

**Master Thesis:**

# **Towards a healthy food transition in the Netherlands: The case of third-level education catering**

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## Abstract

Alarmingly, an increasing percentage of Dutch students aged 18-25 are overweight, with unhealthy dietary habits as the primary cause of this increase (CBS, 2023). Young adults enrolled in tertiary education spend considerable time on campus, making the role of campus caterers significant in shaping their eating behavior (Tam et al., 2017).

Unfortunately, many third-level education institutions are filled with unhealthy food options, and transitioning to a healthier food environment is a complex process due to the mismatch between the goals of the caterers, the education organizations, and the students. To understand and solve this issue, this study answers the research question: *"To what extent are there mismatches between the goals of third-level education caterers, the organizations they cater to, and the customer's wants, and which pathways can be taken to transition to a healthier food environment?"*.

Using the leverage point framework of Meadows (1999) and adapted by Abson et al. (2017), multiple barriers were identified through stakeholder interviews and complemented with a workshop to form pathways to overcome the barriers of this transition. From these three pathways were formulated. Where the first is targeted at the level of *intent*, as it focuses on changing student behavior, encouraging students to make healthier choices by increasing their awareness and understanding of nutritional information. The second pathway is focused on the level of *design*. This pathway aims to enhance student retention by using loyalty programs and new forms of communication to increase student interaction. The third pathway is targeted at the lowest level, *parameters*, as it seeks to make healthy food items more attractive through various nudging techniques, such as visibility, convenience, and economic nudging. By combining these pathways, their effects could be enhanced, creating a culture of healthy eating among students and a healthier food environment. However, despite being considered a lower-level intervention, 'lowering prices of healthy items', remains a critical factor in this transition. If this issue can not be solved, the progress of this transition might get stuck, even as the other two pathways are implemented correctly. Overcoming this issue is important, because successfully completing this transition will benefit students not only during their academic years, but also by developing long-lasting healthy eating habits that can be carried into their future lives.

# Executive summary

## Introduction

An increasing percentage of Dutch students aged 18-25, currently standing at 25 percent, is overweight. Unhealthy dietary habits are the primary cause of this increase (CBS, 2023). Young adults enrolled in tertiary education spend considerable time on campus, making the role of campus caterers significant in shaping their food behavior (Tam et al., 2017). Unfortunately, many third-level education institutions are currently filled with unhealthy food options, and transitioning to a healthier food environment is a complex process due to the conflicting goals of the stakeholders involved. To understand and solve this issue, this study answers the research question: *"To what extent are there mismatches between the goals of third-level education caterers, the organizations they cater to, and the customers' wants, and which pathways can be taken to transition to a healthier food environment?"*. This is supported by sub-questions that focus on identifying stakeholders, finding barriers, and formulating pathways for transition. The findings of this study will serve as valuable input for the pilot study that the Healthy Food Coalition plans to launch in the upcoming year. With this study, the Healthy Food Coalition aims to demonstrate the profitability of offering healthy food options in the catering industry. The input from this thesis will be used to design an optimal food environment that supports this goal.

## Theoretical framework

Transitioning to a healthier food environment is a complex process. To facilitate this, the following theories were used: system thinking (Arnold & Wade, 2015) and the leverage points framework by Meadows (1999) and Abson et al. (2017). These theories seek to find barriers and leverage points for change at different 'depths' within a system. This not only contributed to a comprehensive understanding of the goals (*intent*) of the different actor groups but also dived deeper into the other levels of the system, such as *design*, *feedback*, and *parameters*. These helped identify key areas where interventions could have a significant impact on the system, and from these levers, and ultimately pathways were formulated.

## Method

A total of 33 semi-structured interviews were conducted, which were structured according to the four levels of the 12-point leverage system. From these, 5 were held with caterers, 9 with third-level education organizations, and 19 with students. The interviews with the caterers and stakeholders took place individually, whereas the student interviews took place in focus groups to facilitate discussion. Afterwards, the interviews were transcribed and coded to gather detailed insight from the three different stakeholders regarding the system characteristics and their perceived barriers and solutions. This was complemented with a workshop where interview participants were invited back (2 caterers and 2 third-level education organizations) to identify the most important leverage points and levers to formulate pathways for this transition.

## Results

Third-level education organizations and caterers strive to provide healthy, sustainable, and inclusive meals. However, these goals are often hindered by the demands of students. They prioritize affordability and portion size over health, conflicting with the goals of third-level education organizations and caterers, complicating the transition to a healthier food environment. Additionally, conflicting goals within caterers and universities, such as balancing sustainability, healthiness, and profitability, further hinder this process. This raises the question: how can these goals be aligned? Using the 12-point leverage system, three key barriers were identified during the workshop: *'Difficult to change behavior,' 'Decreasing student retention,'* and *'The attractiveness of healthy items.'*

From these three barriers, the following pathways were formulated (ranking from highest to lowest impact):

1. **Changing student behavior (intent):** using descriptive nudging and educational campaigns to encourage healthier choices. Through this pathway, students can be encouraged and learn to make healthier choices within and outside the canteen environment.
2. **Increasing student retention (design):** boosting loyalty and satisfaction with on-campus dining by enhancing communication and interaction. Caterers can provide information about menu options through mobile applications or other social media platforms. This can be complemented with a reward system, which could increase student engagement and frequent visits to the canteen.
3. **Making healthy items more attractive (parameters):** using nudging techniques such as, visual, convenience, salient, and economic nudging to boost the appeal of healthy items.

## Recommendations

*Finding ways to lower the price of healthy items* The  
above-mentioned pathways were seen as most viable and impactful by the participating stakeholders and can be used in combination to enhance each other. However, despite being considered a lower-level intervention, 'lowering the prices', remains a critical barrier for students in this transition. If this issue cannot be solved, the progress of this transition might get stuck, even as the other two pathways are implemented correctly. To overcome this issue, it is recommended to seek assistance from educational organizations or explore other solutions that can help reduce the prices of healthy items.

### *Testing different types of nudging techniques*

It is recommended to research different forms of nudging to test their impact on student eating behavior. Test, for example, whether descriptive nudging works better in the long term. As it educates consumers about their food choices and could potentially lead to better long-term decisions. In contrast, other forms of nudging might be more effective in the short term by influencing immediate decisions. This research question is especially relevant, as all stakeholders expressed an interest in descriptive nudging.

### *Developing a descriptive label*

Building on the previous suggestion, future research should focus on developing effective descriptive labels for caterers. Using research, the best method for displaying nutritional information in an informative and concise way could be identified. During the interviews, students suggested using simple pie chart graphics to show percentages of protein, fiber, vitamins, carbohydrates, etc. This approach may help students understand nutrient ratios without feeling overwhelmed by measurements like KJ or grams. The same concept could also indicate a product's sustainability.

*Increasing customer interaction:*

A final recommendation focuses on encouraging customers to eat healthier through increased interaction and engagement. An effective strategy mentioned could be the implementation of reward programs. These programs encourage healthier eating habits by offering points for purchasing healthy food items. These can, for example, later be used for discounts, free items, or other rewards.

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## **List of acronyms**

TCV Transitie Coalitie Voedsel

HFC Healthy Food Coalition

RIVM Dutch Institute for Public Health and the Environment



# 1. Introduction

The number of people in Western societies who are overweight or obese has more than doubled in the last three decades (Vuik et al., 2019). This trend can also be noticed in the Netherlands, where studies revealed that 48.7 percent of Dutch people aged 18 years and over are overweight and 13.9 percent are obese (Ministry of Health, Welfare, and Sport, 2019). An unhealthy dietary pattern is responsible for a large part of these ill-health and deaths due to cardiovascular diseases, diabetes, and cancer (Van Kreil et al., 2006). There is no cure for these diseases, and current solutions lie in creating awareness about dietary and exercise habits. Unfortunately, these solutions have not decreased these numbers (Lustig, 2020). One of the factors contributing to unhealthy eating behaviors is the constant exposure to our 'obesogenic' food environment. Meaning an environment that promotes gaining weight and that is not favorable to weight loss (Kakoschke et al., 2017). As a result, Dutch residents often can't afford healthier food, are influenced by others, or find it difficult to give up unhealthy options, even though many understand the associated health risks (CBS, 2023). These factors make it harder for Dutch residents to transition to healthier consumption habits. Which asks the question: Can we not better shift the responsibility to create a healthy food environment to the food provider's side?

Dutch food providers, meaning industry, retail, hospitality, and catering, have considerable influence over people's daily food and drink choices. Despite this, there is currently limited awareness of the role they play in the health of their customers. Many products contain excessive amounts of sugar, fat, or salt, contributing to widespread health concerns (TCV, 2023). To transition to a healthy food system and create a healthy food environment, action is needed from multiple actors in this complex system. To limit the scope of this research, this thesis will focus on catering within universities and universities of applied sciences in the Netherlands. These will be referred to as third-level education organizations.

## 1.2 Third-level Education Catering

The caterer's role in healthy eating is becoming increasingly more important. Owing to our modern lifestyles, individuals are dependent on out-of-home eating, especially during our student lives. An increase in the availability and consumption of unhealthy food eaten outside of the home has been identified as one of the key food environmental factors contributing to rising levels of obesity (Bagwell, 2014). Young adults enrolled in tertiary education spend substantial amounts of time on campus, making this food environment an important factor in shaping their food behaviors (Tam et al., 2017). Alarming, an increasing percentage of 25 percent of Dutch students aged between 18 and 25 are overweight (CBS, 2023). Catering services at tertiary institutions have the potential to influence the food choices of customers by providing a good example and introducing consumers to healthier food alternatives (Wahlen et al., 2012).

However, transitioning to a healthy food environment is not as simple as it seems, because of the complex system that exists within this catering sector. Three major actors are at play: the caterer itself, the third-level education organization that hires the caterer, and the consumers, which are in this case, the students. Various theories have stated that the wants,

needs, and goals of different actors in a system might conflict (Abson et al., 2017; Mclean et al., 2019). This mismatch between the goals of the caterers, the education organizations, and their clients might prevent the transition of caterers to offer a healthier food environment. Universities might be more focused on sustainability (Universiteit Utrecht, 2022) and consumers on health, taste, affordability, and convenience. Food companies are often focused on one goal: to sell food and to make profit. Some of these goals could overlap. However, they are more likely to conflict. The foods that sell best and bring in the most profits are not necessarily the ones that are best for you or the planet (Temples et al., 2017). The presence of these different goals may explain why catering professionals feel pulled in different directions to serve multiple actors. This raises the question of whether these caterers can establish an optimal relationship between the goals and wants of these different actor groups and contribute to the healthy food transition in the Netherlands. To create a better understanding of this problem, the following research question will be answered:

***To what extent are there mismatches between the goals of third-level education caterers, the organization they cater to, and the customer's wants, and which pathways can be taken to transition to a healthier food environment?***

To answer the main research questions, the following sub-questions are established:

**Sub-question 1:** *Which stakeholders are involved within the third-level education catering system in the Netherlands?*

**Sub-question 2:** *What are the goals of each stakeholder group in transitioning to a healthier food environment?*

**Sub-question 3:** *What are the barriers to transitioning to a healthier food environment?*

**Sub-question 4:** *Who has the power to overcome these barriers or capitalize on opportunities?*

**Sub-question 5:** *What are the pathways that can be taken by relevant stakeholders to transition to a healthier food environment?*

Sub-question 1 will be answered using a stakeholder analysis, whereas sub-question 2-4 will be answered using the leverage points system of Meadows (1999) and Abson et al. (2017), which seeks to understand the barriers and leverage points for change at different 'depths' within a system. This will contribute to a comprehensive understanding of the goals of the different actor groups. Which will help identify key areas where interventions can have a significant impact on the system. Lastly, sub-question 5 will be answered by organizing a workshop where the interviewed stakeholders will be asked back to find pathways to overcome these barriers.

This research is part of a thesis internship performed at Transitie Coalitie Voedsel (TCV) as part of their project, the 'Healthy Food Coalition' (HFC). TCV is a coalition of Dutch leaders in the world of agriculture, food, nature, and health. They are working on new solutions for the current sustainability problems within our agricultural and food systems. In November 2023, they started the Healthy Food Coalition (HFC). With this coalition, their goal is to create different standards within the sector. A standard that puts health before profit. They strive that by 2040, 80% of the food supply in the Netherlands will be healthy, as food producers and suppliers recognize their responsibility for their customers' eating habits (TCV, 2023).

### **1.3 Relevance of the study**

#### *Scientific relevance*

To date, previous research has mostly delved into consumer preferences, opinions, and solutions on healthy food provision for third-level education catering (Czarniecka-Skubina et al., 2020; Mongiello et al., 2015; Roy et al., 2019; Tam et al., 2017). As a result, research has been mostly one-sided, with a focus on individual consumers. This is problematic because, as stated above, actors such as caterers play a key role in determining the food environment for consumers. A focus on consumers thus neglects the role that other key actors play in determining dietary patterns. A critical gap, therefore, exists in that previous studies haven't looked at the system as a whole, and because of this, current knowledge is insufficient to address the interplay between these actors. To bridge this gap, this study aims not only to identify the mismatches in goals between the different actor groups, but also to combine their different viewpoints to identify key barriers and solutions. Additionally, it seeks to identify the actors with the power to overcome these barriers and develop pathways to create a healthy food environment for third-level institutions. Understanding the multifaceted challenges and opportunities within a system is essential to developing effective interventions (Posthumus et al., 2021).

#### *Social relevance*

On average, research has shown that students gain 3.38 kg in their first year of third-level education, which is caused by poor diet choices and eating out more frequently. Managing dietary needs can become a challenging task, especially as students navigate living independently for the first time. Due to the substantial amounts of time that are spent on campus, this food environment is an important factor in shaping their food behavior. It is estimated that, on average, 25 percent of students make daily use of this service (Vorbau, 2022). Despite this fact, many third-level education organizations are filled with 'high-energy/'low-nutrient' foods (Tam et al., 2017). Healthy nutrition is not only important for optimal study performance, but also for their physical, mental, and social health (Price et al., 2017). Furthermore, young adulthood is a critical period for the development of food behavior that carries on into later life, as well as a high-risk period for weight gain (Tam et al., 2017). Given the significant influence of these food environments on students, addressing these factors is essential. TCV intends to start a pilot study demonstrating the profitability of

offering healthy food options focused on the catering industry. This thesis will serve as valuable input for the design of the food environment during this research.

Furthermore, until now, the Dutch government has mostly promoted eating healthy foods, such as 'the wheel of five' (RIVM, z.d.), which is focused on the consumer. In addition, they formulated the National Prevention Agreements in 2018, with non-binding measures (Ministry of Health, Welfare, and Sport, 2019). However, until now, this prevention agreement has been falling short. Research showed that the Netherlands scores very low on policy against obesity when compared to other European countries (Pineda et al., 2022). It was stated that *'It's not that we don't do anything. But we discuss a lot, make plans that are too non-binding, and then nothing changes. There is little direct legislation to enforce a healthier food environment.'* (ZonMw, 2022). With this research, TCV has an opportunity to create leverage on why the non-binding agreements aren't enough to transition to a healthy food environment, and by leveraging the insight from this research, an alternative approach can be proposed to foster a healthier food environment within third-level education organizations, aligning with the objectives of TCV.

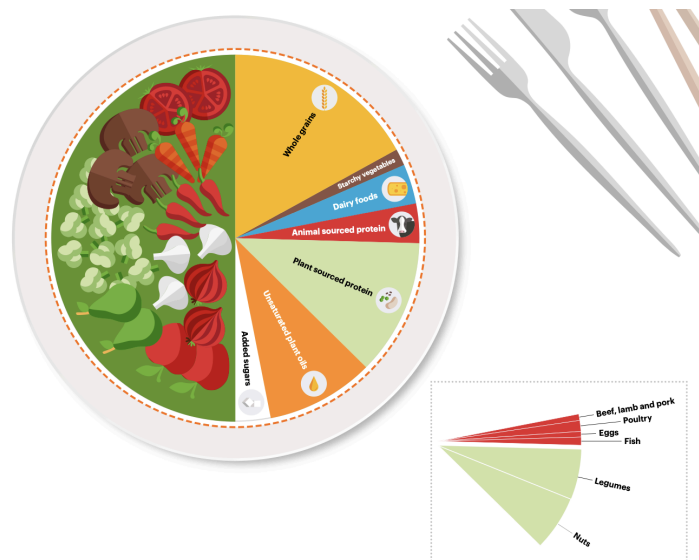
## 2. Theoretical Framework

Transitioning to a healthier food environment is a complex process. With 'healthy' as a difficult concept, carrying diverse interpretations. To align perspectives, this thesis will use the definition as is used within the Healthy Food Coalition (HFC), which will be explained below. Furthermore, to facilitate this transition, the integration of various theories is needed. This section will discuss the theoretical framework that makes use of two theories: system thinking and the leverage points framework by Meadows (1999) and Abson et al. (2017). To transform this system, we first need to understand how and why the system functions as it does. For this system thinking will be used. Next, the leverage point framework will be used to dive deeper into the behavior of the actors that drive this system. From these leverage points and pathways for change can be identified and formulated.

### 2.1 A healthy diet

The following principles were formulated by the HFC to define a healthy diet:

1. The EAT-Lancet report (2019) proposed a planetary health diet that aims to balance human nutrition needs with environmental sustainability. Research indicates that a diet rich in plant-based foods and with fewer animal-sourced foods can both improve health and have environmental benefits. From this, a global framework was developed: A safe operating space for food systems. Operating outside of those spaces increases the risk of harm to the stability of the earth system and human health. Within this operating space, EAT Lancet formulated the optimal diet (see figure 3):



Graph 1: A planetary health plate should consist of half a plate of vegetables and fruits. The other half of the plate should consist of primarily whole grains, plant protein sources, unsaturated plant oils, and (optionally) a small amount of animal sourced protein (Willet et al., 2019).

