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**From Food Product to Food Experience: How to Use Design Thinking to Service  
Vulnerable Populations and Improve Their Food Well-Being**

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## **Abstract**

In this chapter, we argue that design thinking can help to promote and enhance healthy food consumption experiences among vulnerable groups. To do so, we utilize three core elements of design thinking: empathy, visualization, and collaboration. Empathy, as defined within design thinking, is the ability to immerse oneself in the user's situation and to see the problem from his or her point of view; this leads to rich user insights. Vulnerable groups are heterogeneous and face different challenges in life. By conducting participative observation studies, we can learn about the reasons for peoples' behavior. Understanding the problem of unhealthy eating behavior is an important first step to promoting healthier solutions. Visualization, the ability to make abstract ideas visual to other people by utilizing design tools, such as sketches, prototypes, personas, and customer journey maps, improves communication within a team. Good visualizations make it easier to envision other peoples' experiences and improve our ability to hold onto the rich details of the lives of those we seek to help. Collaboration, to orchestrate multi-disciplinary teams of people with different knowledge and skills, increases the likelihood of solving complex problems, such as promoting and enhancing healthy eating behavior among vulnerable populations.

*Keywords:* design thinking, healthy food consumption, experience, vulnerable groups

## 1. Design thinking for food consumption experience

Design thinking, the process of transforming deep user insight into new solutions by utilizing methods and mindsets borrowed from designers, has evolved to become one of the most rapidly spreading approaches for development globally (Pitsis et al., 2020). Today, design thinking is applied not only for product and service development, but for societal, political, and economic problems. For instance, d.school at Stanford University offers courses in designing for social systems with the aim of empowering nonprofit and philanthropic leaders and practitioners to work in more effective, human, and strategic ways (Designing for social systems, n.d.). The world-famous design company IDEO presents examples of how design can be used to shape the world we want to see on its homepage (The future of . . . , n.d.). Designing for circularity, reducing plastic, redesigning cities, and improving peoples' emotional well-being are some of the examples it mentions.

The food industry also applies design thinking. In a *Harvard Business Review* interview, CEO of PepsiCo Indra Nooyi explains how design thinking helped her to turn the company around (Ignatius, 2015). Design in PepsiCo is no longer limited to choosing the packaging's color. Today, design has a voice in nearly every important choice the company makes—design thinking is driving innovation.

Although its popularity has grown, design thinking is still an infrequent approach to food development (Olsen, 2015). While the design thinking approach takes consumer insight as its point of departure for development, the contemporary view within food science is to perceive the consumer's voice as a validation of the expert's voice.

While design thinking asks for an ethnographic deep dive into consumers' life to finding needs and unsolved problems, the traditional food science view asks for consumers' product acceptance. (Olsen, 2015, p. 183)

Experts' and trained sensory panelists' product evaluations are often treated as the core, while the voice of the consumer is added later in the process to secure acceptance. Few studies have empirically investigated design thinking within a food context. One of the few is a qualitative investigation of one agricultural design project in Australia, which found that

. . . a key advantage offered by design over conventional strategy and innovation approaches is the ability and the project structure to (re)frame the perceived challenges. (Peppou, Thurgood, & Bucolo, 2017, p. 13)

Another is Gonera and Pabst (2019), who identified distinct challenges and benefits of using design thinking in large food research projects. To our knowledge, no one has investigated how design thinking can contribute to healthy food consumption among vulnerable populations.

The aim of this book chapter is to discuss whether design thinking can be a useful approach to promote and enhance healthy eating behavior among vulnerable populations. After presenting what we understand by food experiences and healthy eating for vulnerable groups, we discuss how three specific aspects of design thinking—empathy, visualization, and collaboration—can promote or enhance healthy food consumption experiences.

## **2. From food product to food experience**

The food value chain is a complex matter, ranging from “the farm to the fork.” Traditionally, food science has focused on the food product. The aim has often been to optimize production, to make the product safer and healthier, to extend its shelf life, to improve its sensory properties, etc. However, over the last 30 years, consumer sciences have played a more prevalent role within food science. The MAPP, a market-oriented

research center investigating consumer food experiences, was founded at Aarhus University in 1991 (see Scholderer & Brunsø, 2013 for a history of MAPP). Already in 1995, Grunert published a model of how consumers mentally link their perception of food product characteristics to self-relevant consequences. This model describes how consumers' experience of food depends not only on their perception of food quality, but also on the usage situation, the shopping script, the meal preparation script, and their motivation to comply (Grunert, 1995).

