Abstract

Humans are not ready for what humanity has created

By 2020, chronic diseases will account for almost three-quarters of all deaths worldwide. This is a result of malnutrition in today’s food environment.

The food industry takes advantage of predisposed human preferences for sugar, salt, and fat. This creates the necessity for individual willpower and habit control and leads to decision fatigue of healthy food choices in our already busy lives. The critical issue is that we as humans are not biologically ready for what is offered to us today.

Situated between nutrition science and human psychology, this project aims to critique the food industry and our interactions with food by reflecting on human weaknesses and habits. A combination of human centered design and critical design allows this project to address this issue through communicating the needs of what might have to happen if our behavior and environment do not change.

This project is meant to create a critical reflection around our personal relationship to our own body with the hopes that this may lead to an individual awareness of our own food relationship.

How might we enable humans to catch up with the food environment today?
Numerous people have crossed my journey during my thesis and for every single person that gifted me with a smile, some time to talk and support in any way possible I would like to say a big thank you.

I want to thank my tutors and supporters Tara Mullaney and Søren Rosenbak for their guidance, patience and encouragement during my exploration into this new territory. Their knowledge and experience was the key ingredient for me to be able to push the boundaries.

A special thanks also goes to the people at Umeå University for all the knowledge sharing around nutrition, public health and creating with food.

On a more personal note I would like to thank my family for listening me up whenever about anything that I felt like sharing. A huge thank you to my love Doug for standing by me in every situation and for never letting me doubt myself.

Authors note
1. INTRODUCTION

‘When people need medical advice, they go to their GP and when people have a toothache, they go to their dentist, but some people will believe almost anything and anyone when it comes to nutrition, food and diet.’
Sian Porter, Dietitian

Motivation

Last year during my internship I had the opportunity to work on many healthcare projects in the field of chronic disease. I really enjoyed that area, but at the same time was overwhelmed to see how pharmaceutical companies have so much power over peoples health. To see how much people are dependent on chemicals and of how little they understand of what impact their food choice has on their health was startling to me so I decided to further pursue that topic for my thesis.

Growing up on the mountains right next to farmers, fresh vegetables and fruits and being surrounded by the people that only cook with fresh ingredients, my world of food was simple. I didn’t have to think about what was healthy, everything was fresh and homemade and as a child we played outside in the fresh air so much, we would just burn it away right away. Even though that was the case, I have always been very interested in nutrition. I remember as a 8 year old, I would unpack the chocolate, break it into pieces and tell myself how many little pieces I was allowed to eat over time.

Things have changed since then and traveling around the world has given me a new perspective. Also, moving away from home and needing to make more of my own food decisions was not as easy as I thought. I used my body to experiment with different food behaviors and unintentionally test what food will do to my body. From this experience I was able to feel and see results and create a very sensitive reflection process towards food with my body as the tool.

Making food decisions and dealing with planning what to eat every day can be just the extra decision that we don’t have the energy for after a long day. How often are we desperately looking for inspiration on what food to make for dinner or our next lunch break? Does how we interact with food today still fit into our lives?

During this project I also used myself as a test subject with the intention of conducting a self study. Even though two of my favorite things to do are baking and eating chocolate, I know it is not good for me. I can even feel the negative impact on my body with occasional little symptoms. Therefore I thought, if I do a project around healthy living and nutrition, I want to follow my own research and address my individual health and habits with food. Therefore I stopped eating chocolate and have removed nearly all of the carbohydrates from my diet. In addition, working out has become a regular event in my routine and one of my first priorities.

Background

We are built to survive. We strive to live and reproduce. The desire for food and sex are the most natural desires we have as human beings. By applying our most natural behaviors to our everyday lives we take them for granted. Often these two desires are used to brighten our day or to celebrate our achievements. Thinking about it this way implies that we use them as additions to our lives rather than our lives revolving around a life driven by healthy eating.

In the western culture we tend to be overloaded with the availability and sheer number of food options that we have. Have you ever caught yourself being mad about not finding one ingredient in the grocery store? We are used to having it when we want it. We walk into the store, often unsure what to get and let our emotional mind drive the act of choosing food that we desire. Today our desires push us into a direction that has nothing to do with survival. (Bloom P., 2010)
2. METHODS

Critical Design

The term ‘critical design’ is basically used to formulate a certain attitude. It was first used by Dunne and Ruby in 1999. Dunne and Ruby say that many people practice critical design but either don’t know it or just don’t call it that way. (Dunne&Ruby, 2013)

Critical Design can be used to reveal social and environmental conflicts caused by human actions. It is a form which addresses big problems that are difficult to solve or may not be possible to solve in the short term. As opposed to a process which ends in a solution, Critical Design is practiced to make people think.

Critical Design can sketch out possibilities with provocative, imaginative qualities or can be used to outline new areas of interest for designers.

Dunne and Ruby say that this method can provide ‘complicated pleasure’ to challenge what is around us today and provide alternatives challenging the viewers minds. “Ultimately, it is a catalyst for social dreaming.” (Dunne&Ruby, 2013)

For my project I found the space between science and human behavior most interesting. The tension between our emotional mind and our scientific needs are a space where I wanted to dig deeper. Through initial analysis and framing of the problem, it was clear to me that within the topic of nutrition I wanted to create a critical design which makes people think of what is and is not in our power of understanding nutrition and how our decisions impact our health.

This project is meant to ask questions rather than find a solution. It is meant for everyone who is ready to think about their health and what the future of human beings may be if we move forward in the same way that we have been in the last 80 years of food supply and human cravings. I am aiming to build an audience rather than target specific users.

Interviews and Workshops

To create the foundation for a moment of tension rather than a solution, I conducted interviews and workshops with people of different backgrounds to understand their relationship with food.

For me, I am using this process to understand behaviors in nutritional planning and how people with a great knowledge around the topic, such as dietitians and athletes, deal with nutritional habits and the food environment today.