2. The second principle that the HFC formulated is the importance of diversity. They advise eating 30 different kinds of vegetables, fruits, seeds, nuts, and herbs a week to help build and contain a healthy gut microbiome (TCV, 2023).
3. The third principle is focused on eating mostly organic foods. Our microbiome is an important basis for our health, and it's supported by healthy and natural ecosystems. Therefore, healthy soil creates a healthy microbiome. However, it is acknowledged that financial constraints may limit this possibility for many individuals (TCV, 2023).
4. Furthermore, foods should be processed as little as possible. You should be able to (re)make it in your own kitchen with recognizable ingredients (TCV, 2023).
5. A key principle of the HFC is to ensure that a healthy diet is accessible to all individuals. To achieve this, the HFC advocated for policies that incentivize the affordability of nutritious foods while making unhealthy options readily available (TCV, 2023).
6. Lastly, creating healthy diets for children is their priority (TCV, 2023).

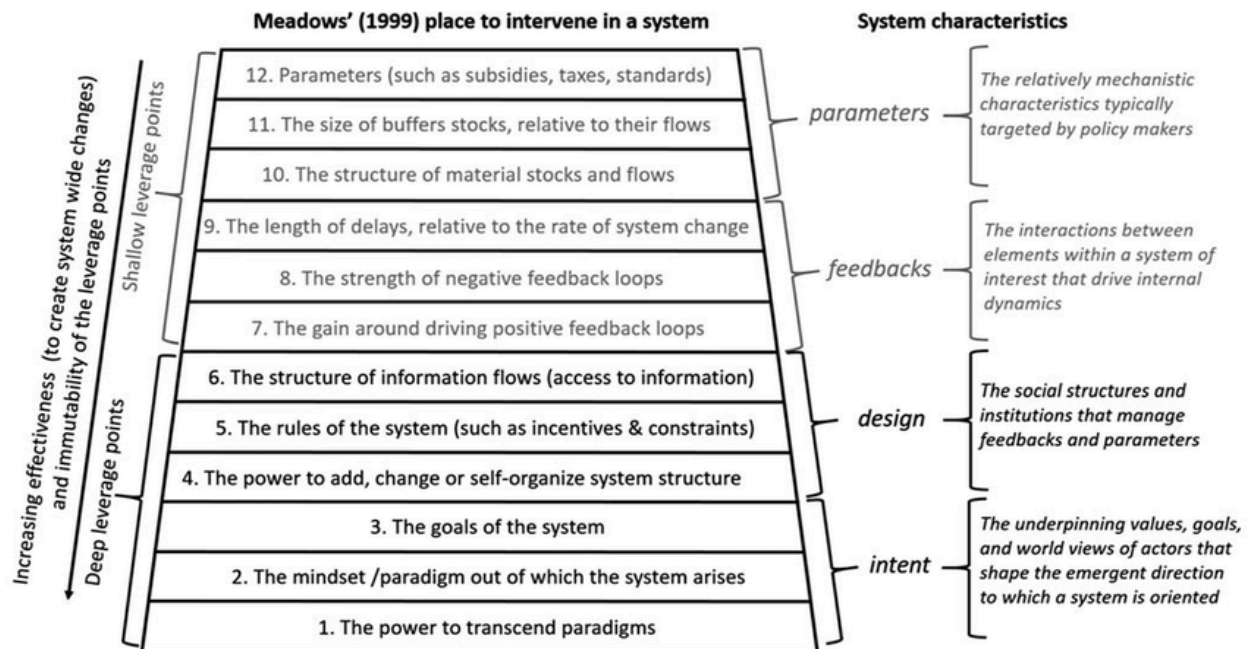
## 2.2 System Change and the Leverage Points Framework

A system, as defined by Mitchell (2009), is a collection of components that interact to produce complex collective behavior. It is characterized by large networks of components with no central control, and they follow simple rules that lead to complicated actions that can adapt and change over time through learning or evolution. System thinking, therefore, is an approach used to understand, analyze, and solve complex problems by examining the relationships and interactions between the actors in the system. It views the system as an interconnected whole, where the behavior of each part is influenced by its relationship with other parts of the environment. It is used to gain more insight into the deep roots of these complex behaviors, aiming not only to enhance predictive capabilities but, more importantly, to tailor interventions that can shape their outcomes effectively (Arnold & Wade, 2015). These interventions are called 'leverage points' (Meadows, 1999). These are places within a complex system where a small shift in one thing can produce big changes in the whole system (Abson et al., 2017). However, system thinking acknowledges that resistance to change often arises within established systems. Although the transformation of food systems is commonly discussed, it is not possible to remove existing ones and redesign them from scratch. These system interventions, therefore, aim to nudge food systems away from their current state. This is done by targeting key leverage points that can redirect the system towards a more desirable condition (Posthumus et al., 2021). For this system, the goal is to shift the 'unhealthy food' regime to a healthy one where health stands above profit (TCV, 2023). To ignite this transition, it may require intervention in non-obvious parts of the system (Posthumus et al., 2021).

In system thinking, a system can often be described as an iceberg. Where only a small part, the events, are visible to the observers. Because we only see the tip of the iceberg, we often let that drive our decisions and interventions. In reality, the events are the outcomes shaped by the activities that are happening beneath the surface (Posthumus et al., 2021). In Meadows (1999), it was stated that *"people know intuitively where leverage points are. However, everyone is trying very hard to push it in the wrong direction. Systematically worsening whatever problems we are trying to solve."* (Meadows, 1999). She argued that we

should focus our interventions on other parts of the system and claimed that there are deeper and more effective leverage points that can be targeted to start a transition. Currently, the Dutch government has created non-binding measures to influence the food environment of residents. However, these leverage points are only targeted at parameters. Meaning that they are only focused on influencing the outcome of the system (the tip of the iceberg) and not the underlying mechanisms that are causing the problem in the first place. These interventions are relatively easily implemented and receive little resistance. However, they will rarely change behavior (see graph 1) and thus won't solve the root of the problem (Abson et al., 2017).

It is argued that the 'deeper' you target your leverage points, the more leverage you can create to achieve systemic change (graph 1) (Nguyen & Bosch, 2013). Considering how to influence this change, Meadows (1999) categorized twelve leverage points, ranging from 'shallow' interventions, which are relatively easy to implement but cause little change within the system. To 'deep' leverage points that are more challenging to modify, however, have the potential to bring about transformational change (Abson et al., 2017). These 12 leverage points can be divided into four broad types of system characteristics (graph 1). Each of the four characteristic types, as can be seen below, can be linked with different types of leverage points where specific interventions can be implemented. However, the effectiveness of the intervention is limited by the hierarchical structure of these four system characteristics (Abson et al., 2017).



The four system characteristics represent a nested hierarchy of, tightly interacting, realms of leverage within which interventions in a given system of interest may be made. Deeper system characteristics constrain the types of interventions possible at shallower realms of leverage

Graph 2: The 12 leverage points divided into system characteristics. Abson, D.J., Fischer, J. Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., Von Wehrden, H., Abernethy, P., Ives, C.D., Jager, N.W. (2017). Leverage points for sustainability transformation. *Ambio* 46, 30-39.

### *Parameters*

Parameters are modifiable mechanistic characteristics, meaning components that can be modified to influence or change the functioning of a system. Examples include taxes, incentives, and standards, or physical elements of a system, such as sizes of stocks or rates of material flows (Abson et al., 2017). In the context of this thesis, parameters could indicate factors such as the amount of food available or the nutrient content. Interventions at this level could focus on portion control or improving the quality of items by providing items with a healthier nutrient content.

### *Feedbacks*

Feedbacks refer to the interactions between elements of the system that steer internal dynamics or give information about desired outcomes (Abson et al., 2017). Positive feedback loops regarding overeating may involve the high price of healthy food items, which in turn causes people to opt more often for cheaper unhealthy foods. Interventions at this level could focus on creating positive feedback loops that support healthy eating behavior or disrupting feedback loops that cause unhealthy eating habits.

### *Design*

Design characteristics relate to the organization of information flows, regulatory frameworks, power dynamics, and self-organization (Abson et al., 2017). These aspects can, for example, refer to the rules and guidelines that are set in place for food quality or information flows between customer and supplier.

### *Intent*

Intent characteristics relate to the norms, values, and goals that are embodied within the system and the paradigms from which they have emerged. However, intent is an evolving characteristic that is created by multiple and potentially conflicting worldviews within a system. This indicates that actors in the system do not have to share the same intent and normative goals. In the case of unhealthy consumption, understanding intent involves recognizing societal norms, cultural influences, and individual motivations related to food choices (Abson et al., 2017). Intent-driven interventions might focus on creating awareness of the importance and benefits of healthy nutrition.

## **2.4 Formulation of pathways**

To formulate successful pathways, not only leverage points are needed but also the levers, the means to overcome these obstacles (Hsien & Evans, 2024). In systems thinking, a pathway refers to a series of actions designed to show new ways to achieve a specific goal. It represents a well-defined route that creates a movement from one state to another desired state. In this context, the transition to a healthier food environment for third-level education organizations. Multiple stakeholders, each playing its own role, are involved in the formulation and implementation of the steps. The actions used are often interconnected and build upon each other, creating a coherent strategy that guides stakeholders through the process. Lastly, pathways formulated using the 12 point leverage system, are not necessarily competitive but can, if well aligned, support and enhance each other (Wigboldus et al., 2021).



## 3. Method

This chapter outlines the methodology that was used to identify pathways to transition to a healthy food environment for third-level education organizations. First, Section 3.1 will dive into the research design that was used and provide a general outline of the applied research methods. In Section 3.2, the data collection will be discussed, followed by data analysis in Section 3.3. Lastly, the validity and reliability of the applied methods will be discussed in Section 3.4 and ethics in Section 3.5.

### 3.1 Research Design

To answer the research question, *'To what extent are there mismatches between the goals of third-level education caterers, the organization they cater to, and the individual customers wants, and which pathways can be taken to transition to a healthier food environment?'* A qualitative research design was used. By employing both deductive and inductive approaches, the research not only used the 12-point leverage framework to find leverage points, but also used it to create theory by finding levers and formulating pathways to overcome the barriers that hinder the transition to a healthier food environment (Azungah, 2018). The research design that was used can be divided into two distinct phases. The first phase focused on answering sub-questions 1-4, which focused on finding relevant stakeholders, conflicting goals, barriers, and solutions for transition. And the second phase focused on answering sub-question 5, which was focused on creating pathways to facilitate this transition.

#### Phase 1

To address sub-question 1, *'Which stakeholders are involved within the third-level education catering system in the Netherlands?'* Expert interviews were conducted, starting with experts from the HFC (see Appendix 1). These interviews aimed to identify Dutch catering organizations that supply their services to third-level education institutions. Furthermore, these first interviews were used to adjust, add, or remove certain topics within the interview-guides for the identified stakeholders. After the selection of catering organizations, the associated third-level education institutions they serve were identified, and subsequently, the students that are enrolled in these institutions.

For sub-question 2, *'What are the goals of each stakeholder group in transitioning to healthier food options?'* Semi-structured interviews (see Appendix 1) were employed with representatives from each stakeholder group that were selected for subquestion 1. The interviews were instrumental in examining the goals of caterers, third-level educational organizations, and individual customers regarding their goals for food provision for third-level education catering.

To answer sub-question 3, *'What are the barriers or facilitators in the transition to healthier food options?'* and 4, *'Who has the power to affect change to overcome barriers or capitalize on opportunities?'* The data from the semi-structured interviews were analyzed to identify what the participants perceived as barriers to transitioning to a healthier food environment and which actors held the power to facilitate the change. After this analysis, the possible

leverage points and levers were identified, from which transition pathways were created in phase 2.

### **Phase 2:**

Finally, to answer sub-question 5, '*What are the pathways that can be taken by third level education caterers to transition to a more healthy food environment?*' The third-level education organizations and caterers from phase 1 were invited back to take part in a follow-up workshop to delve deeper into the findings and formulate pathways for transition. Two caterers (Appèl and Vitam) and two third-level education organizations (Wageningen University and Avans) took part in the workshop. The workshop aimed to foster a collaborative discussion based on the individual interviews. These interactive sessions provided a platform for participants to share perspectives, address differences, and identify barriers and opportunities that have the power to affect change (Thoring et al., 2020).

A comprehensive research timeframe, with task descriptions and deadlines can be found in Appendix 2.

## **3.2 Data Collection**

The following sections will explain in more detail which data collection techniques have been used for primary and secondary research.

### **Primary research**

#### *Sampling strategy and size*

To ensure a targeted and insightful selection of participants, purposive sampling was used. This method involved the identification and selection of individuals with specialized knowledge or direct experiences relevant to this thesis focus. As a starting point, expert interviews were held with members of the HFC to identify catering organizations that deliver their services to third-level education institutions. After this, the catering organizations were contacted to find the person who had knowledge about the company's goals, healthy food policy, and the overall workings of the business. Furthermore, the same tactic was used to identify the persons who were in charge of the food environment of third-level education institutions. Students were selected from all over the country, with the only selection criteria being whether they made use of the canteen on campus. Snowball sampling was used to identify these participants. This is a sampling strategy where initial participants are used to find new participants within his or her network, forming a chain-like recruitment process (Palinkas et al., 2015). In total, 33 interviews were conducted, of which 9 were with third-level education organizations and 5 were with catering organizations. These numbers were chosen because of the limited number of major catering companies and third-level education institutions. Due to the higher variability at the individual level compared to the organizational level, 19 students from different third-level education organizations in the Netherlands participated in the interviews.

### *Semi-structured interviews*

As a

primary research method semi-structured interviews were conducted. The interview guides were adjusted to the different types of interviewees. This resulted in four different interview guides: an *expert interview guide* (Appendix 1.1), a *third-level education organization interview guide* (Appendix 1.2), a *caterer interview guide* (Appendix 1.3), and a *student interview guide* (Appendix 1.4). The guides only contained open-ended questions, allowing for deeper insights from the participants (Bryman, 2012). The questions were structured according to the leverage point framework of Meadows (1999) and Abson et al. (2017), which helped to create a detailed overview of the system. From these, leverage points and levers could be detected later on in the research process.

Individual interviews were conducted with third-level education organizations and caterers. The interview guide for the third-level educational organizations concentrated on the goals associated with selecting a caterer and defining the organization's food environment. Secondly, the interview guide for the caterers revolved around gaining insights into their goals when providing their service to the educational organizations. Additionally, the interview guides explored their viewpoints regarding the barriers and possible solutions to this transition.

The student interviews were organized in focus groups consisting of 2-6 participants. This form was chosen, because of the larger number of students that needed to be interviewed. The focus groups were not only efficient to interview a larger group of participants, but they also facilitated discussions, providing deeper insights in their opinions. Moreover, the interview guides designed for students were centered around their goals in relation to purchasing food within third-level education institutions. They also explored their perceived barriers to purchasing healthy items in the canteen, as well as potential solutions.

### *Workshop*

After the identification of the barriers and key leverage points, the findings were used to structure an interactive workshop following the guidelines of Thoring et al. (2020). The workshop served as a collaborative platform, bringing together caterers and third-level education organizations. It aimed to facilitate a constructive exchange of insights and ideas and identify barriers and opportunities that have the power to create change. Although input from students was used to discuss the barriers and solutions, they were excluded from the workshop because the workshop was focused on finding the most impactful but also most viable solutions, which requires the specific knowledge and expertise of caterers and educational organizations.

The workshop was organized in an online setting, due to the widespread geographical distribution of the participating stakeholders across the Netherlands. This choice made it easier to find a date where multiple stakeholders could take part in the workshop. The workshop facilitated two discussion sessions organized through break-out groups on Microsoft Teams. Each session paired one caterer with one third-level education organization. An online whiteboard tool, Miro, was used to facilitate and visualize the discussions during the break-out groups.

The aim of the first session was to discuss the barriers that were identified from the interviews. During the discussion, the participants needed to identify the two barriers they believed were the most important to overcome. During the second discussion session, the identified solutions from the interviews were presented. The participants were again divided into two groups and discussed how they would overcome the two barriers that were, in their opinion, the most important to overcome by using a combination of the previously presented solutions.

These sessions provided a platform for participants to share perspectives and brainstorm potential solutions. As the facilitator, I guided the discussions to ensure all key topics from the interviews were covered and to keep the discussion on track. The insights gained from the workshop were used to formulate the pathways.

The slides that were used during the workshop can be found in Appendix 1.5.

### **Secondary research**

Secondary research was used to create an understanding of the current problem within third-level education catering systems. This involved researching multiple sources, such as, scientific literature, articles, and documentation from TCV. Furthermore, online research helped to validate the actors identified during expert interviews. These were cross-checked with publicly available information, to ensure an accurate representation of the stakeholders. Furthermore, through the use of online sources, participants were selected that were not identified during expert interviews.

### **3.3 Data Analysis**

All interviews were recorded and afterwards analyzed using NVivo, which is a software tool designed for qualitative research. Both inductive and deductive coding were used to categorize the data. Deductive coding was used to categorize the data within the four levels of the leverage point framework and to identify barriers and opportunities. Inductive coding was used to identify major themes within these categories (Bryman, 2012). The goal of the data analysis section was to establish the mismatches between the goals of the different actor groups. From these leverage points, pathways could be established to transition to a healthy food environment.