More recently, the discussion within food marketing has revolved around food experiences for well-being. Block et al. (2011) proposed that we restructure the food-as-a-health-paradigm away from the emphasis on restraints and restrictions and toward a more positive, holistic understanding of the role of food in our overall well-being. They argued that “no one sits down to eat a plate of nutrients” (Block et al., 2011). Rather, people are seeking physical, psychological, and emotional nourishment from food consumption. Food well-being is the experiential pleasure of food, what Batat et al. (2019, p.392) defined as

. . . a journey that involves the enduring cognitive and emotional pleasure consumers gain from savoring the multisensory, communal, and cultural meanings of food experiences.

Within this stream of literature, food experiences have to do with both food practice activities and consumption—the immediate, the remembered, and the expected food pleasure are highlighted. In addition, food consumption has to do with connection to other people, food cultures, and society as a whole. The fundamental philosophy behind this approach is that greater consumer well-being can be enhanced by supporting positive associations and emotions around food activities (Batat et al., 2019). Previous studies have found support for the view of treating a food experience as a journey. Schifferstein et al.

(2013) investigated how consumers experienced a food product at different stages of product usage; they found that different sensory modality influenced consumers during their food journey. When choosing a product on a supermarket shelf, vision had the largest influence. When opening a package and cooking food, smell was most prevalent. Taste dominated the eating experience. They found that food experiences were not static but varied over time. In their review paper, Dacremont and Sester (2019) discussed how food behavior is modulated by a large variety of contextual factors related to physical, social, and temporal environments; the intrinsic properties of the food; and individual characteristics (Dacremont & Sester, 2019). Another study found that convenience food consumers faced trade-offs related to factors such as sensory perception, health, economy, managing relationships, and values related to food traditions, quality of life, and sustainability (Olsen, 2012). These findings show that food experiences are holistic, influencing many aspects of life. Sharing food is a communal act that links us to other people. In daily life, we often say that “sharing is caring”—serving food is a potentially powerful way of creating a feeling of solidarity and bonding (Belk, 2009).

A qualitative investigation of elderly people’s food consumption reported that the low food intake by these participants appeared to be shaped by a myriad of sociocultural and health-related factors (Chatindiara et al., 2020). Some of the factors it mentioned was that they hardly felt hungry and had lost interest in eating. However, being in the company of others encouraged them to eat. They preferred foods that they had grown up with, and some needed to avoid food due to illnesses, food intolerance, or chewing difficulties. Food experiences are clearly a complex matter, a matter best approached with methodology suitable for complexity. Design thinking is one such approach. Buchanan (1992) claimed design thinking to be specifically good at handling “wicked” problems—those that are incomplete, contradictory, or with changing requirements (Buchanan, 1992).

### **3. What is healthy eating for vulnerable groups?**

Consumer vulnerability is a wide term encompassing vulnerability in all aspects of life, such as in economic, social, situational, personal, or health contexts (Baker, Gentry, & Rittenburg, 2016). Although the term is easy to comprehend, its content may differ depending on who the reader is. It is therefore necessary to define precisely in which context consumer vulnerability is considered. Consumer vulnerability can be described by external factors, internal factors, or by a combination of the two. External factors are associated with, for instance, structural, economic, or societal conditions, which consumers have less control over. Internal factors are closely linked to individual characteristics, which may be tangible, or to individual states, which may be of cognitive origin (Baker, Gentry, & Rittenburg, 2016). Baker et al. (2005) stated that “Consumer vulnerability is a condition, not a status.”(Baker et al. 2005, p 137).

While considering consumer vulnerability is useful for pinpointing factors to be aware of when developing strategies for improving consumers’ situation, knowledge of who is the vulnerable consumer is the logical starting point. From a health perspective, those with serious health conditions are considered to be vulnerable consumers (Kemp, Min, & Joint, 2015). For vulnerable groups, concrete strategies, advice, or products may improve their lives. All people must eat to survive, but for some vulnerable consumer groups, what they eat is more important than it might be for other groups. For instance, consumers with specific medical conditions, children, and older people are more dependent on the nutritional composition of their diets to uphold good health.