Since this project is walking a fine line between realism and near future, it was important to me to have people respond to my thinking and realize the border of where it is too much as well as where it starts triggering peoples mind.

Storytelling

I want to use this project as an opportunity to tell a story and experience that makes us question the realism in it. By creating artifacts and videos to make the environment believable and question its existence, this project is meant to draw people into a reflective space to make them ruminate about their own food interactions and their bodies.

Goals and Wishes

My goal for this project is to create a space to invite people to think about their bodies and the food choices they are making and raise awareness that our desires are tricking us to eat too much energy rich food in today’s environment.

I believe if we increase our sensitivity and self awareness of what our body is often trying to tell us, it might be our best option to judge our own health and get to know what causes our bodies reactions.

For myself as a designer, I wish to learn more about the critical design practice and how I can use it to inform human centered design. In addition, I want to learn more about how to place a design outcome just right to make people think further than the obvious.
I have used my research to get a better understanding of the food environment and our bodies. My research was a combination of expert interviews, user studies and investigations into human behavioral studies. During my process I have conducted interviews with specialists in nutritional science, metabolic science and health care. Talking to specialists in these professions enabled me to draw conclusions from the field of science with knowledge that is relevant today. In addition, I talked to Athletes, who are often on a regimented eating and nutrition plan and have a view of food which can be quite different from the majority of the population. A variety of insights from both the scientific and nonscientific yet disciplined research groups enabled me to achieve a better picture of our environmental influences on food and how we interact with it.

I kept my research very open at the beginning, since I wanted to explore and find out where the conflicts lie in our understanding of nutrition and where design could tap in to bring this very ingrained problem to the surface. During the time of my interview sessions I did a lot of reading and secondary research into the topics of psychological and physiological studies with the idea that these could be major contributors to our eventual decisions. What makes us human and why do we make the choices we make?

For my research I was planning to focus and find directions from the following topics:

**Human behavior and food habits**
How we eat and how do we create food habits?
I believe that in order to make a change in a very natural behavior, we as humans need to understand our behaviors first. Therefore, this project uses scientific and knowledge-driven design research to create the basic groundwork for reflective and provoking behavior.

**Food environment**
How does our lifestyle influence our food choices? Are we manipulated by our surroundings?
The project is meant to look into the changes that have taken place in the food industry over the last 80 years in the western culture and how this affects the decision making with regard to food and healthy lifestyles.

**Evolutionary physiology**
What are we made to eat and do we know what our body actually needs? Regardless of where this question leads me towards, it is a leading thought in this project. Focusing on the physical needs and splitting them from the emotional driven decision making, is a conflict for humans and their health that this project intends to further investigate.

**Quantified self**
How much technology will we need to find out everything about ourselves? Will we trust technology more than our own instincts? In the past few years this topic has emerged as a new way of understanding how our bodies work. This movement was interesting for me to study and to imagine how it might evolve in the future. In addition, it was important for me to investigate how it could potentially help in the relationship between nutrition and the body.

**Alone vs social**
Given how much food contributes to our interaction with other people I wanted to look closer into how keeping a regimented eating plan influences our social life and how this is accepted in our surroundings.

For me the space between science, technology and humanity presented a significant amount of tension and I wanted to dig deeper into finding more crystalline conflicts about food habits and why society is becoming increasingly unhealthy as our separation from a traditional food environment increases.
WHY IS NUTRITION IMPORTANT?

Fuel

Nutrients are the fuel for our bodies. Our food is supposed to be full of nutrients which are transported into our digestive system to then get extracted from the food and to help us grow and provide the energy needed to live healthy lives. Some foods include more nutrients are richer in energy than others. Although our food selection has become bigger over the years and the global food market has allowed for greater availability of a variety of food items, this does not mean that we are intaking more nutritious food than we did years ago and in fact may be opposite of true.

Nutrition Guidelines

The government as well as nutritionists provide us with nutrition recommendations which are based on evidence of what is thought to be good for us. Even though nutrition is a big part of our overall health and well being, interestingly enough, it is not a mandatory part of the medical education curriculum in many countries.

In 1985 the National Research Council stated that nutritional knowledge should play a bigger role in the medical education, but as of yet nothing has been changed in that regard and doctors themselves are no more immune to these diseases than their patients.

Nutrition guidelines are resourceful and detailed, but the information provided is too vague and generalized to accommodate the individual needs of everyone. In addition, the way in which the information is presented can come across too scientific for someone who only has an average level of understanding of food and nutrition.

Research

Nutrition Science appears to be a very young field which is constantly evolving. Because scientific studies need to be reproducible and verified by outside sources to be considered legitimate, it is nearly impossible to satisfy these guidelines. To really point out what is good for us and what is not good for us seems to be very hard for both scientists and researchers. The reason that it is so difficult is that there are a great number of variables which must be considered in terms of nutrition. Not only are our bodies all unique and changing, but also our environment and the technology used to create our food are constantly evolving. This creates even more variables which must be understood and addressed in order to appropriately analyze our nutritional status. All of these result in a change in our food production as well as our consumption.

Personalized Needs

An upcoming trend is that nutrition science is looking for answers in how to individualize or personalize our food intake. Targeting one person’s genetics, cultural influences, and food preferences can help to point out nutritional deficits to make a change. (American Society For Nutrition, 2012) So why are we still looking for holistic answers and diets which work for everyone? The idea of following a food pattern that is working for everyone would be a dream for many people, but in practice is very unrealistic and often unachievable.