### **3.4 Research quality indicators**

To ensure the quality and reliability of the research, the following steps were taken. Reliability was enhanced as interviews and workshops were based on interview guides, increasing observer consistency (Bryman, 2012). Since all interviewees in the same actor group were answering the same questions and no topics were left out, this resulted in comparable qualitative data. However, the research's external validity was limited because of the unique stakeholder stakeholder composition. This uniqueness can impact how broadly

the findings can be generalized to other situations or groups. Furthermore, the interviews were recorded and transcribed to ensure the data's traceability and accuracy. Moreover, data triangulation was used to enhance the credibility and reliability of the findings (Bryman, 2012). This can be seen in the usage of scientific literature, internet articles, documents from VTC, interviews, and workshops.

### **3.5 Ethics**

For this thesis, interviews were held with diverse actors raising ethical considerations. In order to achieve full response and cooperation during the interviews and workshop, it was important that the interviewees felt comfortable during these events (Bryman, 2012). To ensure this, the interviews and workshops were conducted at familiar locations, such as third-level education institutions, the location of employment, or online. Furthermore, prior to the interviews and workshop, a consent form was distributed to the interviewees, which can be found in Appendix 3. Furthermore, the respondents were reminded that they have the right to withdraw their consent for participation at any moment during the interview (Brinkmann & Kvale, 2005). Lastly, permission to record was requested at the start of each interview, and the process of anonymizing and usage in the research was discussed with the participants.

## **4. Results**

## 4.1 Stakeholder analysis

The following stakeholders were identified through expert interviews, snowballing, and targeted online searching to participate in the interviews:

### *Third-level Education Organization*

Table 1 presents the relevant stakeholders from third-level education institutions in the Netherlands who participated in this research. These individuals were selected based on their functions and corresponding responsibilities. These included overseeing contracts with caterers and ensuring that the quality of their food environment is in line with the guidelines of the organizations. By selecting these participants, this research aims to gain insight into their perspectives, challenges and strategies related to promoting healthier food options on campus. Below, the interviewed education organizations can be found. The 'X' in the table indicates that these institutions did not use a single caterer, but instead hired several smaller food retailers.

<b>Third-level education organization</b>	<b>Function participant</b>	<b>Caterer</b>
Universiteit Utrecht	Contract Manager	Compas
Wageningen Universiteit	Contract Manager	Compas
Rijksuniversiteit Groningen	Contract Manager Food Policy	Beijk
Hogeschool Utrecht, Vrije Universiteit Amsterdam	Contract Manager	x
Universiteit van Amsterdam, Hogeschool van Amsterdam	Project Manager Food and Drinks for Facility Services	Cirfood
TU Delft	Process Manager Horeca	Appel
Maastricht Universiteit	Contract Manager Facility	Compas
Avans Hogeschool	Contract Manager Facility	Compas
Han	Contract Manager Facility	Compas

Table 1: Third-level education institutions.

### *Caterers*

In the Netherlands, the catering landscape for third-level education institutions is dominated by a few major players who have the capacity to handle the demands of these big institutions. One notable example is Compass, which provides its catering service to five of the institutions interviewed for this study. Furthermore, through the Healthy Food Coalition,

contact was made with Hutten (a Healthy Food Coalition member) to get additional insights. Other caterers that were interviewed can be viewed in Table 2.

Name company	Third-level education organization	Function of the participant
Compass	Third-level education institutions all over the country	Responsible for sustainability and health issues for the education locations
Beijk Catering	Rijksuniversiteit Groningen	Operations Manager
Vitam	Erasmus Universiteit	Operations Manager
Appèl	Technische Universiteit Delft	Sustainability and Health Nutrition Specialist
Hutten	x	Strategy and sustainability policy

Table 2: Caterers

### Students

The relevant stakeholders that were found for the third group were selected based on their use of the catering services provided by their institutions. Students were selected from a variety of third-level education institutions, all aged between 20 and 25 years. By selecting these students, this research aimed to capture their perspectives, preferences, and experiences related to food choices on campus. The interviewed students can be found in Table 3.

Participant	Gender	Age	University	Focus-group
1	Female	25	Utrecht University	1
2	Female	24	Wageningen University	1
3	Female	23	Groningen University	1
4	Female	24	Groningen University	1
5	Female	23	TU Enschede	2
6	Male	24	TU Enschede	2
7	Male	20	TU Enschede	2
8	Female	20	Utrecht University	3
9	Female	20	Utrecht University	3
10	Female	23	Utrecht University /Rotterdam University	3

<b>11</b>	Female	23	Leiden University	3
<b>12</b>	Female	23	Utrecht University	3
<b>13</b>	Male	23	Hogeschool Breda	3
<b>14</b>	Male	23	Utrecht University	4
<b>15</b>	Female	22	Utrecht University	4
<b>16</b>	Female	24	Utrecht University	5
<b>17</b>	Female	23	Utrecht University	5
<b>18</b>	Female	22	Utrecht University	6
<b>19</b>	Female	23	Utrecht University	6

Table 3: Students.

## 4.2 Interview data

The results of the interviews are shown below. They are organized per stakeholder group and level of systemic depth, based on Abson et al. (2017). A comprehensive and detailed overview of the themes and sub-themes can be found in Appendix 4.1.



## Third-level education organization

### Parameters

#### *Influence over the food environment*

From the data, it is noticeable that all participants (9) mentioned that they provide guidelines to the caterers about their expectations for food availability in the canteen. The caterers, however, have the ability and freedom to operate within those parameters and realize those expectations in their own way.

#### *Selection criteria for hiring caterers*

Nearly all participants (8) highlighted that the selection criteria for caterers are primarily guided by the organization's guidelines and goals. This alignment ensures that the caterers can meet the requirements and standards set by the third-level education institutions. Caterers were selected based on their sustainability goals, whether they could cater to the wants and needs of their students, their quality and price, their capacity, their creativity, and their implementation plan. However, it was also mentioned that it is difficult to sharpen up these selection criteria, because otherwise there will be no applications for the contract (mentioned once).

### Feedback

#### *Monitoring customer satisfaction*

All participants (9) highlighted the importance of actively collecting customer feedback to monitor satisfaction and address potential issues. Multiple methods are used to collect feedback from students regarding the food availability and their preferences. Yearly surveys (mentioned 7 times) and focus groups (mentioned 4 times) were the most commonly used tactics, providing valuable insight into students' opinions and preferences. While the use of QR codes, the use of street managers, and educational assignments were only mentioned twice. The use of sales data was the least mentioned method (mentioned once).

#### *Caterer feedback*

All 9 participants described a similar approach to monitoring feedback from the caterer organizations and addressing potential issues. They mentioned that they schedule frequent structured meetings where they discuss operational, tactical, and strategic plans.

### Design

#### *Communication about catering services, menu-updates, and nutritional guidelines*

The participants described various methods used to communicate information about food services to students. The use of on-site narrowcasting screens (mentioned 8 times) was the most frequently mentioned method. However, other forms of communication were also

mentioned to complement this form of communication. Some participants mentioned using university newspaper articles (mentioned 3 times) or online information for students, which can be found on the university website (mentioned 3 times). The use of an Instagram page (mentioned twice) or an email list (mentioned once) were the least used methods.

#### *Empowerment of students and caterers to propose innovative changes.*

Participants described various methods used to empower students to initiate and contribute to changes in the food environment. The use of the Student Council or the Green Office was frequently mentioned as a key strategy (mentioned 4 times). Other methods mentioned were the use of living labs (mentioned 4 times), student assignments (mentioned twice), and a hackathon (mentioned once).

#### *Intent*

##### *Goals regarding the food environment*

From the data (see Graph 2), it can be noticed that third-level education institutions prioritize sustainability (mentioned 9 times) and health (mentioned 5 times). However, sustainability appears to be a dominant theme among all participating institutions. One participant elaborated that sustainability is a top priority, focusing on issues such as food waste reduction, CO2 emissions, increased provision of plant-based meals, and sourcing locally produced items. Those who did not prioritize health explain their reasoning in two ways. One participant mentioned that while they wanted to focus on health, in reality, the different preferences of students make it a challenging transition to implement, causing them to focus on other priorities. Another participant stated that providing healthy food was not included in their strategic goals. However, more than half of the participants mentioned that they do focus on providing healthy meals:

*“The goal is, of course, simply that you want to be able to offer a product that supports the primary processes of educational research.”*

From the chart, other goals can be noticed, such as, ‘should please everyone’, ‘affordability’, ‘true price’, and ‘feasible business case for the caterer.’ Which shows conflicting goals within third-level education organizations. Pursuing one of these goals might hinder reaching the other. Other goals that were mentioned the least are ‘providing a good example’, ‘true price’, and lastly, ‘providing an attractive meeting spot’, which was only mentioned once.



Graph 3: Hierarchy Chart of the goals of third-level education institutions. The same color code per goal is used for graphs 2, 3, and 4, to allow for comparison across stakeholder groups.

# Caterer

## Parameters

### *Considerations influencing menu options*

From the data, four key considerations can be noticed that influence the menu options offered by caterers. These factors include the demand of clients (mentioned 3 times) and consumers (mentioned 3 times), the caterer's own vision (mentioned 3 times), and the necessity for menu items to be commercially viable (mentioned twice).

## Feedback and Design

Due to the cooperation between the third-level education institution and the caterers, these answers are very similar to those previously mentioned, which is why they are left out here.

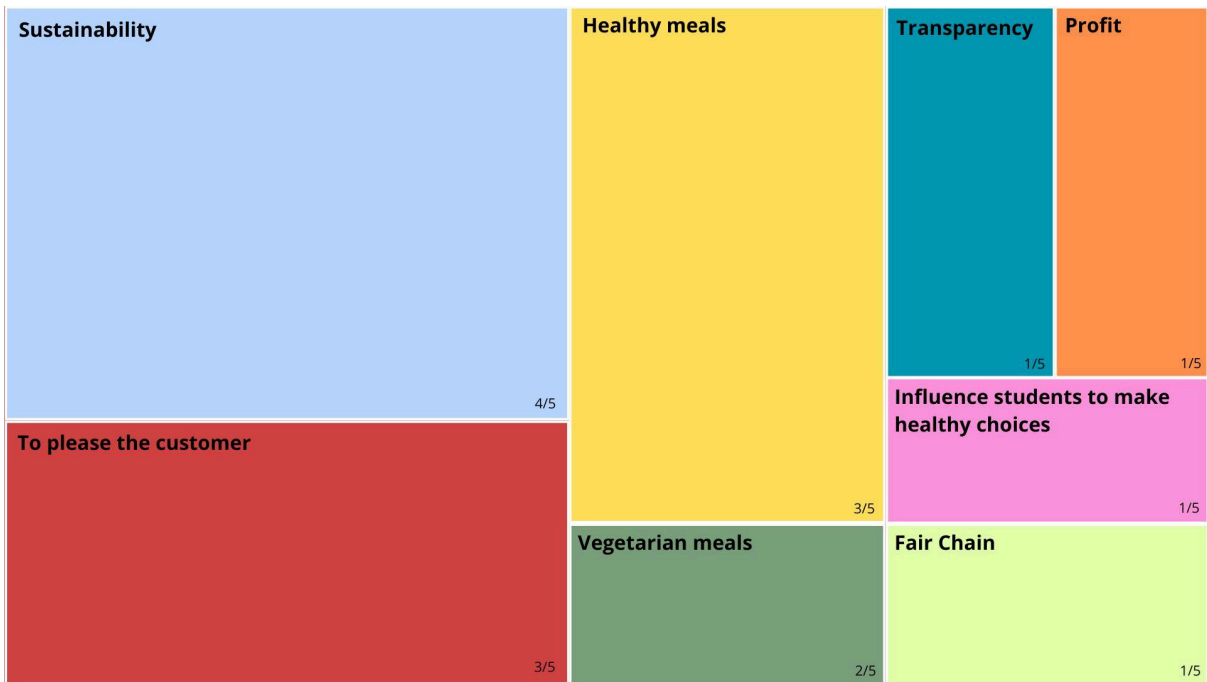
### *Intent*

#### *Goals regarding the food service provided*

Analysis of the gathered data on this stakeholder group, represented in Graph 3, reveals a significant focus on sustainability, echoing the priorities observed among third-level education institutions. However, also between the caterers, the aspiration to provide healthy meals was shared. One participant articulated this dual goal by stating,

*"One of our core goals is that we want vital people in a vital world."*

This perspective highlights the caterers' commitment to providing well-being not only among consumers but also within the broader context of environmental sustainability. Furthermore, in Graph 4, it can be noticed that caterers want to nudge students to make healthier choices (mentioned twice). However, profitability can become a hindering factor in reaching this goal. The caterers must navigate a complex landscape where menu options are influenced by the preferences of the educational organization, the wants of the customer, and their own vision, all while considering the commercial viability of their menu items. Caterers face the challenge of finding a balance between providing healthy options, meeting student preferences and ensuring the success of their business, which makes this a complicated task. One participant even mentioned that, if they wanted to successfully change the assortment, compensation would be needed from the educational institution. Without this compensation, such a transition could not be successful.



Graph 4: Hierarchy Chart of the goals of caterers. The same color code per goal is used for graphs 2, 3, and 4, to allow for comparison across stakeholder groups.

## Students

### Parameters

#### *Considerations when buying food from the caterer*

The data highlights that cost (mentioned 18 times) is the most critical factor in determining which items the students buy. Followed by the need for a filling portion (mentioned 7 times) and good taste (mentioned 7 times). Nutrient content (mentioned 5 times), vegetarian options (mentioned 4 times), and convenience (mentioned 4 times) are also significant considerations. While healthiness (mentioned 3 times), value for money (mentioned once), and freshly made items (mentioned once) play smaller roles.

### Feedbacks

#### *Overall perception of the food catering service at the educational institution*

The data reveals a mix of positive and negative perceptions from students regarding the catering service provided by their educational institution. While there is satisfaction and a positive experience (mentioned 5 times) and a good variety (mentioned 8 times). Concerns about the cost (mentioned 7 times), limited variety within categories (mentioned 5 times), short opening times (mentioned 2), and availability of healthy options (mentioned twice) highlight areas for improvement. Additionally, comparisons with external food trucks that have, according to the students, more to offer (mentioned once) suggest that there are opportunities to enhance the appeal and satisfaction of the food services offered on campus.

### Design

#### *Current methods of receiving information about campus catering services*

From the data, it can be noticed that students primarily get their information by going to the canteen (mentioned 14 times).

*'Basically, only if you walk past it.'*

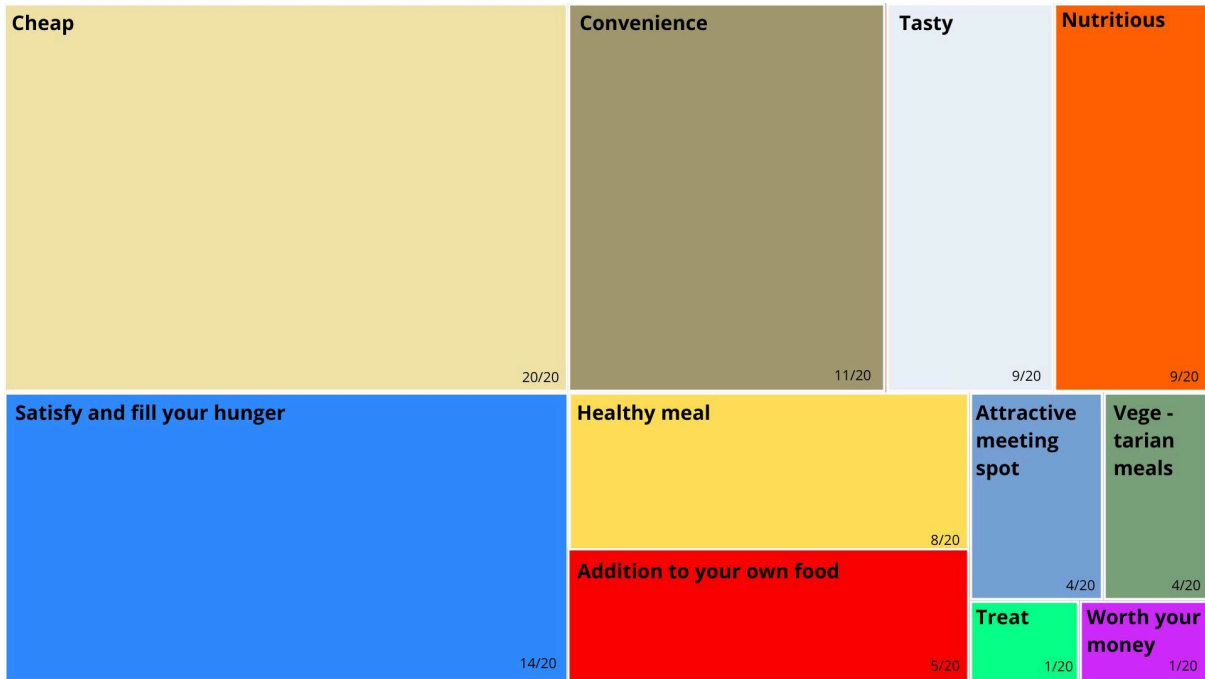
### Intent

#### *Goals when making use of the catering services*

As can be seen in Graph 4, all students mentioned affordability as a concern, reflecting a common desire to spend as little as possible. Following closely behind is the goal of finding meals that fill their hunger, with this criteria mentioned a total of 14 times. As one of the students mentioned:

*"I just want the thing that is the cheapest and that fills the most."*

This statement captures the overarching agreement among students, highlighting the importance of both affordability and a filling meal when making food choices on campus. Interestingly, the prioritization of nutritious or healthy options ranks lower among the goals of students, placing them in the 5th and 6th positions, respectively. This suggests that while students may recognize the importance of a healthy diet, other factors such as cost and portion size play a more important role, overshadowing the others. Due to budget constraints, students are more focused on immediate concerns related to cost and hunger satisfaction.