The World Health Organization (WHO) has published five keys to a healthy diet to provide general advice on what to be aware of on a daily basis (5 keys to a healthy diet, n.d.). In addition, many countries have published their own dietary advice, including



recommendations for groups with special dietary needs (Nordic Council of Ministers, 2014). Consumer groups with special medical conditions such as food allergies, food-related non-communicable diseases, or those undergoing medical treatment are usually (or to some extent) informed of dietary restrictions by their health services. Although these groups are under medical guidance, health consciousness and food intake in these groups may vary, as shown in an example of culturally different approaches to food intake following cancer treatment (Hoang et al., 2019; Zhang et al., 2015). This poses a challenge with respect to increasing compliance with dietary advice in order to limit bad consequences and improve well-being and quality of life in these groups.

Another vulnerable consumer group consists of pregnant women and small children. The basis for a healthy life is established by adequate nutrition during the early stages of life. In this phase, mothers and children are normally followed up on by health care systems—dietary advice is an important part of this contact (Nielsen et al., 2015). However, many consumers are not aware that they belong to a vulnerable group, where adhering to tailored dietary advice can provide a healthier life. This is particularly evident as people grow older—here, changes in nutritional requirements begin in one's fifties and increase in importance with advancing age. For some nutrients, like protein and vitamin D, requirements increase with age compared to younger age groups, whereas energy requirements decrease (Gaffney-Stomberg et al., 2009). Thus, cognitively, older adults often do not relate changes in their bodies to changes in their dietary requirements. This poses a challenge for upholding a healthy life over time.

A healthy life and being able to live at home for as long as possible are desirable for both older people and their communities. Therefore, knowledge of what affects healthy eating is important to ensure that older adults can eat healthily (Host, McMahon, & Walton 2016). Healthy eating for older adults means a more nutrient-dense diet but

without a corresponding increase in energy. Because older adults normally eat less, have reduced sensory sensitivity, and may have difficulties with chewing and swallowing, the sensory attributes of foods are particularly important (Doets & Kremer, 2016).

In addition, knowledge about older adults' thinking about what healthy eating is and means to them is important. For instance, older adults differ in their following of a healthy diet based on how important they deem it to be. Some follow health advice, while others argue that they had lived so long, it does not really matter what they do (Lundkvist et al., 2010). Other drivers of healthy eating among older adults are related to social and contextual aspects (i.e., eating with family, eating with good friends, meeting and eating in cafeterias or canteens). They eat more, they think the food tastes better, and the situation is more pleasurable when they are in the company of friends or family (Bjorner et al., 2018; Vesnaver et al., 2016).

The combination of factors influencing food intake among vulnerable older adults must be addressed using new methods in order to provide solutions that work.

#### **4. Empathy with vulnerable groups**

One of the core elements of design thinking is consumer-centricity. A successful product is a product that solves a problem for the user. Therefore, understanding the user and the problem she faces is necessary in order to develop a good solution. Consumer-centricity is not sufficient to achieve this, but it is a good starting point. According to Brown (2008), for a successful product to materialize, consumer insights need to be combined with what is technically feasible and viable from a business point of view. In design thinking, the consumer insight phase is called the "empathy phase." Here, rich information about the user is collected, often by applying ethnographic methods such as participative observation studies and contextual interviews. Observing the user when

using a product in a familiar situation and asking follow-up questions might generate insights that would be otherwise hard to gain. Consumers are not always aware of what they do, and asking them questions about routinized actions, often conducted without much conscience consideration, may not be the best way to reveal problems with existing products or other latent needs that the user may have. Observing consumers in a real-life situation is a better approach to learning (Beckman & Barry, 2007). To become empathic with users, we need to hear what they say and observe what they do. We know from many previous studies that what people say is not always the same as what they do.

Accordingly, we must try to get under their skin to reveal both their thoughts and their feelings. We need to reveal their latent needs. To be empathic means to put yourself into the user's situation. First, when we are able to see the product through the eyes of the user, can we spot problems and discover opportunities for improvement.

Can empathy, which has proven successful for product development (see the review by Mitcheli et al., 2019), also be useful when promoting healthy eating among vulnerable groups? We argue that it can. No food is healthy before it is eaten. Therefore, understanding why people eat or do not eat a specific food is a good starting point for promoting healthy eating. Let us take a malnourished old woman living alone as an example. To understand why she has lost weight, it can be useful to observe her in her own home when she prepares and consumes food. We may guess about many explanations for why she does not eat. Is it boring to make food and eat alone? Does she miss someone to care for who can compliment her cooking? Do prescribed medications affect her appetite? Is she no longer able to open the food package? Are the pots stored too high up on the shelves? Does she experience a reduction of sensory sensitivity? This is all guesswork. By observing and talking to her, we might get closer to an answer.

