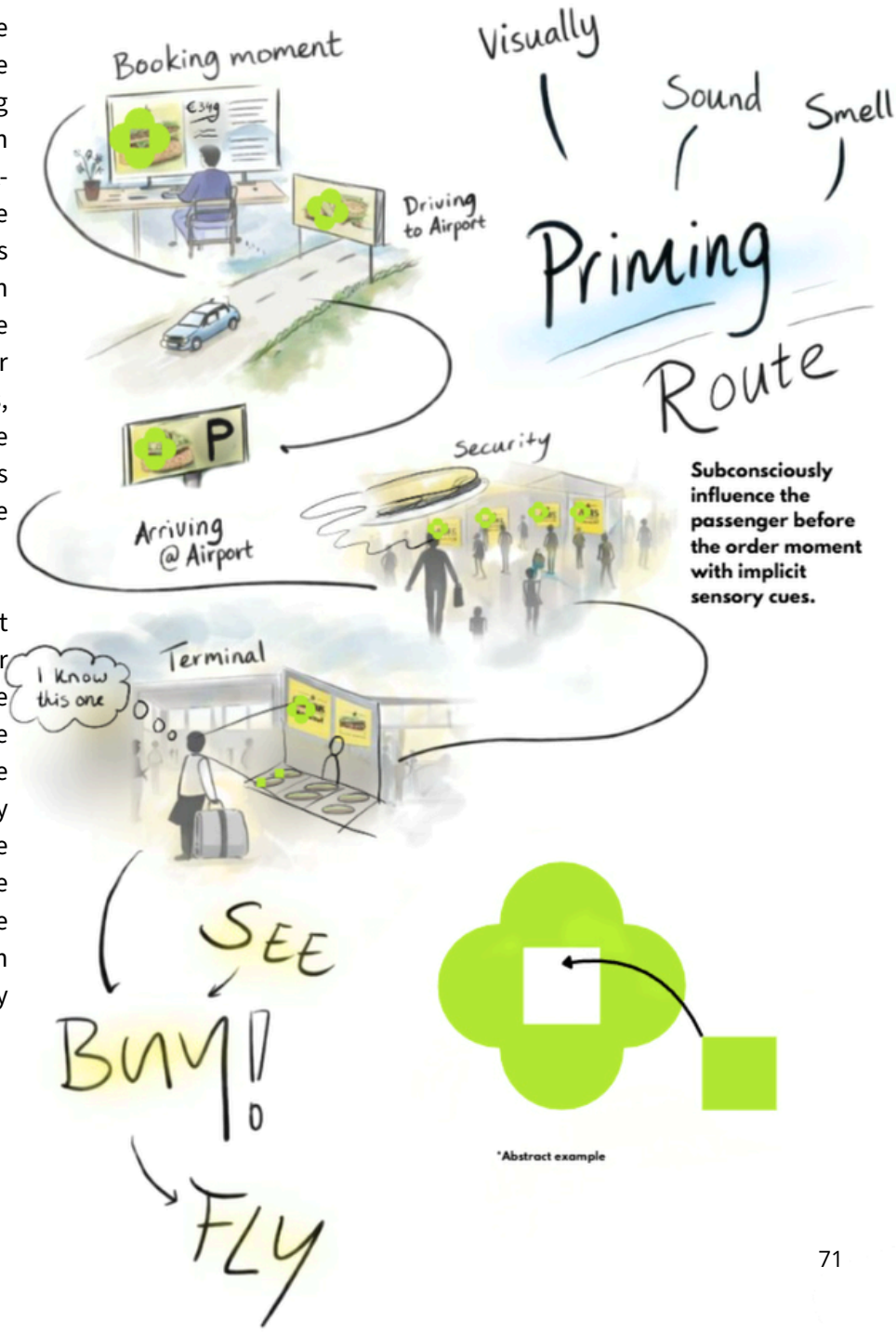
### Intuitive sensory triggers

The second cluster operates at a more subtle level. Instead of providing explicit information, these ideas use sensory cues such as scent, sound, light, projections or spatial markers integrated into existing travel rituals. When developing these ideas to a concept, it became clear that the strength of these ideas did not lie in one single intervention, but in a combination. A single scent or visual would likely go unnoticed. However, repetitive subtle cues across different moments in the journey could create a sense of recognition without conscious awareness. The creation of the concept is inspired on the principle of Priming. Priming involves using stimuli (visual, smell or sound) that trigger nonconscious processing to influence decisions (Hao et al., 2024). Research shows that priming can increase the likelihood of certain choices. For example showing health-related visuals in a period of time can increase the selection of healthier food options in a supermarket (Van der Laan et al. 2016). This shifted the ideas from one touchpoint to the concept of the Priming Route.

# 2. The Priming Route

Subtle sensory cues gradually prepare the passenger for the plant-based choice without explicit instruction. The Priming Route is a multi-sensory design intervention that subtly guides passengers toward plant-based food choices throughout the entire passenger journey. From early touchpoints such as flight booking or parking, through the terminal environment and up to the moment of purchase, passengers encounter recurring sensory cues such as visuals, sounds and/or scents. These cues are designed to work below conscious awareness and do not explicitly reference sustainability or plant-based food.

By appearing consistently across different moments, the plant-based option no longer feels like a sudden or isolated choice at the counter. Instead, it feels coherent within the broader travel experience. In this way, the Priming Route contributes to familiarity by increasing perceived predictability: the option feels less unexpected and therefore safer to commit to. At the same time, the recurring cues function as a very subtle form of guidance, where the environment gently directs.

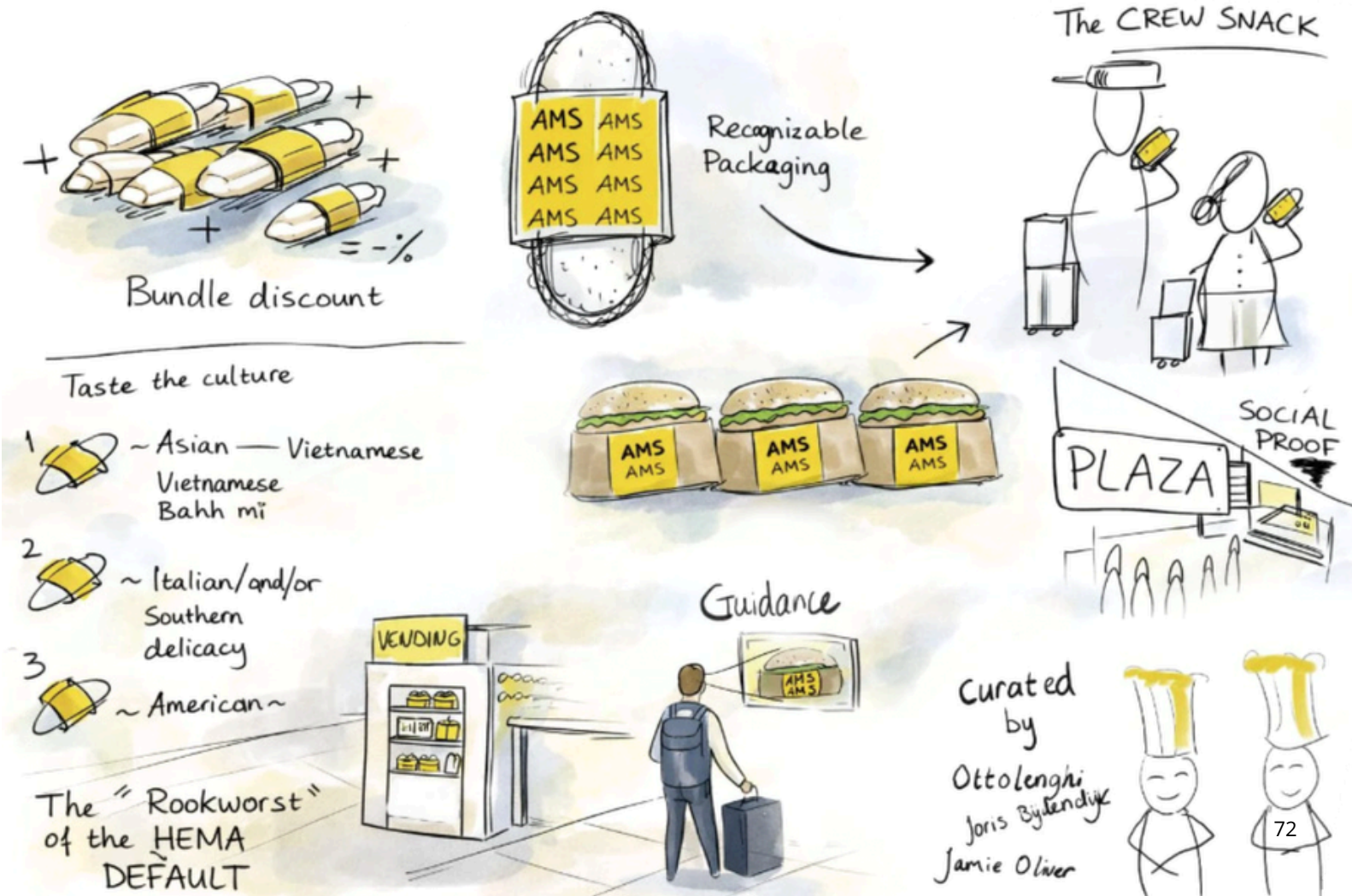


### Familiarity through institutional trust

This cluster grouped ideas in which familiarity and guidance were transferred from a trusted authority to the sandwich itself. Examples included chef endorsements, recognized product signatures (such as the HEMA rook worst), Schiphol recommendations, a default sandwich, or distinctive packaging. The shared mechanism behind these ideas was legitimacy. When an option is curated by a recognized institution, the perceived responsibility of the choice shifts away from the passenger. The sandwich feels safer because it is framed as trusted.
When translating this cluster into a concept, the question became how institutional trust could be made tangible and consistent at Schiphol. The idea evolved into creating one recognizable sandwich made with Schiphol's expertise in facilitating the travel day.

# 3. The Schiphol Sandwich

Here, the mechanism of authority was translated into a single, Schiphol-curated sandwich. The Schiphol Sandwich is a single, plant-based sandwich curated by Schiphol and offered consistently across multiple food outlets in the airport. In this way the passenger will not feel like missing out on options when going to a certain gate and gives peace of mind knowing The Schiphol Sandwich will be available. It is recognizable through its distinctive packaging and positioned as the default, reliable food choice for a travel day. Designed to be filling and nutritious and positioned as a trusted "crew snack," the sandwich becomes a recognizable element of the Schiphol experience. Seen across the airport and developed in collaboration with well-known chefs, it reinforces its legitimacy as a reliable option.



### Reduce perceived commitment

The second cluster operates at a more subtle level. Instead of providing explicit information, these ideas use sensory cues such as scent, sound, light, projections or spatial markers integrated into existing travel rituals. When developing these ideas to a concept, it became clear that the strength of these ideas did not lie in one single intervention, but in a combination. A single scent or visual would likely go unnoticed. However, repetitive subtle cues across different moments in the journey could create a sense of recognition without conscious awareness. The creation of the concept is inspired on the principle of Priming. Priming involves using stimuli (visual, smell or sound) that trigger nonconscious processing to influence decisions (Hao et al., 2024). Research shows that priming can increase the likelihood of certain choices. For example showing health-related visuals in a period of time can increase the selection of healthier food options in a supermarket (Van der Laan et al. 2016). This shifted the ideas from one touchpoint to the concept of the Priming Route.

# 4. Mix & Match

The Mix & Match concept allows passengers to combine two half sandwiches with different flavors instead of committing to a single option. The experience is framed as a tasting or pairing, with recommended combinations guiding passengers toward complementing flavor profiles. This approach can add extra value for the passenger as you get two flavours for the price of one, while remaining choice autonomy. At the same time, presenting the sandwich in halves makes the cross-section visible, which supports imagination of taste by clearly showing ingredients, textures and layers. The smaller, hand-sized portions also activate the motor component of the Theory of Desire: because the sandwich appears easier to grab, hold and bite into, the brain can more easily simulate the eating action (Papies et al., 2020).

# 7.3 Co-creation session 2

The second co-creation session aimed to explore the potential of the concepts and sharpen them before selection. While the first session focused on defining opportunity areas, this session positioned participants as co-designers and evaluators in the Develop phase (Figure 32).

### *Objectives*

1. To add refinements that could strengthen feasibility and desirability
2. To assess which concepts are most promising

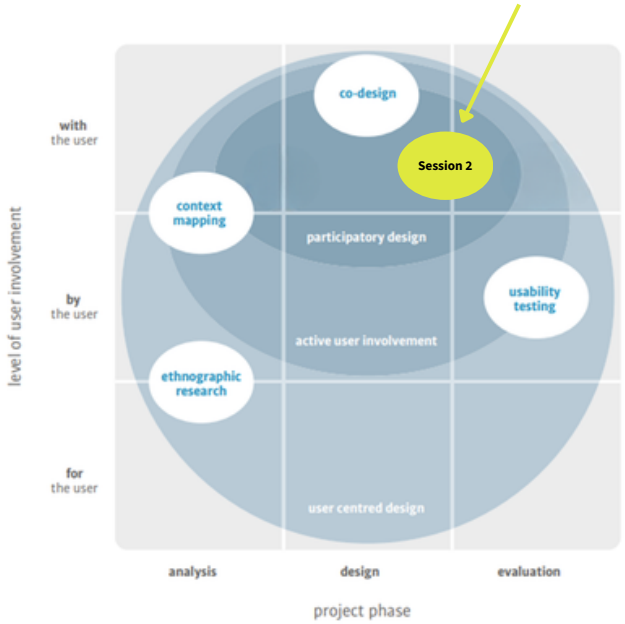



*Figure 32: Session 1 mapped on the field of user-centered design (Harris et al., 2014)*


*Figure 33: Co-creation session 2*

### *Procedure*

Eight participants joined the session, of whom six were sensitized Schiphol employees. The session therefore combined contextual knowledge of the airport with the perspective of travelers, which was valuable to strengthen both feasibility and desirability.

After a free ideation to get everyone in their creative mindset, the four concepts were presented as open and unfinished proposals. Participants rotated around the table, engaging with each concept in turn and adding ideas for improvement, refinement or extension.

After all rotations, participants were asked to individually place two votes on the ideas they felt had the most potential to make the concept stronger and more convincing. This helped identify promising directions for further development.

For set-up and results see Appendix H.

## Results


### *Concept 1: Pre-view and Order (4 votes)*

Scored relatively high. The ideas in this concept highlight a strong desire for control, transparency and predictability in the airport context. Features such as clearly showing ingredients, nutritional information, preparation time, order-to-gate functionality and boarding-pass-based routing all where attractive to the participants. Importantly, these ideas position the sandwich within a broader Schiphol service ecosystem, rather than isolating it as a food choice. The inclusion of loyalty programs and dedicated pick-up points further reinforces the idea of Schiphol actively "thinking along" with the passenger.


### *Concept 2: The Priming Route (1 vote)*

Received limited support and surfaced critical reflections. Participants noted the difficulty of realizing this concept within Schiphol's decluttering ambitions. Also many barriers were seen in the costs of using media at Schiphol. Because of the amount of sensitized/biased participants, this limited thinking out of the box.


### *Concept 3: The Schiphol Sandwich (8 votes)*

Received the highest number of votes and consistently reappeared in participants' ideas at the other concepts. This indicates that the concept is memorable, flexible and capable of absorbing multiple layers of meaning, such as cultural identity, familiarity and trend-sensitivity. Ideas such as one changing sandwich based on trends, destination-linked sandwiches, Dutch references and influencer-led taste tests demonstrate that participants see the Schiphol Sandwich not as a fixed product, but as a platform that can evolve over time while remaining recognizable.


### *Concept 4: Mix & Match (3 votes)*

Contributes primarily to reducing risk of choice and perceived value. Ideas such as ''Schiphol'' selected combinations, health-focused/nutritional framing and chef collaborations align with the need to increase choice confidence and guidance. Participants repeatedly suggested combining this concept with Concept 3, in a format where Schiphol suggests different combinations for the travel day.

## Stakeholder lens

During the concept evaluation, stakeholder feasibility was an important consideration. Although Concept 1 (Preview & Order) scored relatively high among participants, implementing this concept would require a new digital and logistical infrastructure, including ordering interfaces, routing systems and dedicated pick-up points across the terminal. This would involve significant coordination between Schiphol, HMSHost and additional technology partners, making it unrealistic to pilot within the scope of this project.

Concept 2 raised different challenges. Implementing subtle sensory cues across multiple moments of the passenger journey would require large-scale use of media and environmental interventions throughout the terminal, which conflicts with Schiphol's ambitions to reduce visual clutter. In addition, such an intervention would involve substantial investment while the behavioural impact would be difficult to isolate and measure, making it less attractive for stakeholders to test.

Concepts 3 and 4 were therefore considered the most viable directions. Both concepts could be explored within the existing food environment and partnership structure, while still offering meaningful opportunities to influence passenger choice.

### Limitations

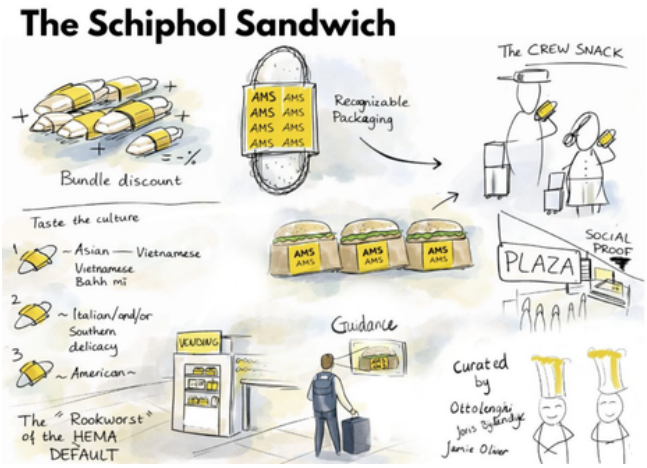
A first limitation of the second co-creation session was the unequal level of concept maturity. The concept of The Priming Route was still relatively abstract compared to the other concepts, which were presented in a more concrete and tangible way. As a result, participants found it more difficult to understand and iterate upon this concept during the session. Ensuring that all concepts are developed to a similar level of detail beforehand would likely have supported a more balanced evaluation.

A second limitation concerns the composition of the participant group. Six of the participants were Schiphol employees, which influenced the discussion dynamics. These participants naturally evaluated the concepts from an organizational and operational perspective, which may have limited more exploratory thinking about possibilities beyond the current system.

# 7.4 Concept selection

The final concept was selected based on its ability to address the three Must Have criteria while remaining feasible within the Schiphol context. During the co-creation session, Concept 3 – The Schiphol Sandwich emerged as the most frequently referenced and voted-for idea. In addition to enthusiasm for the Schiphol Sandwich itself, the combination with Concept 4 – Mix & Match was mentioned as an opportunity.

Therefore the institutional power of the Schiphol Sandwich and the simplicity and added value of Mix & Match were combined into one concept: The Schiphol Selection.





### Stakeholder lens

The opportunity in combining the strengths of both concepts was validated through conversations with stakeholders (Schiphol Commercial, HMSHost and Schiphol Marketing). When talking to stakeholders The Schiphol sandwich was seen as an interesting and disruptive concept, but hard to implement within the current Schiphol F&B system. A centrally curated Schiphol Sandwich across multiple outlets would require complex alignment between the Schiphol and HMSHost. A realistic pilot would therefore not be possible within the timeframe of the project and it would not benefit the current partnership. Mix & Match was viewed as the most promising concept, due to it's simplicity and potential impact.

## Alignment with must haves

***Familiar positioning***

The Schiphol Selection format strengthens familiarity by transferring institutional trust to the plant-based option. By positioning it as curated and recommended by Schiphol as an expert for the travel day, the sandwich feels safe, reliable and predictable.


***Guidance***

The combination format allows Schiphol to suggest pairings or curated combinations, creating subtle guidance without restricting autonomy and making the passenger feels supported in their decision. How the guiding role of Schiphol exactly should look, will be further explored during the concept development.

***Imagination of taste***

The Mix & Match format enhances imagination of taste through visible cross-sections and smaller portions. This contributes to the simulation of the act of eating (Theory of Desire) and reduces uncertainty about ingredients. However this aspect should be further developed in lingual descriptions of the ingredients.

# Conclusion Chapter 7

This chapter translated the design challenge into four concrete concept directions:

1. Preview & Order
2. The Priming Route
3. The Schiphol Sandwich
4. Mix & Match

Each concept addressed the behavioural mechanism in a different way. Preview & Order focused on increasing control and transparency through service integration. The Priming Route aimed to influence choice through subtle priming cues. The Schiphol Sandwich used institutional authority to transfer trust. Mix & Match reduced perceived risk by lowering commitment and increasing value.

During the co-creation session, The Schiphol Sandwich received the most votes and generated strong enthusiasm. However, stakeholder conversations revealed that implementing one centrally curated sandwich across multiple outlets would require structural alignment that is not feasible within the project timeframe.

Mix & Match, on the other hand, was considered operationally realistic, easy to pilot at Loaf and directly aligned with reducing perceived risk at the counter. Participants also repeatedly suggested combining it with the institutional framing of the Schiphol concept.

This led to a strategic decision: combine the trust and legitimacy of the Schiphol concept with the low-risk format of Mix & Match. From this combination, ***The Schiphol Selection*** emerged.

The next step is to refine this combined concept, clarify the role of each element and test how they function together in practice.

Chapter

# 08 Concept refinement

This chapter aims to clarify Schiphol's role within The Schiphol Selection. Also recipes for the assortment are created, inspired through a supermarket-safari. The concept is tested in a tangible set-up to understand how passengers respond to the Schiphol framing and the Mix & Match principle. Insights from this test are used to feed the next iteration loop.

# 8.1 Combining the strengths

The final concept combines the strongest mechanisms from the previous concept directions into one coherent intervention (Figure 34). The Schiphol Selection provides the overall structure by presenting a curated set of sandwiches for the travel moment. Within this selection, the Mix & Match format allows passengers to compose a combination of two halves, translating the behavioural principles into the food experience itself.

In this chapter, this combined principle is further developed into a concrete design. This includes defining the recipes within the selection, the presentation of the sandwiches, and how the format can be implemented at the counter.


*Figure 34: Mock-up of the Schiphol Selection format*

# 8.2 Composing recipes

To eventually test The Schiphol Selection in the terminal, choice autonomy is an important condition. To offer real freedom in mixing and matching, at least three recipes are needed in the format, instead of limiting passengers to only one possible combination.

One existing Loaf recipe (Hummus, ratatouille) was included, and two new recipes were developed. Each recipe followed a structure: a spread as a base, a vegetable element, and a green salad or herb accent. This structure did not include a meat substitute, but the vegetable or spread as the main part of the sandwich (DC.1).

For inspiration and to ensure the new recipes would resonate with the current market, a "supermarket safari" was conducted. This involved documenting a range of plant-based products available in the retail market (Figure 35).