Graph 4: Hierarchy Chart of the goals of students. The same color code per goal is used for graphs 2, 3, and 4, to allow for comparison across stakeholders groups.

## 4.3 Identified barriers

During the interviews, the participants were asked what they believed to be barriers that hinder the transition to a healthier food environment. From these answers, five overarching themes emerged as significant barriers to this transition. How often a certain barrier is mentioned can be seen within the brackets after the statement. T stands for third-level education organization, C for caterers, and S for students. In Appendix 4.2, a detailed overview of the results can be found.

### 1. Decreasing student retention

From the data, it could be noticed that there are concerns about the potential impact on student retention if the menu were to shift towards healthier options. Both third-level education organizations and caterers expressed that students might seek alternative food retailers if healthier assortments were introduced (T=6, C=3, S=0). Exacerbating the already declining customer rate due to factors like the Covid-19 pandemic (T=3, C=1, S=0). The pandemic resulted in fewer students coming to campus, even now, four years later. Additionally, stakeholders noted challenges in attracting and reaching students to dine in the canteen (T=4, C=0, S=1). Highlighting the need to enhance the overall appeal of on-campus dining experiences (T=0, C=0, S=1). Furthermore, one participant mentioned that due to the expensive image of the canteen, students avoid eating there altogether (T=0, C=0, S=1).

*'The biggest dilemma that we are facing at the moment is that we can't reach the students at all.'*

–Third-level education organization

### 2. Difficult to change behavior

Most caterers and universities agree that it is difficult to change the behavior of students. Especially because their choices are led by emotions (T=6, C=3, S=0). The 'treat yourself' mentality among students, often triggered by the stress of academic careers, presents a challenge to healthy eating. After a demanding day of studying, students are more likely to choose comfort foods as a treat or reward, complicating efforts to promote healthier options. Furthermore, some stakeholders highlighted the reluctance of students to be told what to do, or have their choices constrained (T=2, C=0, S=0). This shows that just changing the menu to contain only healthy items, won't do the trick.

*'Bring about a change in behavior so they actually want to choose it. That's the hardest thing.'*

– Caterer

### 3. The attractiveness of unhealthy food items

The most frequently mentioned barrier identified by stakeholders was the perception that healthy food items are too expensive for students, while unhealthy options are perceived as cheap and more affordable (T=3, C=0, S=20). Additionally, unhealthy food items are often viewed as convenient and more tasteful (T=0, C=0, S=9). One student mentioned that the aroma of unhealthy food items even lured them to buy those products. The high demand for these types of food places pressure on caterers when balancing financial viability and the



promotion of healthier options (T=4, C=2, S=0). While there is recognition of the importance of making healthy items more affordable, achieving this goal is not that easy. The production and sale of healthy foods typically entail higher costs and greater effort, making it challenging to offer them at price points that compete with less nutritious alternatives (T=1, C=1, S=0). Furthermore, even when universities attempt to offer simple and cheap healthy food options (T=1, C=0, S=0). These items are often not popular with the students.

*'We see that there is an excessive need for snack-like products. And that is logically what an entrepreneur likes to respond to, because that is where his profit lies.'*

–Third-level education organization

#### **4. Bad information flow**

A barrier recognized by 3 participants was the lack of information on this topic (T=3, C=0, S=0). Despite efforts to conduct research and gather feedback from customers, the stakeholders expressed frustration with the lack of reliable data on market trends and consumer preferences. Each third-level institution presents unique challenges and requires tailored strategies, making it difficult to generalize approaches for promoting a healthier food environment. Furthermore, stakeholders mentioned a potential knowledge gap among entrepreneurs regarding the successful implementation of changes to promote healthier food options (T=1, C=2, S=0).

*'The creativity and knowledge about plant-based menus and plant-based products are still very behind. And so you also see among entrepreneurs that a lot still needs to be done'*

– Third-level education organization

#### **5. Staff issues**

Another identified barrier has to do with the challenges regarding the staff of caterers. The caterers highlighted difficulties in retaining staff members, leading to shortages and limited people and time available to deal and work on problems such as the healthy food transition (T=2, C=0, S=0). Moreover, the decrease in the number of students on campus leads to fewer customers and less workload. Which in turn decreases the morale of staff on location (T=0, C=1, S=0). Another obstacle mentioned is the perceived lack of support or knowledge among on-site staff. They are responsible for the items that are sold in the canteen (T=0, C=1, S=0). However, they often rely on their own assumptions about student's preferences, placing more unhealthy items on display than healthy ones.

*'And it is difficult to retain those people because they earn more at other catering establishments. This also means that they cannot make sufficient effort to achieve these types of objectives.'*

Caterer

Placing the barrier within the 4 level of the 12 point leverage system:

Using the four levels of the 12-point leverage system, the barriers can be categorized into the levels: *parameters*, *feedbacks*, *design*, and *intent*. This categorization helps to identify

the importance of barriers, as lower impact barriers are easier to overcome and higher impact barriers are harder to solve but more effective. The categorized barriers can be found in Table 4.

Level	Leverage point
<p><b>Parameters</b> The relatively mechanistic characteristics typically targeted by policymakers (Abson et al., 2017)</p>	Unhealthy food items are cheap and more affordable.
	Aromas of unhealthy food items lure students.
	Unhealthy food items are more convenient and tasteful.
	Universities offer cheap and simple, healthy options that do not sell.
	Challenges in making healthy items more affordable, due to higher production costs and sales efforts.
	Decreasing staff retention impacts the ability to make consistent efforts towards promoting healthier food options.
<p><b>Feedbacks</b> The interaction between elements within a system of interest that drive internal dynamics (Abson et al., 2017)</p>	Students avoid eating on campus because of the expensive image associated with the canteen.
	Declining customer rate after Covid-19.
	Students might go elsewhere after the introduction of healthy items.
	High demand for unhealthy items causes caterers to focus on unhealthy items to remain economically viable.
	The lack of information available makes it harder for third-level education organizations to adapt strategies successfully.
	The knowledge gap among entrepreneurs hinders their ability to adapt and implement healthier food options effectively.
<p><b>Design</b> The social structures and institutions that manage feedbacks and parameters (Abson et al., 2017)</p>	Challenges in attracting and reaching students.
	Lack of support and knowledge among on-site staff.
<p><b>Intent</b> The underpinning values, goals, and world views of actors that shape the emergent direction to which a system is oriented (Abson et al., 2017)</p>	The 'Treat yourself' mentality, which is a reflection of how students view food.
	Students don't want to be told what to do.
	Students' choices are led by emotions.

Table 4: The barriers positioned into the four levels of the 12-point leverage system

## 4.4 Identified solutions

During the interviews, it was discussed what the participants believed to be the most impactful solutions to overcome the barriers that hinder the transition to a healthier food environment. From these, 11 overarching themes emerged as significant solutions for this transition. In Appendix 4.3, a detailed overview of the results can be found.

### **1. Visual nudging**

From the data, it can be noticed that visual nudging was mentioned by multiple stakeholder groups. Visual nudging entails that buying behavior is influenced by visual cues. The first nudge that was mentioned was to play with the look of prices. For example, making the pricing of unhealthy items red and those of healthy ones green (T=0, C=1, S=0). Another tactic highlighted was to make healthy portions bigger than unhealthy ones, which might encourage students to buy the healthy ones more often (T=0, C=0, S=2). The last form of visual nudging mentioned involved using footsteps on the ground to guide students towards healthier options (T=1, C=0, S=0).

*'So you really lure someone in a certain direction with footsteps, so to speak'*

– Third-level education organization

### **2. Economic nudging**

This form of nudging uses financial incentives to influence customers choices. People respond to changes in prices by adjusting their decisions to maximize their perceived value for money. An example mentioned by multiple stakeholders was to make healthy food items cheaper than unhealthy ones (T=2, C=2, S=2), encouraging students to buy healthy options more often.

*'It would be easier to choose healthy things if a healthier sandwich was slightly cheaper than the unhealthy one.'*

– Student

### **3. Descriptive nudging**

The next form of nudging is called descriptive nudging. This type of nudging uses education or descriptive cues about the food item's content to influence students' buying behavior (T=2, C=0, S=5).

*'If you can see more easily what the nutritional value is, just like what you have on the packaging. Even if there is a small price difference, you are still more likely to choose the healthy option.'*

– Student

### **4. Convenience nudging**

This form of nudging is a behavioral strategy used to influence people's choices by making certain options easier to select and access. This approach leverages the human tendency to favor options that require the least effort. The first type mentioned was the use of timeslots (T=1, C=0, S=0). With this tactic, the students can only get unhealthy items during a certain period of time. The second tactic was the use of a default menu (T=0, C=0, S=1). This is a special type of menu that only displays healthy items. If a student really wants an unhealthy item, he or she has to ask for it.

*'Certain items may not be on the shelves for a certain period of time.'*

– Third-level education organization

### **5. Salient nudging**

The last form of nudging that was mentioned during the interviews is called salient nudging. This form of nudging uses a method focusing on the placement of food items. For example, placing healthy food items in such a way that it influences people to buy those items more often (T=1, C=1, S=1).

*'We present healthy products where people come in. Then they tend to grab them first.'*

– Caterer

### **6. Knowledge sharing**

This pathway focuses on increasing knowledge and information flow among students and caters to promote healthier food options on campus. Proposed solutions revolve around education and awareness initiatives aimed at empowering both students, caterers, and their employees to make informed choices and implement healthier food practices. The first solution revolves around educating students about healthy eating behavior and showing them the benefits of following a healthy diet. This knowledge can be used to make healthier decisions when selecting meals on and off campus (T=1, C=2, S=0). Secondly, providing caterers with training and resources on how to successfully transition or implement guidelines for healthier food options can support their efforts in catering to students' needs (T=1, C=0, S=0). Another solution mentioned was to encourage students to try new sorts of foods. This can involve introducing new menu items, offering diverse cuisines, or creating opportunities for students to try new food items. These tactics can create an open mindset towards healthier food alternatives (T=0, C=2, S=0).

*'We are in the business of education. We have to prepare students for their future careers. That is why these topics should actually be offered on a broad basis by the university.'*

– Third-level education organization

### **7. Outsourcing information/research**

Other solutions were focused on outsourcing experts on behavioral psychology (T=1, C=0, S=0) or marketing (T=0, C=0, S=1) to research the best way to influence students to make more healthy choices regarding their diets. Furthermore, the use of pilot studies was mentioned to test which solutions would work and which wouldn't (T=0, C=1, S=0).

*'I think it would be useful to hire a marketer or behavior psychologist to see how students make choices'*

– Student

## 8. Customer retention

This solution focuses on strategies aimed at increasing customer retention among students by enhancing their dining experience and incentivizing repeat visits. The most frequently mentioned solution was the implementation of a ‘loyalty app’ (T=1, C=3, S=1), which would use a reward system offering points to win free meals for frequent customers. Furthermore, such an app or other social media applications could also provide students with daily information on menu items available (T=0, C=0, S=2). Making use of digital platforms would not only enhance convenience by providing real-time updates on menu items but also foster engagement and loyalty through a reward program.

*‘They have now launched a loyalty app. As a student or employee, you can download it, and then there will be news on it, but you can also collect points with it.’*

–Caterer

## 9. Hidden Improvements

The following solutions focused on hidden improvement, meaning improvements that are not visible or won’t be noticed directly by the consumer but promote healthier choices and overall well-being. Two different examples were highlighted: The first focuses on reformulating ingredients to enhance nutritional value without compromising taste or quality. For instance, reducing the salt content and increasing the amount of fiber in food items can help improve their nutritional profile (T=0, C=1, S=0). The second focuses on substituting existing items with healthier alternatives (T=0, C=0, S=2). This one is more noticeable but involves replacing current menu items with healthier options that offer similar taste and satisfaction. For example, swap the sausage roll for a mushroom roll.

*‘What really helps is improvements at the back end, so for example a little less salt and more fiber added.’*

–Caterer

## 10. Top-down approach

These interventions were focused on the need for subsidization and policy changes at the governmental level to provide financial support and a regulatory framework that incentivizes and facilitates the adoption of healthier food practices. Subsidization could involve government-funded initiatives to decrease the cost associated with providing healthier food options. This financial support can help institutions not only to improve the nutritional quality of their menu items, but also to decrease the prices of meals for consumers (T=2, C=0, S=0). Furthermore, the participants suggested the implementation of new rules and

regulations regarding dietary guidelines to standardize and promote healthier food options across third-level education organizations (T=0, C=1, S=0). These regulations could, for example, include rules for specific nutritional standards or requirements for menu labeling.

*'Support from the government can be used to create more understanding and then changes are simply easier to implement.'*

–Third-level

education organization

## 11. Other

The last category contains a diverse set of recommendations that don't fit neatly into the above-mentioned categories. These are:

1. Avoid labels: one student suggested that to make healthy items more appealing, they should not be labeled as 'vegetarian' or with similar names (T=0, C=0, S=1).
2. Encourage creativity: multiple participants highlighted the need for caterers to be more creative in their offerings (T=0, C=0, S=4).
3. Start small: several participants recommended that any transition towards healthier options should begin with small changes to ensure success (T=1, C=2, S=4).

*'So you really have to take it step by step. You cannot change the entire menu overnight, because people also have to deal with flavor development.'*

– Caterer

4. Quality matters: To make healthier choices more appealing, it's important that these items are of good quality (T=0, C=1, S=0).
5. Build-your-own meal bar: to reduce costs and minimize food waste, many participants suggested the introduction of a bar where students can build their own meal (T=0, C=0, S=8).
6. Individual Entrepreneurs: one participant recommended that instead of using a single caterer, third-level education organizations should consider hiring individual entrepreneurs. This approach could offer a wider variety of options and prevent limitations imposed by a single caterer (T=1, C=0, S=0).

## Placing the solution inside the leverage point system

The same as was done with the barriers, the solutions can also be categorized by the four levels of the 12-point leverage system: *parameters*, *feedbacks*, *design* and *intent*. Each level has its own characteristics. The deeper the interventions are targeted, the more impact they have on the system. In Table 5, it can be seen how the previously mentioned pathways position themselves in the leverage point system and also how often they were mentioned.

Levels	Solutions	How often mentioned
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<p><b>Parameters</b> Barriers are focused on the attractiveness of unhealthy items, such as: price, smell, convenience, taste, low production cost, and the decreasing staff availability.</p>	<i>Visual nudging</i>	Use of footsteps	1
		Make healthy options bigger	2
		Play with the look of prices	1
	<i>Salient nudging</i>	Foodplacement	3
	<i>Economic nudging</i>	Make healthy items cheaper	<b>6</b>
	<i>Convenience nudging</i>	Healthy items as default options	1
		Time slot for unhealthy items	1
	<i>Hidden improvements</i>	Ingredient improvement	1
		Healthier alternatives	2
	<i>Top-down approach</i>	Subsidiation	2
	<i>Other</i>	Quality matters	1
		Start small	<b>6</b>
		Build-your-own-meal bar	<b>8</b>
		Individual entrepreneurs	1
		Avoid labels	1
Encourage creativity		4	
<i>Out-sourcing information</i>	Use pilot studies	1	
	Hire a marketers	1	
	Hire a behavioral psychologist	1	
<i>Customer retention</i>	Loyalty app	<b>5</b>	
	Make use of social media to inform students better	2	
	<i>Top-down approach</i>	New governmental rules	1
<i>Knowledge sharing</i>	Education of students	3	
	Help caterers learn and develop	1	
<p><b>Feedbacks</b> Barriers are focused on decreasing customer retention, implementation knowledge gaps, and caterers' goals to stay economically viable.</p>			
<p><b>Design</b> Barriers are focused on challenges attracting and reaching students, and lack of support and knowledge from on-site staff.</p>			
<p><b>Intent</b> Barriers are focused on</p>			



<i>conflicting goals between stakeholders and within stakeholder groups.</i>		Encourage students to try new things	2
	<i>Descriptive nudging</i>	More information about food items content (labels)	7

Table 5: The pathways and their place within the leverage point system

## 4.5 workshop

The goal of the workshop was to identify the most important leverage points within the system and its levers to effectively overcome the barriers that hinder the transition to a healthier food environment for third-level education organizations. To find these leverage points, the participants were first asked to identify the barriers they considered most critical to address. From this discussion, the following barriers were selected:

## Barriers

### Attractiveness of unhealthy items

The first barrier selected was *'the attractiveness of unhealthy items'*. It was agreed upon by both groups that addressing this issue would significantly increase student's ability to choose healthier options. One of the caterers even shared their success story about how they managed to reduce the prices of healthier items:

*"We found that students were more inclined to buy healthier options if they were less expensive. So, we reduced the prices of those items by half. This was costly for us, but in collaboration with the university, we created a fund of 50,000 euros. The difference in margin is covered by this fund."*

–Caterer

### Student retention

The next barrier that was selected was *'decreasing student retention'*. One of the groups acknowledged their awareness of this issue and highlighted that they are actively working on adjusting their marketing strategies to address it. They emphasized that student presence is essential for profitability.

*"What we experienced as a career is that we needed to really adjust the marketing side of our business."*

– Caterer

### Changing behaviour

The final barrier was identified as the most important barrier to overcome, which is the challenge of changing student behavior. The participants concluded that making healthier items more attractive and encouraging students to choose these options is not enough to overcome the 'treat yourself' mindset. Addressing this mindset requires a fundamental shift in how students think about food choices.

*'Through nudging and making those items attractive, either by presenting them nicely or by making the prices more attractive, you can convince them. However, when they've had a hard morning working or have just finished exams or something, you see that their needs change. Even though they initially express a preference for healthy or sustainable products, in practice, it's difficult. Even if you offer them these options, they still choose the unhealthy chocolate croissant or something similar. So, we discussed that the hardest and most important barrier is changing their behavior.'*

-Caterer

## Pathways to overcome the selected barriers

For the second part of the workshop, participants were asked to identify the levers to overcome the selected barriers. To do this, they needed to discuss which of the previously identified (or combined) solutions could effectively address these barriers and develop pathways for transition. Due to overlapping responses, three pathways have been identified.