Vulnerable groups can be very heterogeneous. Individual disabilities, medical conditions, and limitations imposed by stages of human life as well as social, political, and environmental determinants can make people vulnerable. To promote healthy eating among these groups, we need to collect deep data on their concerns and perspectives. By immersing ourselves in different groups' experiences, we are less likely to look exclusively at our own experience as the source of understanding. The empathy phase helps us to recognize that these groups' preferences might differ from our own preferences (Liedtka, 2015). This deep dive into the life of the user might also help us to broaden our perspective and let go of a too-narrow, too-focused perspective. Until we really understand the problem, it is hard to develop a good solution.

One of the challenges with such an ethnographic approach is the resources it demands. While a survey can be distributed to a large pool of respondents and analyzed quickly, it is time-consuming and expensive to conduct participative observation studies. Accordingly, these studies are often conducted on small sample sizes (Beckman, 2020). Instead of statistical generalizability, theoretical generalizability is applied. If what is observed does not hold for a larger sample size, the conclusions are of limited use. It is therefore important to look for general patterns and to conduct other studies to verify the observations later.

## **5. Visualization of vulnerable groups**

Another core element of design thinking is the ability to visualize ideas, often by applying tools borrowed from design, such as simple sketches, models, or prototypes. Metaphors, role-plays, and oral pitches are also used to communicate ideas. In their review of design thinking, Micheli et al. (2019) found 37 different types of design

methods and tools that researchers had applied, including personas, journey maps, prototypes, sketching, and storytelling.

Visualization is both a communicative activity and a cognitive device. It is an approach to allow everybody working on a problem to see the same thing. Sense-making follows a phase of collecting deep insight. Intense engagement with reflections around the observations are necessary to develop a deep understanding of the problem to be solved or changed (Beckman, 2020). Visualization is a way of making abstract ideas so concrete that other people can understand them. With a common understanding of a problem, it is easier to orchestrate brainstorming sessions for solutions or further elaborations of the problem. The problem needs to be framed—framing and reframing is at the heart of design thinking.

Can visualization also be useful for promoting healthy eating among vulnerable groups? Again, we argue that it can. Visual tools, such as an empathy map (Empathy map, n.d.), which categorizes what people say, do, think, and feel, can be helpful for structuring observations. Thinking around such a map can help user patterns to evolve, which can be described as “personas.” Personas are fictitious descriptions of users based on rich observations of real users. To make these personas more real, we provide names and pictures and describe backgrounds, skills, demographics, and other relevant characteristics. By describing such personas for different vulnerable groups, it becomes easier to imagine their situation and thereby to develop plans for promoting healthier consumption.

A sketch showing critical points in a person’s food consumption journey is another visualization technique that can be useful for understanding vulnerable groups. Safeconsume, a large Horizon 2020 project aimed at reducing food-borne illnesses, developed a customer journey map that visualizes critical customer handling points for

safe food handling at home: 1) planning, 2) shopping, 3) packing, 4) transporting, 5) storing, 6) hygiene (both personal and for the kitchen), 7) preparing, 8) serving, 9) eating, 10) storing, and 11) disposing of food. What type of food we buy, and how we transport, store, prepare, and consume food, matters. Illustrating this complex process that is based on scientific evidence in a simple drawing makes it easier for the team working to improve food safety behavior to form a common understanding of critical consumer handling points that need to be addressed. Similar customer journey illustrations can be developed for specific vulnerable groups, helping to communicate where the critical points that need attention are.

Liedtka (2015) argued that the visualization methods applied in design thinking have a positive effect on the outcome because they improve researchers' ability to envision other peoples' experiences. Visualizations, such as personas and customer journey sketches, help "decision-makers take in and hold onto the rich details of the lives of those for whom they seek to create value" (Liedtka, 2015, p. 9). Visualizations stimulate decision-makers' imaginations, reducing reliance on their own past, broadening their field of vision, and helping them to acknowledge that different groups may have different preferences, which are all good for idea-generation and problem-solving.