Out of this inspiration and considering DC.1, two distinctive, but complementing plant-based recipes were developed :

**1. Artichoke cream, tomato & basil: fresh mediterranean option**

**2. Pulled mushroom, truffle mayo (vegan) & rucola: more umami/rich option**


*Figure 35: Supermarket-safari*

# 8.3 Test with The Schiphol Selection

Because two previously separate concepts were combined into one integrated direction, an experiment was conducted to clarify the role of each element within the concept. By comparing the Schiphol Selection with a single Schiphol-branded sandwich, the experiment explored how Schiphol branding and the Mix & Match format each influenced decision-making. The single Schiphol Sandwich acted as a comparison point and helped initiate discussion about the role Schiphol could play in the food experience. These insights helped determine where emphasis should lie in the development of the MVP.

To avoid making the set-up suggestive, both plant-based options were included in the comparison. Presenting only the Mix & Match format as the plant-based option could have revealed the intended concept direction and influenced choices. Including a single Schiphol-branded sandwich alongside the Schiphol Selection created a more neutral comparison. See Appendix I for the full set-up.

### *Objectives*

- To explore how the Mix & Match format influences willingness to choose a plant-based sandwich.

- To explore how Schiphol branding influences perceived attractiveness and trust.

### *Assumptions*

1. Offering two flavours lowers perceived commitment and increases perceived value
2. Schiphol branding attracts more attention and trust than Loaf branding.

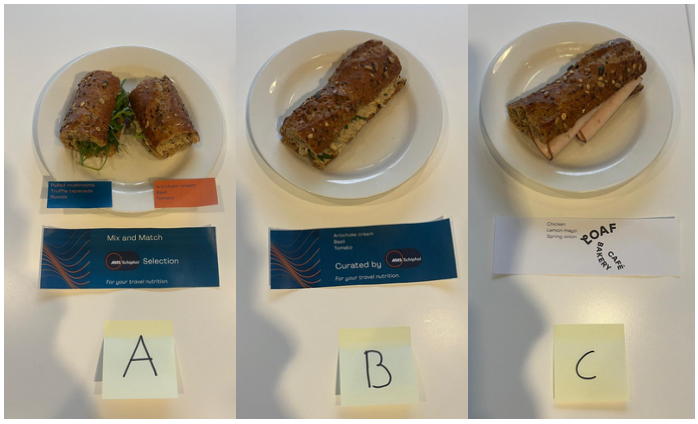



*Figure 36: Experiment set-up*

### *Procedure*

Three options were presented: the Schiphol Selection (Mix & Match format), a single Schiphol-branded sandwich, and a neutral animal-based option (Figure 36). Participants were asked to imagine themselves at Schiphol Airport before going on vacation and to choose the sandwich they would buy in that situation (Figure 37).

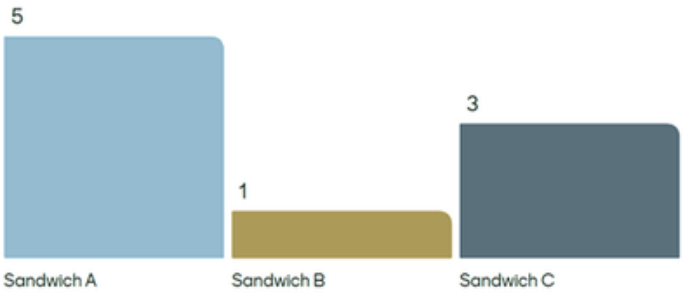
The animal-based comparison sandwich consisted of chicken, lemon mayonnaise and spring onion. All options were presented at the same assumed price to avoid price influencing the decision.

The plant-based prototypes were designed around vegetables as the main ingredient and avoided meat substitutes, in line with the design criteria of highlighting intrinsic qualities such as freshness and flavour. The recipes represented contrasting flavour profiles to make the Mix & Match principle tangible.

After making their choice, participants answered follow-up questions via Mentimeter, explaining why they found the option attractive.

*Figure 37: Participants choosing*

## Key insights




### *Variety increases value*

The Schiphol Selection received the most votes. Participants consistently mentioned the value of getting “two flavours” or “two sandwiches”, confirming that combining options reduces the pressure of committing to a single choice. As one participant summarized: “You don’t have to choose one, you can have both.” This validated assumption 1.

### *Schiphol works better as a guide than as a food brand*

While the concept was perceived as clear and reliable, participants felt limited emotional connection with food explicitly branded as “curated by Schiphol.” Schiphol was mainly associated with its institutional role in the airport, while Loaf was seen as the credible food provider. The label Schiphol Selection was received more positively than a Schiphol-branded sandwich. Participants interpreted it as subtle guidance that helps them navigate the food options. This suggests that Schiphol’s strength lies in facilitating and recommending, not curating the food itself. Assumption 2 was therefore validated with a condition.

### *Plant-based can compete when psychological barriers are lowered*

Although the animal-based sandwich remained an attractive familiar option, it did not dominate the results. This indicates that a well-designed choice architecture for plant-based options can compete with default meat choices

## Limitations

As the experiment was conducted with Schiphol employees, existing associations with the Schiphol organization as their office had a strong influence on brand perception, despite efforts to reduce bias through a short passenger role-play exercise. Still the insights can be treated as a relevant for further development: the institutional character of Schiphol should be replaced with a personality or narrative that evokes an emotional connection with the passenger.

# Conclusion Chapter 8

The test showed that the Mix & Match format directly influenced perceived value and reduced hesitation. Participants explicitly mentioned that choosing two flavours made the decision easier and felt like “getting more” for the same price.

The Schiphol framing was received positively when positioned as a selection or recommendation. Participants experienced this as guidance. When Schiphol appeared as the creator of the sandwich, the association shifted toward a more institutional and massive tone, which caused rejection. The concept therefore performs strongest when Schiphol acts as a recommending factor instead of a curator.

A clear refinement followed from this: the Schiphol role should be expressed through subtle recommendation and create an emotional connection with the passenger to move away from the institutional tone.

With these adjustments defined, the concept moves into the next phase, where the guiding role, taste imagination and emotional connection are translated into different interaction types.

Chapter

# 09 MVP development

This chapter focuses on developing a Minimum Viable Product of The Schiphol Selection that can be tested. The guiding role, taste imagination are further developed and an emotional connection layer is added, by translating three interaction types onto The Schiphol Selection. These versions are tested through a survey (n=27) and the results are analyzed to decide on the final iteration of the design intervention.

## 9.1 Imagination of taste

Besides the smaller sized sandwiches and the cross-section view of ingredients, that make it easier to imagine picking it up and eating it, imagination of taste in the form of language and context was developed. A version for every peak of the day target in the right moment and reinforce imagination of the taste by putting it in context. It was important to balance between the descriptive language about the sensory experience of the food, while still remaining clarity about the ingredients (Figure 38).

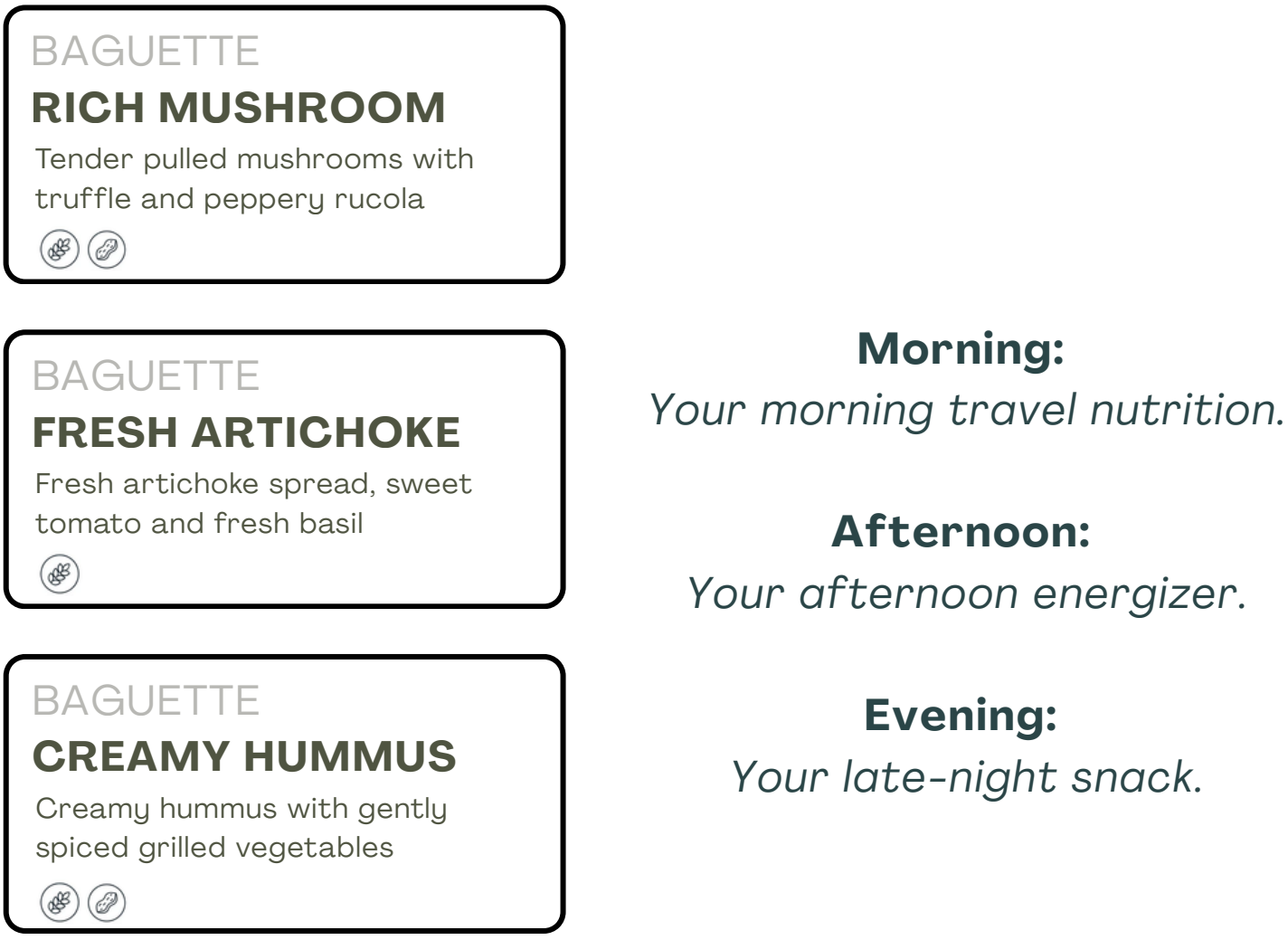



*Figure 38: Labels and context triggers based on the Theory of Desire*

# 9.2 Schiphol as guiding actor

The experiment showed that the role of Schiphol should be subtle in the form of a recommender. This was done in the form of a signing print to make it a versatile part of the intervention that could be applied to any counter. The idea was to recommend a combination at each moment of the day. Different forms of recommending combinations with the brand colours of Schiphol were explored. The forms were kept simple to within the Schiphol branding guidelines.

Eight participants were shown the visual options presented in Figure 39 and asked which form most clearly conveyed the idea of a combination. Seven out of eight people selected the two circles that were horizontally aligned as the most subtle and clear visual.

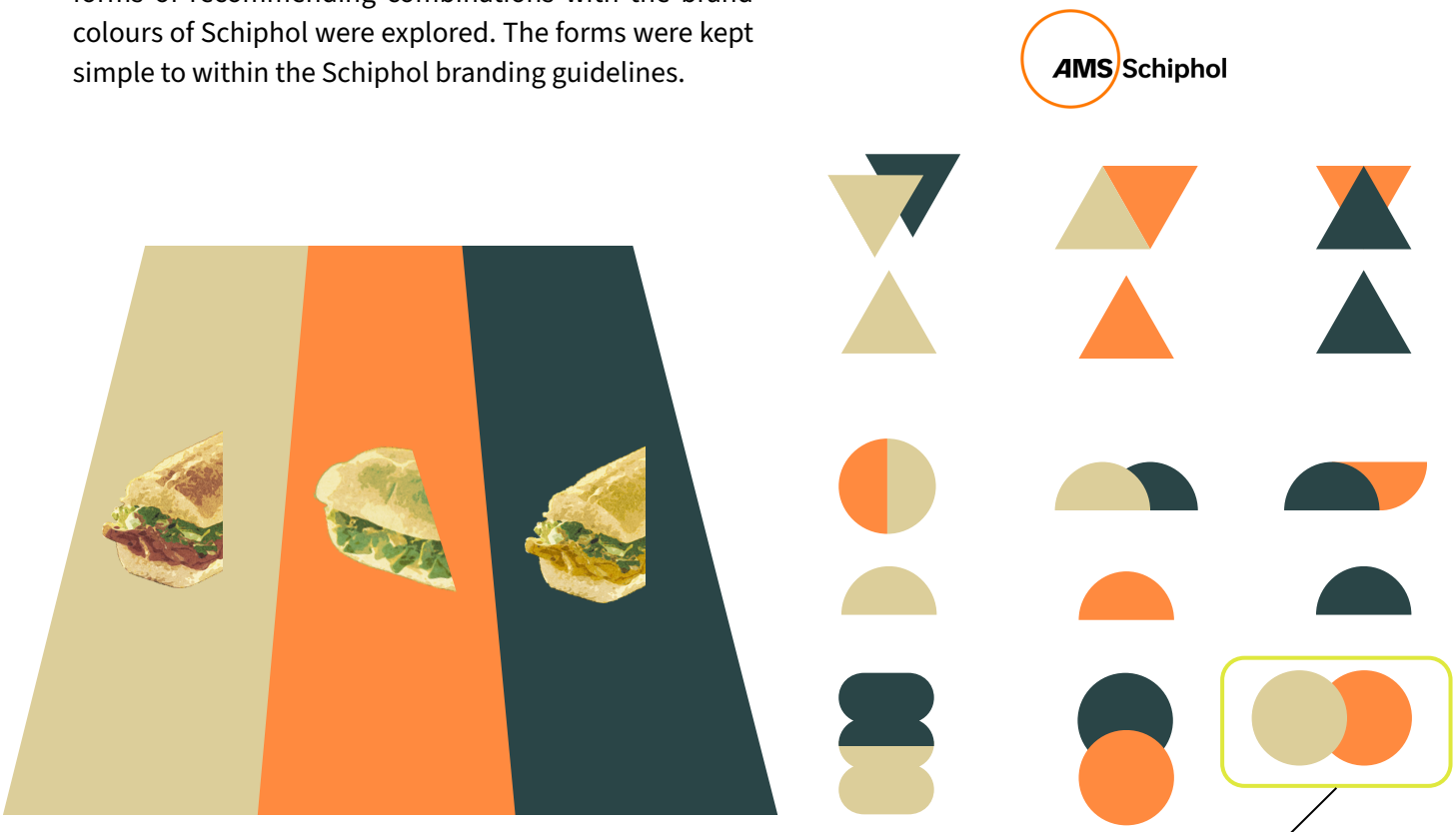



*Figure 39: Guiding format and combination visual options*

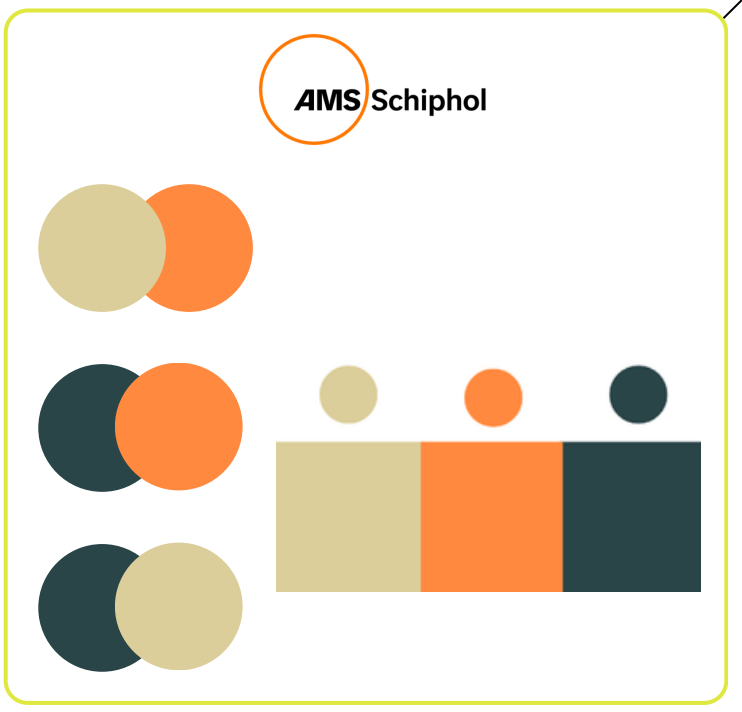



*Figure 40: Chosen guiding format*

All the parts were combined to a signage lay out, where the sandwich labels each get their own coloured circle to make it clear in a subtle way what combination is recommended and what the intention is (Figure 41).

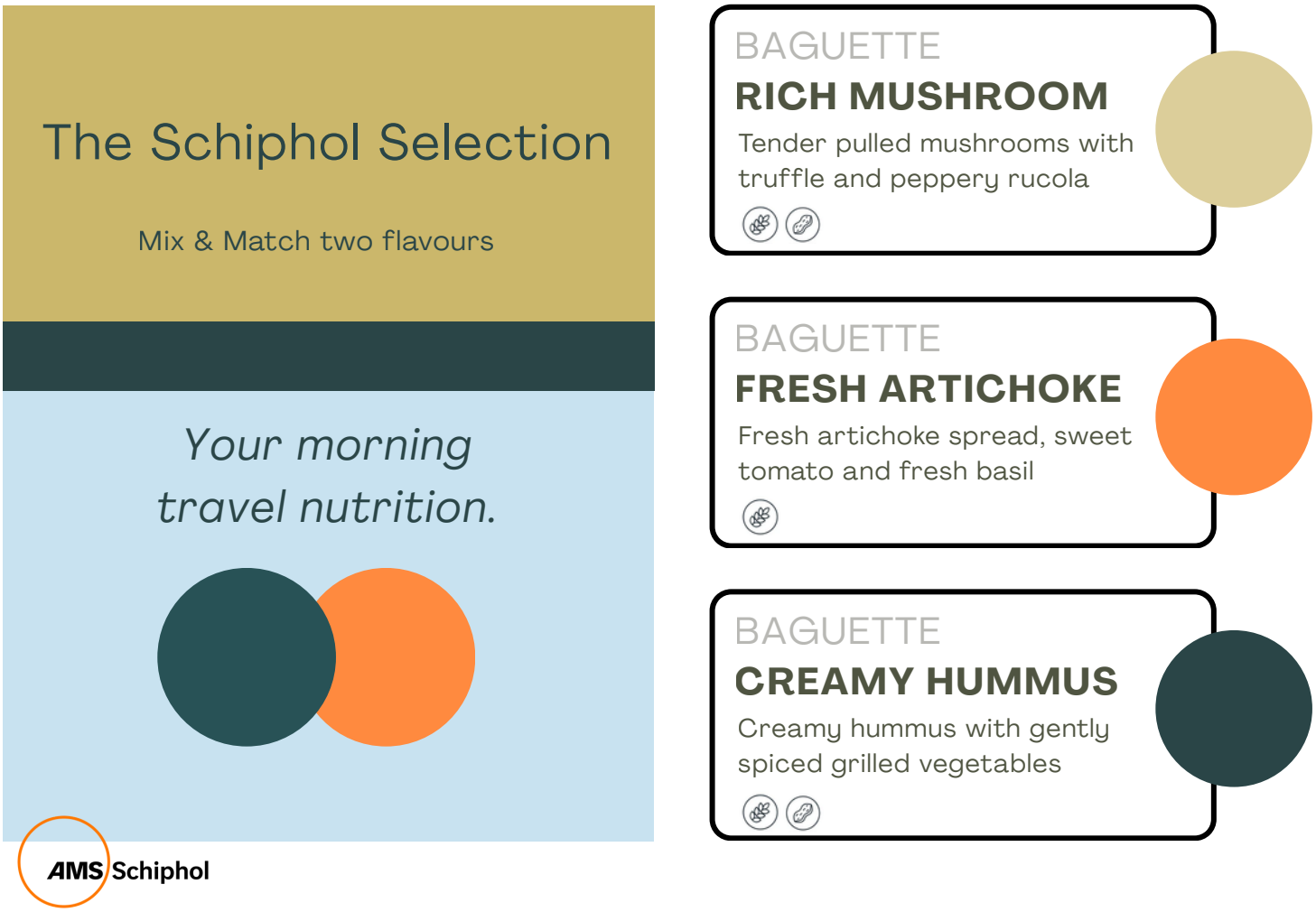
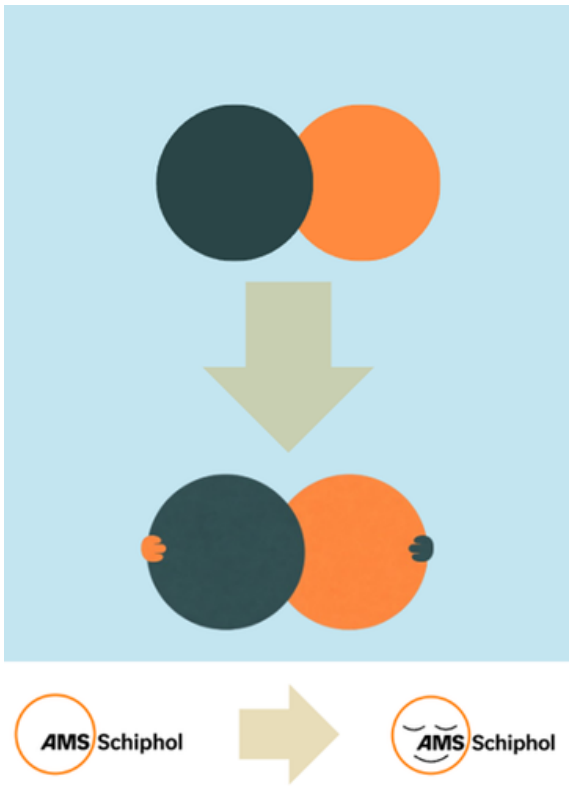



*Figure 41: Signing design*

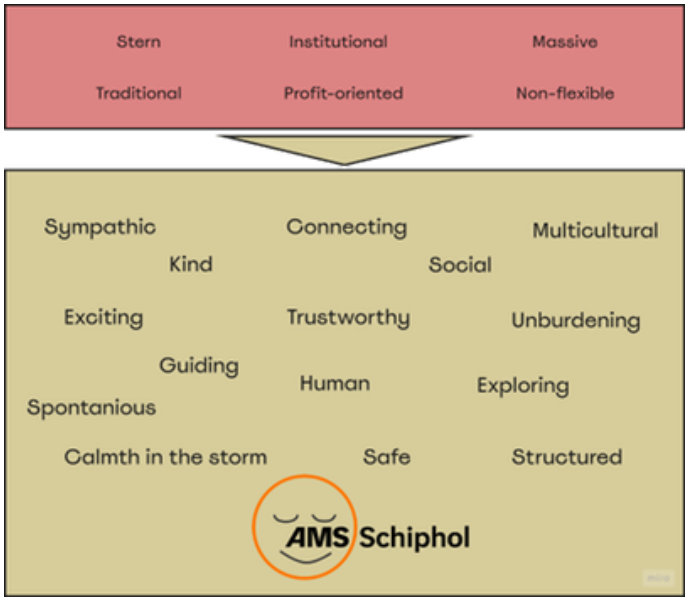
# 9.3 Connect with the passenger

By subtly adding a face to the Schiphol logo and the two flavours ‘’embracing’’ each other, a more human touch was added.