Public Health

Data shows that chronic diseases such as cardiovascular disease cause most of the deaths in the world today. This commonly stems from poor nutrition and a diet which includes an increased sugar, fat and salt intake. The authors of the book Sick Societies have referred to this self inflicted disease as a ‘rational slow suicide’. (Stuckler & Siegel, 2011) In 2004, Governor Tommy Thompson, U.S. Secretary of Health and Human Services, said “We just eat too damn much.” Obesity is often one of the first indicators for us to visually recognize an imbalance in energy intake versus energy output. The rates of obesity are still increasing because of the fact that the fact that many of us are eating too much and exercising too little. It is clear that simply letting people know how much to eat or what to eat is not the answer to this epidemic. Robert Lustig, author and pediatric endocrinologist add, has proposed that our overweight and unhealthy population is all a result of our environment and more specifically a direct result of the increased development and reliance on today’s food industry. (Lustig, 2013)
NUTRITION AS HEALTH INFLUENCE

Human evolution

Biological evolution
We are wired to survive. Our instincts are designed so that we like the food that is nutritious and rich in calories. From an evolutionary perspective, we want to be fat. Fat is the source of energy in our body and without it there would be no human race. After our body has stored fat it doesn’t want to give it up anymore. As fat cells get smaller they stop producing leptin and if there is no leptin, there is no puberty and no pregnancy which leads to a discontinuation of the human race. Evolution in short means essentially to reproduce and to develop. Food is an essential element in our development and is key to the future development of our species and our environment.

Cultural evolution
In the last 12,000 years humans have evolved in terms of language and culture and have dispersed around the globe, but in terms of biological evolution we have changed very little. Lieberman says that the dominant force of evolutionary change today is the cultural evolution which can cause health problems through poor adaptation to the novel environment we live in today. Even though we are not creating a new species, we as humans change. As a result we create all kinds of diseases that did not exist prior to the 21st century. (Lieberman, 2013)

Mismatch diseases
In human history we have most likely never lived longer or been healthier than we are today. Most diseases that used to kill people such as measles and smallpox are no longer a threat to us thanks to modern medicine. However, we also never suffered from this self inflicted many diseases like obesity, type 2 diabetes and chronic, preventable illnesses.

Practicing medicine is focused on treating one symptom at the time and because this is working out very well in most cases, we often don’t determine what caused the problem in the first place.

Mismatch diseases are caused by our Paleolithic bodies being unable to fully adapt to our new environments. For every individual there is a difference in how their own body adapts to the new environment and the characteristics they are living in. A common characteristic of these diseases is that they occur over a longer period of time and symptoms don’t immediately result. This is another reason why a preventative and more holistic lifestyle change would be important, but as we know from experience, we often don’t do something against it unless it is happening and obvious and in these diseases this might be too late.

We can’t pass on mismatch diseases directly to our children, but it is a result of our cultural evolution and we pass on the environments and the behaviors that cause these problems. (Lieberman, 2014)

Inborn preferences
“Taste buds tell your brain whether or not to swallow what’s already in your mouth.” According to Dr. Bartoshuk

Favorite for sugar, salt and fat
There are preferences that are hard wired in us. Humans naturally like sweets since sugar is one of the richest sources of calories whereas we dislike bitter things because bitterness is an indicator for toxicity. (Bloom, 2010)

In nature sweetness identifies safe food. No sweet foods are poisonous and so we prefer sweetness by default. As a baby we learn a new taste if it is introduced to us ten to thirteen times, but a sugary taste only takes one try before babies fall in love. This explains quite well, how easy we are hooked to sugar and why we almost can’t resist it. (Lustig, 2013)

Habits / human behavior
If we look at the way that we as humans decide on what food to eat, we often chose pleasure over nutrition. The taste, flavor and sensory satisfaction are so powerful that we
simply overlook if it actually is good for us. Finding excuses like “I deserve this” or “I want this because it makes me happy” allows us to undeservingly justify our potentially poor choices.

To me it is fascinating how difficult it is to overcome learned behaviors especially if they have to do with inborn preferences. Learning new tastes and building new behaviors around food habits in today's food environment is like Daniel Lieberman says when he states that “it takes super-human effort to lose weight”.

No processed food is directly wired to our brains. Food habits emerge through the reward of satisfaction by eating sugar, salt or fat. The food industry relies on food technologists to make sure that these preferences are exploited and to create very enjoyable yet ultimately unhealthy food habits. Why would we spend time and potentially unpleasant effort learning a new taste, if we can get the tastes we like? By associating the engineered foods with the reward system of our brain, we create pleasant memories and habits. This eventually leads to neurological cravings, which evolve gradually over time. We are often not really aware of the existence of these cravings and are blinded by their influence. Whenever we see a cake or chips, we know how satisfying it is to eat it, because we had it before. That is why these habits are so powerful.

If we are willing to change our behaviors towards food and shift the focus of the reward to something such as feeling energetic, we would be able to create new habits and maybe even overcome some environmental influences. (Lustig, 2013)

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**Decision fatigue**

Today’s food habits are not only a result of learned memories and cravings. Another important point is the way in which we fit the food into our daily routines. In our consumer oriented environment, the number of food choices and possibilities is always increasing. More and more similar products are coming to the market. Having a choice is good and it is easy to think that the more choices we have, the better the outcome will be and that more choices enable us to express who we are and what we stand for. Although having choices is a good thing, it doesn’t necessarily mean that it is better. Too many options also implies that there is more pressure on making the right choice. (Schwartz, 2004) By making decisions over and over again we get tired of it and the strength of our willpower fades away. If your brain wants to just relax it will most likely fall into making easier decisions or resort back to something familiar rather than something new. This phenomena is called ‘decision fatigue’. (Clear, 2013)

Sadly, our food decisions often suffer from this phenomena. The easier and faster it is, the better. If we want to make more health based choices, planning and giving more importance to our nutrition and its relationship to our health can be a way of overcoming a bad choice in food.