### **Pathway 1: Changing student behavior regarding their food choices**

This pathway focuses on overcoming the students 'treat yourself' mentality, where choices are often led by emotions. The goal is to shift students' intent towards healthier eating habits and reduce their reliance on unhealthy comfort foods. One of the solutions mentioned was to focus on educating the students and providing them with information to make them more aware of their food choices. This is in the form of labels that directly show the nutritional content of the items, such as protein, fiber, carbs, etc.

*'We happened to conduct a small study with an intern. From that, we received a lot of feedback indicating that people would like to see more nutritional information.'*

– Caterer

While all participants agreed on this solution, they also pointed out several criticisms and challenges that need to be addressed. For example, especially in buffet-style restaurants, it might be difficult to provide a lot of information next to the products themselves without overwhelming the customer. This raises the question of what information to provide and how to present it, which can also vary per location. This makes it difficult for caterers to develop a consistent concept for this solution. Furthermore, it was also discussed that when detailed information is provided, consumers might not notice or understand it. This presents an additional design challenge, as there might be a gap between the efforts made and the consumer's perception.

Furthermore, it was also discussed that descriptive labels, in combination with different and more education of students on this topic, would help alter their intent.

*"I find education crucial, especially for students, because when you actually receive lessons about it at school, right? So, specifically discussing why healthy eating and sustainability are so important. That's why, with our program, we give guest lectures, for example, at Hogeschool Zuyd. We've developed a focus group with students and teachers to tailor our approach. How do we convey this message effectively? Taking them to a farm, showing them around the city. What are some cool concepts and activities to engage them? We try to do all of that, but education is essential because otherwise, it won't work. And I believe it should start as early as elementary school."*

– Caterer

## **Pathway 2: Making healthy items more attractive**

This pathway focuses on overcoming the attractiveness of unhealthy items, which makes it difficult for students to choose healthier alternatives. The goal is to increase the appeal of healthy food items and encourage students to choose nutritious options. A combination of solutions were mentioned to overcome this barrier.

A combination of various nudges can play a significant role in this approach. For example, visual cues, such as footsteps or arrows leading to sections where healthy food is displayed, can subtly guide students towards making better choices. Another effective technique is making healthy options more prominent or larger in display. Additionally, creatively presenting price information can nudge people towards healthier options. For example, price tags can be designed to nudge people toward certain products by making healthy options green and unhealthy options red.

Furthermore, reducing the cost of healthy items is another critical strategy. Participants suggested that financial support from the university could help make these items more affordable. Subsidies or discounts on healthy food options can lower the economic barrier for students, making it easier for them to choose healthier foods without worrying about higher costs. This economic incentive, coupled with visual cues, can significantly enhance the appeal of nutritious options.

*‘So, definitely presentation of healthy items, possibly with price differences. ‘*

–Third-level education organization

## **Pathway 3: Increasing customer retention**

The last pathway addresses the challenge of decreasing customer retention. The goal of this pathway is to increase student loyalty and satisfaction with the catering service on campus to enhance student retention. Students are often difficult to reach, which makes it difficult to inform them about updates regarding the catering service. Participants emphasized the importance of overcoming this objective, mentioning that there is often a perception that little is being done to improve their dining experience, even though significant efforts have been made. To overcome this perception and effectively communicate the value being provided, several strategies were proposed. To improve communication between caterers and students, caterers need to focus on using social media or loyalty apps to keep students informed about new menu items and special offers. The use of a loyalty program could encourage regular dining on campus due to the rewards or discounts that guests can get

when purchasing healthy items. These programs can help build a stronger connection between students and on-campus catering facilities.

*"We have an app where you can earn points, and we try to make it fun. For example, you get rewarded for healthy choices, so if you buy 3 or 4 salads per week, you earn points. Then you can get a free kroketje or something else."*

– Caterer

## 6. Discussion

The goal of this thesis was to identify the conflicting goals of the involved stakeholders and to find the barriers that are hindering the transition to a healthier food environment in third-level education catering. By utilizing the leverage point framework, specific areas for intervention within this system could be uncovered. Additionally, this research addresses the complex interplay between the three key actors: students, third-level education organizations, and caterers. Highlighting the interdependencies that complicate this transition, an aspect not yet explored by previous studies. By including the perspectives of all three stakeholders, this study provides a comprehensive view, contrasting with prior research that has mostly focused on one stakeholder group. This study has not only bridged that gap, but also brought these three stakeholders together to address and formulate pathways to overcome the identified barriers. Consequently, it contributes not only to academic literature but also offers a practical application to aid this transition.

The first subquestion to be answered in this research was: *What are the ambitions of each stakeholder group in transitioning to healthier food options?*

While both educational organizations and caterers aspire to provide healthy, sustainable, and inclusive meals, they encounter challenges hindering this process due to student demand. The primary obstacle to this transition comes from the divergent priorities of students, who prioritize affordability and portion size over considerations of health. Students, driven by budget constraints, hunger, and emotions, prioritize affordability and portion size when making food choices on campus. Sustainability and health are often overshadowed and take a backseat in their decision-making process or are not even thought about, as reflected by their limited mention among their goals. This is consistent with previous studies that identified students' food preferences on campus (Mongiello et al., 2015; Roy et al., 2019; Tam et al., 2017). Furthermore, it is acknowledged by the educational organization that catering services must also operate profitably to remain viable. Which causes caterers to focus on the student's wants, which are not directly focused on sustainability and health. The misalignment between the goals of educational organizations and caterers on the one hand and the preferences of individual customers on the other hinder the transition to a healthier food environment.

Moreover, the conflicting goals within caterers and universities complicate this transition even further. For instance, while both parties may prioritize sustainability, this goal can conflict with other goals, such as, 'offering healthy options'. Sustainability does not automatically equate to healthiness, and balancing these priorities can be a challenging task. Moreover, other mismatches arise from a variety of competing goals, including making a profit, pleasing everyone, providing affordable items, offering healthy choices, and ensuring sustainability. These competing priorities create a complex landscape to navigate, making the effort to establish a healthier food environment even more difficult.

The next step of this thesis was to identify the barriers that hinder this transition using the 12-point leverage system. From these barriers, three were selected as leverage points during the workshop, as they were seen as the most effective and feasible to realize. These barriers were: *'difficult to change student behavior'*, *'decreasing student retention'*, and *'the attractiveness of unhealthy items'*. Which raised the last sub-question: *'What are the pathways that can be taken by relevant stakeholders to transition to a healthier food environment?'*. To overcome these barriers, several levers were identified to formulate three new pathways. Each of these pathways can be placed within the four levels of the 12-point leverage system (Meadows, 1999). Where deeper leverage points within the level of design and intent have more impact, but are harder to realize. Whereas leverage points within the levels of parameters and feedback are easier to implement but have less of an impact on the transition. By analyzing the identified pathways, the following order has been selected from most to least effective:

1. *Overcoming student behavior by using knowledge sharing and descriptive nudging.*

This barrier highlights the challenge of changing student behavior, as students often choose comfort foods as a reward after a stressful day. Their reluctance to have their choices constrained shows that simply offering only healthy items won't be effective. Among the

pathways, the utilization of knowledge sharing and descriptive nudging stands out as a critical leverage point for influencing students' behavior and shifting their intent towards healthier food choices. By providing students with comprehensive information about the nutritional content of food items and employing descriptive cues to guide decision-making, caterers have the potential to cause significant behavior change. By learning why and how they need to make certain food choices, it would not only help students to make better choices within the campus environment, but also outside of it. This aligns with the overarching goals articulated by third-level education institutions, which emphasize the importance of preparing students for the future workforce. As one institution stated, *'We are in the business of education. We have to prepare students for their future careers. This is why these topics should actually be offered on a broad basis by the University'*. Similarly, a University of Applied Sciences expressed a commitment to setting a positive example for students. Third-level education organizations serve as more than just academic institutions. They are environments where students learn and grow. Therefore, third-level education organizations play a key role in educating students about healthy eating. By starting education programs, such as courses, workshops, and seminars they have the power to shape students' attitudes and behaviors towards food. Which will not only promote individual well-being, but also creates a culture of health and wellness within the student community.

## *2. Attracting students to increase student retention.*

This barrier revolves around the concern that introducing healthier menu options may affect student retention, as students could turn to alternative food retailers. Furthermore, the ongoing decline in customers due to the COVID-19 pandemic exacerbates this issue, along with challenges in attracting students to campus. This second pathway operates at the design level and involves the implementation of initiatives aimed at enhancing the overall appeal of on campus dining. Educational Institutions and caterers need to shift their focus to creating an inviting environment to attract students and encourage regular visits. This can be done by improving communication and interaction, for example, by developing mobile apps, websites, or using other digital platforms that offer information about menu options and rewards programs. These could make use of features such as discounts, loyalty points, or other rewards to encourage students to choose healthy options. However, despite operating at a lower level, this pathway can have significant influence, particularly because most caterers and third-level education organizations primarily rely on on-site narrow casting as their primary form of communication. Resulting in that many students are only provided with information when they walk by on campus. Furthermore, from the data, it can be noticed that only one of the education institutions mentioned that they have the goal of creating an attractive meeting spot for students, indicating that this is not one of the primary goals of the education organizations. However, creating an attractive meeting place might attract more students to campus. Big steps can be made in these two aspects, especially because most caterers have to compete with other food retailers near the campus that do make use of such tactics.

## *3. Making healthy items more attractive*

This barrier centers on the greater attractiveness of unhealthy food items due to their convenience, luring aroma, and appealing taste, making them more tempting for students to buy and due to their lower cost, more affordable for caterers to produce. The third pathway operates at the parameter level because it involves altering the physical, sensory, and economical aspects of the dining environment to influence students' food choices. This includes factors such as presentation, availability, visual appeal, and the price of healthy food options. By manipulating these parameters, caterers have the power to make healthier choices more appealing and desirable to students, thereby encouraging them to choose nutritious options over less healthy alternatives, while maintaining their economic viability. These solutions are easier to implement, however, on their own, they might not achieve the desired outcome, because they don't change a students' intent. When students are faced with similar choices outside the campus environment, they might revert to unhealthy options again. However, by using these pathways in combination with each other, the overall effectiveness of the transition can be significantly enhanced.

However, despite being considered a lower-level intervention, 'lowering the prices of healthy items', remains a critical factor in this transition. The cost of healthy food items is a critical concern for students, as it was unanimously chosen as the most important barrier for students, due to their budget constraints. If this issue can not be solved, the progress of this transition might get stuck, even as the other two pathways are implemented correctly. Third-level education organizations might have the power to mitigate the barriers that revolve around the high prices of healthy items. For instance, the caterer in TU Delft highlighted that with the university's financial support, they were able to offer healthier items at lower price points compared to unhealthy options. This demonstrates the significant impact that institutional support can have on making healthy foods more affordable and accessible.

Previous studies have mostly focused on one sided opinions, which proposed solutions centered around reducing the cost of healthy food items and increasing the variety of available foods (Mongiello et al., 2015; Roy et al., 2019; Tam et al., 2017). While this thesis acknowledges the importance of these measures, it also proposes alternative pathways that may have a greater impact because they are not only targeted at deeper levels of the system, but also offers solutions that address this transition from multiple viewpoints, providing a holistic approach to tackling the barriers. Collaborative efforts between caterers and third-level education organizations are needed to achieve these goals, particularly in addressing the critical issue of price. The introduction of innovative strategies such as app-based interventions for student retention and the implementation of descriptive nudging represent novel approaches not yet been applied in this form for third-level education catering in the Netherlands. The confrontational nature of the proposed descriptive labels presents nutritional information directly at the point of choice, making it more difficult for students to ignore and potentially more effective in influencing students' dietary habits. By integrating these solutions, institutions can foster an environment that encourages healthy dietary choices among students.

### **Limitations**

This study utilized a qualitative research design to explore the mismatches between the goals of third-level education caterers, the organizations they serve, and the individual



customers preferences. The methods include semi-structured interviews and focus groups, which were selected to capture detailed insight into the experiences and perspectives of various stakeholders. However, while efforts were made to achieve data saturation, the small sample size may have limited this, particularly among the student stakeholders group. This is an important consideration, as it suggests that some variability in students' perspectives might not have been fully captured.

Furthermore, during the focus groups, the participants consisted of 75 percent females and 25 percent males, all aged between 20 and 25 years. This demographic skew may have influenced the findings, with health and nutrition potentially being a more prominent theme as a result due to the higher proportion of female participants. If more male students had been included, the emphasis on health and nutrition might even be lower than it is now. Additionally, the focus groups primarily involved students in their third to sixth year of study. Excluding the first and second years, which would have provided insight into students within their first years of studying. These might differ from the older students that were included in this research.

The last limit of this research has to do with the limited participation of stakeholders in the workshop. The workshop was organized for 8 participants, but due to last-minute scheduling conflicts, only 4 could participate. This limited participation might have resulted in unsaturated data for the formulated pathways. Furthermore, due to the different work agendas of the participants, the workshop was limited to just one hour. This restricted time for discussion could potentially have led to some pathways being explored in more detail than others. A last limit of the workshop was the absence of students, which may have caused the importance of price to be downplayed during the discussions.

These limitations suggest that, while the findings provide valuable insights, they should be interpreted with caution. Further research in different contexts with larger sample sizes would help validate and extend these findings.

### **Future research and recommendations for HFC**

The following suggestions are relevant for the HFC, as they plan to launch a pilot study to explore ways to make a healthy assortment economically viable. This pilot study could serve as a model for other caterers, to show successful strategies to promote healthy eating, while maintaining profit. However, to ensure the success of this initiative, further research could focus on:

#### *Expanding sample size and diversity*

Future research should include a larger and more diverse sample of students. Including equal male and female participants from different study phases and study backgrounds to get a comprehensive and unbiased view of the results.

#### *Testing different types of nudging techniques*

Research should focus on testing various forms of nudging, such as visual, convenience, and descriptive nudging, to assess their impact on student food choices. Test, for example,

whether descriptive nudging works better in the long term. As it educates consumers about their food choices and could potentially lead to better long-term decisions. In contrast, other forms of nudging might be more effective in the short term by influencing immediate decisions. This research question is especially relevant, as all stakeholders expressed an interest in descriptive nudging.

#### *Developing a descriptive label*

Building on the previous suggestion, future research should focus on developing effective descriptive labels for caterers. Using research, the best method for displaying nutritional information in an informative and concise way could be identified. This would help caterers provide clear, useful information that encourages healthier choices without confusing or overloading students. During the interviews, students suggested using simple pie chart graphics to show percentages of protein, fiber, vitamins, carbohydrates, etc. This approach may help students understand nutrient ratios without feeling overwhelmed by measurements like KJ or grams. The same concept could also indicate a product's sustainability.

#### *How to decrease prices of healthy items*

As mentioned earlier, overcoming the price barrier is crucial for advancing this transition. Researching effective methods to lower the prices of healthy items is essential. While securing funding from the university is one approach, it may not always be feasible, as indicated by the data. Therefore, there is a need for research to explore alternative strategies to reduce the prices of healthy items.

## **7. Conclusion**

The main question to be answered in this thesis was: *'To what extent are there mismatches between the goals of third-level education caterers, the organization they cater to, and the customers wants, and which pathways can be taken to transition to a healthier food environment?'* To formulate an answer to this question, this thesis made use of the 12-point leverage system to identify barriers, supplemented with a workshop to find levers to formulate pathways to transition to a healthier food environment for third-level education organizations.

Educational organizations and caterers aim to provide healthy, sustainable, and inclusive meals but face challenges to realize this due to the demand of students. The main issue is that students prioritize affordability and portion size over health. This misalignment between student preferences and institutional goals complicates the transition to a healthier food environment. Additionally, conflicting goals within caterers and universities, such as balancing sustainability with healthiness and profitability, further hinder this process. These competing priorities create a complex landscape, making it difficult to establish a healthier food environment. The 12-points leverage system was used to identify the specific barriers that are needed to be overcome to align these goals. The 3 barriers that were selected were: *'Difficult to change behavior'*, *'Decreasing student retention'*, and *'The attractiveness of*

*healthy items*'. During the workshop, three different pathways were formulated, combining different solutions to overcome these barriers. Based on these results, the following recommendations were formulated, which can be used in combination to enhance their effect:

The first pathway focuses on changing the *intent* of students by using forms of descriptive nudging and knowledge sharing, such as providing nutritional information and education campaigns. These can be realized due to collaboration between third-level education organizations and caterers. Through this pathway students can be encouraged and learn to make healthier choices within and outside the canteen environment. The second pathway is focused on changing the *design* of the system. The focus lies on increasing student retention by boosting loyalty and satisfaction with on-campus dining by enhancing communication and interaction. Caterers can provide more information about menu options and promotion through a mobile app, along with a reward system, which can increase student engagement and frequent visits to the canteen. The last pathway focuses on *parameters*, because this pathway focuses on making healthy items more attractive. To realize this, caterers can use multiple nudging techniques, such as visibility, visual, convenience, and economic nudging. However, despite being considered a lower-level intervention, the issue of price remains a critical factor in this transition. If this issue is not addressed, it can have a big impact on the success of all the other pathways.