This was a beginning, but to really emotionally connect with the passenger, new types of interaction were explored. Together with Schiphol employees, a word cloud was created to articulate the negative and the desired personality traits of Schiphol. This was later used as a tool to translate interaction examples to an interaction at Schiphol.



## One-to-many intimacy

To explore how emotional connection could be created in a massive, one-to-many environment such as an airport, inspiration was drawn from phenomena that create a sense of personal intimacy within mass communication. Examples include a popstar addressing a crowd as if speaking to individuals or influencers creating the illusion of knowing them. This principle of "one-to-many intimacy" became the basis for the emotional connection layer (Figure 42).

A popstar in concert or an influencer who feels like you know him/her was the inspiration for exploring interactions that create a one-to-many intimacy. Three existing interaction examples were analyzed for how they successfully create subtle human connection at scale: Pickwick's tea questions, which invite a small reflective moment; handwritten bookstore staff notes, which make recommendations feel personal and Starbucks writing names on coffee cups, which transforms a generic product into something more personal. However, the Starbucks example also shows a limitation. As writing names on cups became standardized and globally scaled, the gesture started to feel less personal and more like a brand routine that was used for efficient operation. This shows that personalization loses impact when it becomes a part of the operational process.

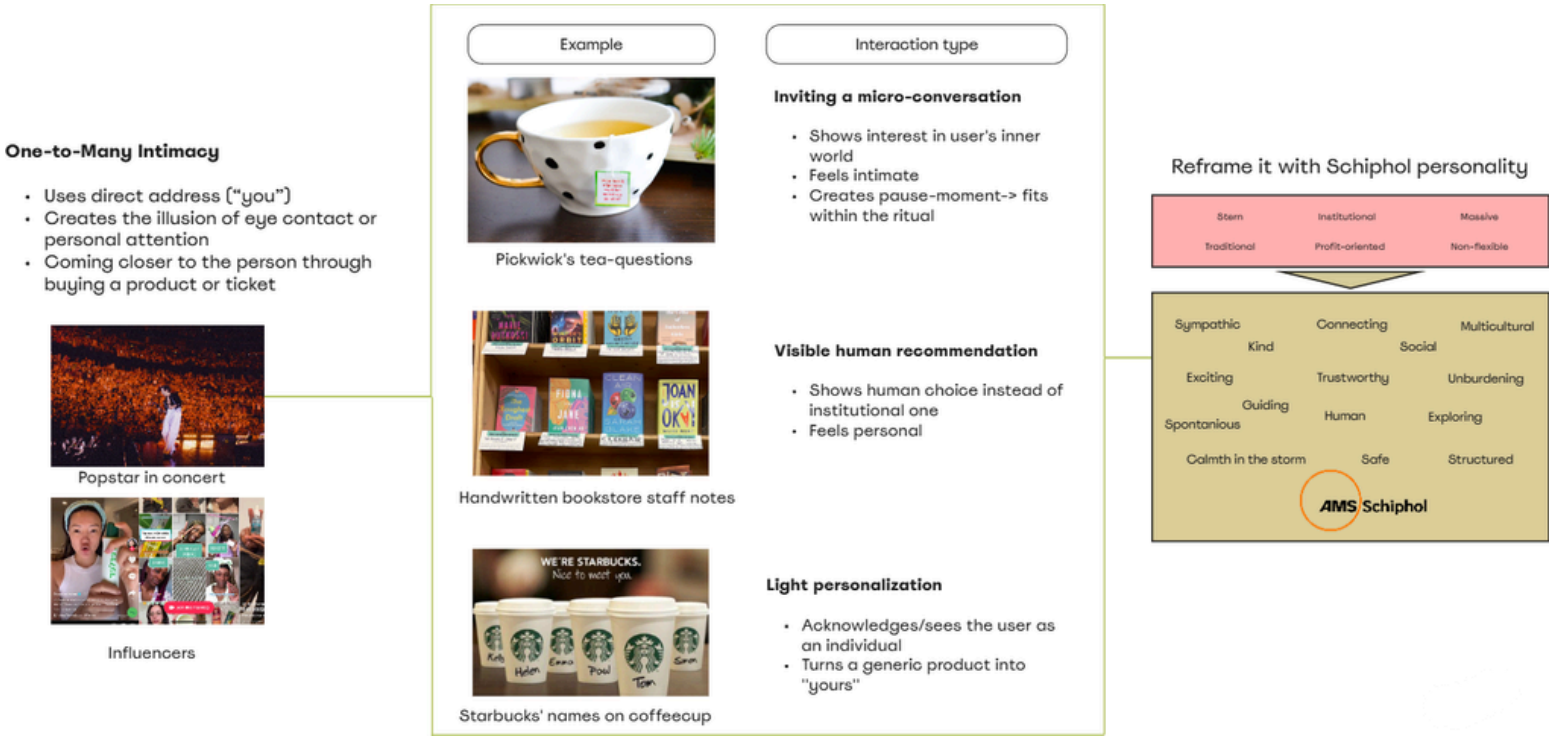



*Figure 42: Emotional connection layer*

## Stakeholder lens

### *Schiphol*

Adding a small moment of personal recognition strengthens the perception of Schiphol as a welcoming and caring host during the travel journey. Even brief interactions can contribute to a more positive passenger experience, which aligns with Schiphol's ambitions to improve PSAT and overall passenger satisfaction.

### *HMSHost*

For HMSHost, the concept introduces a slightly stronger service component in the counter interaction. This may require small adjustments in staff training and service awareness, ensuring that employees feel comfortable addressing passengers personally while maintaining operational efficiency during busy periods.

## Interaction type A: Inviting a Micro-conversation

This interaction type was inspired by Pickwick's tea questions, which place a short reflective question on the tea label. The strength of this approach is that it creates a small pause in the moment, without asking much effort from the user. It feels personal, but remains optional.

This was translated into "Travel Questions." Instead of a general reflection, the question connects directly to the travel context with personal questions such as *Who are you thinking of as you travel?* or *What's one thing that always makes a trip feel like it's really started?*. This gives a subtle and optional conversation starter for the passenger and their travel company. By framing the context trigger as a question, it can give the sense of being personally addressed (Figure 43).



*Figure 43: Interaction type A Inviting a micro-conversation*

## Interaction type B: Human Recommendation

This interaction type was inspired by visible human recommendations, such as handwritten bookstore notes. These recommendations make a product feel selected by a real person rather than presented by an institution. The value lies in showing human choice and experience.

This principle was translated into staff recommendations. A short quote from a crew member or staff member is shown alongside the sandwich combination, explaining when or why they prefer it. The recommendation does not instruct passengers on what to choose. Instead, it shares a personal preference, making the offering feel more relatable and providing social proof. By connecting the sandwich to a real person, the interaction adds a human layer to the selection.



*Figure 44: Interaction type B Staff Recommendations*

## Interaction type C: Light Personalization

TThis interaction type was inspired by small personalization gestures, such as writing a customer's name on a coffee cup. The strength of this approach lies in briefly acknowledging the individual within a larger system.

This principle was translated into the Personal Mix. Passengers are invited to create their own combination and their name will be asked when picking your selection and written on the plate. At the check-out the employee wishes the passenger a nice flight with their name. The point of the name is not operational, but just focused on connecting with the passenger and giving the passenger a sense of buying a personalized sandwich.



*Figure 45: Interaction type B Light Personalization*

# 9.4 Validation of interaction types

To determine which interaction type passengers preferred, a survey was conducted using a randomized in-between testing format. Participants were shown all three concepts in varying order to reduce bias. After excluding respondents who indicated they usually do not purchase food at Schiphol, 27 participants remained within the defined target group. See Appendix J for the survey results.

## Key insights

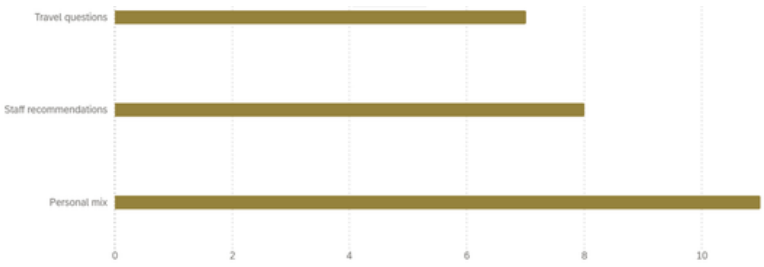



*Figure 46: Most votes for the Personal Mix*

### *Personal Mix was the most attractive interaction type*

All concepts were evaluated positively (≥4.42 on a 1–7 Likert scale). This result shows that human interaction positively contributes to the food experience when travelling. This reflects the literature of the passenger trends in chapter 3, where the growing need for human interaction is highlighted. However, Personal Mix received the strongest preference. Participants described it as clear, unique and not overly promotional (Figure 46). The personalization element, especially showing the passenger's name, created a positive food experience and comfort. One participant described it making you feel "at home" while travelling.

This directly reflects the renewed strategy of Schiphol:

> *''Creating a home for world travelers''.*

### *Passengers value autonomy within guidance*

Participants appreciated that Personal Mix allowed them to "do it themselves" and choose what suited them in that moment. The interaction felt supportive without being directive. This suggests that passengers prefer freedom of choice within a structured offering.

### *Visible curation and human interaction provide reassurance*

Participants indicated that seeing sandwiches as part of a Schiphol-curated selection already created a sense of support. The Staff Recommendation concept reinforced this effect: staff were perceived as knowledgeable advisors who make the decision easier. This suggests that visible curation combined with freedom of selection may be enough to create a sense of support.

### *Playful interactions enhance the travel experience*

The Travel Questions concept was mainly valued for adding a playful, travel-related moment. With the Personal Mix, participants found it ''fun'' to create their own mix.

## Limitations

As the sample group is too small for a statistical conclusion, personality played a big role in the results. Some people value more autonomy than others which and some find questions interesting and some can't be bothered. As the most votes were received by the Personal Mix this was the chosen design direction.

# Conclusion Chapter 9

In this chapter the visual layout of the Schiphol signing was developed, that positions Schiphol as a guiding recommender at the counter. An emotional layer was added to The Schiphol Selection into three interaction types: Travel Questions (micro-conversation), Staff Recommendation (human recommendation) and Personal Mix (light personalization).

The interaction types were tested through a randomized in-between survey format. All three interaction types were evaluated positively. However, Personal Mix received the strongest preference. Participants responded especially to the act of composing their own combination and having their name used at the check-out. This interaction strengthened autonomy, added a human touch and made the choice feel personal without being directive or promotional. The results show that visible curation combined with light personalization creates the strongest sense of guidance and confidence.

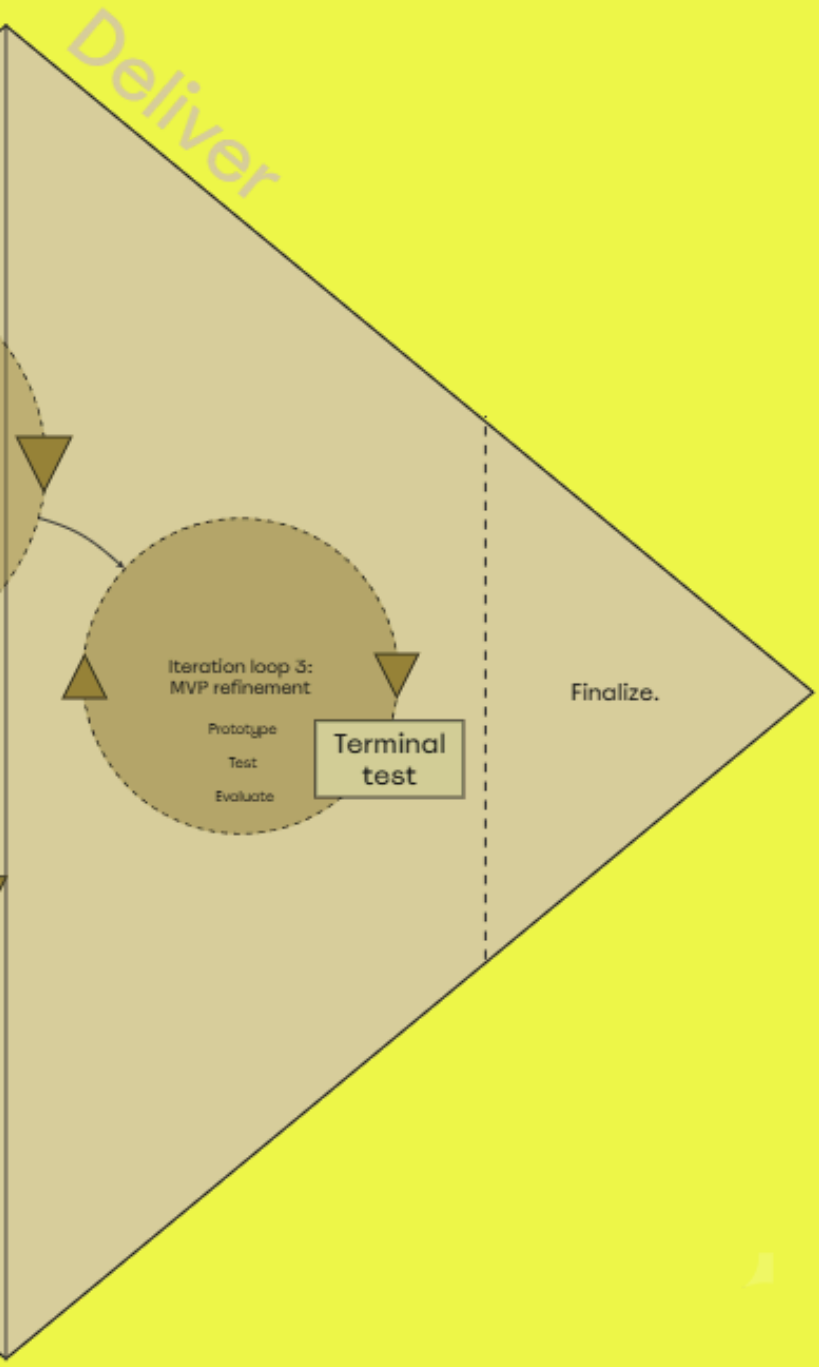
With the interaction direction defined and the visual signing established, the project moves toward integrating these elements into one coherent final design with all the refined elements and roles of the concept.

Section

# D | Deliver

This chapter presents and evaluates the final design intervention: *Your Schiphol Mix*. While the previous phase focused on developing the concept, the Deliver phase examines how the intervention performs in practice.

Together, these evaluations provide insight into the potential of the proposed intervention. The findings form the basis for the limitations and recommendations presented in the final chapter of this report.


Deliver
Iteration loop 3:
MVP refinement
Prototype
Test
Evaluate
Terminal test
Finalize.

Chapter

10

# Final design: Your Schiphol Mix

Your Schiphol Mix is a guided in-store intervention at Loaf that makes plant-based sandwiches a confident choice for passengers through familiar positioning, sensory imagination triggers and subtle institutional guidance. The intervention does not change what passengers value, it changes how they perceive and experience the option in the moment of choice. This chapter presents the final design through the passenger perspective, followed by an explanation of the system, its elements and stakeholder roles.

# Your Schiphol Mix

An intervention that supports passengers in confidently choosing a plant-based sandwich in the terminal.

## The project driver

Food production, particularly livestock farming, contributes significantly to global greenhouse gas emissions. At Schiphol Airport, this has led to an ambition to reduce the emissions of Food & Beverage (F&B) operations by shifting the assortment toward 60% plant-based ingredients by 2030.

However, in practice many passengers still choose animal-based options. The context of a travel day amplifies the need for familiar and predictable choices. Plant-based options often feel uncertain in taste and satisfaction, making them a riskier choice.

## Intervention elements

**1**

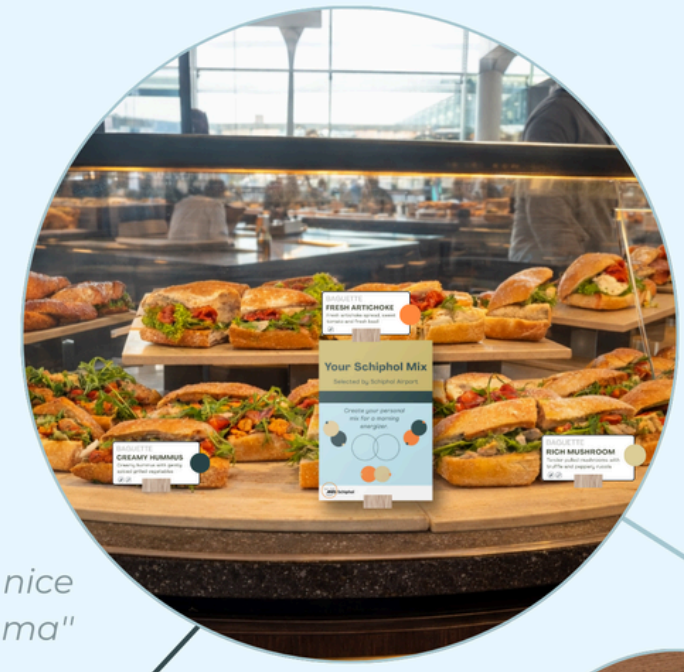
**Schiphol as guiding selector**
The mixes are presented as selections for your travel day, selected by Schiphol. This positions the airport as a more human and guiding presence, helping passengers feel supported in making a choice.

**2**

**Mix & Match format**
Passengers can **combine two half sandwiches**, allowing them to experience two flavours for the price of one in an engaging way. This increases the perceived value and lowers risk of choosing for one flavour. The sandwich is described by a fitting moment and sensory elements of the ingredients, helping passengers imagine the taste and satisfaction before choosing.

**3**

**Personal interaction**
The **passenger's name is written** on the plate and used to wish them a nice flight at checkout, creating a brief moment of human interaction and personal recognition in the otherwise anonymous airport environment.




*"Have a nice flight, Emma"*





HMSHost ByAvolta
F&B Business partner

AMS Schiphol
Commercial

## Stakeholder fit

Your Schiphol Mix fosters collaboration within Schiphol's complex stakeholder partnership by offering a lightweight, testable intervention that fits HMSHost's existing operations while supporting Schiphol's plant-based ambitions.

# 10.1 Through the eyes of the passenger

To illustrate how the intervention functions in context, this section presents the narrative of the Your Schiphol Mix experience from the perspective of Emma, a 32 year old leisure passenger.

She checks the departure board one more time. Gate D24. On time. There's about forty minutes left. Enough to eat something. Not enough to overthink it. The security was quite stressful, now she just wants to relax with something good.

Her stomach reminds her that breakfast was early. The flight is two hours long and it's unclear how long everything will take until she arrives at her friends place in the center of Lisbon.

Better eat now than regret it later.

The food area feels busy, slightly chaotic. Bright displays, gate-signing, different food outlets. Everything looks fine. Also looks expensive. But she travelling, so it's eligible to treat yourself.

Her eyes land on an interesting setup at the Loaf counter. A sign reads:


It feels structured. Intentional. Not flashy or overwhelming. Like Schiphol was hearing her thoughts in this exact moment. Helping her with the first part of her choice by already selecting some options.

Three options. That's manageable.

She steps closer. The sandwiches are sliced open, showing layers inside. No hidden empty sandwich. The smaller size of the sandwiches intuitively look easy to hold and bite into.

The labels show appealing descriptions: fresh artichoke spread, sweet tomato, creamy hummus.. It looks fresh and filling. Now she's suddenly getting really hungry.

Oh, you can combine two halves.

That changes something. This feels like a pretty good deal for an airport.
She picks one half she knows she'll like. One half she wouldn't usually go for, but there is not much risk in this situation. She has seen all the ingredients, Schiphol recommends it and she at least has two flavours if one wouldn't be as expected.

The lady behind the counter smiles and asks what name she can write on the plate. She hesitates for half a second, then answers "Emma".
The lady hands over the plate.
It says 'Emma's mix'.

A moment later, she arrives with her tray at the check-out “€7,50 please”.
Emma pays with a confident feeling that she made the right choice.
The lady looks at her plate and hands out the receipt.

“Have a nice flight, Emma.”

It’s small. Almost nothing.
But Emma smiles.
“Well thank you!”

For a second, the airport feels less anonymous. Less transactional. Less like a system. More like a welcoming place.

The sandwich is now her mix. And what a mix, she is proud of the composition she made. This was exactly what she needed.
In a day full of queues, security checks and unknowns, the food moment feels settled.

“Flight KL0782 to Lisbon is now boarding.”
She stands up.
Knowing the journey won’t start at gate D24.

It already started here.

# 10.2 Intervention components

*Your Schiphol Mix* consists of three interdependent components:

1. Schiphol as guiding selector (*Schiphol*)
2. The Mix & Match format (*Mix*)
3. Personal interaction (*Your*)

### 1. Schiphol as guiding selector

Within Your Schiphol Mix, the sandwich offering is framed as a Schiphol Selection: a small set of sandwiches presented as suitable options for the travel moment. The selection signals that these options are reliable, convenient and appropriate for the journey.

By presenting a curated set instead of the full assortment, the concept structures the decision environment. The reduced choice space lowers cognitive effort and helps passengers quickly understand what fits their situation. At the same time, passengers retain autonomy by composing their own combination through the Mix & Match format.

This framing positions the selection as a trusted recommendation for the travel day. The Schiphol identity appears in signage and communication at the counter, signalling that the options are thoughtfully selected for the passenger's journey. The message conveyed is that these sandwiches belong in the airport context and can be chosen with confidence.

Importantly, the communication does not emphasise sustainability or plant-based messaging. Instead, the selection is framed around reliability, suitability for travel and ease of choice, allowing the plant-based options to be encountered as a natural part of the airport food offering.