**The bliss moment**

In 1991 an Australian psychologist, Robert McBride said “…the bliss point is a powerful phenomenon and dictates what we eat and drink more than we realize” (Moss, 2013)

This bliss moment is the moment when the exact amount of sugar, fat or salt has the perfect dose to make food pleasant (Moss, 2013). This moment dictates what we eat and what we want to eat more often than we realize, which is what makes it one of the most successful recent accomplishments of the food industry. Sometime during the 1970s the term ‘bliss point’ first appeared in Boston by a mathematician named Joseph Balintfy, who worked on predicting eating behaviors through computer modeling. Since then food technicians have been working on perfecting the formulas for products such as soda and potato chips along with many other familiar items.


3.2 PRIMARY RESEARCH

Interviews

My collaboration with the Nutrition department in the Umeå University allowed me to connect with a diverse group of people in the field of nutrition science. At the beginning of the project I made a choice to understand the extremes in human behavior around food. Talking to professionals in the field of nutrition and food was important to me to understand their point of view and their own food habits as well as their professional and scientific knowledge around the topic. I was able to carry out interviews with Nutritionists, a Chemist, a Physician, Dietitian and a Chef for culinary arts. My desire to see the extremes of human behavior around food also led me to talk to athletes and discuss how they interact with food. I was fortunate to have access to Iksu and was able to talk to several professional athletes with very different personal approaches and beliefs toward food. The input from these athletes, and their extreme eating habits made my research richer and showed another side of food routines and regulation.

“*It’s a learning experience in the limits of science!*” - Gary Taubes

*Why I chose to work with experts in the field rather than an average user?*
Since science doesn’t always provide definitive answers, it would be difficult for me to say I know it better than somebody else, since that is not at all possible and true. We are unique individuals and have very individual needs, but our culture in food habits and rituals and the offer of so much junk, makes it a matter of willpower and regulation of ones food habits. Therefore I was interested in interviewing people that are well aware of what food does to their body and discovering if knowledge helps them make better decisions. In addition, I was interested to hear how athletes that create knowledge about food by looking at the impact on their bodies as well as its impact on their performance.
Nutrition Science

At the beginning I wanted to get a good understanding of where we are with scientific knowledge as well as how the scientific research is looking at the obesity epidemic. Over the course of my research I was able to talk to 4 different people in this area.

Anna, a chemist, is doing her PhD in metabolic science and is studying the effect of certain Vitamins on the human body. She said its hard to get accurate data from the studies she does, since participants often falsify their food intake data.

Petra is a nutritionist, a professor at Umeå University and a Mother of three boys. Even though she is in the field of nutrition and she likes to eat for the health, she experiences difficulties in keeping her nutrition the way she likes it for herself and her family. Individual preferences inside the family setting requires a lot of sacrificial decisions.

Elin works as a dietitian and has her own business. People usually come to her with the goal of making a change in their lives. She often has to deal with peoples opinion around food knowledge which has been accumulated from the news and often they like to tell her what is better or worse. Also, to help the situation because in her point of view, medical doctors don’t do anything they don’t know enough about the impact of nutrition on their clients.

Bernt is a physician and works with Behavioral Medicine. He conducts studies around psychological impacts on healthy living. The combination of medical health & mental science. “What we know about food is that there is the good kind of food and that we shouldn’t go extreme, but there is no solid answer.”

Some questions which were asked to this group:
How do we understand nutrition in the public?
What impact does food have on us?
Relationship to food and how we eat?
Food policies and food production today?
How does our digestive system work?

Athletes

My motivation to talk to Athletes was really to see how people with enormous discipline work with food. A professional bodybuilder who I interviewed explained how she just makes up her mind and sticks to it until the goal is reached. Athletes do a lot of food impact testing on their own and often deal with weight gain and weight loss throughout the year for professional reasons. For athletes a healthy lifestyle is almost unavoidable to see and feel results in their discipline.

I was able to interview 4 different type of athletes.

Pernilla, a former professional soccer player and now fitness instructor thinks that we owe it to our body to eat the best way we can.

Amanda, Fitness Professional in Bodybuilding is mentally so strong that she sometimes needs other people to point out that she is ill and shouldn’t workout. Another example of her discipline with regard to her diet is that she weighs her food in grams to ensure absolute accuracy with energy intake and output when working out 3h everyday.

Karl, a Jujitsu National winner in Sweden and also medical student eats what he likes and hopes it has what he needs. With his training as a medical student, he says nutrition is so far away from being scientifically understood, that he has critical thoughts about what we should eat.

David is a personal Trainer, Nutritionist and Vegetarian. He is fascinated by how we can optimize our energy storage for the activities we are planning to do.

Some questions which were asked to this group:
Would you say you eating for health or for pleasure?
Can you imagine to divorce nutrition from food?
Do you know how many nutrients you need per day and what food can provide you with that?
Does your sport require a certain diet?

“In sport we overcome a lot of things by mental strength. So food is just a small part of it.” - Amanda
### 3.3 FINDINGS

**Listening to the body**

“The doctor says I am not allergic, but I can feel the pain” - Pernilla, Athlete

“I use my body to listen to what food is good for me.” - Amanda, Athlete & Diabetic T1

“When I was playing in the National Soccer team, so many people tried to tell me how to eat, I almost felt like I lost myself and I don’t know at all what is good for me.” Pernilla

Listening to their own body was often used as an indicator of how food really affects them. The people that mentioned it also said that it took them a lot of trial and error to know what works for them, but was the only way to be healthy they said. The food choices people make always affect the body in one way or another, but it depends how sensitive people are listening to the small indicators or if most people wait until they are ill.

**Choice on the Market / Temptations**

1

“Everyone thinks they know a lot”- Elin, Dietitian

Making a healthy food choice is impacted by a lot of environmental influences; the huge variety that we are offered in the stores, the media that tells us something new every day and the peoples opinion around us.

2

“If I wouldn’t have all these choices, I would eat healthier.”

client of Dietitian

“If I have cravings, I just stick something in my mouth to distract myself”- Amanda, Athlete

For most people it is not the knowledge about what is healthy food, its more the willpower to stick to the healthy food.