In summary, this research has demonstrated that creating a healthier food environment within third-level education institutions requires a multifaceted approach. It takes more than just replacing unhealthy items with healthy ones to make this a viable transition. Addressing the identified barriers and fostering collaboration between caterers and educational organizations are crucial steps in promoting a culture of healthy eating among students and improving the campus food environment. However, this thesis also reveals that students' needs also need to be met to ensure a transition. Unless the pricing issue is resolved, meaningful progress in this transition is unlikely. This highlights the need to align stakeholder objectives and address the financial barriers, ensuring the transition to a healthier food environment does not remain stalled. When successful, through cooperation, education, and strategic interventions, a sustainable and health-conscious food system can be achieved, benefiting students during their academic lives and equipping them with lifelong healthy habits.

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## 9. Appendix

### Appendix 1: Interview guide

#### 1.1 Expert interview with HFC

##### **Introduction:**

- Welcome and introduction
- Briefly introduce yourself and the purpose of the interview.
- Ensure that the participant understands the confidential nature of the interview and obtain consent for recording.

##### **Background Questions:**

- Can you provide a brief overview of your role and expertise on this topic?
- How long have you been involved in this domain, and what motivated your interest in this area?

##### **Stakeholder Analysis:**

- From your perspective, who are the key actors that provide third-level education catering in the Netherlands?
- Which educational institution do they cater to?
- Do you have contact information that can be used in this research?

##### **Interview-guide topics:**

In this part, we will go through the interview questions of all the stakeholders to see if we can adjust, remove, or add important questions.

### **Conclusion:**

- Allow participants to share any additional insights or thoughts they consider pertinent.
- Closing Remarks: express gratitude for their time and contributions.

## **1.2 Caterer organization interview**

### **Introduction:**

- Welcome and introduction
- Briefly introduce yourself and the purpose of the interview.
- Ensure participants understand the confidential nature of the interview and obtain consent for recording.

### **Background Questions:**

- Can you provide a brief overview of your catering company and its involvement in tertiary education food services?

### **Parameters:**

- Are there specific considerations that influence your menu and food options?  
→ For example, pricing, portion size, labor intensity, equipment, nutritional value, economic objectives, social objectives, health objectives, and competition.
- Is there a focus on healthy food?

### **Feedbacks:**

- How do you monitor customer satisfaction and address any potential issues?
- How do you collect feedback from the education organization, and if so, how is this feedback utilized?

### **Design:**



- What rules or guidelines govern decision-making processes within the catering services, especially those related to menu planning, customer interactions, and quality control?

**Intent:**

- When providing food for these institutions, what are the main goals for you as a company to achieve, and can you elaborate on them?

**Barriers:**

- What challenges have you encountered in transitioning or delivering healthy food options to tertiary education institutions?
- How have you addressed or mitigated these challenges?

**Recommendations:**

- Are there specific strategies you would suggest to create a healthier food environment?

**Conclusion:**

- Do you have any additional thoughts or insights?
- Closing Remarks: Thank them for their time and ask if they would like to participate in the follow-up workshop.

### **1.3 Third-level institution interview guide:**

#### **Introduction:**

- Welcome and Introduction
- Briefly introduce yourself and the purpose of the interview.
- Ensure participants understand the confidential nature of the interview and obtain consent for recording.

#### **Background Questions:**

- Can you provide an overview of your role within the third-level education organization and your involvement in decision-making related to catering services?

#### **Parameters:**

- What are the considerations that influence the university's menu and food options?  
→ For example, pricing, which foods, portion size, labor intensity, equipment, nutritional value, economic objectives, social objectives, health objectives and competition.
- What criteria and considerations guide the organization in selecting catering services for the institution?
- Is there a focus on healthy food”?

#### **Feedbacks:**

- How do you collect feedback from students and staff, and, if so, how is this feedback utilized?

- How do you collect feedback from the catering organization, and if so, how is this feedback utilized?

**Design:**

- How is information about catering services, menu updates, and nutritional guidelines communicated within the educational organization?
- In what ways does the organization empower the catering organization or students to propose innovative changes, or contribute to the improvement of catering services?

**Intent:**

- What are the organization goals for catering services within third-level education organizations?

**Barriers:**

- In your experience, what challenges have arisen from this collaboration, and how have they been addressed?
- What challenges have you encountered in transitioning to a more healthy food environment and how have you addressed or mitigated these challenges?

**Recommendations:**

- Are there specific strategies you would suggest to create a healthier food environment?

**Conclusion:**

- Do you have any additional insight or questions regarding this research?
- Closing Remarks: Thank them for their time and ask if they would like to participate in the workshop.

## **1.4 Student Interviews:**

### **Introduction:**

- Welcome and introduction
- Briefly introduce yourself and the purpose of the interview.
- Ensure participants understand the confidential nature of the interview and obtain consent for recording.

### **Background Questions:**

- Can you briefly introduce yourself? (name, study, age, etc)
- How long have you been associated with this institution, and how often do you make use of the food services that are offered?

### **Parameters:**

- What are your considerations when buying food from the university caterer?

### **Feedbacks:**

- What is your overall perception of the food catering services provided within the institution?
- How does this impact your decision to buy food from the third-level education institution catering?

**Design:**

- How do you currently receive information about catering services available on campus? Would you like to see improvements in terms of communication?
- Are there specific areas where you believe customers should have more influence in shaping the catering experience for themselves and other students?

**Intent:**

- What are your goals when making use of the catering services in third-level education?

**Barriers:**

- What are in your perception the barriers that cause students and staff to buy the unhealthy food options over the healthy ones?

**Recommendations:**

- Looking ahead, what changes or improvements would you like to see in the food services provided within the institution?
- Are there specific strategies you would suggest to create a healthier food environment?

**Conclusion:**

- Do you have any additional insights?
- Closing Remarks: Thank them for their time and ask if they would like to participate in the workshop.

### **1.5 Workshop powerpoint slides**

The workshop was conducted in Dutch and translated into English. The following presentation was used to guide the workshop:

## Scriptieworkshop

Doreen Smid



## Inhoudsopgave

- Korte voorstelronde
- Korte recap hoofdvraag
- Resultaten
- Barrières/breakout group
- oplossing/break out grup



## Korte voorstelronde



Hoofdvraag:

*"Hoe groot zijn de verschillen tussen de doelstellingen van de onderwijsorganisaties, de cateraars en wensen van de studenten, en welke stappen kunnen worden genomen om de transitie te maken naar een gezondere voedselomgeving?"*

## Dus wie heb ik gesproken?

### Cateraaars:



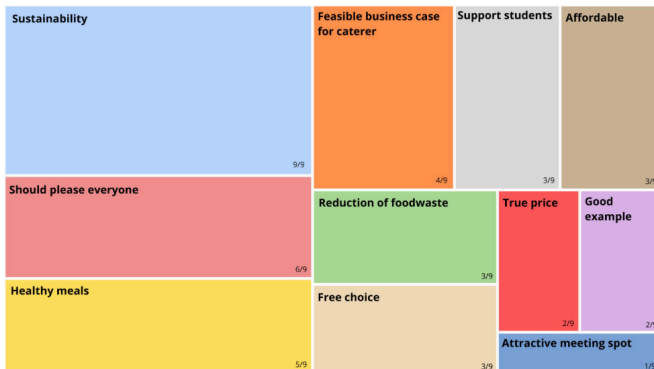
### Universiteiten/ Hogescholen:



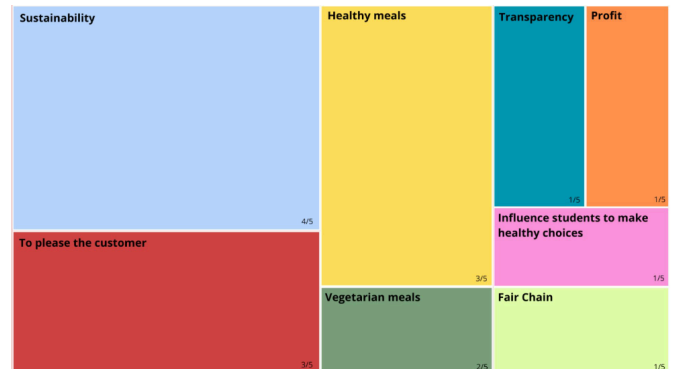
### Studenten:

- Universiteit Utrecht
- Universiteit Wageningen
- Rijksuniversiteit Groningen
- Erasmus universiteit Rotterdam
- Leiden Universiteit
- Avans
- TU Enschede

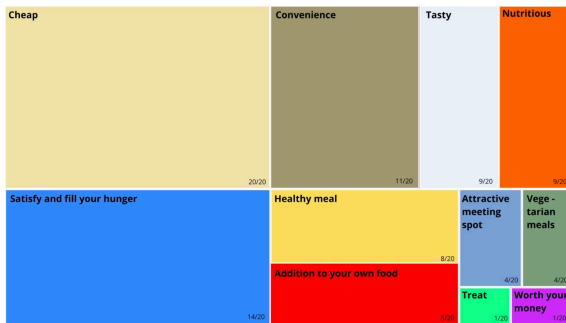
## Universiteiten



## Cateraars



## Studenten



Hoe kunnen we ervoor zorgen dat studenten gezondere keuzes maken?

*'Ik wil eigenlijk het ding dat het goedkoopste is en dat het meest vult. Dus ik ga eerder voor het bord met friet, dan voor de gezondere kleinere optie.'*



## Break out group

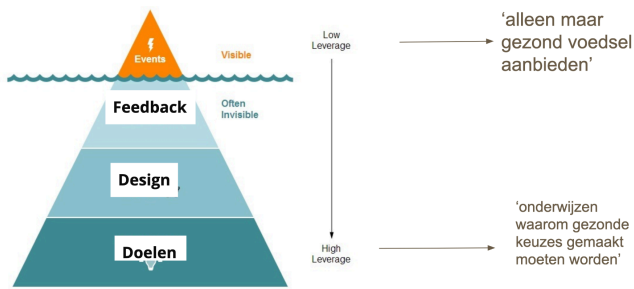
Bespreek in groepjes:

- o welke van deze barrières het belangrijkste om op te lossen zijn
- o welke van deze barrières het moeilijkst en makkelijkst zijn om op te lossen

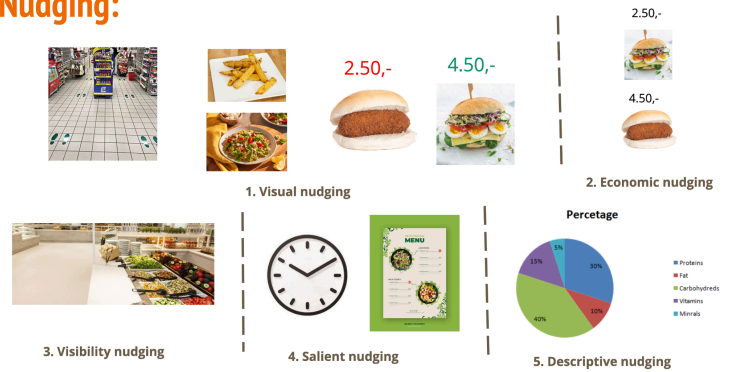
**10 overleggen minuten + ong. 10 minuten bespreken**



## 12 point leverage system



## Nudging:



## Kennis delen:

- Studenten beter onderwijzen
- Caters helpen leren en ontwikkelen
- Studenten aansporen/aanmoedigen om nieuwe dingen te proberen

## Onzichtbare verbeteringen:

- Ingrediënten verbeteren (minder zout, meer vezels, etc)
- Producten vervangen door gezondere alternatieven. (Frikandelbroodje naar groentebroodje).

## Klantenbinding:

- Loyalty app/strippen kaart
- Meer informatie over wat er te vinden is/reclame

## Uitbesteden van onderzoek:

- Maak gebruik van pilot studies
- maak gebruik van marketing bedrijven
- maak gebruik van gedragspsychologen

## Van bovenaf:

- Nieuwe landelijke regels
- Subsidies

## Other:

- vermijd labels
- Stimuleer creativiteit
- Begin met kleine veranderingen
- Kwaliteit is belangrijk
- Build-your-own meal bar
- Individuele entrepreneurs

## Breakout group 2

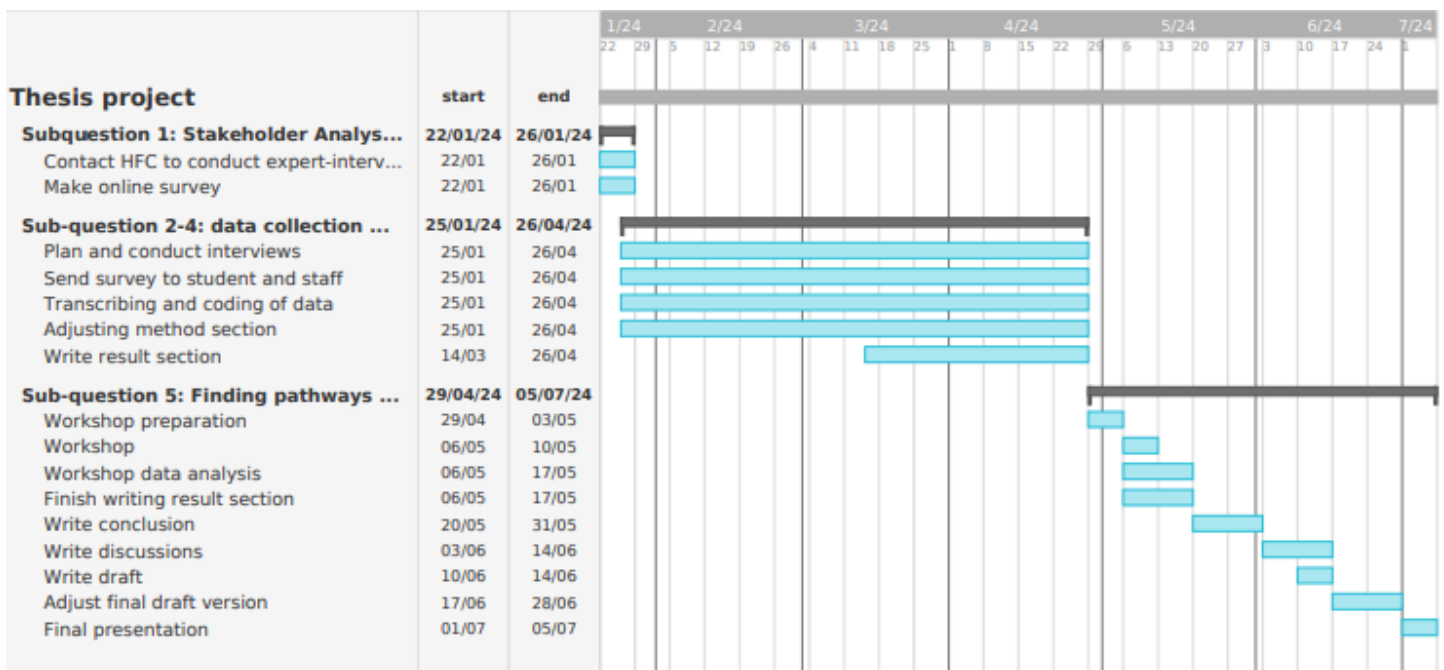
Besprek in groepjes:

- Kies de twee barriers uit de vorige opdracht die jullie het belangrijkste vinden om op te lossen en besprek hoe je met een combinatie van de genoemde oplossingen (of eventueel nieuwe) dit probleem zou kunnen verhelpen.
- Als er nog tijd over is besprek ook welke tactiek het meeste haalbaar is.

**10 minuten overleggen + 10 minuten bespreken**

## Appendix 2: Planning

The research period started 5-02-2024 and ended at 28-06-2024. Below, the rough schedule of this research period can be found. On the x-axis the months (divided by weeks) can be found, and on the y-axis, the task per period. This is a rough schedule, because in reality, the tasks overlapped due to planning difficulties regarding the interviews and workshop.



Graph 5: Gantt chart: Master thesis planning

## Appendix 3: Consent form

### INFORMED CONSENT FORM (INTERVIEW)

In this study we want to learn about the mental models of different actor groups regarding the healthy food provision of third-level education organizations. Participation in this interview is voluntary and you can quit the interview at any time without giving a reason and without penalty. Your answers to the questions will be shared with the research team. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act). Please respond to the questions honestly and feel free to say or write anything you like.

I confirm that:

- I am satisfied with the received information about the research;
- I have no further questions about the research at this moment;
- I had the opportunity to think carefully about participating in the study;
- I will give an honest answer to the questions asked.

I agree that:

- the data to be collected will be obtained and stored for scientific purposes;
- the collected, completely anonymous, research data can be shared and re-used by scientists to answer other research questions;

I understand that:

- I have the right to see the research report afterwards.

**Do you agree to participate?**  Yes  No

## INFORMATION SHEET (INTERVIEW)

### INTRODUCTION

You are invited to take part in this study on XXX. The purpose of the study is to learn about XXX. The study is conducted by Doreen Smid who is a student in the Msc programme Innovation Science at the Department of Sustainable Development, Utrecht University. The study is supervised by Brian Dermody.

### PARTICIPATION

Your participation in this interview is completely voluntary. You can quit at any time without providing any reason and without any penalty. Your contribution to the study is very valuable to us and we greatly appreciate your time taken to complete this interview. We estimate that it will take approximately XXX minutes to complete the interview. The questions will be read out to you by the interviewer. Some of the questions require little time to complete, while other questions might need more careful consideration. Please feel free to skip questions you do not feel comfortable answering. You can also ask the interviewer to clarify or explain questions you find unclear before providing an answer. Your answers will be noted by the interviewer in an answer template. The data you provide will be used for writing a Master thesis report and may be used for other scientific purposes such as a publication in a scientific journal or presentation at academic conferences. Only patterns in the data will be reported through these outlets. Your individual responses will not be presented or published.

### DATA PROTECTION

The interview is also audio taped for transcription purposes. The audio recordings will be available to the Master student and academic supervisors. We will process your data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

[In case audio recordings will be deleted: Audio recordings will be deleted when data collection is finalized and all interviews have been transcribed.]