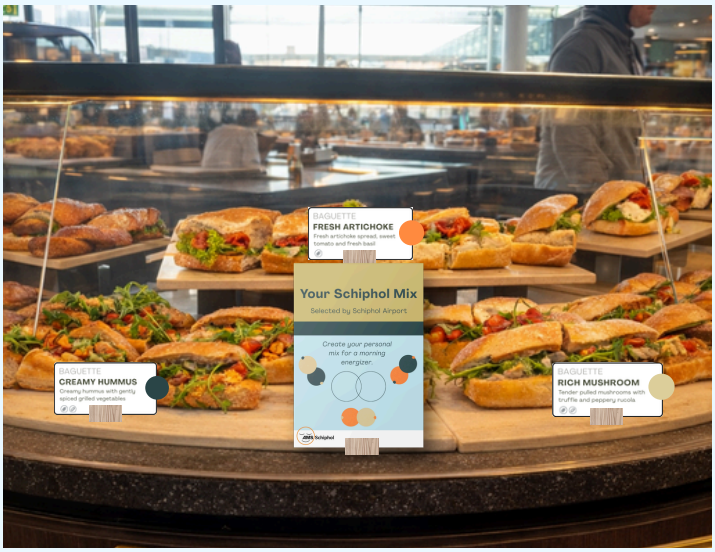
## 2. Mix & Match format

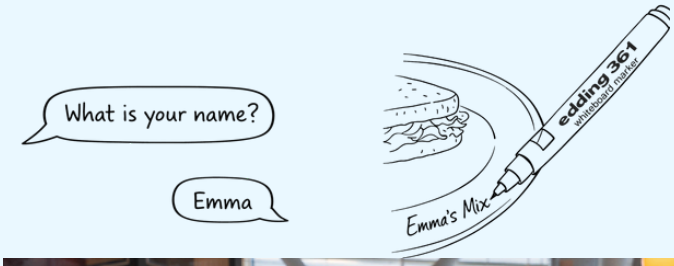
The Mix & Match format translates the curated selection into a tangible food experience.
Passengers compose their own combination by selecting two half sandwiches from three plant-based recipes.

This format creates several effects simultaneously:

- Reduced commitment: choosing two halves lowers perceived risk
- Increased value perception: two flavours for one price
- Taste imagination: visible cross-sections reveal ingredients
- Motor simulation: smaller portions are easier to mentally grab and bite

The recipes are structured around vegetables and spreads as the main components, avoiding meat substitutes and highlighting intrinsic qualities such as texture, richness and freshness.




## 3. Personal interaction

When selecting a combination, passengers are asked for their name. The employee then writes “[Name]’s Mix,” on the plate with a dissolving marker. At the check-out the employee reads the name on the plate and creates a brief personal interaction by saying:
“Have a nice flight, [Name].”

This small gesture adds a moment of personal recognition within an anonymous airport environment. Research in the Discover phase showed that passengers increasingly value human interaction and moments of hospitality during their journey. Addressing passengers by name can create a short but meaningful connection, making the food purchase feel more welcoming and memorable.

Because the interaction is brief and embedded in the existing service flow, it adds a personal touch without slowing down the operation. In this way, the moment contributes to a more positive and human travel experience, while remaining feasible within the fast-paced airport context.


## Alignment with design criteria

### Must haves

#### *DC.1 Familiar positioning*

- Not positioned as alternative
- Using recognizable ingrediënts and naming
- Risk-reduction of committing to a choice
- Framed as safe-option through Schiphol guidance

#### *DC.2 Guidance*


- Schiphol acts as guiding selector by pre-selection (no persuasion)
- Personal interaction and reassurance

#### *DC.3 Imagination of taste*

- Sensory language and contextual cues reinforce desirability
- Cross-sections and smaller portions enable sensory simulation

### Supporting criteria

#### DC.4 Choice autonomy

- Personal curation of mix
- Multiple available options

#### DC.5 Social risk

- Could be experienced by some as socially uncomfortable to say name (however this happens after the choice)

#### DC.6 Practical testability

- Partially within this time-frame
- Testability of concept as whole possible on longer term

#### DC.7 Positive passenger experience

- Contributes to a positive food experience at Schiphol (survey test)
  - Human interaction
  - Higher value perception
  - Fun element

### Avoid

#### DC.8 Moral sustainability framing

- Personal curation of mix
- Multiple available options

#### DC.9 Spatial disruption

- Adds a sign on the counter (minimal, but for implementation a different way of communicating should be considered)
- Added physical step: say your name

#### DC.10 Price disadvantage

- Same price as lowest price-> even higher value for money perception

# 10.3 Stakeholder roles and collaboration

### Role of Schiphol

Within Your Schiphol Mix, Schiphol takes the role of guiding selector and becomes the visible face of the selection. Schiphol frames a small set of sandwiches as reliable, travel-appropriate options for passengers. This guidance is expressed through branding, communication and the framing of the assortment, while the daily outlet operations remain the responsibility of HMSHost.

In practice, this role becomes visible through the Your Schiphol Mix identity at the counter. Signage, menu communication and other communication materials signal that the combinations are thoughtfully selected for the travel moment. The Schiphol brand functions as a signal of trust and relevance, helping passengers feel confident about the choice without explicitly directing them toward a specific product.

Schiphol also contributes to the curation of the selection. Together with HMSHost, Schiphol evaluates which recipes fit the Schiphol selection and what is most relevant for passengers in the airport context. In addition, Schiphol supports the concept through branding of signs and out-of-store communication, such as Schiphol media channels, the airport app and online platforms. Through these activities, Schiphol helps shape how the assortment is presented and encountered by passengers.

### Role of HMSHost

HMSHost remains responsible for the operational execution of the concept. This includes recipe development, ingredient sourcing, food preparation, staffing and service in the outlets.

Within Your Schiphol Mix, HMSHost develops the recipes and prepares the sandwiches using its existing kitchen setup and expertise in food concepts. The Mix & Match format is implemented within current preparation practices, where employees assemble the combinations and explain the concept at the counter when needed.

HMSHost is also responsible for staff training and embedding the concept in daily operations, ensuring that employees can execute the format smoothly within the existing service flow. Because the concept builds on existing products and service routines, it fits within HMSHost's operational structure.

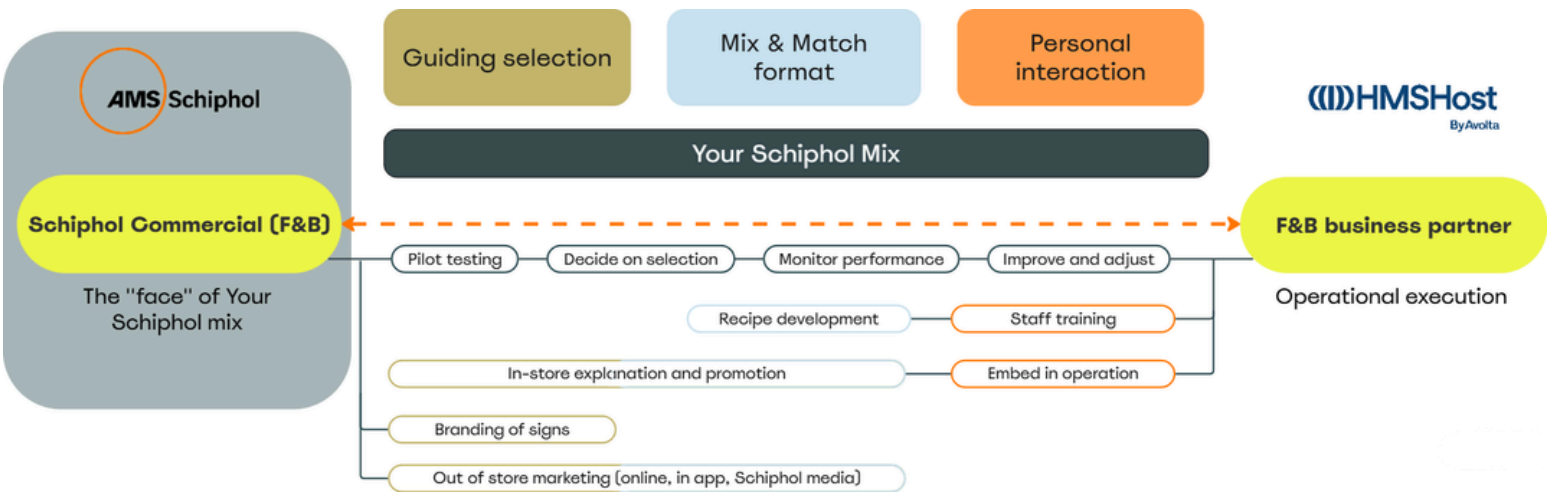



*Figure 47: Collaboration and division of roles*

## Collaboration within the partnership

Within the partnership between Schiphol Commercial (F&B) and HMSHost, Your Schiphol Mix strengthens the collaboration between strategic direction and operational execution. The concept does not change the formal responsibilities within the partnership. Instead, it provides a clearer way to translate Schiphol's ambitions into the passenger experience.

The curated selection is developed collaboratively, combining insights about passenger needs, travel context and food expertise. Both parties participate in activities such as pilot testing, deciding on the selection, monitoring performance and improving the concept over time.

The concept operates within the existing "grey zone" of the partnership, where strategic ambitions must be translated into operational practice. Your Schiphol Mix introduces a shared framework that connects these levels while maintaining HMSHost's operational autonomy. Because the concept supports the shift toward more plant-based choices, it can be positioned within the Sustainable Food Route.

Chapter

# 11 Validation

This chapter evaluates *Your Schiphol Mix* in the context of Schiphol Airport. While the previous chapter presented the final design, validation is necessary to understand how the intervention performs beyond the design process.

The validation therefore explores three perspectives: passenger response, stakeholder feasibility and potential sustainability impact. Together, these perspectives help assess whether the intervention can realistically function within the operational and behavioural dynamics of the airport environment.

First, a terminal test is conducted to observe how passengers respond to the Mix & Match format. Second, the concept is discussed with stakeholders to evaluate its feasibility within the operational context and the partnership between Schiphol and HMSHost. Finally, the potential contribution of the intervention to the sustainability ambitions of the Sustainable Food Route is explored.

# 11.1 Terminal test: Mix & Match format

The terminal test focused on the Mix & Match principle. This choice was made with stakeholders to ensure feasibility and maintain a controlled setup. Testing the full Your Schiphol Mix concept, including Schiphol branding, sensory naming and personal interaction would have introduced multiple variables and exceeded the available operational and time constraints. The Mix & Match format could be implemented more easily and tested without complicating the setup. This step-by-step approach was intended to make the initial pilot manageable for HMSHost and to create a basis for testing additional elements in future pilots. The remaining elements are therefore addressed in the recommendations.

### *Objective*

To test if the Mix & Match format increases passengers' willingness to choose plant-based food and gain qualitative insights for recommendations.

### *Assumption*

Allowing passengers to combine flavours increases perceived value and lowers perceived risk, which can encourage the selection of plant-based options.

### *Data collection (n=20)*

Quantitative data was collected through sales numbers. Qualitative insights were gathered through observations at the counter and short interviews with 20 passengers who purchased a sandwich at Loaf, including both passengers who chose the Mix & Match option (n=12) and passengers who selected a regular sandwich (n=8). Together with ensuring diversity in age, gender and nationality, this helped capture a broader range of insights into how the concept is perceived.

### *Set-up*

The test was conducted over two days, Monday and Tuesday, during peak hours between 10:00 and 12:00. A corner section at the Loaf counter was adapted to the Mix & Match format (see Figure 48). Three plant-based sandwiches were offered in half portions, allowing passengers to compose a combination of two halves, which were sold together as one product at the same price as a regular sandwich. The sandwiches were presented without explicit communication about their plant-based nature. The intervention was supported by simple in-counter signage explaining the Mix & Match principle in Loaf's branding style, while employees provided brief explanations when needed. The final assortment was developed in collaboration with a plant-based culinary expert (K. Tiedemann) and the HMSHost food developer. Following their input, the recipes were refined by adding grilled aubergine to the artichoke sandwich and replacing the mushroom option with the existing Loaf vegan cream cheese sandwich due to its proven popularity. The resulting selection consisted of:

**A: Artichoke & aubergine** (newly developed),
**B: Hummus & ratatouille** (existing Loaf recipe)
**C: Cream cheese** (existing Loaf recipe) *not described as vegan

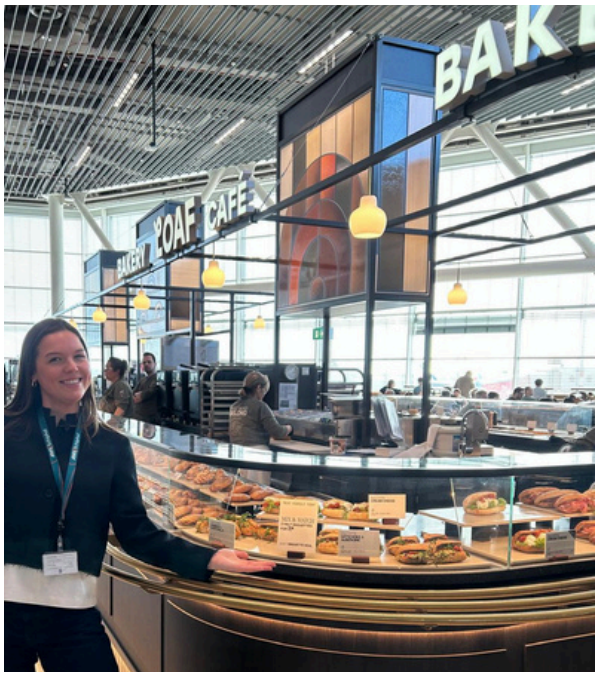




*Figure 48: Terminal test set-up*

## Quantitative insights: increase in plant-based share

Sales during the pilot were compared with a baseline measurement taken during the same time window (10:00–12:00) on two comparable low-season days in February. The aim was to examine whether the Mix & Match format influenced the share of plant-based sandwich choices.

During the baseline measurement (February):

- Total baguettes sold: 277
- Plant-based baguettes: 44

Plant-based share: ~16%

During the pilot in March regular plant-based baguette sales remained relatively stable. In addition, plant-based sandwiches were sold through Mix & Match combinations.

Results during the pilot period (March):

- Total baguettes sold: 327
- Regular plant-based baguettes: 48
- Plant-based equivalents through Mix & Match: 22
- Total plant-based: 70

Plant-based share: ~21%

Overall, the plant-based share increased from approximately 16% to 21%, representing +5 percentage points increase (Figure 49).

**≈ 31% relative growth in plant-based share**

Because sales of regular plant-based sandwiches remained largely stable (44 → 48), the increase can largely be attributed to the Mix & Match format itself. This indicates that the intervention generated additional plant-based choices, instead of simply shifting demand within the existing plant-based assortment.

Based on this pilot, the Mix & Match format resulted in:

a behavioural shift of approximately 5–6% of sandwich choices from animal-based to plant-based,

which can serve as a realistic parameter for future impact scenario calculations.

### *Artichoke & Aubergine was sold most*

Within the Mix & Match selection, the new recipe developed in this project, Artichoke & Aubergine, was chosen most often. Out of 44 half-sandwich selections, Artichoke & Aubergine accounted for 41%, while Hummus & Ratatouille (30%) and Cream Cheese (29%) were selected less frequently. This indicates that the newly developed recipe was well received and shows the impact that plant-based recipe development can have.

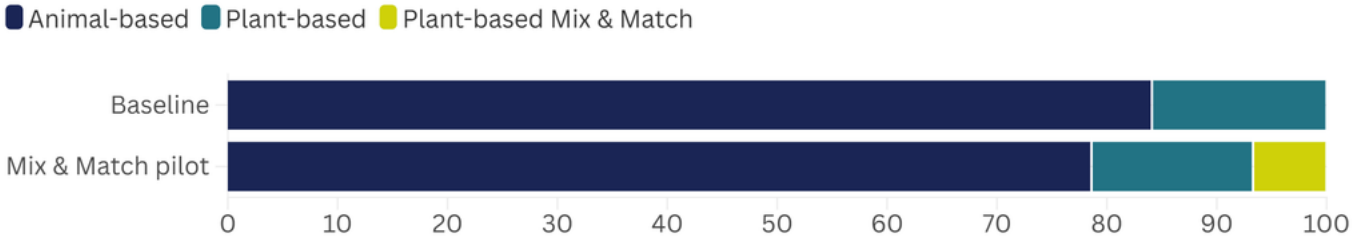



*Figure 49: Plant-based share comparison between baseline and pilot results*

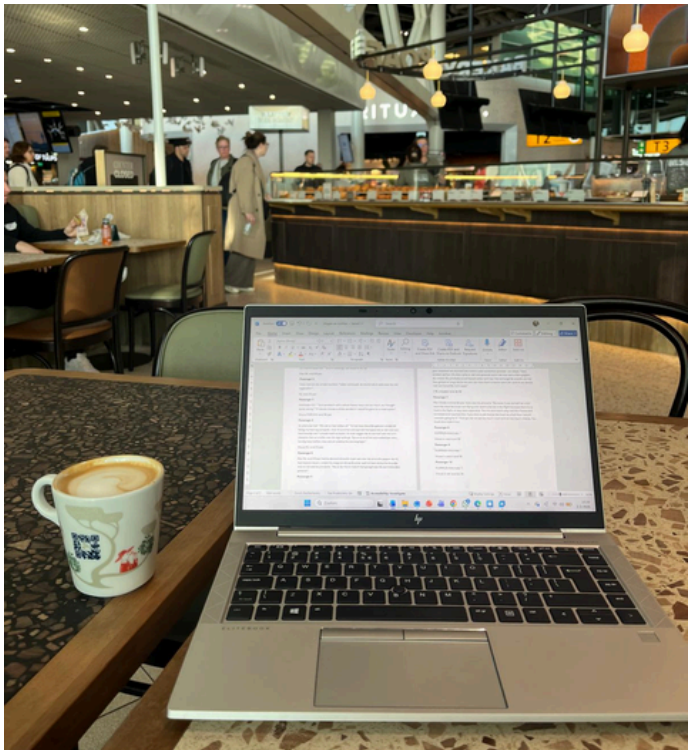


*Figure 50: Observation spot*

## Key qualitative insights

### *1. Mixing format was found appealing*

Among passengers thate were interviewed and who chose the Mix & Match option (n=12), many described the possibility to combine two halves as making the decision feel easier and less committing. One passenger said:

*"A whole sandwich with one flavour was a bit too much, so I thought some variety is nice."*

Another passenger described how the format lowered the barrier to choosing the plant-based option:

*"I really liked that I could mix two, because I'm very indecisive. If this wouldn't be an option, I would have gone for the jambon I think, because I know how that will taste."*

At the same time, this effect was not universal. Many passengers still chose familiar animal-based sandwiches. However, a part of these passengers asked if they could also mix with the cheese or the jambon sandwich.

One passenger who chose for a meat sandwich said:

*"If you also could choose the meat as a half then I would consider going for it, but I just wanted meat."*

Also during observations, passengers were frequently seen pointing at the Mix & Match option and discussing possible combinations before ordering. This suggests that the format appealed to or grabbed the attention of a significant part of the passengers.

### *2. Stronger appeal to women*

A noticeable difference became visible between male and female passengers in how they interacted with the Mix & Match display. Over 80% of the passengers who chose Mix & Match was female.

During observations, women were more likely to pause at the display, walk back and forth between options and discuss combinations before making a decision. Their comments often related to balance, flexibility and portion size. One female said:

*"Nice portion, maybe I can give a half to my husband because I'm not so hungry."*

Another female said:

*"This is perfect, now I don't have to choose. I always do this in a restaurant as well."*

Her husband who ordered a prociutto sandwich followed with :

*''She is bad at making choices haha, I just knew I wanted something with meat, so the choice was easy.''*

Men were often observed moving directly toward a specific sandwich, particularly meat options.

This suggests that the current Mix & Match format aligned more naturally with the decision patterns and/or taste preferences and/or openess to plant-based of female passengers. This can be connected to the literature about ''men and meat'' (*4.2 Consumer and (plant-based) food*)

### *3. Practical value of two halves*

Beyond flavour variety, several passengers mentioned that two halves felt easier to handle and more practical in the airport setting. One passenger explained that the smaller portions felt less messy:

*"I find it easier, then I don't spill."*

Another participant emphasized the convenience of the format:

*"I also found it easier to eat, the two halves are practical."*

The divided format was also perceived as easier to share or portion. During observation and talking to the staff, it appeared that many passengers asked whether a regular sandwich could also be cut in half, suggesting that the physical format itself added value independent of the flavours.

This shows the impact of the convenience driver described in chapter 4.2 *The consumer and (plant-based) food* and could also be connected to the Theory of Desire.

### *4. Visibility needs improvement: right > left*

The Mix & Match option clearly attracted attention at the counter. Many passengers pointed at the display, discussed the concept with companions or examined the sandwiches closely before making a decision.

At the same time, several interviewees indicated that they had not noticed the option immediately. One passenger mentioned:

*"I didn't notice the mix and match option, but it would be nice to pick two."*

This suggests that the format needs more promotion to reach all passengers.

Observations on the first testing day revealed that placement influenced how easily the option was seen. Most passengers approached the counter from the left side and scanned the display while moving toward the cashier on the right. Once passengers passed the first section of the display, they were less likely to walk back to reconsider earlier options (Figure 51). The second testing day the placement was therefore moved to the right corner of the counter. This resulted in more attention. This suggests that positioning the Mix & Match option closer to the cashier on the right side increases visibility and likelihood of selection.


*Figure 51: Different placements, with 'right' as the best placement for attention'*

## Limitations

The terminal validation should be interpreted as an initial exploration of the Mix & Match format. The test represents a momentary snapshot of passenger behaviour. Observations and interviews were conducted during limited hours on two days and the quantitative sales data therefore reflects only a short time window. As a result, situational factors such as flight schedules, may have influenced the outcomes, making it difficult to draw firm conclusions from the quantitative results at this stage.

The findings should therefore be interpreted as directional insights that indicate how passengers respond to the Mix & Match format in practice.

# 11.2 Potential sustainable impact

### $CO_2$eq difference per sandwich

To illustrate the potential scale of impact, a rough estimation was made using lifecycle assessment (LCA) data for the ingredients of the sandwiches offered at Loaf (RIVM, 2024 ;The Big Climate Database, 2024). The bread itself is not included as this is the same for every sandwich and the estimation is about the differences.

The LCA databases were used to approximate the $CO_2$-equivalent emissions ($CO_2$eq) associated with the ingredients of several sandwiches (see Appendix K for calculations).

| Plant-based sandwich | $CO_2$eq (g) |
|---|---|
| Vegan cream cheese | 77 |
| Artichoke & aubergine | 53 |
| Hummus & Ratatouille | 150 |

| Animal-based sandwich | $CO_2$eq (g) |
|---|---|
| Prosciutto | 1.497 |
| Pastrami | 2.552 |
| Ham | 718 |
| Cheese | 407 |
| Goat cheese | 355 |
| Omelet | 379 |

*Figure 52: $CO_2$eq (g) of Loaf sandwiches (see full calculation in Appendix K)*

These numbers indicate a substantial difference in climate impact between plant-based and animal-based sandwiches. Even the highest-impact plant-based option (150 g $CO_2$eq) remains significantly lower than the lowest-impact animal-based option (355 g $CO_2$eq).
For the purpose of this estimation, an average value can be used:

- Average plant-based sandwich ≈ 93 g $CO_2$eq
- Average animal-based sandwich ≈ 984 g $CO_2$eq

This suggests that replacing one animal-based sandwich with a plant-based alternative could reduce emissions by approximately:
≈ 890 g $CO_2$eq per sandwich

### Behavioural change scenario's

To illustrate the potential impact of a behavioural intervention, a hypothetical scenario was explored. If 5% of passengers (based on the pilot results, so with improvements this percentage could only increase) who would normally choose an animal-based sandwich instead selected a plant-based option, the reduction per switched purchase would be approximately 890 g $CO_2$eq.