**Willpower**

“My clients have tons of excuses to eat unhealthy. Celebrating achievements. Celebrating being happy…”

When people start getting serious illnesses or if they are pregnant, all they can think of is how to eat healthy. - Elin

“My participants like the easy way out and like to blame somebody else for their mistake.” - Bernt, Physician

“People always lie about their food intake, they feel ashamed of their failing, since they know what they shouldn’t eat” - Petra

A need for willpower to make healthy food choices appeared to be the only solution that came up during my interviews as a way to stay away from the junk food. ‘Mind over Matter’ is a common expression which is frequently used by athletes to achieve their goals. Everyone knows how hard it is to leave sugar, salt or fat out the diet. Eating for well being only often gets overruled by the sense of pleasure. Why would we give up pleasure if it makes us happy?
Eating Frequency

“I am eating when I am hungry, I don’t wait until the evening.” Pernilla

“People wait too long from lunch to dinner, then they eat too fast and too much.” Elin

“It’s important to look at how we eat, since that is often more important than what we eat.” - Bernt

In the modern society we created fixed times to have meals; breakfast, lunch and dinner. The business world adapted to this module and most cultures follow this structure. It’s interesting that we have bigger meals at certain times and snacks in between. During my interviews I learned that for the people that are healthy and fit this system doesn’t apply, they would rather eat when they feel hungry and eat smaller portions during the day. Basically their body tells them when to eat, not the time.

Individual vs. Social

1 “I do eat unhealthy with my family even though I am a Nutritionist and I know it’s bad for me” - Anna

Making food for a family requires compromises and the need to, at times, also cook unhealthy food. Since kids have food interactions at school which influences their taste, it will impact what they want to eat at home.

2 “I need my partner to understand how I eat and it’s easier if he eats the same thing” - Amanda

To follow a healthy eating routine the people around us need to accept it or understand it.

3 “I always cooked differently than what my parent ate” - David-Nutritionist

“When I am going home, I always want to cook for my family.” - Pernilla-Athlete

More often the younger generation wishes to cook at home or cook differently from what their parents would normally eat. The diet of our parents is often based on the western culture standard diet and includes a lot of energy rich food.

4 “Taking a break often has to do with a snack. Like Lunches, Fikas, going out for dinner.” - Elin-Dietician

Social events can be a compromise for staying healthy. Most of the subjects who were interviewed in this project say it is difficult to have friends around that don’t understand their habits or that come from a different environment. Rejecting food seems to be rude and puts people that care for their health into a contradicting position. Food is involved in so many different social activities curated in our lives. Often food is the excuse to take a break or to stop working.
4. RESEARCH - ANALYSIS

After the interviews, in addition to discovering complementary information in books and articles, I mapped the findings out and discovered the contrast between the topics of science and humanity. I realized that it was basically impossible to give people quick nutrition advice. We might think we know a great deal about food based on strong cultural attachments as well as historical knowledge. However, times have changed and some conflicts around nutritional advice have become apparent through my research.

4.1 CONTROVERSIES

The research validated that the problems we have today around the food environment are much bigger than they could be addressed with one design solution.

These problems are not new to us and most people are aware of the results. Never the less, the situation is not getting better and the obesity rates are going up. I find the space between science and humanity very fascinating. Perhaps not everything can be solved with research, but maybe our emotional nature is smarter than our rational mind?

We often try to find the same answers for problems in either of those two categories. Philosophers and Scientists try to make their point by marginalizing their field of expertise.

For me as a designer this is a very interesting space to work and for this project I am claiming to have a space between those two.
Controversies between science & humanity

1 Nutrition-requirements are made for the public

Most people don’t understand what they intake in terms of nutrients

The nutrition requirements around the world are made for the public to be able to educate themselves about the nutrients we should intake and give advice on what kind of food we can eat. In most cases, these requirements are written in a scientific language yet vague enough that it is difficult to actually understand and quantify. Everyone I interviewed about nutrition said that they never use the word ‘nutrition’ in front of a client. If they talk about protein people don’t understand but if they say eggs, meat, fish then clients start to get an idea.

2 Science says they know a lot about nutrition but can’t be sure

People believe everything written in the media

Everything we find about food in the news is very contradicting. As soon as we find an article about how good coffee is for us we find one that says how bad it is. Scientific research is working hard on understanding how food and human bodies really work and what we need, but unfortunately it is a young science. The findings often come with a lot of restrictions and the effects are often not the same for everyone around the world. That said, it doesn’t stop people from writing diet books, drawing unproven conclusions, and making theories widely available as if there is one formula for everyone.

3 Technology allows us to make food more available (Biological Science informs the food industry)

People believe everything written in the media

Today’s food in developed countries is long lasting and constantly available. Food engineers are doing a great job in making it appealing and lasting to make sure we don’t suffer from hunger. Most foods today are highly processed, and we don’t even know if our fruits and vegetables are free of chemicals. We do know, however, that food includes a lot of additive taste makers which are based on our inborn preferences. Making processed food available which we are wired to crave is the biggest mismatch we are facing today. Human evolution is not as fast as technology and therefore we fall into the trap of having to overcome natural human instincts.
4.2 CONCLUSIONS

To bring the research to a point where I could start building arguments which I was able to work with, I extracted the essence of all the findings of my research as well as secondary research. This narrowing helped to create new starting points for the ideation phase as well as create a foundation for opportunity areas to grow upon. The key points which I have drawn from my research are as follows:

1. **WE ALL HAVE INDIVIDUAL NEEDS, THERE IS NO SOLUTION THAT FITS ALL OF US.**

One of the leading conclusions from the entire research is that there is not one solution to tell people how or what they should eat. Our organism is so individual and everybody needs to individually calibrate their own intake in order to function in an optimum way. Hearing from Athletes as well as Nutritionists of how it is a trial and error road to success, and not one rule that fits everyone, seems to be a matter of being able to listen to our own body instead of to the outside world.