## **6. Multi-disciplinary collaboration for promoting healthy eating**

The third core element of design thinking we wish to highlight is collaboration. Design thinking promotes collaboration, both within different departments in an organization and across organizations. Even co-creation with users, as in engaging users in generating, developing, and testing new ideas, is common within design thinking (Liedtka, 2015). One of the design thinking slogans is to develop *with* users, not *for* them (Olsen, 2015). Users are perceived as resourceful actors who have a first-hand understanding of the

problem, and they should therefore collaborate with designers to transform the situation. Multi-disciplinary collaborative teams consisting of people with different knowledge and skills are more likely to result in successful innovations compared to homogeneous groups consisting of like-minded people (Micheli et al., 2019). The underlying principle is that heterogeneous teams are necessary to sort out complex problems.

Food production is clearly a multi-disciplinary industry. To be able to promote healthy food consumption among vulnerable groups, many actors need to collaborate. Medical competence needs to team up with food competence. In addition to knowledge about the body and the food product, knowledge about peoples' behavior and sensory experiences should be included. Regarding the latter, psychologists, social scientists, and sensory scientists are more knowledgeable than medical doctors or food technologists. Depending on which vulnerable group we focus on, other experts may also be included. For malnourished elderly people, nutritionists, geriatricians, other family members, or chefs from institutional kitchens (like hospitals or nursing homes) might be relevant actors.

One of the factors to be aware of when promoting multi-disciplinary collaboration is the common finding in the organizational behavior literature that collaboration with similar others produces smoother and more harmonious group processes, improves willingness to share information, and gives homogeneous groups an advantage over heterogeneous groups (Veflen, Scholderer, & Elvekrok, 2019). However, what is more important than smooth collaboration is that sharing unique information has a significant positive effect on team performance (Mesmer-Magnus & DeChurch, 2009). Sharing information that is not commonly known among all team members builds up the available stock of knowledge and improves the outcome.

## **7. Implications for design thinking scholars, the food industry, and public policy**

The practical implications of design thinking can be illustrated using an example from a research project led by a food industry company in Norway. The aim of the project was to design a complete daily menu for retired older adults, 67 years and older, living at home. The designed and developed food concepts needed to meet the group's needs with regard to dietary requirements, taste, acceptability, and usability.

The first task was to be empathetic with the users—here, uncovering the older adults' own experiences, thoughts, and needs. A university course on design thinking was the basis for tackling the challenge, and through the students' work to follow the design thinking process, they developed a number of concepts demonstrating a variety of solutions ranging from apps to social facilitation to advertising to food and meal concepts. The development of these solutions involved a wide range of actors, including information technology (IT) specialists, social welfare actors, marketers, and food producers. The outcome of the design thinking project was perceived as being valuable both for the users and for the food industry initiating the project. The users, in this case vulnerable older adults living at home, liked what the designers developed for them. The food industry was also satisfied, since it got suggestions for new products to offer. The designers involved in the project claimed that the project provided them with new insights that they could not have encountered by other means. The university students were satisfied since they learned the design thinking approach by doing.

This project had clear practical implications for many actors, and other design thinking projects may have other implications. Design thinking projects may, for instance, empower people by developing products or services that make them less dependent on help from others, or by developing less expensive solutions that low-income people can



also afford. Design thinking has also been applied to public policy problems, such as developing good food experiences in hospitals. By making the dining room into a social area that created a home-kitchen feeling with familiar interior design and the smell of food, a Norwegian hospital greatly improved patients' food experience and consumption.

Design thinking has proven useful in many practical situations. What is needed now are empirical studies investigating when design thinking should be applied and when it should not. Most approaches have their limitations—so does design thinking. Some researchers even compare design thinking to syphilis (Vinsel, 2017). We need to move on from the many anecdotal success stories and start collecting scientific evidence of the usefulness of design thinking. Few studies have empirically investigated the effect of design thinking (the exceptions are Leenders, Engelen & Kratzer, 2007; Seidel & Fixon, 2013; Roper, Love, & Vahter, 2016). To be able to develop theoretical explanations for why design thinking works, we need more empirical studies. A good starting point could be to test conceptual design thinking papers, such as those by Liedtka (2015) and Thompson and Schothal (2020).

## **8. Conclusion**

Applying design thinking to promote healthy eating in vulnerable groups provides a new dimension to an area characterized by many traditional approaches. The advantages lie in design thinking combining insight and knowledge from widely different areas in ways that are understandable beyond that separate scientific disciplines have set. Three aspects of design thinking are particularly relevant: empathy, visualization, and collaboration.

- Empathy places the target group at the center, with knowledge and new ideas revolving around them.
- Visualization provides the tools that bring understanding and ideas to tackle the challenge.
- Collaboration ensures that relevant actors are involved, and that the process covers necessary steps to a successful outcome.

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