The total yearly reduction would depend on the total number of sandwiches sold at Loaf:

*Annual $CO_2$eq reduction=Total sandwiches sold per year × 5% × DELTA $CO_2$eq (~890 g)*

| Annual animal-based sandwiches sold | 5% switch | $CO_2$eq reduction per year |
|---|---|---|
| 100.000 | 5000 | ~4.45 tons $CO_2$eq |
| 500.000 | 25.000 | ~22.25 tons $CO_2$eq |
| 1.000.000 | 50.000 | ~44.5 tons $CO_2$eq |

*If one million animal-based sandwiches were sold annually and 5% of passengers switched to Your Schiphol Mix, this could reduce emissions by approximately 44,500 kg $CO_2$eq per year, which is* ***comparable to the emissions of one passenger going on about 150 transatlantic flights between Amsterdam and New York.***

*(ICAO Carbon Emissions Calculator)*

## Limitations

The $CO_2$eq values presented in this section are rough estimates based on average values from an LCA database. They are intended to illustrate the potential magnitude of environmental impact associated with different sandwich choices and do not represent exact emission values for the sandwiches sold at Loaf.

Actual emissions may vary due to several factors. Ingredient sourcing strongly influences environmental impact, as production methods and transport distances differ between suppliers and regions. Seasonal variation can also affect emissions, since ingredients may be locally grown in some periods and imported or greenhouse-produced in others. In addition, differences in supply chains, such as processing, packaging, and logistics, contribute to variation in lifecycle emissions.

For these reasons, the calculated values should be interpreted as indicative scenario estimates that illustrate the potential environmental implications of shifts in sandwich choice.

# 11.3 Stakeholder validation

The Schiphol Mix was validated with stakeholders through conversations about the design. This was done with HMSHost, the Loaf staff and Schiphol

### HMSHost

The Mix & Match pilot and *The Schiphol Mix* as a whole was evaluated with HMSHost to assess the concept from an operational perspective. HMSHost mentioned:

*"Guests responded positively to the possibility of choosing from two different baguettes."*

At the same time, HMSHost indicated that offering only plant-based combinations may still be a relatively large step for many passengers. A hybrid format, where a plant-based option can be combined with a dairy or meat option, was suggested as a promising next step to increase adoption. Operationally, the concept does introduce some additional work for staff, mainly related to cutting the baguettes and explaining the concept to passengers.

Despite this, HMSHost also highlighted the scalability potential of the concept across different food outlets in the terminal.

*"This concept could be applied very broadly, for example in Grab & Fly but also in The Wanderer."*

HMSHost also indicated that the format could be particularly interesting during quieter periods:

*"This is definitely something to look at in the low season to increase turnover."*

*The Schiphol Mix* was seen as an interesting strategy. However, HMSHost emphasized the importance of keeping the concept simple. They were cautious about combining multiple concepts or brands, to prevent complicating the operation. For this reason, the Mix & Match format was seen as a suitable starting point to test feasibility before expanding the concept.

HMSHost also expressed caution about the personal interaction element. Writing the passenger's name on the plate and addressing them personally was considered a sympathetic gesture, but it could require extra time that often is not available.

### Staff

The Mix & match format was also discussed with the staff of Loaf who worked during the pilot. They indicated that cutting sandwiches in half was manageable during quieter periods. One staff member explained:

*"During low season it's not a problem to cut sandwiches in half. In fact, I think it is a part of the service we need to offer."*

However, staff also noted that the situation changes during peak periods:

*"In high season it becomes much busier and then it gets more difficult. We often have fewer staff and there isn't extra workspace to cut sandwiches."*

This suggests that operational feasibility may depend on staffing levels and counter capacity.

Another issue that emerged during the pilot was pricing confusion at the cashier. In one case, a cashier assumed that a regular sandwich that had been cut in half was the Mix & Match product, which led to a pricing misunderstanding. This highlights the importance of clearly distinguishing the Mix & Match offer from regular sandwiches that are simply cut in half.

## Schiphol

To assess the role of Schiphol and the fit within Schiphol's F&B strategy, *Your Schiphol Mix* was discussed with Schiphol Commercial F&B.

Schiphol commercial considered the approach a valuable addition to existing initiatives aimed at promoting plant-based food. A current project within the Sustainable Food Route (FUEL) focuses on sustainability and health promotion from the staff behind the counter. In contrast, this project approaches the topic from a hospitality and passenger experience perspective, focusing on reducing uncertainty and improving the overall food decision moment. The FUEL project is conducted in collaboration with researchers from Wageningen University.

*"Detaching the concept from plant-based messaging and really touching the hospitality side of the experience is a very refreshing approach."*

The stakeholder noted that the outcomes of this graduation project would be shared with the Wageningen research team, indicating that the approach developed in this project may contribute to ongoing discussions within the FUEL project.

The potential role of employee and the interaction with the passenger was also discussed. While peak periods may introduce operational constraints, Schiphol indicated that these challenges can be addressed over time and do not need to limit the concept's long-term potential.

*"It is an interesting angle, also in combination with the employee interaction. Even if it might initially only be possible in the low season, processes can always be streamlined over time."*

The discussion on positioning Schiphol as the "face" of the selection highlighted an uncertainty: passengers often do not distinguish between Schiphol and the outlet operator, making it unclear whether Schiphol branding would have a stronger influence than the outlet's own brand. This has to be tested.

The perspective introduced in this project was considered valuable for strengthening collaboration between Schiphol and its operators.

*"The way of thinking about the assortment and the way passengers make choices would already be an interesting conversation between landlord and operator."*

Overall, the discussion confirmed that the behavioural approach of Your Schiphol Mix aligns with ongoing sustainability initiatives while introducing a complementary hospitality-driven perspective on promoting plant-based choices. It also highlighted the need to test whether Schiphol branding at the decision moment would influence passenger choices compared to the outlet's own brand.

Chapter

12

# Discussion and conclusion

This chapter reflects on the outcomes of the design project and places the results in a broader perspective. While the previous chapter validated the final intervention, this chapter interprets the findings and discusses their implications for both design practice and Schiphol.

First, the limitations of the research are addressed, highlighting factors that may influence the interpretation of the results. Based on this and the insights from the validation, recommendations are provided for further development and implementation of the intervention within the Schiphol Food & Beverage environment.

After this a brief conclusion of the whole project is presented. Finally, the chapter closes the report by reflecting on the overall design process and learning outcomes.

# 12.1 Limitations

This section discusses the main limitations of the overall project and the developed design intervention. Because the project was conducted in a complex real-world context, several factors may influence the interpretation of the results and the potential impact of the intervention. The following paragraphs reflect on these broader limitations.

Limitations related to specific research methods, experiments and co-creation sessions are discussed throughout the report and can be found at the end of the respective research or testing sections.

### Partial validation of the concept

The holistic concept of *Your Schiphol Mix* was not tested in practice. The terminal test focused primarily on the Mix & Match format, while other key elements of the intervention were not implemented in the real environment. As a result, the influence of the Schiphol label as an institutional guide has not been validated in a purchasing situation. The same applies to the real effect of the personal interaction element on the passenger experience. While these elements were explored through concept testing and surveys, their combined effect on passenger behaviour has not yet been evaluated. Future pilots would therefore be required to test the complete intervention as an integrated experience.

### Influence of other factors

A limitation of this project is that the intervention was tested in a complex airport environment. Passenger behaviour is influenced by many factors such as time pressure, habits, travelling with others, and the presence of competing food options. In addition, personal taste preferences play a major role in food choices and differ strongly between individuals. Even when passengers feel confident about a choice, their final decision may still depend on whether the flavours and ingredients match their personal preferences. Because these factors cannot be fully controlled, it is difficult to determine exactly how much of the behavioural effect is caused by the intervention itself.

### Applicability to other food outlets

The intervention was developed specifically for the sandwich offering at Loaf within the Schiphol terminal. While the underlying behavioural principles may also apply to other food concepts or airport locations, the effectiveness of the intervention may vary depending on differences in product type or outlet type.

### Limited insight into internal decision processes

The concept was developed using behavioural theories and qualitative insights from passengers. These helped identify mechanisms such as perceived risk, familiarity and imagination of taste. However, the internal thought processes that lead to food choices cannot be directly measured in this project. The role of these mechanisms is therefore based on interpretation of observed behaviour and participant feedback.

### Design research explores possibilities instead of proving outcomes

This project follows a design research approach in which ideas are developed, prototyped and tested to explore possible solutions. The goal of this approach is to generate insights and promising directions for design. Because of this exploratory nature, the project cannot guarantee that the intervention will lead to consistent behavioural change when implemented on a larger scale.

# 12.2 Recommendations

The following recommendations describe how the concept can be further developed, tested and implemented beyond this project. A three-horizon roadmap structures these recommendations, distinguishing between short-term experimentation, medium-term expansion within Schiphol, and long-term strategic opportunities for scaling and evolution.

### Implementation roadmap

## HORIZON 1: Loaf as pilot hub

In the short term, Loaf can function as the pilot hub for *Your Schiphol Mix*. Within this outlet, different versions of the format can be tested in a controlled way to understand passenger responses and operational feasibility. Based on the terminal validation and stakeholder feedback, several concrete improvements can already be explored.

#### *Hybrid format*

One promising direction that came out of the terminal test is to experiment with a hybrid format, where passengers combine one plant-based sandwich with one animal-based option. This format could further lower the barrier for passengers who are hesitant to choose fully plant-based, making the concept appealing to a broader group. This way, the format could lead to a greater overall reduction in animal-based consumption.

When testing the hybrid format, it is recommended to make a strategic selection of the animal-based options. Lower-impact products such as chicken or omelet can be included, while higher-impact options like pastrami should be avoided.

In addition, a pricing strategy should be developed that allows hybrid combinations while still making two plant-based options the most attractive choice. For example, two plant-based halves could remain the best value option, while combinations including animal-based ingredients are priced slightly higher. This keeps the format accessible while still nudging passengers toward the fully plant-based combination.

#### *Focus on recipe development*

The research and validation showed that taste is the strongest driver of food choice. Small changes in ingredients and flavor combinations can therefore strongly influence purchase decisions.

It is recommended to continue experimenting with recipes, for example by organizing small tastings with passengers in the terminal. This can help identify which plant-based combinations are most appealing and refine the selection over time.

#### *Test Schiphol guidance and personal interaction*

The role of Schiphol as guiding selector was not tested in the terminal and therefore requires further exploration to understand whether this increases trust and willingness to buy the options for the passenger. Also the operational feasibility of the personal interaction should be improved. Writing on a plate is too time consuming, so other ways for personalization should be explored.

At the same time, this element should be evaluated within the partnership with HMSHost. While Schiphol guidance may strengthen the connection between the airport brand and the food experience, it may also introduce additional complexity. Testing should therefore determine whether this role adds value or complicates the collaboration.

#### *Improve visibility*

The validation showed that some passengers did not immediately notice the Mix & Match option. Clearer signage and promotion at the counter can therefore increase visibility and understanding of the format. This could also lower the workload of explaining the concept for the staff. The pilot showed that most passengers approach the counter from the left and move toward the right cashier, therefore it is recommended to place the concept closer to the cashier in future tests.

#### *Adress gender differences*

Both the literature review and the terminal validation suggest that men and women approach plant-based food differently. Women tend to be more open towards

buying plant-based food. Future iterations of the concept could therefore explore two complementary strategies. One approach is to focus primarily on female passengers, who may adopt plant-based options more easily. Another approach is to specifically target male passengers in communication and promotion.

### *Monitor environmental impact*

To track the impact of the intervention, it is recommended to integrate $CO_2$eq indicators into the F&B performance dashboards. This would allow Schiphol and HMSHost to monitor how shifts in sandwich choices translate into environmental impact over time and make it more on top of mind when making decisions.

### *Position within the Sustainable Food Route*

It is recommended to position the pilot within the Sustainable Food Route. This would allow the concept to be tested as part of an existing collaboration between Schiphol and HMSHost that focuses on increasing the share of plant-based food.

## HORIZON 2: Expansion within Schiphol

In the medium term, the concept can be **expanded beyond Loaf** to other food outlets within Schiphol. In this phase, the focus shifts from experimentation to **adaptation** and **visibility**.

**Marketing** and **promotion** become more important in this stage. The concept should be clearly communicated as part of the Schiphol passenger experience, positioning it as a service that helps travelers make food choices during their journey.

An opportunity in this phase is to integrate *Your Schiphol Mix* into the **"Taste of Schiphol" marketing project**. This initiative aims to give greater visibility to the F&B offering at Schiphol. At the moment, the project is still in an early stage, which makes it fit well in the second horizon. In this way, the concept can become part of a broader narrative that highlights the diversity and quality of food at Schiphol.

As the concept develops, Schiphol could collaborate with **well-known chefs** and/or **food influencers** to develop and promote combinations.

## HORIZON 3: Scale and evolve

In the long term, the concept can grow beyond Schiphol. Because the intervention mainly changes how food is presented, it does not require major operational changes. This makes it suitable to scale to the **other international airports** where HMSHost operates.

At the same time, plant-based ingredients and products are improving quickly. As these products become more accepted and widely available, the selection could gradually **shift toward fully plant-based** Mix combinations. This allows the concept to evolve step by step without forcing passengers to immediately give up animal-based options in Horizon 1.

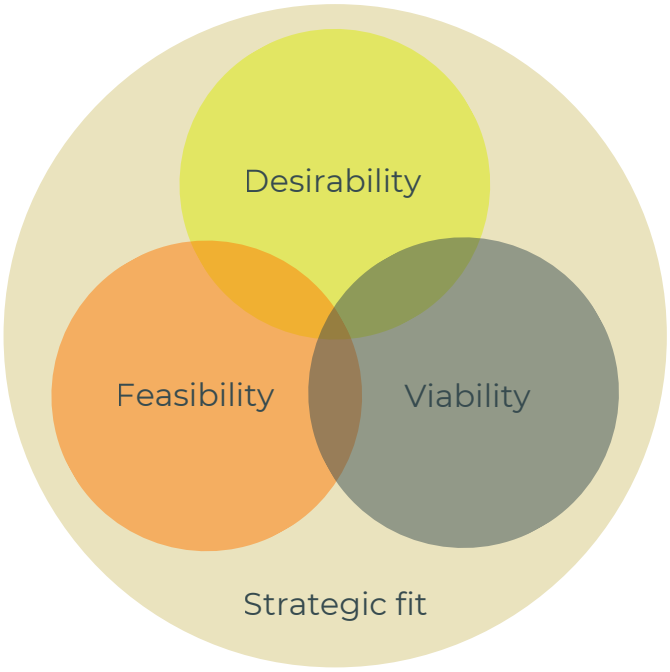
If the collaboration between Schiphol and HMSHost, and the institutional guidance strategy proves successful, the concept could also evolve toward introducing the ***Schiphol Sandwich:*** one recognizable sandwich curated by Schiphol and consistently available across multiple outlets in the terminal. This idea emerged during the concept development phase and received strong appeal. However, implementing such a central product would require significant alignment between Schiphol and HMSHost regarding recipe development, branding and operational execution. Because of this complexity, the idea was not pursued in the short term. In the long-term this could be revisited as a future step to further strengthen institutional guidance in the passenger food experience.

### Transfer to other industries

Although this project focuses on Schiphol, the underlying behavioural principle, reducing perceived commitment and guiding choices through framing and combinations, can also be applied in other food environments, such as:

- Corporate and university cafeterias
- Theme parks
- Festivals
- Restaurants
- Gas stations
- Supermarkets
- Food delivery platforms

# 12.3 Conclusion




This project explored how Schiphol Airport can support passengers in choosing a plant-based sandwich without compromising the overall food experience. The research showed that the low uptake of plant-based options at Loaf is not primarily caused by resistance toward plant-based food, but by uncertainty in the decision moment. In the context of travel passengers seek choices that feel predictable and reliable. Plant-based sandwiches are often perceived as less familiar and therefore riskier to choose.

Through literature research, stakeholder interviews and user research with leisure passengers, the project identified three behavioural levers that can reduce this perceived risk: familiar positioning, subtle guidance, and enabling imagination of taste. These insights led to the design challenge:

*"Design a guiding intervention that enables imagination of taste and builds familiarity around a plant-based sandwich at Loaf."*

The final concept, *The Schiphol Mix*, translates the behavioural insights into a concrete intervention consisting of three elements. Schiphol acts as a guiding selector, presenting a selection from the assortment for the travel day. A Mix & Match format allows passengers to combine two half sandwiches to experience two flavours in one purchase. Finally, a personalized interaction, where the passenger's name is written on the plate, adds a small hospitality gesture to the moment of serving. The concept also supports collaboration within Schiphol's F&B partnership by aligning with HMSHost's operations while supporting Schiphol's plant-based ambitions.

From a desirability perspective, the concept responds directly to the passenger's underlying need for confidence in the food decision. During the Mix & Match test, the plant-based share increased by 31% relative to the baseline, indicating that the format can effectively lower the barrier to choosing plant-based. Qualitative feedback showed that passengers appreciated the possibility of trying two flavours in one purchase, which reduced the perceived risk of disappointment and increased the perceived value of the offer. Curated combinations and clear sensory cues support imagination of taste and make the options easier to evaluate, while subtle guidance through the Schiphol-curated selection positions the airport as a supportive host in the decision moment. The personalized interaction adds a small hospitality gesture that strengthens the passenger experience. Together, these elements align with the intuitive and emotionally driven nature of airport food choices.

Regarding feasibility, the concept fits within the operational context of Loaf and the broader Food & Beverage system at Schiphol. The intervention primarily changes how sandwiches are presented. Validation with HMSHost and Schiphol Commercial indicated that the concept, especially the Mix & Match format, could be implemented with relatively small operational adjustments. While employee interaction may be more challenging during peak periods, stakeholders noted that such elements could be further improved by using clearer signing and to streamline processes over time.

In terms of viability, the concept supports Schiphol's long-term ambition to accelerate the protein transition while maintaining commercial performance and passenger satisfaction. Lifecycle assessment estimates show a substantial environmental difference between sandwich types: the average plant-based sandwich at Loaf generates approximately 93 g $CO_2$eq, compared to 984 g $CO_2$eq for an average animal-based sandwich. This means that switching one purchase from animal-based to plant-based could reduce emissions by

roughly 890 g $CO_2$eq per sandwich. Scenario calculations suggest that if 5% of passengers who would normally choose an animal-based sandwich instead selected a plant-based option, this could lead to a reduction of approximately 44,500 kg $CO_2$eq per year when one million sandwiches are sold annually. At the same time, the concept creates value for HMSHost by offering a flexible format that can stimulate sales and be scaled across different outlets.

The recommendations focus on testing and refining the concept within Schiphol's F&Beverage system. Starting with Loaf as a pilot location, the Schiphol Mix can be tested in practice by monitoring passenger responses, operational feasibility and sales performance. Particular attention should be given to testing the effect of Schiphol branding on passengers' willingness to buy, as well as exploring operationally faster ways to personalize the experience. Based on these insights, the concept can be further optimized before expanding to other outlets in the terminal. In this way, the concept provides Schiphol and business partners with a concrete opportunity to experiment with hospitality-driven interventions that encourage plant-based choices while maintaining passenger experience and commercial performance.

Overall, the project demonstrates that supporting the protein transition in an airport context does not require persuading passengers with sustainability arguments. Instead, effective change can emerge from designing the choice environment in a way that makes the sustainable option feel familiar, safe and appealing. By addressing the psychological dynamics behind food decisions, the Schiphol Mix offers a strategic fit for gradually increasing the role of plant-based food within Schiphol's F&B system.

# 12.4 Reflection

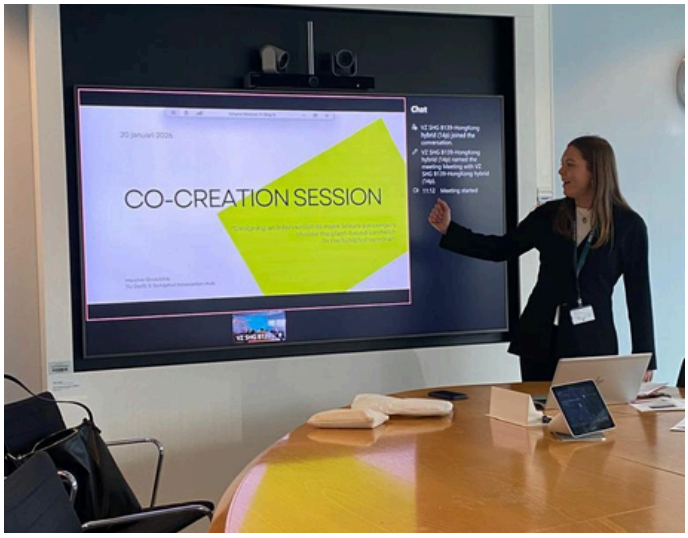
I never thought before hand that I would touch upon so many aspects of a project. Constantly zooming in to the user and out to the complex stakeholder landscape of Schiphol has teached me a lot. I have learned by doing, how to keep the important people in the loop in order to make things happen. And it worked. I am proud to say that I have realized a terminal test on my own initiative and to get people excited about trying the concept in practice.

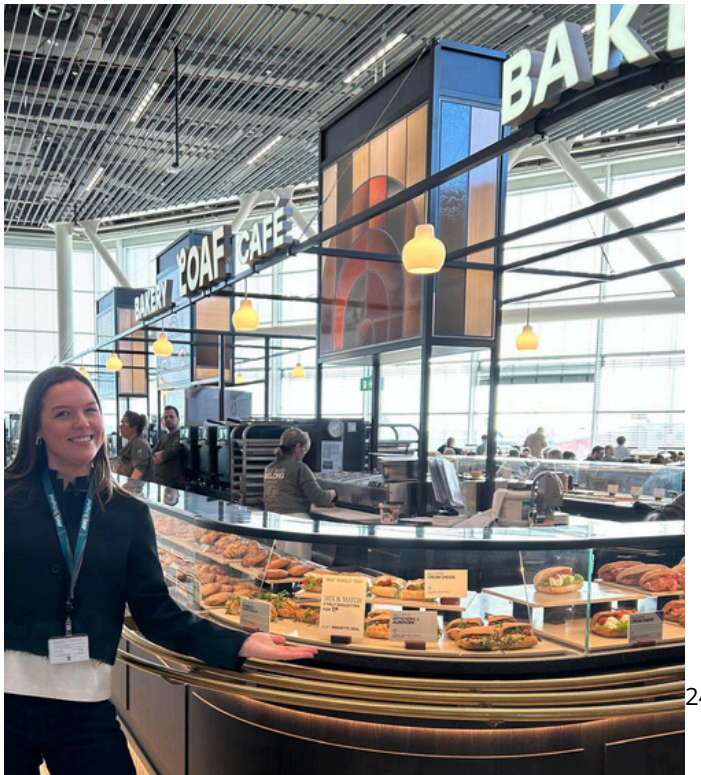
This project also taught me a lot about working independently. From planning interviews and organizing co-creation sessions to managing stakeholders and validating ideas, I had to take ownership of every step myself. One of my personal learning goals was to organize co-creation sessions with users, and I am happy that I succeeded in doing this twice. Preparing, facilitating and translating the outcomes into design directions gave me confidence in using participatory methods.