2. **BEING HEALTHY IS A CHOICE AND, IN TODAY’S ENVIRONMENT, IT REQUIRES SUPERHUMAN ABILITIES.**

As described in previous findings, making healthy choices basically means to work against human nature. The inborn preferences for sugar, salt and fat make it hard in today’s food environment to withstand the desires. The food industry is making sure to include these human preferences in our food choices to make us buy more processed food than is actually good for us.

3. **BIOLOGY PREDISPOSES US TO LIKE CALORIE RICH FOOD**

It may not be our fault when we get sick and obese, we could blame our slow evolution. In order to survive we store food for more scarce times because that is how our bodies are designed. The more we have the more we want it, and that is only because these kinds of food were so rare, we needed to store what we got for later. Well this ‘later’ we made to disappear for a better life. Now this life is making us sicker with diseases we didn’t even know could exist.

4. **HUMAN EVOLUTION IS TOO SLOW FOR WHAT HUMANITY IS CREATING (TECHNOLOGY)**

Only through more nutritious food we were able to evolve our brains. The kind of brains that are smart enough to create technologies that make our lives easier. The technology that allows us to have consistently available food in developed countries. Our food consumption has been growing dramatically over the past 80 years, but the quality of the food we eat is going down. It might taste good, but nutritious values are lacking. The human biological organism is not made for a constant influx of food or for artificially created food. All our bodies are trying to do is to keep us healthy and its up to us what fuel our cells will use to grow.

5. **GET TO KNOW OUR BODY TO IDENTIFY EARLY SIGNS**

Creating a sensitive relationship with your body can help identifying what is working for your body and what is not working. There are different indicators on our bodies that are correlated with our well being. For example, our skin or our fluctuations in weight. Hearing from the athletes about feeling what makes them tired or how they can achieve their goals by listening to their body is a key aspect in us understanding our bodies in order to better understand our health.
4.3 DESIGN PRINCIPLES

To break down my findings and conclusions I put them in a simplified form to be able to relate my design to my research during the ideation process.

- **Personal / Individual**
  It is for personal use to trigger personal reflection. Targeting individual needs.

- **Fictional**
  It is fictional to reflect on a possible consequents of human behaviors.

- **Relevant**
  It is relevant for people today and easy to relate to.

- **Engaging**
  People will be able to set action of food interactions.

- **Humorous**
  The space between science and humanity is serious enough, so the interaction should be fun with a serious message.

- **Inviting**
  Low threshold of understanding to create a bigger audience.

- **Critical**
  Criticize the food industry through a personal interaction.

- **Illuminating**
  Giving some information about humans biological evolution in relation to food.
To explain where I ended up with my final design I want to go one step back to explain my journey:

**Overview**

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5.1 FOCUS 1: ‘NUTRIENTS OVER FOOD’

In the beginning of my ideation phase I started with focusing only on nutrients. These nutrients would serve as the building blocks of food which would be fashioned to target personal needs of people. My theory revolved around how difficult it is to make the right food choices and that the complexity of food is hard to quantify. The knowledge from a scientific point of few was not bullet-proof and the idea of a clear nutritional belief led to my research of the bigger conflict between our individual human composition and the current environment.

By digging further into this situation I imagined a future where we would be able to know exactly what our body will need to be healthy and proactive for the future health status. This idealistic thinking brought me to where technology is able to quantify humans nutritional needs with an infrastructure that is supporting these new eating behaviors. This concept eliminated decision making and the risk of eating by emotion.

My key curiosity was driven by how such an environment might influence the four following ‘Opportunity Areas’ and what these would mean projected into the near future with its consequences on humans.

![Individual Needs](image)

**Individual needs**
A 24/7 check that allows a constant body vital update for a perfect base to target the body with the exact needs. This is basically the base for this concept/world to work. So the concept is staged in the future.

**Shape nutrients**
How might we shape nutrients and redefine the way we interact with food today? What shape, texture or smell should it be like? How can we like/dislike nutrients?

**Take Nutrients**
Taking nutrients to us is a different act than simply taking food to us. In my concept I was trying to understand what it would mean for human behavior or evolution if eating nutrients in the perfect amount was the accepted standard?

**Social Rituals**
These new situations would mean a big change in human-food interaction and especially the way we create social events around a meal. Historically and from a cultural prospective this would require a whole project on its own. Considering my time frame I was curious how the previous settings would affect or create rituals around eating together.

(See the fictional story in appendix 10.2)
The first workshop was meant to open up a discussion around the topics I defined previously. I invited 4 fellow students to do a small group workshop. The small size allowed me a certain depth into the discussion. The participants were chosen by the difference of their nationality and food interactions, from what I could observe during the time together.

I structured the workshop around the four opportunity areas. I kicked off each category with a quick activity and a discussion following each topic. (see workshop cards in appendix 10.1) Whereas the activities were more to reflect on today’s situation, the discussion was meant to investigate the possible impact on us with the implementation of new technologies.

The workshops elevated the general interest in food and how strongly we are tied to it. I realized it would be difficult to change the thinking of food interactions if we can’t grasp why it would be bad or why it would need such a change. It was clear that the group felt disturbed by some of my thoughts around shaped nutrients, but it was hard for them, as well as for myself, to really understand what the reason would be to make food nutritional building blocks.

**Workshop insights**
Food individualism in group settings results in feeling like an outsider.
> How might we keep group settings if we are all tied to our individual nutrition schedule?

Social rituals allows for being guilty together, but makes it less guilty by sharing.
> How might we create rituals in an optimized food environment and create a new guilt?