## Appendix 4: results

Third-level education institution

Parameters:

*How much influence do you have over the menu items?*

<b>Code considerations</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>We give guidelines, and the caterer has free rein to move within those guidelines</b>	Providing rules and guidelines to the caterer but giving them freedom to move within those guidelines to allow them to sell what they want to the students. The caterer is seen as the expert.	'We actually set a framework and certain objectives for where we want to go and the actual implementation thereof. We actually leave that to the caterer'.	9

Table 6: How much influence do you have over the menu items?

*What criteria and considerations guide the organization in selecting a caterer for the institution?*

<b>Code selecting caterers</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>University goals and guidelines</b>	Selection criteria are guided by the organization's guidelines and goals.	'What are the needs of the university?'	8
<b>The wants and needs of students</b>	Selection criteria are guided by the wants and needs of students.	'It is also important that they can cater to the wants and needs of students'	4
<b>Quality/price</b>	Finding the highest value for money.	'And there was also a price aspect. And quality weighed 80 percent, price 20 percent. We didn't buy based on price, we bought based on	3

		quality.'	
<b>If they can handle the capacity</b>	Is the caterer able to handle the capacity of the third-level education organization.	'It also depends on whether you can handle the quantity. Because we have quite a lot of locations, you have to be able to do it.'	1
<b>Difficult to sharpen the selection criteria</b>	They can't sharpen up the criteria, because otherwise there will be no applications for the contract.	'So it is difficult to make your selection criteria even stricter, because otherwise you will not get any applicants.'	1
<b>Implementation plan</b>	The caterers need to be able to show how they are going to execute their plans.	'How are you going to achieve your plans?'	1
<b>Creativity</b>	The caterers need to be creative to make the items as cheap, sustainable, healthy and attractive as possible.	'We do expect some creativity in dealing with how to make it as affordable, attractive, sustainable, and healthy as possible, right? But still, for a nice price.'	1
<b>Communication</b>	The communication between the caterer and third-level institution.	'How do you consult with each other?'	1

Table 7: What criteria and considerations guide the organization in selecting a caterer for the institution?

Feedback:

*How do you monitor customer satisfaction and address any potential issues?*

<b>Code customer feedback</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <b>(9 participants)</b>
<b>Customer satisfaction survey</b>	Providing a yearly survey to get insight into the opinion of	'We also use a yearly survey to collect feedback from our	7

	students on the food availability.	students.'	
<b>Focus group</b>	Organizing focus groups for students to give feedback.	'A few times a year, we organize a focus group, to dive deeper into the opinions of students.'	4
<b>QR-Code</b>	Providing QR-codes at the canteens for students to leave feedback.	'In the canteen, we place QR-codes, which students can scan.'	2
<b>Streethmangers /community managers</b>	Using a middleman to align the stakeholders.	'These are actually the bridge builders between the students and the entrepreneurs in the canteen. So how do you ensure that it is in the interests of both the entrepreneur and the student, and for us, that our organization comes together as best as possible?'	2
<b>Take part in educational assignments, internships, and graduation assignments</b>	Using students' assignments to do research.	'One of our obligations in the contract is to participate in educational assignments, internships, and graduation assignments.'	1
<b>The use of sales data</b>	Using sales data to research which products are successful and which are not.	'We do a lot with data. So we can also see very well what is and what is not successful.'	1

Table 8: How do you monitor customer satisfaction?

*How do you collect feedback from the caterer organization, and if so, how is this feedback utilized?*

<b>Code caterer feedback</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>Structured meeting structure: operational,</b>	Having regular meetings with the caterer to discuss sales, menu changes,	"Receive management reports on what is purchased, how many products they sell, and	9

<b>tactical, and strategic</b>	new plans, etc.	sometimes we have conversations about the menu options that need to be changed.'	
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Table 9: How do you collect feedback from the caterer organization?

Design:

*How is information about catering services, menu-updates and nutritional guidelines communicated within the educational organization?*

<b>Code information</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>Assortment information on site/narrowcasting</b>	Information is provided on site.	'Students see the information on site from narrowcasting'.	8
<b>1-3 monthly articles in the university newspaper</b>	Writing 1-3 monthly articles about the activities of the caterers in the university paper.	"We write down what the caterers are going to do. What you can get.'	3
<b>Online information students/website</b>	Putting information on the university websites.	'We have a website, where students can see which locations have a caterer.'	3
<b>Instagram page</b>	Using an instagram page to provide information.	'We have an Instagram page on which we can post promotions.'	2
<b>Email list</b>	Making an email list which students can subscribe to to get weekly menu updates.	'and then in one of the first newsletters, we want to post a weekly menu for the students.'	1

Table 10: How is information about the catering services communicated?



*In what ways does the organization empower the catering organization or students to propose innovative changes, or contribute to the improvement of catering services?*

<b>Code propose innovative changes</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned?</b> <i>(9 participants)</i>
<b>Green Office/Student Council</b>	Student Councils and the Green Office influence and advise third-level education organizations.	'Yes, of course we are fed quite a bit by Green Office, right? This is again represented by students'.	4
<b>Living labs</b>	Testing students' ideas in living labs or pilot studies.	'Yes, we work with living labs, so students are invited to come up with an idea and then we look to see if there is room and space for collaboration.'	4
<b>Students assignments</b>	Using students bachelor/master thesis or other assignments.	'We also write out different research topics for master or bachelor students'	2
<b>Hackathon</b>	Students take part in a competition to find a solution for this problem.	'One time there was a hackathon, from which students could find and present their ideas. This also resulted in some changes in our menu items'	1

Table 11: How does the organization empower the catering organization or students to propose innovative changes?

Intent:

*What are the organization goals for catering services within third-level education organizations?*

<b>Code goal</b>	<b>Explanation</b>	<b>Example</b> <i>(translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>Sustainability</b>	Reaching sustainability goals:	'And less meat, less fish, less dairy. So	9

	protein transition, CO2 reduction, etc.	we set percentages there.'	
<b>Should please everyone/inclusivity</b>	Providing a food environment that has something for everyone: diets, cultures, etc.	'How do we ensure that we take culture-related eating patterns into account and diet-related eating patterns? How do we ensure that there is something for everyone?'	6
<b>Healthy</b>	Offering healthy food options	'We are also focusing on providing healthy meals for our students'	5
<b>Feasible business case for the caterer</b>	Making sure the caterer can survive	'There needs to be a revenue model for the entrepreneur. Because if it doesn't have a business model, then it won't work anyway.'	4
<b>Support students</b>	Supporting students in their learning performance.	'The goal is, of course, simply that you want to be able to offer a good product that supports the primary process of educational research'	3
<b>Affordable</b>	Matching the price to students	'It needs to be as affordable and attractive as possible for our students'	3
<b>Free choice</b>	Making sure students can make their own choice.	'But what was also found important is that the consumer always has the choice to pick what they want to eat'	3
<b>Reduction of food waste</b>	Reduction of food waste.	'So what we have found very important	3

		in any case is to reduce food waste as much as possible.'	
<b>True price</b>	Ensuring the right value for your money.	'True price'	2
<b>Good example</b>	Providing a good example for the students.	'At the University of Applied Sciences, we really want to be a good example for our students.'	2
<b>Attractive meeting spot</b>	Providing a comfortable and attractive place for students to meet.	'The warm welcome and the well-being of employees and students is our top priority.'	1

Table 12: What are the goals of the third-level education organizations?

*Is there a focus on healthy food?*

<b>Code vision</b>	<b>explanation</b>	<b>example (Translated from Dutch)</b>	<b>How often mentioned (9 participants)</b>
<b>Providing healthy meals</b>	Wanting to provide healthy meals	'Yes, so our ambition regarding this topic is linked to eat-lancet.'	5
<b>Sustainability is a top priority</b>	There is a focus on providing healthy food, but the priority lies in sustainability.	'Our ambitions currently lie in focussing on the protein transition and CO2 reduction.'	1
<b>It is a focus, but the customers want something else</b>	Although they want to focus on providing healthier food, students don't buy these items, so they keep selling the 'unhealthy' items.	'In the end, you try to choose something that is common for the vast majority, and people still buy. And yes, that is also why you can still buy croquettes.'	1
<b>Not specifically on their agenda</b>	'Providing healthy meals' is not specifically part of	'I always look at what the strategic goals of the university are. And	1

	the strategic goals.	it doesn't specifically say that we need to focus on health and vitality or those kinds of topics'.	
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Table 13: Is there a focus on healthy food?

## Caterers

Parameters:

*Are there specific considerations that influence your menu and food options?*

<b>Code menu options</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(5 participants)</i>
<b>Demands Client (differs per client)</b>	What does the third-level education organization want?	'What does the third-level education organization want? What is included in the contract?'	<b>3</b>
<b>Demand customers</b>	What do the students want?	'What is your type of guest at a location? And which trends fit into this? In terms of product type.'	<b>3</b>
<b>Employees vision</b>	What is the caterer's vision?	'And the interpretation of our employees.'	<b>3</b>
<b>Products need to sell</b>	Which product sells the best?	'Our main goal is to please our guests, but also to earn some money. Purchasing and selling is a very important goal for us. I would like to have items on the shelves that actually sell.'	<b>2</b>

Table 14: What are the considerations that influence your menu options?

Feedbacks:

*How do you monitor customer satisfaction and address any potential issues?*

Due to the cooperation between the third-level education institution and the caterers these answers are very similar with the answers in table 6, which is why it is left out here.

*How do you collect feedback from the education organization, and if so, how is this feedback utilized?*

Due to the cooperation between the third-level education institution and the caterers these answers are very similar with the answers in table 7, which is why it is left out here.

## Design

*How is information about catering services, menu-updates, and nutritional guidelines communicated with clients?*

Due to the cooperation between the third-level education institution and the caterers these answers are very similar with the answers in table 8, which is why it is left out here.

*In what ways does the organization empower the catering organization or students to propose innovative changes, or contribute to the improvement of the catering services?*

Due to the cooperation between the third-level education institution and the caterers these answers are very similar with the answers in table 9, which is why it is left out here.

## Intent

*When providing food for these institutions, what are the main goals for your company to achieve and can you elaborate on them?*

<b>Code goal</b>	<b>Explanation</b>	<b>Example (Translated from Dutch)</b>	<b>How often mentioned (5 participants)</b>
<b>Sustainability</b>	Providing sustainable meals.	‘And CO2 emissions we find especially important’	4
<b>Please the customers</b>	Keeping customers happy and satisfied	‘Our products must ultimately be of good quality and tasty. Otherwise, the consumer will not come back.’	3
<b>Provide a healthy meal</b>	Ensuring that customers can get a good balanced and healthy meal.	‘And one of our core points is that we want vital people in a vital world.’	3
<b>Providing vegetarian meals</b>	Focusing on providing an increasing amount of vegetarian meals.	‘Slowly want to integrate more and more vegetarian meals into the menu.’	2
<b>Transparency</b>	Being honest about what they serve their	So that our guests really know what's in it. And	1

	customers.	that you do not sell a potato salad with 3% potatoes but a real potato salad.'	
<b>Provit</b>	Creating profit	'But also to make money at the end of the month.'	1
<b>Fair chain</b>	Striving for a system that ensures fairness and equity throughout a supply chain.	'We also want to do well for our colleagues.'	1
<b>Positive influence</b>	Influences customers to make healthier and more sustainable choices.	'At the same time, we also say that we do not want to impose but want to influence the guest positively.'	1

Table 15: What are the goals of the caterers?

*Vision on healthy food:*

<b>Code vision regarding healthy food</b>	<b>Explanation</b>	<b>Example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(5 participants)</i>
<b>Striving to deliver healthy meals</b>	Having the goal of delivering healthy and tasty meals for the students.	'Our ambition is that at least 70% of our purchases should be healthy by 2026.'Which are based on the guidelines from the Voedingscentrum.'	3
<b>Nudging students to eat healthier food</b>	Leaving the choice open for the student to choose healthy or 'unhealthy' snacks but nudging them to go for the first.	'But we try to do it this way. So that the student continues to come to us. And that we can continue to do this.'	2
<b>Changing the assortment needs compensation from the university to be successful</b>	Changing the menu items needs compensation from the third-level education organization; otherwise it won't succeed.	'Then we have to remove items from the menu and compensation will have to be provided by the client, then you can do that.'	1

Table 16: What are the caterers' vision on healthy food?

Students

Parameters

*What are your considerations when buying food from the university caterer?*



<b>Code considerations</b>	<b>explanation</b>	<b>example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(19 participants)</i>
<b>It should not cost too much</b>	Looking for an affordable price.	'It shouldn't cost too much, because otherwise I wouldn't buy it.'	<b>18</b>
<b>should be filling/portion size</b>	The portion should be large enough to satisfy your hunger.	'I just want to feel full and satisfied'.	<b>7</b>
<b>Tasty</b>	The item should be enjoyable and tasty.	'Of course, it is also important that it is tasty.'	<b>7</b>
<b>Nutrient content</b>	Students are looking for certain kinds of nutrients: protein, fiber, etc.	'Besides the price, I also check the nutrient content'.	<b>5</b>
<b>Vegetarian</b>	The item should be vegetarian.	'Vegetarian options, because that is important to me'.	<b>4</b>
<b>Convenient</b>	The item should be easy to eat or take with you.	'So it needs to be convenient and easy.'	<b>4</b>
<b>Healthy</b>	The item should be healthy.	"I look for healthy items".	<b>3</b>
<b>worth your money</b>	The item should be worth your money.	"Meals should be worth my money"	<b>1</b>
<b>freshly made items</b>	The item should be freshly made.	"First of all, I look for freshly made items."	<b>1</b>

Table 17: What are your considerations before buying food from the caterer?

## Feedbacks

*What is your overall perception of the food catering services provided within the institution?*

<b>Code overall</b>	<b>explanation</b>	<b>example</b>	<b>How often</b>
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<b>perception catering service</b>		<i>(Translated from Dutch)</i>	<b>mentioned (19 participants)</b>
<b>Good variety</b>	There is a good variety of meals and menu items.	‘There are quite a lot of options’.	<b>8</b>
<b>Expensive</b>	The menu items are too expensive.	‘In general, I just think it's too expensive’.	<b>7</b>
<b>positive experience</b>	A general positive experience	‘The main study canteen, I am finding it amazing recently because they changed the stands and I can have a poke bowl for a reasonable price.’	<b>5</b>
<b>Because they offer so much, they also don't have a lot of everything, limiting the choice</b>	Due to the large variety of food items, there is not much choice in vegetarian or vegan options.	‘I think I must say limited because there is a bit of everything. There are some warm meals, like soup. But not enough, and when you look at the sandwiches, most of them are not vegetarian. There are plain breads, like cheese. However, I can make that at home, or I can get it for like half the price. So there are not a lot of vegetarian options. You're just limited.’	<b>5</b>
<b>Short opening times, and often the food is gone</b>	Due to the short opening times, around 13:00 there are, for example, no sandwiches left.	‘There was always far too little for me. Everything was gone for the people who came there. Sometimes you actually skip your lectures, so to speak, so you can score a lunch.’	<b>2</b>
<b>Foodtrucks outside have more to offer</b>	Even though the food trucks are more expensive, they have bigger meals and taste better. Giving you more value for your money.	‘I think that I also want to add that they have more things to choose from and they are mostly also better in taste. They might be a bit more expensive, but they are much better, and they can give you	<b>1</b>

		so much more than what the university offers.'	
<b>There are not many healthy items</b>	There were not many healthy items, besides fruits.	'There are not many healthy products. Yes, there are apples, bananas and other things like that. Suppose you just forgot your lunch, then there are not many healthy options left.'	<b>1</b>
<b>The really simple and cheap items don't sell</b>	The really simple items such as pieces of bread don't sell.	'They also offer these plain, but cheap, pieces of bread. However, nobody buys them. Maybe they can replace them?'	<b>1</b>
<b>Unhealthy</b>	The food items are unhealthy.	'I notice that the items that are are mostly unhealthy'	<b>1</b>

Table 18: What is the overall perception of the catering service provided?

## Design

*How do you currently receive information about the catering services available on campus?*

<b>Code how do you receive information</b>	<b>explanation</b>	<b>example</b> (Translated from Dutch)	<b>How often mentioned</b> (19 participantes)
<b>By going to the canteen</b>	Only getting information by going to the canteen.	'Basically, only if you walk past it.'	14

Table 19: How do you receive information about the catering service provided?

## Intent

*What are your goals when making use of the catering services in third-level education?*

<b>Code goal</b>	<b>Explanation</b>	<b>Example</b> (Translated from Dutch)	<b>How often mentioned</b> (19 participants)
<b>Cheap</b>	Not wanting to spend much money on lunch.	'It shouldn't be too expensive, otherwise, I wouldn't buy it.'	<b>20</b>

<b>Satisfy and fill your hunger</b>	Feeling satisfied and full after your meal.	'I just want the thing that is the cheapest and that fills the most. So, I go for the plate of fries instead of the healthier, smaller option.'	<b>14</b>
<b>Convenience</b>	It needs to be convenient: easy to eat, easy to take with you, etc.	'We are students that need to do things and also master students. These are usually people that are already working. So we don't have time, so it needs to be convenient.'	<b>11</b>
<b>Tasty</b>	Wanting a tasty meal.	'I just choose what I like the best'	<b>9</b>
<b>Nutritious</b>	Wanting nutritious meals, such as protein, fiber, etc.	'And that it should also be nourishing in itself, so I think there are a lot of those snack options, but I never actually go for that.'	<b>9</b>
<b>Healthy meal</b>	Wanting a healthy meal	'It is of course important that it is a little healthy, otherwise, you will just get sick.'	<b>8</b>
<b>Addition to your own food</b>	Using the service as an addition to lunch brought from home.	'So it would rather be an addition to what I already brought with me.'	<b>5</b>
<b>Fun meeting spot</b>	Using the canteen as a meeting spot.	'I almost never go to a canteen alone.'	<b>4</b>
<b>Vegetarian</b>	Wanting a vegetarian option.	"Vegetarian, because that is important to me."	<b>4</b>
<b>Treat</b>	Buying food to treat yourself.	'Yes, I think to me it's just that you think, okay, nice and easy, but also a treat yourself moment'.	<b>1</b>
<b>Worth your money</b>	Getting worth your money.	'But also whether I think it is worth my money'.	<b>1</b>

Table 20: What are the students' goals?