At the same time, the project made me realize that the ideation phase could have been structured more clearly. Some ideas focused on small interaction elements, while others moved towards broader concept directions. This made it harder to compare concepts and make clear design decisions, because they were not always operating on the same level of magnitude. Looking back, it would have been stronger to structure the ideation phase in a way that guided ideas toward a similar and more narrow scope.

In addition to that, I could have scoped this project in a simpler way. The design challenge tackled the key insights that were found during research, but looking back it was still too complex for ideation.  I could have made it a lot easier for myself by using less abstract terms and definitions, such as 'familiarity'. That said, it forced me to rethink the exact causal system more than 50 times, so at the very least it can be presented with confidence.

Another important lesson for me was about decision-making. Throughout the project I sometimes spent a lot of time analysing options before committing to a descision. A bit like my target group;) Over time I realized that trusting my intuition as a designer can be just as important. Some of the best moments in the

project, such as pitching the terminal test or merging concepts, came from acting on that intuition.

One moment I clearly remember is the first time I stepped forward to a passenger to in my experience intrude during their relaxing moment after eating. It took me some time to gather the courage and I asked if I could ask some questions about their food experience. They politely declined. So I moved on, because now there was no turning back. The next person, a friendly man of around 65, was happy to talk and turned out to be a professor from Bilbao. He gave genuinely insightful answers and, at the end of our conversation, told me I had made him feel at ease and that I would do well with the other interviews. After that, the threshold was gone.

Doing research at Schiphol meant talking to people from all over the world, each bringing their own relationship with food. From Indians with strong cultural and religious ties to food, to a Norwegian couple who only eat what they hunt and fish themselves back home. During my first research visit I spoke with 6 passengers and by the time of the pilot, that number had grown to over 20.

It taught me that good research is as much about people skills as it is about methodology and that the willingness to just walk up and ask is often the hardest but most important step. Stepping into the terminal with a notepad and talking to real people was one of the best decisions of this project. The messiness of real conversations, with the hesitations and the unexpected answers, gave me the kind of insight that no survey could have captured.

## Use of AI in this report

AI tools were used in several stages of this project. Elicit was used to identify and screen relevant literature; after this selection, original papers were read and analyzed by the author. Amber notes and Fireflies.ai were used to transcribe interviews. ChatGPT was used to assist in detecting themes in qualitative results, validate thematic clustering, generate images, structuring of the report and writing.

# References

Aiking, H., & De Boer, J. (2018). The next protein transition. Trends in Food Science & Technology, 105, 515–522. https://doi.org/10.1016/j.tifs.2018.07.008

Airport Council International. (2025). ACI World reveals key trends shaping air travel in 2026 | ACI World. https://aci.aero/2025/11/19/aci-world-reveals-key-trends-shaping-air-travel-in-2026/

Airport World. (2025). The power of food and beverage offerings at airports. https://airport-world.com/the-power-of-food-and-beverage-offerings-at-airports/

AkgiŞ İlhan, Ö. A., Balyali, T. Ö., & Günay, S. (2023). A holistic view of the tourist experience of Generation Z. Advances in Hospitality and Tourism Research (AHTR), 11(3), 341–370. https://doi.org/10.30519/ahtr.1125474

Anwar, K., Putri, F. S., & Maskar, D. H. (2024). Hubungan Menu Anxiety, Pemilihan Makanan, dan Kebiasaan Makan pada Status Gizi Generasi Z di Cinere, Depok. Amerta Nutrition, 8(3SP), 326–335. https://doi.org/10.20473/amnt.v8i3sp.2024.326-335

APA Dictionary of Psychology. (n.d.). https://dictionary.apa.org/familiarity

Blackford, B. (2021). Nudging interventions on sustainable food consumption: a systematic review. The Journal of Population and Sustainability, 5(2). https://doi.org/10.3197/jps.2021.5.2.17

Blanke, J., Billieux, J., & Vögele, C. (2022). Healthy and Sustainable Food Shopping: A survey of intentions and Motivations. Frontiers in Nutrition, 9, 742614. https://doi.org/10.3389/fnut.2022.742614

Boffi, L., & Halse, J. (2020). Design Interventions as a Form of Inquiry. 10.4324/9781003085188-8.

Congiu, L., & Moscati, I. (2020). A Review of Nudges: Definitions, Justifications, Effectiveness. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3728512

Davison, L., & Ryley, T. (2012). The relationship between air travel behaviour and the key life stages of having children and entering retirement. Journal of Transport Geography, 26, 78–86. https://doi.org/10.1016/j.jtrangeo.2012.08.016

Demkura, T. & Markovych, I. (2022) The choice architecture and nudging in the behavioural economics. Socio-Economic Problems and the State (electronic journal), Vol. 27, no. 2, pp. 85-92. http://sepd.tntu.edu.ua/images/stories/pdf/2022/22dtvvpe.pdf

Dimitriou, C. K., & AbouElgheit, E. (2019). Understanding generation Z's travel social decision-making. Tourism and Hospitality Management, 25(2), 311–334. https://doi.org/10.20867/thm.25.2.4

Farrar, S., Davis, T., & Papies, E. (2024, May 6). Increasing the Appeal of Plant-Based Foods through Describing the Consumption Experience: A Data-Driven Procedure. OSF. https://osf.io/preprints/osf/z78qk_v1

Hao, J., Plangger, K., & West, D. (2024). Conceptualizing sustainable consumption priming: A scoping review. Psychology and Marketing, 41(11), 2772–2788. https://doi.org/10.1002/mar.22083

Harris, D., McCartan, S., Verheijden, B., & Nordby, K. (2014). European Boat Design Innovation Group: The Marine Design Manifesto. ResearchGate. https://www.researchgate.net/publication/280065046_European_Boat_Design_Innovation_Group_The_Marine_Design_Manifesto

Hwang, E., Kim, Y., & Song, H. G. (2023). Airline passengers' willingness to reserve inflight meals online and their willingness to pay for meal upgrades: The case study of U.S. students. Sustainability, 15(10), 8071. https://doi.org/10.3390/su15108071

ICAO Carbon Emissions Calculator. (n.d.). https://icec.icao.int/calculator

Kahneman, D. (2011). Thinking, fast and slow. http://bvbr.bib-bvb.de:8991/F?func=service&doc_library=BVB01&local_base=BVB01&doc_number=024469072&sequence=000003&line_number=0001&func_code=DB_RECORDS&service_type=MEDIA

Kumar, R. (1999). Ranjit Kumar. Research methodology: a step-by-step guide for beginners. Investigación Bibliotecológica Archivonomía Bibliotecología E Información, 13(27). https://doi.org/10.22201/iibi.0187358xp.1999.27.3925

Lajoie, E. W., & Bridges, L. (2014). Innovation Decisions: using the Gartner hype cycle. Library Leadership & Management, 28(4). https://doi.org/10.5860/llm.v28i4.7083

Langyan, S., Yadava, P., Khan, F. N., Dar, Z. A., Singh, R., & Kumar, A. (2022). Sustaining protein nutrition through Plant-Based foods. Frontiers in Nutrition, 8, 772573. https://doi.org/10.3389/fnut.2021.772573

LCA Food Database. (n.d.). https://thebigclimatedatabase.com/

Loy, L. S., Wieber, F., Gollwitzer, P. M., & Oettingen, G. (2016). Supporting Sustainable Food Consumption: Mental Contrasting with Implementation Intentions (MCII) Aligns Intentions and Behavior. Frontiers in Psychology, 7, 607. https://doi.org/10.3389/fpsyg.2016.00607

Michie, S., Van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implementation Science, 6(1), 42. https://doi.org/10.1186/1748-5908-6-42

Mueller, F. '., Obrist, M., Bertran, F. A., Makam, N., Kim, S., Dawes, C., Marti, P., Mancini, M., Ceccaldi, E., Pasumarthy, N., Claire, S., Jung, K. S., Deng, J., Steimle, J., Krasteva, N., Schwalk, M., Reiterer, H., Wang, H., & Wang, Y. (2023). Grand challenges in human-food interaction. International Journal of Human-Computer Studies, 183, 103197. https://doi.org/10.1016/j.ijhcs.2023.103197

Muñoz-Vilches, N. C., Van Trijp, H., & Piqueras-Fiszman, B. (2020). Tell me what you imagine and I will tell you what you want: The effects of mental simulation on desire and food choice. https://www.semanticscholar.org/paper/Tell-me-what-you-imagine-and-I-will-tell-you-what-Mu%C3%B1oz-Vilches-Trijp/86992abac413168d2aa240a5eb9ba93068162f12

Mylan, J., Andrews, J., & Maye, D. (2023). The big business of sustainable food production and consumption: Exploring the transition to alternative proteins. Proceedings of the National Academy of Sciences, 120(47), e2207782120. https://doi.org/10.1073/pnas.2207782120

Nagyova, I. (2020). Applying translational behavioural science to improve people's health. European Journal of Public Health, 30(Supplement_5). https://doi.org/10.1093/eurpub/ckaa165.1073

Onwezen, M., Bouwman, E., Reinders, M., & Dagevos, H. (2020). A systematic review on consumer acceptance of alternative proteins: Pulses, algae, insects, plant-based meat alternatives, and cultured meat. Appetite, 159, 105058. https://doi.org/10.1016/j.appet.2020.105058

Papies, E., Johannes, N., Daneva, T., Semyte, G., & Kauhanen, L. (2020, August 5). Using consumption and reward simulations to increase the appeal of plant-based foods. OSF. https://osf.io/preprints/osf/hwqpg_v1

Pilat, D., & Krastev, S. (2024, September 18). The COM-B model for behavior change. The Decision Lab. https://thedecisionlab.com/reference-guide/organizational-behavior/the-com-b-model-for-behavior-change

Pinna, M., & Del Chiappa, G. (2011). Consuming Food and Beverage at the airport: analogies and differences among business and leisure tourists. University of Sassari.

Plaza, A. G., Saulais, L., & Delarue, J. (2022). What really matters when dining out? Insights into the role of context from a qualitative study with French consumers. International Journal of Gastronomy and Food Science, 28, 100537. https://doi.org/10.1016/j.ijgfs.2022.100537)

Popşa, R. E. (2024). Exploring the Generation Z travel trends and behavior. Studies in Business and Economics, 19(1), 189. https://doi.org/10.2478/sbe-2024-0010

Pyett, S., Vet, E., Trindade, L., Zanten, H. V., & Fresco, L. (2019). Chickpeas, crickets, and chlorella: our future proteins. https://www.semanticscholar.org/paper/Chickpeas%2C-crickets%2C-and-chlorella%3A-our-future-Pyett-Vet/0c2ea02637ad6f849908492ff02cb33cb4432a52

Rauscher, S., & Zielke, A. (2019). Introduction. In BesMasters (pp. 1–3). https://doi.org/10.1007/978-3-658-28017-8_1

RIVM. (2024). Database milieubelasting voedingsmiddelen. Retrieved from http:// https://www.rivm.nl/documenten/database-milieubelasting-voedingsmiddelen-2024

Royal Schiphol Group. (2024). Sustainable Food Route [Internal report]. Royal Schiphol Group.

Sanders, E., & Stappers, P. J. (2012). Convivial Toolbox: generative research for the front end of design.

Schiphol. (2024-2025). Internal data and research [Internal documents]. Royal Schiphol Group.

Sleeswijk Visser, F., Stappers, P. J., Van Der Lugt, R., ID-Studiolab, Faculty of Industrial Design Engineering, Delft University of Technology, Sanders, E. B.-N., & MakeTools, LLC. (2005). Contextmapping: experiences from practice. In CoDesign: International Journal of CoCreation in Design and the Arts (Vol. 1, Issue 2). Taylor and Francis. https://isfcolombia.uniandes.edu.co/images/documentos/contextmapping.pdf

Szejda, K., Parry, J., & The Good Food Institute. (2020). Strategies to Accelerate Consumer Adoption of Plant-Based Meat: Recommendations from a Comprehensive Literature Review. https://gfi.org/images/uploads/2020/03/FINAL-Consumer-Adoption-Strategic-Recommendations-Report.pdf

Szejda, K., Urbanovich, T., The Good Food Institute, & The Good Food Institute. (2019). Plant-based and cultivated meat Diffusion of Innovation: Profiles of U.S. early adopter consumer segments. https://gfi.org/images/uploads/2020/04/Jan-2020-US-PBCM-Early-Adopter-Profiles-FINAL-REPORT-V2.pdf

Taste of ~~Airport~~ Travelers | Airport Dimensions. (n.d.). https://airportdimensions.com/news-and-insights/keeping-up-with-the-changing-tastes-of-airport-travelers

Tél, Vermeir, I., Verbeke, W., & Iris. (2004). Sustainable ~~Food Consumption: Exploring the Consu~~mer Attitude – Behaviour gap Sustainable Food Consumption: Exploring the consumer attitude – behaviour gap. https://www.semanticscholar.org/paper/Faculteit-Economie-En-Bedrijfskunde-Hoveniersberg-%E2%80%93-Tel-Vermeir/78d94d26d6ed9cce487816779e0e04fe954a9f10

The big climate database. (2024). CONCITO. https://concito.dk/en/thebigclimatedatabase

Van Der Laan, L. N., Papies, E. K., Hooge, I. T. C., & Smeets, P. a. M. (2016). Goal-directed visual attention drives health goal priming: An eye-tracking experiment. Health Psychology, 36(1), 82–90. https://doi.org/10.1037/hea0000410

West, R., & Michie, S. (2020). A brief introduction to the COM-B Model of behaviour and the PRIME Theory of motivation. https://www.semanticscholar.org/paper/A-brief-introduction-to-the-COM-B-Model-of-and-the-West-Michie/5c9f12efcef2b089b1a620c8bacd31a9c1586f6d

Wiklund, J. (2024, January 9). Understanding Gen Z's 'Menu anxiety' - The Food Institute. The Food Institute. https://foodinstitute.com/focus/understanding-gen-zs-menu-anxiety/

Willmott, T. J., Pang, B., & Rundle-Thiele, S. (2021). Capability, opportunity, and motivation: an across contexts empirical examination of the COM-B model. BMC Public Health, 21(1). https://doi.org/10.1186/s12889-021-11019-w

# Appendices

# APPENDIX A: Project brief


TU Delft

## IDE Master Graduation Project

### Projectteam,procedural checks and PersonalProject Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

### STUDENT DATA&MASTERPROGRAMME

Complete all fields and indicate which master(s) you are in

| | |
|---|---|
| Family name | Grobbink |
| Initials | M |
| Given name | Maxine |
| Student number | 5002125 |

| | | | | | |
|---|---|---|---|---|---|
| IDE master(s) | IPD | | DfI | | SPD | ✓ |
| 2nd non-IDE master | | | | | |
| Individual programme *(date of approval)* | | | | | |
| Medisign | | | | | |
| HPM | | | | | |

### SUPERVISORYTEAM

Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

| | | | |
|---|---|---|---|
| Chair | Sicco Santema | dept./section | DOS |
| mentor | Stefan Persaud | dept./section | DFS |
| 2nd mentor | Micha Dijkhuizen | | |
| client: | Schiphol | | |
| city: | Amsterdam | country: | Nederland |
| optional comments | | | |

! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.

! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.

! 2nd mentor only applies when a client is involved.

### APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

Sicco Santema

Digitaal ondertekend door Sicco Santema
Datum: 2025.10.08 17:13:33 +02'00'

Name Sicco Santema Date 8 okt 2025 Signature

# Personal Project Brief – IDE Master Graduation Project

**Name student** Maxine Grobbink **Student number** 5,002,125

## PROJECTTITLE,INTRODUCTION,PROBLEMDEFINITIONand ASSIGNMENT

Complete all fields, keep information clear, specific and concise

**Project title** Designing a sustainable food experience at Schiphol:Nudging passengers towards greener food options

*Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.*

### Introduction

*Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)*

Schiphol has committed to ambitious sustainability goals: waste- and emission-free by 2030 and fully circular and energy-positive by 2050. Schiphol Innovation Hub (Healthy Environments) focuses on sustainability innovation, where they explore and pilot new solutions to improve sustainability development in and outside the terminal. Many of the projects are focused on operational and aviation related sustainability, but little to no research has been done on how to consider the passenger and their behavior in contributing to sustainability. With around 70 million passengers passing through the terminal each year, I want to explore the sustainable development from the perspective of a very important actor: the passenger. The key stakeholders for this project include passengers, F&B partners and different Schiphol departments (Commercial, PX, Sustainability and Innovation Hub). Each stakeholder group has different interests: passengers expect a seamless and enjoyable travel experience, F&B partners depend on consumption and efficiency and Schiphol must meet sustainability demands, while managing the complex landscape of stakeholders. As part of its commitment to sustainability, Schiphol's Food & Beverage (F&B) offerings are set to increase the availability of sustainable food options in the terminal. However, even with sustainable products on offer, the real challenge lies in influencing the passengers consumption choices. Only then will the full potential of the sustainable F&B approach be realized. Human Food Interaction (HFI) principles can offer a valuable approach for designing sustainable food experiences in the Schiphol terminal. HFI is a recent design research domain that focuses on how design and technology can stimulate certain attitudes and behaviors regarding food (Cadario & Chandon, 2020; Hollands et al., 2017). Studies have shown that for example visual technologies in food purchase environments can have a significant impact on consumer behavior (Petit et al., 2021; Velasco et al., 2018; Toet et al., 2017). In this project I want to investigate how HFI can be integrated into the terminal's F&B to create a pleasant and sustainable passenger experience.

→ *space available for images / figures on next page*

# Personal Project Brief – IDE Master Graduation Project

**Problem Definition**

*What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.*
*(max 200 words)*

Schiphol faces the challenge of significantly reducing it's environmental impact, while preserving the quality of the passenger experience. A key area of focus is the Food & Beverage (F&B) sector, where passengers' food choices contribute significantly to emissions, waste and resource use. Passengers tend to default to more traditional food options, even when more sustainable alternatives are available. At the same time, Schiphol has measured a relatively low passenger satisfaction score compared to other European Airport Hubs and the current F&B experience takes part in this with current scores of: 3.39/5 for the overall F&B experience and 2.62/5 for value for money of the F&B. Introducing sustainable options without compromising on the passenger satisfaction is a challenge, as passengers may view these alternatives as less satisfying or too unfamiliar. However, this creates an opportunity area where these two factors could lift each other up, which I am aiming for in this project.

The word "sustainable" in the title has therefore two meanings: it refers to environmental sustainability, but also to the long-term strategic sustainability of the F&B offering that remains effective without compromising passenger satisfaction, which is crucial for Schiphol's success.

**Assignment**

*This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the* green text format*:*

Design a food/dining experience for the F&B outlets in the Schiphol terminal using HFI principles that nudges passengers towards choosing the sustainable food option, without comprimising on the overall F&B experience.

*Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)*

The project will have the structure of the double diamond: 1. discover, 2. define, 3. develop, 4. deliver.

1. In this phase I want to understand the field of sustainable food (innovation), where do I want to nudge the passengers to? What are the definitions of sustainable food? Also understand the possibilities of HFI in sustainable behavior context. --> Context + trend analysis, internal analysis, stakeholder mapping, competitor analysis, technology scouting, interview relevant stakeholders, literature research (untill 3 nov)
2. Here I want to define the specific design area, what target group, which environment, where can I make the biggest/realistic impact? --> Stakeholder interviews, needs and value mapping, passenger journey mapping, forecasting (untill 1 dec)
3. This phase will consist of: Ideation, design 3 MVP's, validation with passengers and stakeholders, iteration, calculate different impact scenario's (untill 9 feb)
4. Finalize design, report, prepare presentation (untill 20 mar)

*introduction (continued): space for images*

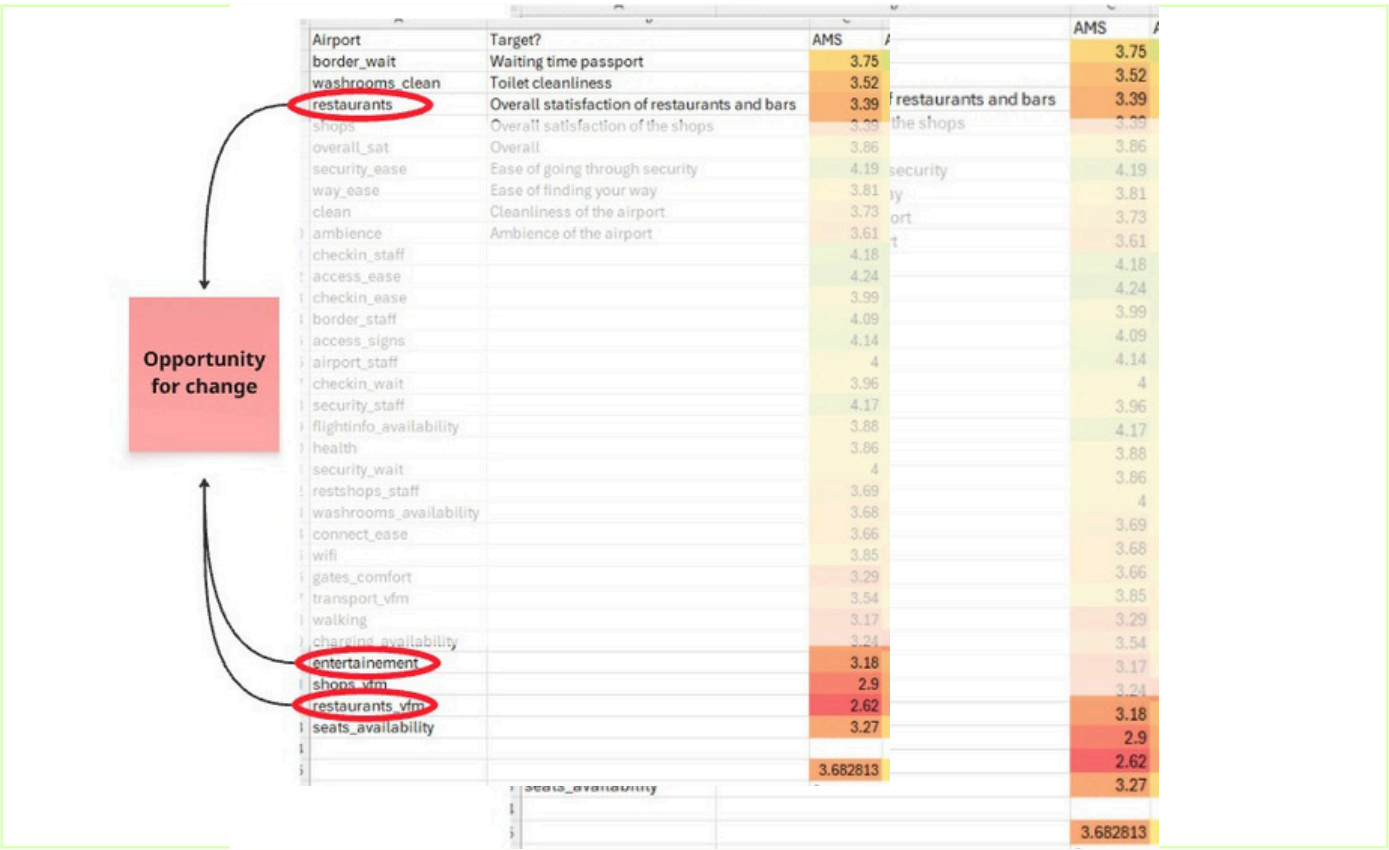



image / figure 1 Passenger satisfaction scores at Schiphol Airport (out of 5)

**Project planning and key moments**

*To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting**, **mid-term evaluation meeting**, **green light meeting** and **graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

*Make sure to attach the full plan to this project brief.*
*The four key moment dates must be filled in below*

| | |
|---|---|
| **Kick off meeting** | 8 Oct 2025 |
| **Mid-term evaluation** | 3 Dec 2025 |
| **Green light meeting** | 20 Feb 2026 |
| **Graduation ceremony** | 20 Mar 2026 |

*In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project*

| | |
|---|---|
| Part of project scheduled part-time | ✓ |
| For how many project weeks | 6 |
| Number of project days per week | 4,0 |

Comments:
Myrole as managing director at DeKleine Consultant ends mid november, untill then I need a day per week to focus on that.