**Take away**
What I took away from this was that it is important to make the story relevant to a situation today. I learned how important it was in critical design to make the design and the story emotionally touching. The design should have a clear message with a possible demonstrated consequence of the implementation and human behavior.
Key Tensions

Looking further at my opportunity areas, I tried to find the key tensions between science and humanity seen from a nutritional perspective. It came down to a question which helped in leading me to my final focus area.

What would happen to us if we were able to understand our bodies through added technology?

Thoughts:
Staying rational in our food decision might make us more healthy in theory. In science we are able to work with numbers and tests, but I think most things that makes us human are not quantifiable. Why do we need to have words and proof to justify our behavior instead of listening to instincts and natural desires? What if we take aways these desires in food?

Needs / Desire

Individual needs

Should we separate food for physical vs. mental health?

How to justify food desire?

How convenient does eating for health need to be?

Social Rituals

What if healthy food is regulated individually, how should we eat together?

If we are all outsiders, does it makes us belong again?

Can we forget about the food history and create new rituals?

Thoughts:
Imagine eating granules, liquids, powders or even ergonomically perfectly shaped goods to melt in our mouth. How would we eat together? This questions triggered some ideas and imaginations of how our interaction with each other could become more intimate and moves ‘healthy’ eating into a different perspective.

Critical space for critical questions

This space I created for myself allowed me to ask many questions around how we interact with food today. Looking at food without emotions provoked everything about human interaction with food that I was interested in exploring. I was hoping to create a space where people can reflect on their own behavior and looking at how much food could evolve if we add more technology and what the consequents would be following this set up.

Some initial ideas.
**5.2 FOCUS 2: ‘THE NUTRITIOUS SENSE’**

Following my second workshop I came to the realization that my ideas have been slightly too far away from connecting to people without an explicit introduction to the space. Therefore I decided to take all of the information that I had learned and step back for a moment. Being so deep in the topic often makes it harder to see the full picture. Pretty soon I realized my core idea had to do with how we can find our way back to ourselves. I looked at how many influences we had due to our environment and how hard it has become to actually listen to ourselves and make healthy decisions. By looking at it a little closer, I took the inborn preferences very serious and I changed my focus from 'listening to our body' to ‘what if we are listening to our body and we could blame our slow evolution for not being able to handle the food-environment today?’

So I put the focus on how we are not ready for the current food environment and how I could create a design that would allow us to get a sense for good nutrition or a sense to identify sugar early enough. It would be a kind of evolutionary assistant.

Through both ideation and a workshop I tried two different approaches:

**1 Creating a new sense**

Use existing human senses in a new way to recognize nutrients in food. For example: seeing or hearing nutrients.

Why not:
In this scenario I realized it became too much of a Neuroplasticity project and again I fell into the trap of having to know exactly what nutrients are good for us.

**2 What if we all had to prepare ourselves to get ready for diabetes Type2?**

Why not:
The workshop with about 10 people showed me how little diabetes is understood today and that most people believe they can only get it if they have it in their family history. Even though the statistical numbers show that more than half of the population will be obese in 2030, because diabetes often correlates with obesity this is a problem that most people don’t understand as applicable to their lives.
How close are you to get insulin resistant (Diabetes Type 2)?

YOUR INSULIN/BLOOD GLUCOSE needs for life!

1. Food for yourself
2. Sugar in products
3. Diabetes

Settings
- Choose your pleasant picture
- Choose a picture you both

Sugar extractor from our food.

Sugar in cubes.

Small sugar = Dessert.

Feel the nutrients on your skin.
The final design is heavily inspired by the evolutionary mismatch between the food industry and the human biochemistry which influences our food behaviors. My final concept is a system which provides a service in the year 2024 and enables your organs to talk to you. This interaction between you and your organ is an attempt to bring some irrationality to the quantified self and seeks to create an intimate relationship between the user and their own bodies.

System overview

Parts of the system

The user can purchase the product through an online platform. There you can find a series of organ-bots which each come with an earplug that enables the communication to take place. To present the concept I have chosen to focus on the liver in more detail and keep the idea of the other organs as a product line representation. In order to have a conversation with the organ the user places the ear-piece into their ear to start talking, asking questions or listening to their organs thoughts. The product software also provides an online service which collects data from the interaction with the organ, provides updates on the vital statistics of the organ, and displays the ongoing conversations that your organ is holding with other organs.

Interactions
This concept began with the idea of specific upgrades to our organs in order to balance out what is evolving too slowly in our bodies. After a brainstorming workshop and hearing people's thoughts, I became aware that the idea itself sounded good, but in practice I didn’t really know why tangibly feeling sugar in our body would change our perception of it.

I came back to my principles and started thinking of how to engage people with this topic without being too aggressive or judgmental.

Talking to our organs was an idea which came from the development of creating a ‘6th sense/sugar’ organ. The basic idea of bringing people closer to their body all of a sudden became a little bit more fun.

Through talking to people about the idea of having conversations with their organs, it was apparent how engaging this idea could be. I was looking for something which people could immediately relate to but still feel a little bit odd about doing. What made this so fun was that people created voices and dialogues and started talking to whatever organ they had in mind.

“Hello Stomach, watch out... I am going to eat my fatty meat now!” - Classmate
“Uhh Fika, I wonder what my liver thinks now.” - Classmate

‘Body Language’ (working project title)

After hearing these initial reactions, I made the decision of going for the fun yet critical approach of making a conversation with your organ possible.

This brought together all my previous findings, thinkings and goals. Working with our bodies instead of with food sensors was definitely one of the big drivers for this project and with the idea of enhancing our organs I could touch upon the quantified self movement and slightly bend the rules and meaning behind it. I believe that technology has its place in a healthy lifestyle today, but I wonder how far we want to go with it and how alienated we have to become to find our way back to the pure nature of being human.
6.2 INFLUENTIAL TOPICS

By conducting my final concept I continued with some research that helped me define my thoughts and ideas. The following topics had the biggest influence on my product interactions.