## 4.2 Identified barriers

Third-level education institution

*What challenges have you encountered in transitioning to a healthier food environment and how have you addressed or mitigated these challenges?*

<b>Code barrier</b>	<b>Explanation</b>	<b>Example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>Students will get their 'snack' elsewhere.</b>	If students can't get their unhealthy food item here, they will get it elsewhere.	The people who normally order a meatball sandwich from us and then no longer can get it here, will go to the sandwich shop at the corner.	6

<b>'Unhealthy' food as cash cow</b>	Entrepreneurs see that there is high demand from students for 'unhealthy' products, so that's what they deliver.	'We see that there is an excessive need for snack-like products. And that is logically what an entrepreneur likes to respond to, because that is where his profit lies.'	4
<b>It is difficult to reach students</b>	Finding it difficult to reach or attract students.	'The biggest dilemma that we are facing at the moment is that we can't reach the students at all.'	4
<b>Choices are influenced by emotions</b>	Students' food choices at the canteen are heavily influenced by emotions.	'They are guided by emotion much more than previous generations.'	4
<b>Absence of reliable data</b>	Not having enough data or not the right data to change.	'It is also difficult to get reliable data.'	3
<b>Side effects after Corona</b>	The effects of Corona have decreased the profit rate of the caterers.	'However, it is simply no longer commercially feasible, and you can really see that. And that has really changed after Corona. The occupancy rate has decreased a lot.'	3
<b>Cheaper 'unhealthy' food items</b>	Unhealthy food items are cheaper than healthy ones.	If you just look at the ingredient list on the back of the label, it is disappointing, so I think it is misleading and also that those items are cheaper 9 times out of 10.	3
<b>It is difficult to change behavior</b>	The difficulty of changing student behavior.	'Bring about the change in behavior so that they actually choose it. That's the hardest thing.'	2
<b>Staff shortage</b>	The shortage of staff is caused because it is not an attractive branch to work in and it results in too	'And it is difficult to retain those people because they earn more at other catering establishments. This	2

	few hands to work on problems like this.	also means that they cannot make sufficient efforts to achieve these types of objectives.'	
<b>Students don't want to be told what to do</b>	Students don't want to be told what to eat. Restricting their choices would work counterproductive.	'But on the other hand, we also notice that they do not want to be patronized when it comes to choosing.'	2
<b>Absence of courage and knowledge</b>	Insufficient knowledge about new practices and courage to try new things on the caterer's side.	'But also the knowledge and courage of entrepreneurs. The creativity and knowledge about plant-based menus and plant-based products are still very behind. And so you also see among entrepreneurs that a lot still needs to be done.'	1
<b>Very cheap and simple healthy foods also don't sell</b>	Providing simple and cheap food items, but these items are not selling well.	'But the moment you offer a simple cheese sandwich for 80 cents, and then it goes up 10 cents. Then they are angry, because it has become a kind of expensive sandwich.'	1
<b>The financial aspect of offering healthy/sustainable meals</b>	The increasing cost when you want to offer a healthy and sustainable meal.	'Including transport, sustainable logistics, etcetera, etcetera. The bill is always placed with the end user. And then someone says, 'why do I have to pay so much?'	1

Table 21: Identified barriers from third-level education organizations.

Caterer

What challenges have you encountered in transitioning to a healthier food environment and how have you addressed or mitigated these challenges?

<b>Code barrier</b>	<b>Explanation</b>	<b>Example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(5 participants)</i>
<b>It is difficult to change behavior</b>	The difficulty of changing behavior	'The most difficult part is to break people's habits'	3
<b>Students will get their meals somewhere else</b>	Students will get their meals somewhere else.	'Yes, and not that they walk to the Albert Heijn to go. It's a 5-minute walk and they can get everything there, so it's always a bit of a game. What is there in the environment, what does it want from us, what does our client want and what can we offer? How do we ensure that we still make a profit?'	3
<b>The availability of healthy products</b>	There aren't enough good options to offer healthy products. And sustainable products take something away from the health aspect, there are not enough healthy alternatives for some sustainable products.	'If you look at the requirements of the 'Voedingscentrum' then almost nothing meets the requirements, so there. There are small-scale products that have been developed in this regard, but they are often relatively expensive, which means that you can't sell it.'	2
<b>The commercial side</b>	They still need to make enough profit as a company.	'And that risk lies entirely with us, so if we suddenly no longer have any income, then that is especially a problem for us, not the university.'	2



<b>The decreasing number of students that visit</b>	A decreasing number of students is visiting the campus.	'Just make sure we have enough guests. That's a very big barrier.'	1
<b>Providing healthy and sustainable meals will cost more in the end</b>	The high price of these meals	'Well, of course it's only going to get more expensive.'	1
<b>Lacking support from staff on location</b>	The staff is to the new 'healthy rules' and serving what they like best and what they think the students like best.	'Yes, a large part is indeed in the support and knowledge of employees. We often see that they put down what they like best.'	1
<b>Unhappy staff members</b>	Unhappy staff members, due to the loss of customers.	'Sometimes the challenge at the moment is not even very often in terms of food content. But to keep it profitable and to ensure that people enjoy their work. If you are used to being busier and you are standing in a quiet canteen, then that bridge also disappears.'	1

Table 22: Identified barriers from caterers.

## Students

*What are in your perception the barriers that cause students to buy the unhealthy food options over the healthy ones?*

<b>Code barrier</b>	<b>Explanation</b>	<b>Example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(19 participants)</i>
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<b>To expensive</b>	Food items are too expensive.	'Price, so let's say if you can get fries for €2, for example, and a well-filled sandwich with something healthy costs €4 or €5. Yes, I understand that people go for the fries.'	20
<b>Unhealthy food items are seen as a treat</b>	'unhealthy' food items are seen as a treat or are more attractive to eat.	'Yes, the sweet cravings. Yes, you're just more likely to have cravings for unhealthy things.'	8
<b>Easier</b>	It is easier to take and eat an 'unhealthy' snack.	'I also think that the convenience of taking a snack with you, causes people to drift more towards unhealthy snacks'.	1
<b>Expansive Image</b>	The expansive image of the caterer causes students to avoid the cafeteria.	'But they also have a certain image in my head. Which is that it is expensive, so I won't go there anyway.'	1
<b>Information didn't reach students</b>	Missing information on where the canteens are.	'In my first year, I only went to the Spar because I didn't know there was a cafeteria.'	1
<b>It is not attractive to go and have lunch there</b>	It isn't attractive for students to go and have lunch in the cafeteria.	'However, it is often just not very pleasant or cozy to sit there. It is therefore a bit of a waste of money.'	1
<b>Smell</b>	The smell of unhealthy food items is nudging people to buy more unhealthy food items.	'Then you first walk past the sandwiches, but you actually smell the fries right away. Then I think if it were somewhere	1

		else, just separate from each other, I think more people might choose something healthy.'	
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Table 23: Identified barriers from students.

Overview: (combined barriers):

Main theme	Sub theme	How often mentioned (33 participants)
<b>Decreasing student retention</b>	Students will get their food somewhere else	9
	Decreasing number of students visit after corona	4
	Difficult to reach students	4
	Not attractive to go and have lunch at the canteen	1
	Expansive image	1
	Information didn't reach students	1
	<b>Difficult to change behavior</b>	Choices of students are influenced by emotions
	Students don't want to be told what to do	2
<b>Attractiveness unhealthy food items</b>	Healthy items are more expensive than unhealthy ones.	23
	Unhealthy items are seen as a treat	8
	Market still demands unhealthy items	6
	The financial aspect of offering healthy/sustainable meals	2
	Simple, cheap healthy foods don't sell	1
	Unhealthy items are more convenient	1
	The smell of unhealthy food items	1
<b>Bad information</b>	Absence of reliable data	3

<b>flow</b>		
	Absence of courage and knowledge from entrepreneurs	1
	Lacking support/knowledge of staff on location	1
<b>Staff issues</b>	Staff shortage causes lack of time to work on this issue	2
	Unhappy staff members	1

Table 24: Overview all barriers.

### 4.3 Part 1: Identified solutions during interviews

Universities:

<b>Strategy code</b>	<b>Explanation</b>	<b>Example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(9 participants)</i>
<b>Making healthy food items cheaper than unhealthy ones</b>	Providing healthy food items that are cheaper than unhealthy ones.	'We have selected 10 products that have a permanently low price. So we also want to prevent people from having to pay a lot.'	2
<b>More information on food items</b>	Improving information and transparency about what is in the food items.	'so that could be in a restaurant, for example, at a buffet, for example, you say Well. This product contains 800 calories, but this can also be done	2

		with how sustainable a food item is.'	
<b>Subsidiation</b>	Getting subsidization from the government to decline the food prices	'And given the decline in income at university, we have no options there. So then you might have to go to the government.'	2
<b>More education of students</b>	The education of students is the role of the third-level education organization	'We are in the business of education. We have to prepare students like you for the future work field, right? With an SDG mindset. That is why this topic should actually be offered on a broad basis by the university.'	1
<b>Help caterers learn</b>	Coaching and teaching caterers to implement the changes needed for this transition.	'Courage and knowledge about how to implement these are missing.'	1
<b>Food placement</b>	Nudging by using food placement	'When you enter our outlets, you often see that the healthier things are presented first and the less healthy things underneath, a little further or a little less out of sight.'	1
<b>Behavioral psychologist</b>	Use psychologist to look for the best way to nudge students	'They could really look at that side of this problem. How do you involve your consumer? What can you do to influence them, and in what ways?'	1
<b>Customer retention</b>	Improving customer retention through apps.	'They have now launched a loyalty app. As a student or employee, you can	1

		download it, and then there will be news on it, but you can also collect points with it.'	
<b>Play with the look of prices</b>	Playing, visually, with the look of prices for certain food items.	'Adjusting prices to round prices or just giving a price in different colors.'	1
<b>Time slots for food items</b>	Only selling certain foods in certain time slots.	'For example, they may not be on the shelves for a certain period of time.'	1
<b>From caterers to individual entrepreneurs</b>	Moving forward with only individual entrepreneurs, instead of one big caterer.	'I am absolutely in favor of as many individual entrepreneurs as possible, because then your steering wheel is very large. And if you go back to one large caterer who has to arrange it all for you, your options will be very limited.'	1
<b>Physical nudging</b>	Providing physical nudging strategies.	'So you really lure someone in a certain direction with footsteps, so to speak.'	1
<b>Start small</b>	Not making big changes all at once, but starting small, and from there additions can be added.	'I think that starting small might be the best direction forward.'	1

Table 25: Identified solutions from third-level education organizations.

Caterer:

<b>Code strategy</b>	<b>Explanation</b>	<b>Example</b> <i>(translated from dutch)</i>	<b>how often mentioned</b> <i>(5 participants)</i>
<b>Loyalty program</b>	Strategies that increase customer retention.	'And the savings system I just mentioned also works very well.'	3
<b>Gradual change</b>	A strategy that provides gradual change in food items	'So you really have to take it step by step. You cannot change the entire menu overnight because people also have to deal with flavor development'	2
<b>Make healthy options cheaper</b>	Making healthier options cheaper than unhealthy ones.	'Yes, in terms of price, so if we can do something about that, if you can apply a price differentiation so that you can make healthier products cheaper and unhealthy products more expensive.'	2
<b>Knowledge sharing with students</b>	Knowledge sharing and creating awareness among students.	'We have these products as replacements, because they are healthier for you. And then you address at least some of the people personally.'	2
<b>Encourage students to try new things</b>	Encouraging students to try new things and to adjust to healthier food options.	'By tasting a few pieces to see what it is, you can then slowly take steps within defined groups or products to convert to that healthy line. To get used to it. To get to know it.'	2
<b>Food placement</b>	the placement of food to nudge students	'You can work with the design of your restaurant, so you say that we present healthy products to people when they come in and then they tend to grab them first.'	1
<b>Hidden improvements</b>	Hidden improvements, such as healthier nutrients, without making it obvious.	'What really helps is improvements at the back end, so for example , a little less salt and more fiber added.'	1

<b>Good quality</b>	providing good-quality food items.	‘So a strategy is quality. So make sure you have good quality products. Then the switch to plant-based is easier.’	1
<b>Solutions and rules should come from the government</b>	A top-down approach should be used. New rules or subsidation should come from the government.	‘The support from the government can be used to create more understanding, and then changes are simply easier to implement.’	1
<b>Use pilot locations</b>	Testing how to make a healthy menu profitable.	‘And then you start looking at where my big opportunities are to convert things. On the way to that 80%. You make a plan for how you are going to do that. Instead of saying, from today, tomorrow, or in a month, we will go from 40% to 80%. But how are we going to do that?’	1

Table 26: Identified solutions from caterers.

Students:

<b>Strategy code</b>	<b>Explanation</b>	<b>Example</b> <i>(Translated from Dutch)</i>	<b>How often mentioned</b> <i>(19 participants )</i>
<b>Build your own meal</b>	Students being able to put together their own meal	‘Where you can put together your own meal and you pay for the weight of the meal. And then you also had control over how healthy it was. There were just different options, in terms of vegetables, carbs, and proteins. And that was also affordable.’	8
<b>Be more creative</b>	Being more creative with food to attract customers	‘And I think you can really be a bit more creative with food.’	4
<b>Bring change gradually</b>	Not changing the menu items too quickly.	‘And maybe make the change less intense, because going from fries to	3



		a beet wrap, might be a bit intense for some people.'	
<b>Providing information on nutritional content</b>	Give more information on the nutritional content of food items, such as carbs, proteins, etc.	'If you can see more easily what the nutritional value is, just like what you have on the packaging. Even if there is a small price difference, you are still more likely to choose the healthy option.'	5
<b>Better information on daily menu items</b>	Providing better information on the food items available.	'It would be cool if you could see a day in advance, oh tomorrow they have nasi for lunch, then I won't bring any food. Then I think I would buy more things in the canteen, because I think oh that is tasty and not expensive so I don't have to cook for myself.'	2
<b>Don't advertise things as vegetarian/vegan.</b>	The way that food is presented.	'Yes, that also depends on how you present it. Something like saying the word vegetarian means that 50% of the students will no longer buy it.'	1
<b>Keep it simple</b>	Providing just a few meals and not a whole variety of things.	'If you just make three meals, for example, three hot meals or something like that. That's pretty cheap to make in my opinion. If you just make that in large quantities.'	1
<b>Make healthier portions bigger</b>	Making the healthier meals a bit bigger, so that students will feel full and satisfied after.	'That you also think that you get such a small portion, so you are not really full, so then you have to go and get something more, so then it becomes even more expensive.'	2
<b>Make healthy items cheaper</b>	Making healthy items cheaper than unhealthy ones.	'It would be easier to choose healthy things if a healthier sandwich was slightly cheaper than the unhealthy ones.'	2
<b>Hire a marketer</b>	Outsourcing	'I think it would be useful to	1

	information on how students behave and how to influence this.	hire a marketer or behavior psychologist to see how students make choices.'	
<b>Product placement</b>	The product placement of items to influence the choice of students	'So you see the healthy options first, and you start thinking about them before you even see the unhealthy, tastier things. Because then you have often already made the choice: Oh, I am going to take this and then you already have that and then you are not going to switch anymore. Then you're not going to put it back to get a sausage roll.'	1
<b>providing healthier alternatives</b>	The replacement of unhealthy food items with healthier alternatives.	'But suppose you have a sausage roll that is really unhealthy. Maybe you can also make a healthier version of that.'	2
<b>Student retention (membercard)</b>	Anything that has to do with making it attractive for students to come back to the cafeteria, using a member card.	'Maybe with a member card, for example, you get the 10th meal for free.'	1

Table 27: Identified solutions from students.

Overview pathways to transition:

<b>Main Theme</b>	<b>Sub theme</b>	<b>How often mentioned (34 participants)</b>
<b>Economic nudging</b>	Make healthy food items cheaper than unhealthy ones	6
<b>Visual nudging</b>	Make healthier portion bigger	2
	Play with the look of prices	1

	Using footsteps	1
<b>Descriptive nudging</b>	More information on food items content	7
<b>Salient nudging</b>	Foodplacement	3
<b>Convenience Nudging</b>	Set healthy items as the default option	2
	Time slots for food items	1
<b>Knowledge sharing</b>	More education of students	3
	Encourage students to try new things	2
	Educate caterers	1
<b>Outsourcing information/research</b>	Behavioral psychologist	1
	Hire a marketer	1
	use pilot locations	1
<b>Customer retention</b>	Loyalty app	5
	Better information on daily menu items available	2
<b>Hidden improvements</b>	Ingredients improvement that contain for example less salt and more fiber. These are non-visible improvements.	1
	Healthier alternatives for already existing items. instead of a sausage roll, a veggie roll.	2
<b>Other</b>	Don't advertise things such as vegan or vegetarian	1
	Be more creative	4
	Start small	6
	Good quality	1
	Build your own meal	8
	Keep it simple	1
<b>Top-down approach</b>	Subsidization	2
	New rules government	1

Table 28: Overview solutions.