**Motivation and personal ambitions**

*Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).*

*Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.*
*(200 words max)*

I want to aqcuire more knowledge on experience design, the psychology behind it and how tech can/will play a part in the future

Out of my own curiosity and to get inspired I want to gain deeper knowledge on future food innovation, how we will be eating in the future and how to do that in a sustainable way

Gain experience in real stakeholder management, how and what you communicate with different stakeholders? What are the different powers that drive an organization

I want to gain experience in a large professional organisation where many departments come together,

On the process part I want to make mistakes as a project manager and learn from them: what are things I should have considered in my project planning, but didn't, how do I keep structure in my work, how you best make choices during the project without staying stuck for it too long etc.

## CHECK ON STUDY PROGRESS

To be filled in **by SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total _____ EC

Of which, taking conditional requirements into account, can be part of the exam programme _____ EC

| | | |
|---|---|---|
| ★ | **YES** | all 1st year master courses passed |
| | **NO** | missing 1st year courses |

Comments:

i.v.m. curriculumherziening MSc 1 = 53 EC

Sign for approval (SSC E&SA)

K. Veldman Digitally signed by K. Veldman Date: 2025.10.13 15:39:04 +02'00'

Name K. Veldman Date 13 Oct 2025 Signature _____

## APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

| | | |
|---|---|---|
| **YES** | ★ | Supervisory Team approved |
| **NO** | | Supervisory Team not approved |

Comments:

Based on study progress, students is …

| | |
|---|---|
| ★ | **ALLOWED** to start the graduation project |
| | **NOT** allowed to start the graduation project |

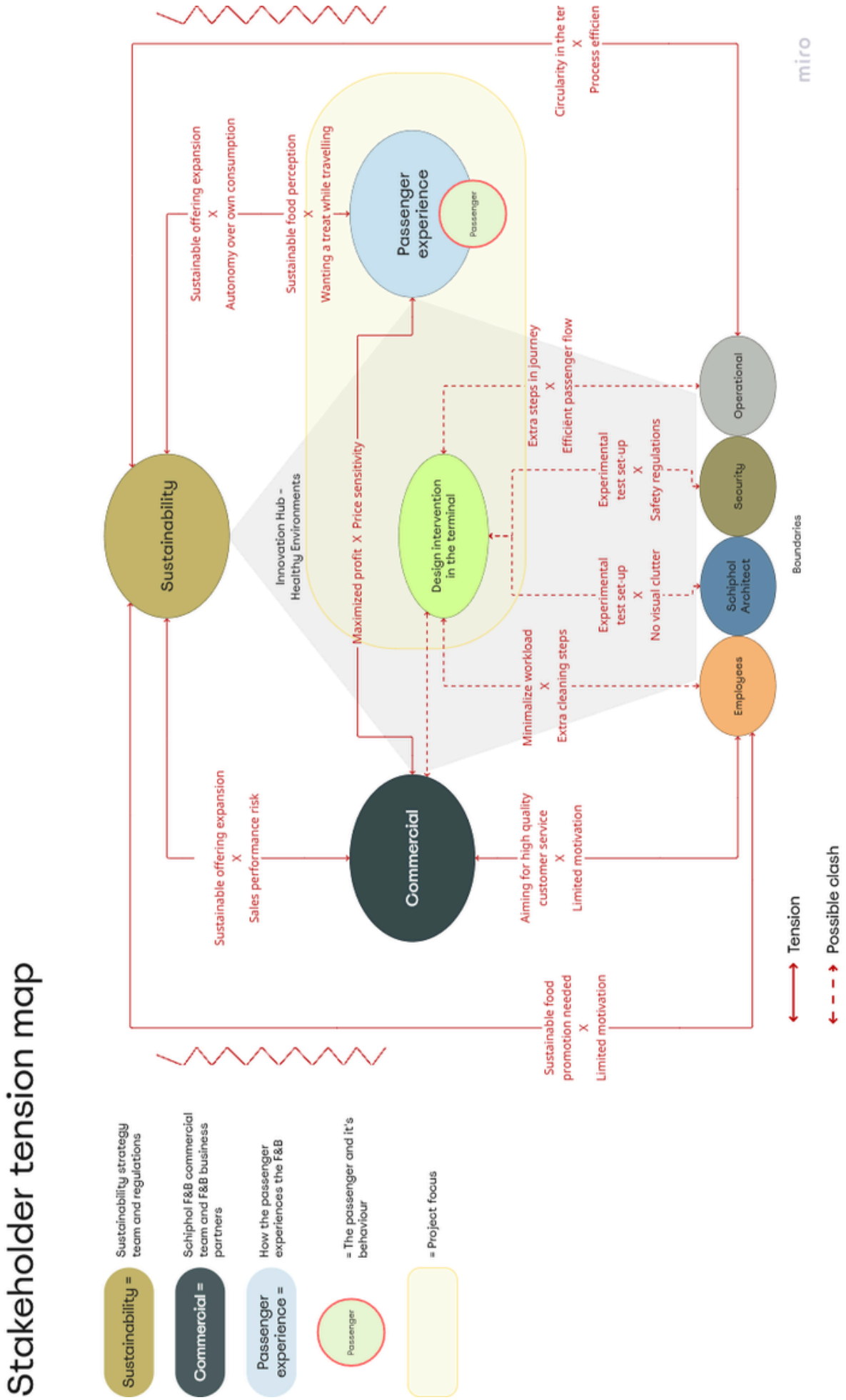
Comments:

Sign for approval (BoEx)

Joni Schuurman Digitally signed by Joni Schuurman Date: 2025.10.15 13:23:56 +02'00'

Name Joni Schuurman Date 15 Oct 2025 Signature _____

# APPENDIX B: Stakeholder tension map



# APPENDIX C: Sample demographics

The participant group consisted of 58% female and 42% male participants. In terms of age, 58% of participants were between 18–29 years, 10% between 30–44 years, 16% between 45–59 years, and 16% were 60 years or older. The majority of participants were Dutch (77%), while 23% had a non-Dutch nationality (including American, Spanish, German, Indian, and Norwegian). Regarding travel purpose, 81% of participants were travelling for leisure, while 19% were travelling for business. As a result, the findings may be less representative of older passengers, frequent business travellers, or non-Dutch traveller groups. In terms of meat-eating behaviour, 61% identified as meat eaters, 26% as meat reducers, and 13% as meat avoiders.

Participants for the diary study, interviews and co-creation session were intentionally not the same individuals. By using different participants for these three methods, methodological triangulation is applied, strengthening the validity of the findings and reducing the risk of socially desirable answers. For the diary studies, the group mainly consisted of young adults. For the interviews I recruited participants in my own network and via Nextdoor.nl to gain a diverse set of passengers.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Data type | Age | Gender | Nationality | Meat eating behavior | Leisure/business traveler |
| 2 | | | | | | |
| 3 | Travel Diary | 25 | Male | Dutch | Meat eater | Business |
| 4 | Travel Diary | 52 | Female | American | Meat reducer | Business |
| 5 | Travel Diary | 23 | Female | Dutch | Meat eater | Leisure |
| 6 | Travel Diary | 24 | Female | Dutch | Meat eater | Leisure |
| 7 | Travel Diary | 56 | Female | Dutch | Meat reducer | Leisure |
| 8 | | | | | | |
| 9 | Interview | 20 | Female | Dutch | Meat eater | Leisure |
| 10 | Interview | 24 | Female | Dutch | Meat eater | Leisure |
| 11 | Interview | 24 | Female | Dutch | Meat eater | Leisure |
| 12 | Interview | 54 | Female | Dutch | Meat eater | Business |
| 13 | Interview | 42 | Female | Dutch | Meat reducer | Business |
| 14 | Interview | 62 | Female | Dutch | Meat eater | Leisure |
| 15 | Interview | 62 | Female | Dutch | Meat avoider | Leisure |
| 16 | Interview | 67 | Male | Dutch | Meat eater | Leisure |
| 17 | Interview | 25 | Male | Dutch | Meat reducer | Leisure |
| 18 | Interview | 29 | Male | Dutch | Meat reducer | Leisure |
| 19 | Interview | 23 | Male | Dutch | Meat eater | Leisure |
| 20 | Interview | 28 | Male | Spanish | Meat reducer | Business |
| 21 | Interview | 32 | Male | Dutch | Meat avoider | Leisure |
| 22 | Interview | 23 | Male | Dutch | Meat eater | Leisure |
| 23 | | | | | | |
| 24 | Terminal Interview | 29 | Female | Spanish | Meat eater | Leisure |
| 25 | Terminal Interview | 31 | Female | German | Meat reducer | Leisure |
| 26 | Terminal Interview | 60 | Female | Spanish | Meat eater | Leisure |
| 27 | Terminal Interview | 53 | Male | Dutch | Meat eater | Leisure |
| 28 | Terminal Interview | 52 | Male | Indian | Meat avoider | Business |
| 29 | Terminal Interview | 65 | Male | Norwegian | Meat eater | Leisure |
| 30 | Terminal Interview | 25 | Male | Dutch | Meat eater | Leisure |
| 31 | | | | | | |
| 32 | | | | | | |
| 33 | Co-creation 1 | 24 | Female | Dutch | Meat eater | Leisure |
| 34 | Co-creation 1 | 24 | Female | Dutch | Meat eater | Leisure |
| 35 | Co-creation 1 | 24 | Female | Dutch | Meat eater | Leisure |
| 36 | Co-creation 1 | 25 | Female | Dutch | Meat reducer | Leisure |
| 37 | Co-creation 1 | 26 | Male | Dutch | Meat avoider | Leisure |
| 38 | | | | | | |
| 39 | Co-creation 2 | 25 | Male | Dutch | Meat eater | Leisure |
| 40 | Co-creation 2 | 27 | Male | Dutch | Meat eater | Leisure |
| 41 | Co-creation 2 | 27 | Male | Dutch | Meat eater | Leisure |
| 42 | Co-creation 2 | 56 | Female | Dutch | Meat avoider | Leisure |
| 43 | Co-creation 2 | 59 | Female | Dutch | Meat eater | Leisure |
| 44 | Co-creation 2 | 60 | Female | Dutch | Meat eater | Leisure |
| 45 | Co-creation 2 | 27 | Female | Dutch | Meat eater | Leisure |
| 46 | Co-creation 2 | 26 | Female | Dutch | Meat reducer | Leisure |

# APPENDIX D: Interesting target group

## Segmentation

- What traveller segment is interesting and why?
- What influence does each passenger segment have on the COM-B model elements?

Several passenger groups were analyzed through parameter mapping, including travel purpose, dwell time, and age group. While many combinations are possible, three main archetypes were initially identified: the Routine Business Traveler, the Organized Family, and the Young Explorer. These archetypes were chosen because they clearly differ in key drivers of travel behavior, such as spending patterns, openness to experiences, and sustainability attitudes. By selecting three contrasting profiles based on these parameters, it becomes possible to compare how each group influences these areas.

Routine Business Travelers typically travel with a strict schedule, focus on efficiency, and rely on familiar routines. This makes them useful for understanding quick, habitual food decisions under time pressure. Organized Families introduce the complexity of group decision-making, where adults and children have different needs, budgets must be managed, and coordinating travel with children's routines matters. Although families often have more time at the airport, their time is shaped by practical demands (Davison & Ryley, 2012). Young Explorers, usually Gen Z or early Millennials, travel mainly for leisure and are more open to trying new experiences, including food. They seek authenticity and novelty in their travel choices (Popşa, 2024).

## Target group selection

To identify which traveler segment offers the strongest potential for the design intervention, three target-group attributes were derived from the conceptual framework. This framework explains how sustainable food-choice behavior at Schiphol is shaped by three overarching domains: commercial viability, passenger experience, and sustainable impact. When translated to the individual traveler level, these domains become three behavioural determinants: spending behavior, experiential openness and sustainability intention.

These attributes were introduced not only to represent the system domains at the user level but also because, together, they form the conditions under which behavior change can occur. This relationship is grounded in the COM-B behavioural model (Michie et al., 2011), which conceptualizes behavior as emerging from the interaction of Capability, Opportunity, and Motivation. Spending behavior reflects the physical opportunity of the wallet size. Experiential openness corresponds to psychological capability, capturing a traveler's cognitive

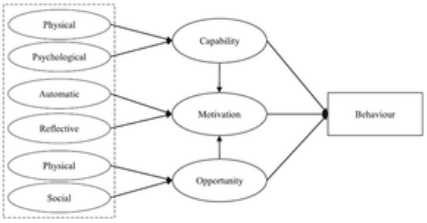
receptiveness to experiential cues, design elements and new food experiences. Sustainability intention represents motivation, including values and willingness to choose sustainable or plant-based options. Promotion of any product is more effective when it targets a consumer segment that has greater openness to adopt a novel innovation, such as plant-based meat (Szejda et al., 2019).

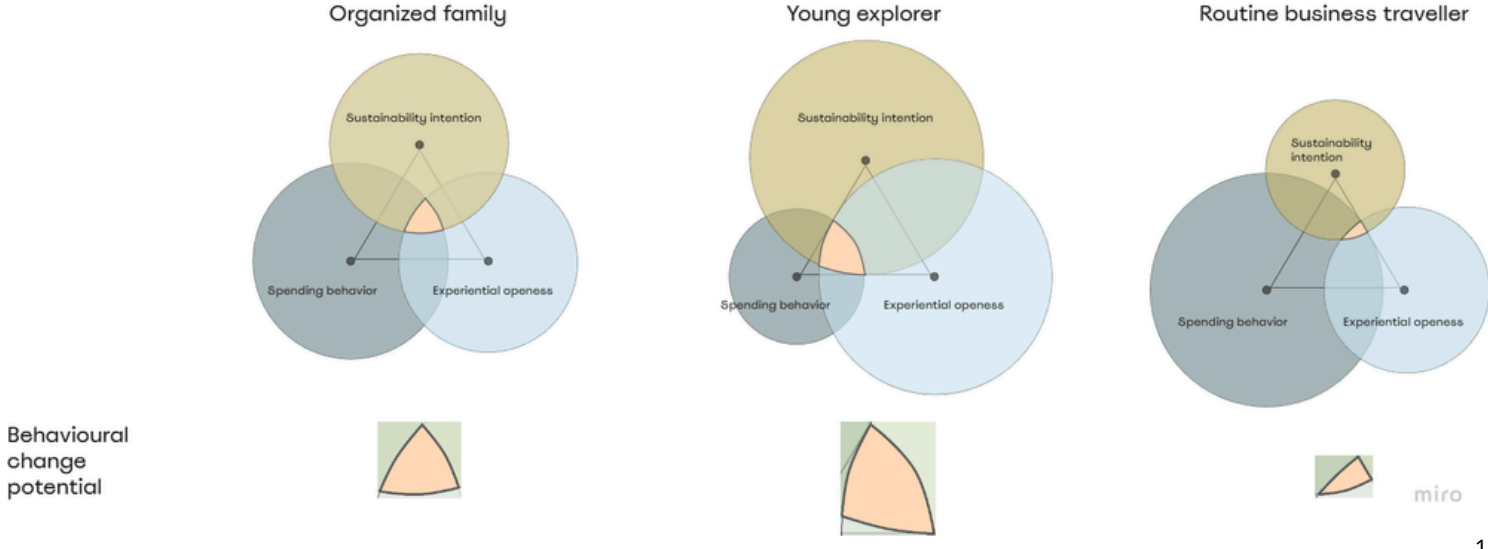
The degree to which these three elements align indicates a traveler group's behavioural-change potential: their likelihood of responding to a sustainable food intervention. Using this logic, the relative strength of each attribute per traveler group was then evaluated through a qualitative, comparative assessment supported by literature.

Research shows that business travelers, who represent only 27% of Schiphol's total passenger base (Schiphol, n.d.), exhibit high spending behavior but low experiential openness due to time-pressured, habitual decision-making (IATA, 2022; ACI ASQ Reports).

Organized Families, within the leisure segment that makes up 73% of Schiphol's travelers, display moderate spending. Their longer dwell times can increase spending behavior, but they typically organize their budget (Davison & Ryley, 2012). Their food decisions rely on multiple people and are often driven by children's preferences. This makes both their experiential openness and sustainability intention less predictable, which is why they have a moderate size.

Young Explorers, however, have the most favourable alignment: they are strongly motivated by authentic and memorable experiences, including trying new cuisines, indicating high experiential openness. Additionally, 56% of Gen Z travelers prioritize eco-friendly choices and actively engage in sustainable travel behaviours, supporting high sustainability intention. Although they typically travel on limited budgets and show modest F&B spending (Popşa, 2024), the strong combination of motivational and experiential factors results in the highest behavioural-change potential among all groups. Consequently, the Young Explorer segment presents the most promising focus for the intervention.



Persona

The Young Explorer represents a new generation of leisure travelers who are digitally fluent, health-oriented and experience-driven. Typically aged 18–30, they belong to the late Gen Z and early Millennial cohorts. Unlike older leisure travelers, they are spontaneous, curious and guided by emotion and price rather than routine or comfort. They are a highly connected consumer segment that integrates technology and social influence throughout their entire travel and purchase lifecycle (Dimitriou et al., 2019).

**Travel style and motivations:** Primarily leisure-seeking, focused on acquiring unique experiences, exploring different cultures, and making memories. Seeks personalized experiences and unconventional destinations. Heavily interested in museums, historical sites, and arts/culture. Enjoys exploring the outdoors and being active (Dimitriou et al., 2019). Gen Z has a limited budget for travel. They need to devise certain strategies to cope with this. Escape from everyday life is their most important motivation in travel. The idea that the best time to travel is school and youth years (Akgiş İlhan et al., 2022).

**Spending behavior:** Is budget cautious. 93% are looking for the best deals and most value for their money. They prefer affordable package deals. They are also fond of personalized promotions and are likely to use loyalty programs (58%).

**Information processing:** A self-educating, adept researcher. Is multi-tasking, processing many types of information simultaneously. Has a shorter attention span, which is compensated for by demanding technology-enabled efficiency. Responds best to visual communication like photos, videos and rich content over text. They have a decision-making process involving social media inspiration during travel (Dimitriou et al., 2019).

**Values and consciousness**: More realistic, self-aware, and environment and sustainability oriented. Appreciates honesty and authenticity in communication. Is more receptive to genuine brand communication messages than Millennials.

**Food behavior and attitudes:** A significant majority (58%) plan their travel around where and what they eat and drink. They appreciate healthy food options (Dimitriou et al., 2019). For Gen Z, eating is often a shared, social ritual where experience and social connection matter as much as taste and quality. Gen Z has a desire for authentic, communal and emotionally engaging food experiences (Plaza et al., 2022).

**Menu anxiety among Gen-Z**

Menu-anxiety is a recently found psychological phenomenon where individuals experience anxiety and stress when selecting food items, particularly characterized by fear of making the wrong choice and being overwhelmed by numerous options (Anwar et al., 2024). It can also be caused by the complexity of the menu, high costs, fear of judgment from others and overwhelming options. While not a formal diagnosis, it's a common issue, especially among younger generations like Gen Z and millennials (Wiklund, 2024).

- More receptive to behavioral change
- Often travelling with friends→ opportunity for peerfluencing
- Represent the future mainstream: by 2030 Gen Z + Millennials will be largest part of global flyers

**Use of technology during travel of the Dutch Young Explorer:**

Functional

- Google maps, NS, 9292
- Boarding pass in digital wallet
- Self-service luggage, passport check and food ordering
- Schiphol website (not the app)→ airline app

# APPENDIX E: Travel diary prompt questions

**Eerste vragen**

1.Wat voor reis maak je? (Bijv. vakantie, werk, familiebezoek, overstap)
2.Met wie reis je? (alleen, partner, gezin, vrienden, collega's…)
3.Wat voor vlucht is het? (kort of lang, en op welk tijdstip vertrek je ongeveer?)
4.Heb je bepaalde eetgewoontes of voorkeuren? (bijv. vegetarisch, flexibel, geen voorkeur)
5.Hoe zou je je eetstijl omschrijven tijdens het reizen? Verschilt deze van je normale eetstijl?
6.Denk je normaal gesproken na over duurzaamheid als je eten kiest?
7.Hoe voel je je meestal op het vliegveld? (bijv. ontspannen, gehaast, gestrest, enthousiast, relaxed)

**Vragen tijdens de reis**

Voor vertrek naar Schiphol

1.Waar denk je aan als je aan eten op Schiphol denkt vandaag?
→ Wat verwacht je, waar heb je zin in, waar heb je geen zin in?
2.Heb je een plan of laat je het afhangen van het moment? Waarom?
→ "Wat maakt dat je (niet) plant?"

Bij aankomst of tijdens het rondlopen

Maak een foto van iets dat meteen je aandacht trekt rond eten of horeca.
3.Waarom trekt dit je aandacht?
4.Wat valt je nog meer op aan het eten of de plekken om te eten?

Op het moment van kiezen of bestellen (indien van toepassing)

5.Voor welk restaurant heb je gekozen?
6.Wat heb je gekozen om te eten of te drinken? Stuur hier een foto van
7.Dacht je op dit moment aan duurzaamheid? Zo ja/nee → waarom?
8.Welke factoren hebben het sterkst je keuze beïnvloed (smaak, tijd, prijs, gemak, iets anders)?
9.Was er een alternatief waar je tussen twijfelde? Waarom ben je daar niet voor gegaan?

Tijdens of net na het eten

10.Waar ben je aan het eten? Is dit bij de plek van bestelling of bijv. bij de gate? Waarom heb je voor deze plek gekozen?
11.Hoe ervaar je deze plek en het eten (ontspannen, gehaast, gezellig, lekker, prima, niet bijzonder)?
12.Stel dat Schiphol jouw ideale eetervaring zou aanbieden, hoe zou dat eruit hebben gezien als alles mogelijk was?

# APPENDIX F: Interview guides

## Semi-structured interview guide

VOORAF TOELICHTEN
Doel van het gesprek:
"Ik onderzoek hoe mensen tijdens het reizen op een luchthaven keuzes maken over eten. Dat helpt me te begrijpen wat ze nodig hebben om een keuze te maken waar ze zich goed bij voelen, en hoe duurzame opties daar beter in kunnen passen."
Structuur (de 3 thema's):
"We gaan het gesprek in vier stukjes doen:

1. Keuzeproces op de luchthaven
2. Associaties met onbekend eten/eten zonder vlees
3. Het verbeteren van de eetervaring op Schiphol

Zo hou ik het gesprek overzichtelijk, en kan ik ook even terugpakken wanneer we ergens inschieten."
Toestemming opname.

THEMA 1 —KEUZEPROCES OP DE LUCHTHAVEN
Hoofdvraag 1:
"Je komt aan op de luchthaven en je hebt zin om iets te eten. Hoe pak jij het meestal aan wanneer je op een luchthaven iets te eten wilt kiezen?"
Waar let je als eerste op? Wat trekt je aandacht? Hoe kies je iets uit?
Hoofdvraag 2:
''Hoe verschilt jouw eetmindset tijdens het reizen vergeleken met het dagelijks leven?''
"Heb je tijdens het reizen meestal het gevoel dat je snel moet kiezen, of heb je juist wel de tijd?"
Hoe voelt dit proces tijdens het reizen voor jou? Zijn dit positieve of negatieve gevoelens? Zou je dit uit kunnen leggen?
Hoofdvraag 3:
''Voelt het voor jou belangrijk om een goed (tevreden) keuze te maken tijdens het reizen? Waarom wel/niet?''à Aanpassen
"Wat helpt jou in zulke momenten om de goede keuze met vertrouwen te maken?"

Hoofdvraag 4:
''Wat moet het eetkeuzeproces op de luchthaven jou geven om tevreden het vliegtuig in te stappen? Welke waarde moet het jou bieden?'' Omschrijf dit per stap van het proces:
1.Bij het zoeken naar opties
2.Bij het bestellen van je eten
3.Tijdens het eten
4.Na het eten

THEMA 2 — ASSOCIATIES MET ONBEKEND/VEGA
Ik lees vier stellingen voor. Je kunt aangeven hoe sterk je het ermee eens bent op een schaal van 1 tot 7 (MAQ scale)

1. Ik geniet echt van maaltijden met vlees.
2. Vlees eten voelt vertrouwd en comfortabel voor mij.
3. Voor mij hoort een goede maaltijd eigenlijk wel iets van vlees te bevatten.
4. Zonder vlees voelt een maaltijd voor mij vaak minder vullend of compleet.

Hoofdvraag 5:
“Probeer je op luchthavens weleens nieuwe dingen/dingen waar je minder mee bekend bent?’’
‘’Wat maakt dat je iets nieuws of minder bekends wél of niet kiest?’’

Hoofdvraag 6:

“Eet je wel eens opties zonder vlees tijdens het reizen? Waarom wel, waarom niet?”
‘’Voelt een optie zonder vlees als iets wat minder bekend is?’’
‘’Wat maakt dat dit voelt als een risico? Hoe zou je dat risico omschrijven? Welk gevoel geeft jou dat?’’

THEMA 3 — EETERVARING VERBETEREN
Hoofdvraag 6:
‘’Wat zou het voor jou makkelijker maken om tijdens het reizen een minder bekende optie te kiezen’’
‘’Wat zou het voor jou makkelijker maken om tijdens het reizen een optie zonder vlees te kiezen’’
‘’Wat zou helpen om onbekende/duurzame opties sneller te vertrouwen?’’
‘’Als jij de eetervaring op Schiphol zou kunnen verbeteren, hoe zou je dat dan doen?’’

## Terminal interview guide

Hi! I’m doing research for Schiphol on how passengers choose food here. Could I ask you 3–4 quick questions? It won’t take more than 10 minutes.

Q1 — "What did you choose to eat? And what made you choose that?"
- "What caught your attention first?"
- "When did you know: yes, I’ll take this?"

Q2 — "Which factors influenced your choice the most?"
- Prompts: time, hunger, familiarity, overview, price, stress
- "Which factor mattered most? Why?"

Q3 — "Did this option feel like a ‘safe choice’ for you? What made it feel safe?"
- "What would have made it feel less safe?"
- "What risk were you trying to avoid?"

Q4 — "Did a plant-based option cross your mind while choosing? Why or why not?"
- "What would have made a plant-based choice easier?"
- "What would help you trust it more in this moment?"

Q5 — "How clear was the overview of choices for you?"
- "What was missing that would help you choose faster or more confidently?"

Q6 — "If Schiphol could make this moment of choosing food better, what would help you most?"

# APPENDIX G: Co-creation session 1

**Sensitizing assignment**

## Content of the session

**Exercise 1: What would make it easier & more attractive?**

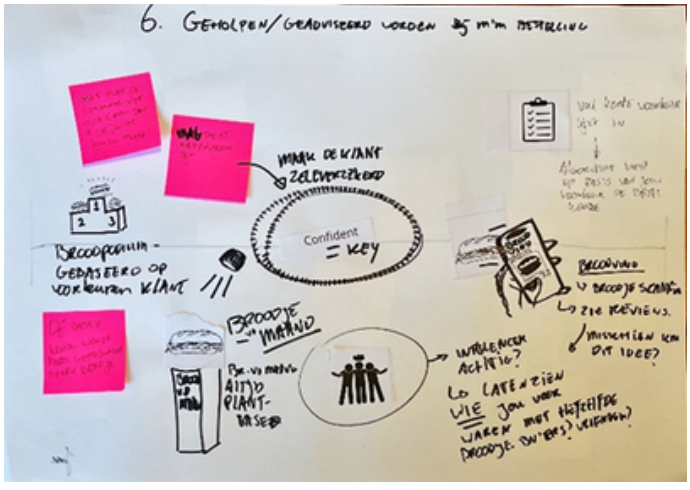
Participants rated the earlier mentioned 11 possible motivators to choose a sustainable sandwich, based on research results, on an X-axis:

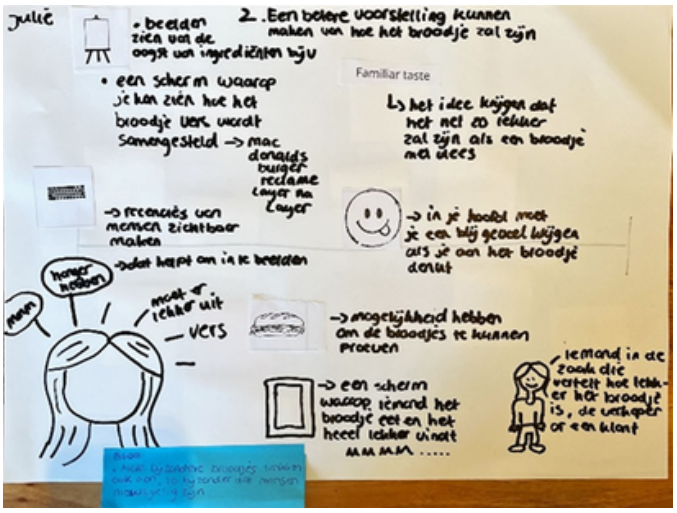
- Left: *"This wouldn't really make a difference for me"*
- Right: *"If this was possible, I'd be much more likely to choose a plant-based sandwich"*

**12:35 – Exercise 2: your ideal version (25 mins)**

- We've just discussed what would make choosing a plant-based sandwich easier or more attractive."
- "I want you to imagine: what would the *ideal version of this direction* look like for you?" Think in terms of *experience*: what you see, feel, want or expect, not in terms of feasibility."
- Choose 2 or more things you want to think of ideas for, you can combine things, you can do a small idea for every statement or a big one for less. Use the illustrations and words om te expressen en de Post-its mag je gebruiken en je mag zelf helemaal vrij tekenen: Het hoeft niet realistisch te zijn!





**13:15 – Exercise 3: From ideal to design criteria (15 minutes)**

- “Write down the things this ideal version really needs to have.”
- ‘Om dit te laten werken voor mij moet dit voldoen aan de volgende eisen (Het moet mijn tijd op het vliegveld efficiënter maken, het moet kort te lezen zijn etc) Denk aan dingen waardoor je meteen af zou haken (bijv. een langere rij of het downloaden van een app)

# APPENDIX H: Co-creation session 2

11:00–11:15 Welkom, intro van mijn project, spelregels

11:15-11:30 Free ideation en op assen positioneren

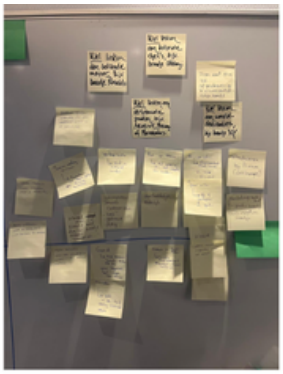
11:15-12:00 Co-creatie rondes per concept met rotaties á 15 min.

12:00-12:20 Lunch

12:20-12:45 Favoriete richtingen kiezen  met criteria discussie

12:45 Wrap-up

## Results



1st quadrant:

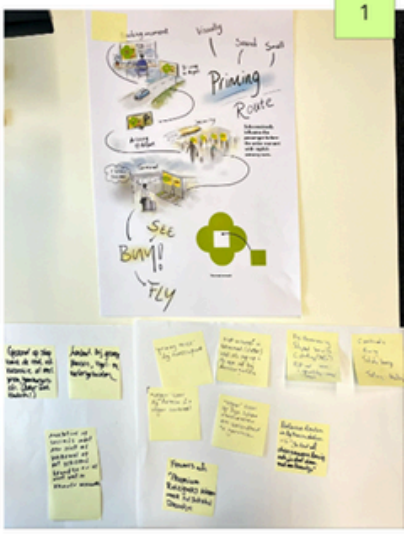
- Link to recognized chefs (for ex. Ottolenghi) or people (Ronaldo sandwich)
- Link to familiar cuisines: Asian, Maroccan, Mexican
- Link to world destinations: NYC sandwich, Munich sandwich etc.
- Show the ingrediënts in a visual compelling way
- Make it visually appealing with color and show how it will taste with words and visuals. Use COLOR to make it stand out and make it look appealing
- Catchy slogan and repeat it
- Introduce to Privium lounge
- Sustainability needs to pay off--> make it cheaper or create a loyalty program: buy 5 get 1 free (good for frequent flyers)
- Place high on menu
- Provide taste-tests in the terminal: 2 sandwiches and make passengers taste the difference
- Collaboration with airlines: promote vegan sandwich in airplane folders

1


Ideas:

- Show ingrediënts of the sandwich clearly
- Build your own sandwich
- Order 2 gate
- Nutritional info for every sandwich
- The Schiphol "Bonus-card" with pointsystem for frequent flyers
- Scans your boarding pass and calculates best route and pick up station for you
- Shows preparation time
- Could be at HMS outlets
- Could be at own pick-up stations
-

2



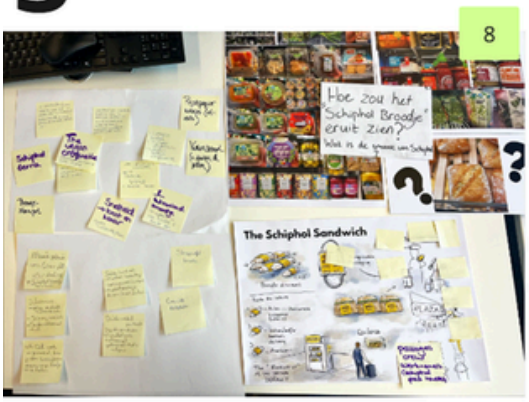

Lastig waar te maken met de decluttering van Schiphol.

Kritisch: Daarbij is het ook lastig om aan de passagier zelf te vragen hoe hij/zij onbewust geprimed kan worden.

- Frame als: gezond op stap, want rest van de reis veel pizza, hamburgers etc. (vooral met kids)
- Schiphol services inzetten
  - → Parking booking/ Security slots / pop-ups
- Combinatie: Schiphol branding "Today's the day"
- Verkooppunten bij groene planten / watergeluiden
- "Vegan" icoon bij horeca die vegan aanbiedt
- "Vegan" icoon op bijv. schoonmaakkarren om bekendheid te genereren
- Reclameblokken in treinstation → je bent al duurzaam bezig, pak dat door met een broodje
- Marketing op socials zodat men zich al vertrouwd voelt met het Schiphol broodje → "weet wat ze kunnen verwachten"
- Frames als: "Premium reizigers kiezen voor het Schiphol broodje"

miro

3




Van iedereen een stem gekregen.

Ideeën:

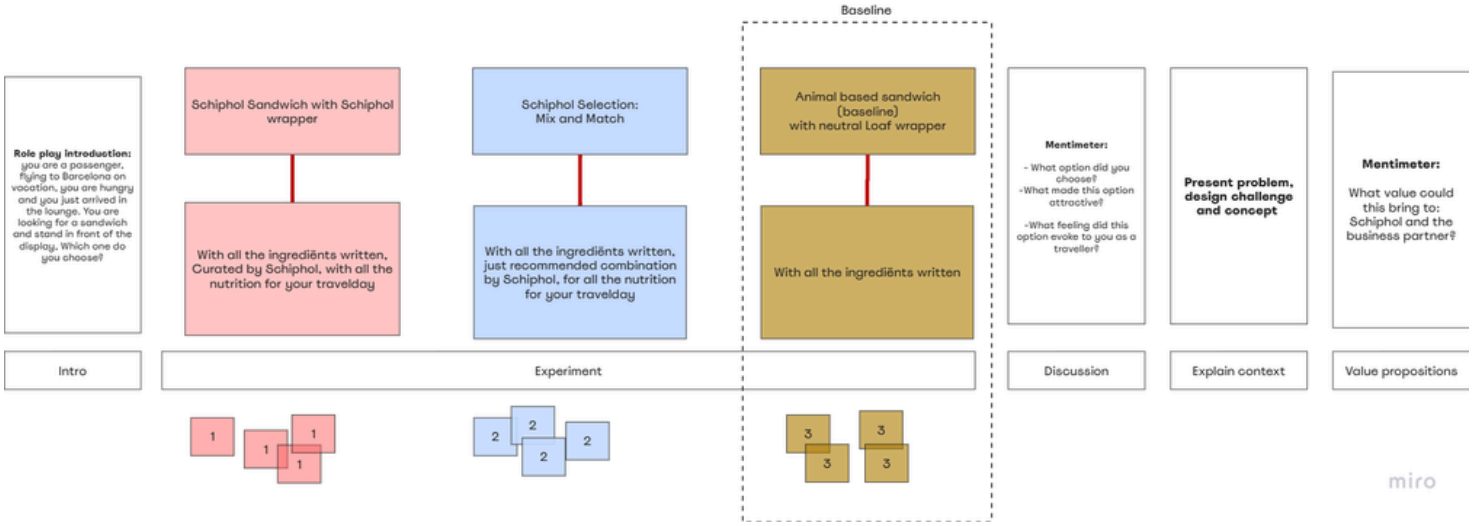
- Schiphol Terra
- The vegan kroket with good mustard: DUTCH
- One changing sandwich based on the trends
- Use the time slot booking touchpoint to pre-order a sandwich pick-up (combine with preview and order)
- Polder-, Buitenveldert-, Kaag-sandwich (landing lanes of Schiphol)
- Sandwich "stamppot"
- Ricepaper burrito or wrap
- Match ingrediënts to destinations
- No waiting lines with the Schiphol sandwich
- Influencers doing "taste-tests"

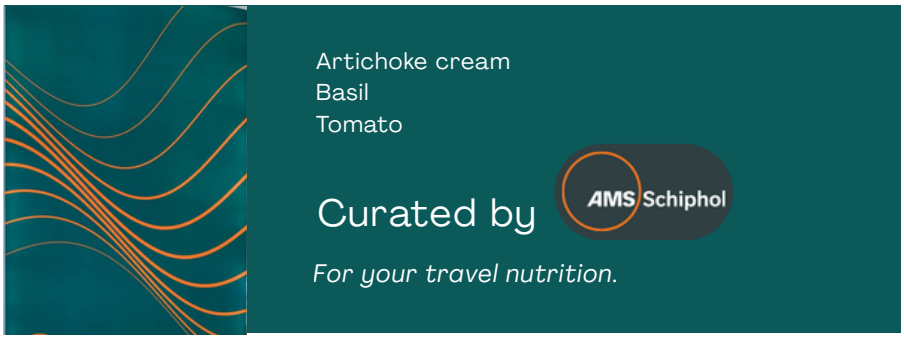
4


Ideeën:

- Selected combinations: this one with this one gives a balanced combo--> Like wine tasting combinations
- Build your travel nutrition
- Focus on health benefits
- "Immunity-boost"
- Play with different colors
- Show the sustainable journey of the ingrediënts
- Different chefs for every sandwich type
- Discount on vegan sandwich

# APPENDIX I: Experiment set-up




Chicken
Lemon mayo
Spring onion

LOAF BAKERY CAFÉ


Artichoke cream
Basil
Tomato

Pulled mushrooms
Truffle tapenade
Rucola

# APPENDIX J: Survey results

QID2: This interaction TRAVEL QUESTIONS 27

| This interaction | Average (This interaction) | Minimum (This interaction) | Maximum (This interaction) | Standard Deviation (This interaction) | Variance (This interaction) |
|---|---|---|---|---|---|
| Makes it appealing to mix & match | 4.73 | 1.00 | 7.00 | 1.53 | 2.35 |
| Makes me feel supported by Schiphol | 4.39 | 2.00 | 7.00 | 1.66 | 2.76 |
| Contributes to a positive food experience at Schiphol | 4.92 | 2.00 | 7.00 | 1.62 | 2.61 |

QID7: This interaction STAFF RECOMMENDATION 25

| This interaction | Average (This interaction) | Minimum (This interaction) | Maximum (This interaction) | Standard Deviation (This interaction) | Variance (This interaction) |
|---|---|---|---|---|---|
| Makes it appealing to mix & match | 4.84 | 2.00 | 7.00 | 1.25 | 1.57 |
| Makes me feel supported by Schiphol | 4.68 | 1.00 | 7.00 | 1.58 | 2.49 |
| Contributes to a positive food experience at Schiphol | 5.12 | 1.00 | 7.00 | 1.56 | 2.43 |

QID8: This interaction PERSONAL MIX 27

| This interaction | Average (This interaction) | Minimum (This interaction) | Maximum (This interaction) | Standard Deviation (This interaction) | Variance (This interaction) |
|---|---|---|---|---|---|
| Makes it appealing to mix & match | 4.74 | 1.00 | 7.00 | 1.86 | 3.45 |
| Makes me feel supported by Schiphol | 4.62 | 1.00 | 7.00 | 1.57 | 2.47 |
| Contributes to a positive food experience at Schiphol | 4.78 | 1.00 | 7.00 | 1.57 | 2.47 |

QID15: Age 27

| QID15 - Age | Count | Count |
|---|---|---|
| 18-24 | 48% | 13 |
| 25-34 | 33% | 9 |
| 55-64 | 11% | 3 |
| 65+ | 7% | 2 |

QID16: Gender 27 ...

| QID16 - Gender | Count | Count |
|---|---|---|
| Male | 26% | 7 |
| Female | 74% | 20 |

## Reasonings for choice

Reasons for personal mix:

·It feels unique
·It is clear, not too much promoting
·When it is more personal, you feel more at home
·It gives agency and the feeling of getting a good deal
·They liked that their name was shown
·It feels self-supporting
·“I do it myself”
·It is the most fun
·It allows space for my own opinion
It fits my needs in that moment

Reasons for staff recommendations:

·It is very clear, and they feel personally addressed
·Not interested in travel-related questions; this makes the food experience feel more special
·Staff must come here often, so they likely know what the best choice is
·The person working there knows which combinations work well, making the decision easier
·It helps with decision-making, especially for those who find choosing on their own difficult
·It feels like personal advice, not just information
·Interaction with staff is valued; they like being asked what they are looking for
·They appreciate when something is designed for them, based on their preferences
·The recommendation feels human and relatable
·It creates a sense of connection, realizing staff (and crew) are “regular people”
·Good food is the first priority, followed by feeling good
·Staff are seen as advisors who know what is good for customers

Reasons for travel questions:

·Small talk makes the travel experience more joyful
·It sparks curiosity and makes them want to see the question
·It gives them something to think or talk about after buying the sandwich
·It works as a conversation starter
·It reinforces the feeling of being on a journey / traveling
·It strengthens their travel mindset
·They simply like traveling, and this connects to that feeling
It adds a light, playful moment to the experience

# APPENDIX K: Co2eq calculation

**Source: RIVM; Thebigclimatedatabase**

| | Ingrediënt | quantity | unit | g CO2e/g | | CO2e |
|---|---|---|---|---|---|---|
| **Vegan Creamcheese** | Cream cheese | 60 | g | 1 | | 68,22 |
| | Cucumber | 20 | g | 0,421 | | 8,42 |
| TOTAL CO2e | | | | | | 76,64 |
| **Artichoke & Aubergine** | Artichoke spread | 40 | g | 1 | | 34,4 |
| | Grilled aubergine | 30 | g | 0,288 | | 8,64 |
| | Fresh basil | 3 | g | 0,348 | | 1,044 |
| | Tomato | 20 | g | 0,463 | | 9,26 |
| TOTAL CO2e | | | | | | 53,344 |
| **Hummus** | Hummus | 40 | | 3 | | 119,36 |
| | Ratatouille | 15 | | 2 | | 30,99 |
| TOTAL CO2e | | | | | | 150,35 |
| Prociutto | Prociutto | 75 | g | 17 | | 1308,75 |
| | Mozzerella | 30 | g | 6 | | 187,8 |
| TOTAL CO2e | | | | | | 1496,55 |
| Pastrami | Pastrami | 75 | g | 31 | | 2289,75 |
| | Cheese | 20 | g | 13,1 | | 262 |
| TOTAL CO2e | | | | | | 2551,75 |
| Cheese | Cheese | 50 | g | 8,13 | | 406,5 |
| TOTAL CO2e | | | | | | 406,5 |
| Goatcheese | Goatcheese | 50 | g | 7 | | 347,5 |
| | Cranberry | 10 | g | 0,796 | | 7,96 |
| TOTAL CO2e | | | | | | 355,46 |
| Ham | Ham | 75 | g | 10 | | 714 |
| | butter | 5 | g | 0,796 | | 3,98 |
| TOTAL CO2e | | | | | | 717,98 |
| Omelet | Egg | 75 | g | 3 | | 216 |
| | Cheese | 20 | g | 8,13 | | 162,6 |
| TOTAL CO2e | | | | | | 378,6 |