Mind and Body

With this subject I am mostly talking about the brain and the body. I am not proposing that these two could exist independent from each other, but I am believing into the term ‘Mind over Matter’. That is to say that we can overcome situations with a strong mindset and the body will follow. This project will rely on the mental power of the user influencing their physical activities and eventually their physical health.

The rationality of irrationality

Science writer Matthew Hutson argues in his book that everyone is a believer and that some irrationality can help us be rational in some situations. I really like this combination of thinking and how it can affect humans. His work started with finding answers to ‘How do we find meaning in the world and how do people define their reality’. (Hutson, 2012)

Intuitive thinking

‘The brain uses mechanisms that are sometimes imprecise’ like Martie Hasleton writes, and can be divided into two different systems: (Mckay & Dennett, 2009) The rational and the intuitive system. The intuitive system is described as quick, automatic and emotional. This system also includes the irrational thinking. If I relate this back to my final concept and its tendency to irrationality it makes sense to also think that food decisions, like I would hear in my interviews, are mostly made by emotional thinking. This intuition can be mapped onto the desires for energy rich food, which furthermore describes why we are victims of our own brain.

By creating conversations with your organ, I am taking an irrational step to be more rational about our food decisions. Using artificial intelligence to personify our organs leads to conscious conversations, arguments and in the end hopefully makes us think.

Artificial Intelligence

After deciding on the concept, the recently released movie HER became a great inspiration for a vision of how artificial intelligence can be handled and how they can be different from humans.

One characteristic of artificial intelligence is the ‘deep learning’. Deep learning or ‘Deep Natural Networks’ (DNNs) are Machine oriented data connections which mimics a human brain but with even more success, since it can accurately draw more connections from learned experiences. What is interesting about that is that the ‘deep learning’ allows for seeing more optimal solutions in a global perspective. (Wired, 2013)

What is outstanding in the movie HER is how Samantha seems to be the perfect operating system through her ability to always adapt to the needs of the user.

picture:
‘HER’ - movie.
Quantified Self

The quantified self movement stands for improving life by tracking data related to ourselves through electronic gadgets. Algorithms allow us to see connections and realizing a trend over time. (Counting every moment, 2012 Corporations have been doing this for some time to get to know our behaviors whereas we as individuals started utilizing this only in the last few years through self data tracking. Gary Wolf, one of the founders of the quantified self movement, sees the value in getting to know yourself better as a way of living a healthier and better life. (Want To Make Your Life Better?, 2014)

For my project I wanted to bring this movement a little bit further and, instead of tracking our activities, I am interested in the impact on our organs through our eating habits. In existing tools, entering our mood level is one way of understanding how our habits affect our wellbeing.

I think tracking everything of what we do through technology also has a sad aspect, since we outsource our self trust to data and technology companies. Although do I see the benefit of his movement, but it also makes me reflect on how far we have gone in letting technology influence us. In my project I wanted to push this movement further to raise awareness toward our body and how little we tend to ignore listening to ourselves.

“The self is just our operation center, our consciousness, our moral compass. So, if we want to act more effectively in the world, we have to get to know ourselves better.”

Gary Wolf
6.3 SYSTEM OVERVIEW

Making our organ talk is meant to serve as a critique of how our body and human evolution has not been able to keep up with the evolution of today’s food industry. As part of this, I have given each organ its own personality and the capability of its own ‘mind’. Our brains are wired in a certain way and when it comes to food, humans are almost cursed with the inborn preferences for liking energy rich food. This emotional desire overrules our rational decision making for food and results in our current health predicament. By giving the organ a voice it is possible to have conversations about food and use almost therapeutic behavior to reflect on the own behaviors.

Organ-bot evolution

The Organ bot is enabling an organ to become its own voice. It enables us to believe an organ has its own personality. The evolution of each organ is different for each human–organ combination. They are creating a relationship together if the human allows the organ to be a part of its life and to allow for conversations. Although the bot is based on an artificial intelligence and it is not really sure how it will evolve is not predefined, I believe there could be predictive structure to underline the existence of the organ–bot.

Nature of relationships

The system consists out of 2 key relationships. The relationship between you and the organ as well as the relationship between the organs.

HUMAN - ORGAN – RELATIONSHIP

The main concept of the project is to bring us humans closer to our bodies and provide a better understanding of how we function. Within this relationship, getting to know each others understanding of what food is doing stands in the foreground.

Dependent on the personality of the human, the organ-bot will learn from the behaviors, choices and activities around the food interaction of the human. The more trust the human has in the artificial intelligence, the more the relationship will adapt and the more useful it will become. In the end we should almost feel like we can’t live without it. The friendship can include educational attributes but it should never be about only doing the right thing, it should be about understanding each other and find a way of living together.

ORGAN - ORGAN – RELATIONSHIP

Organ-bots have the capability to connect to other organs of their kind.

Compared to the human – organ relationship, this one is very open and reflects on each organ’s unique experience. This is a little bit like an agency behind the whole ‘making people better humans’ goal. Together they get more and more of an idea how different and still similar humans stick in their food relationships and, by exchanging their experiences, this information will enhance their ability to help humans make better choices.
6.4 USER JOURNEY

Why people buy this product?
The product is presented as a way of getting assistance in making better food choices. A part of yourself which knows better what is going on with the food we eat. It’s a helper which makes you aware of what the body is doing for us. People that buy this are aware that we are in charge of our body but don’t know how to get over the next step. This device can help guide into a new way of navigating through sugar world.

Usergroup

With this project I am targeting people that have taken on their own food responsibilities. With this I mean people that started thinking about their own shopping list, preparing and buying their own food and have established a certain habit around the food intake in their lifestyles.

Making our own food choices

Our childhood is one of our biggest influencer’s when it comes to creating tastes for food we like or dislike. For the majority of people, the food choices are either provided by a family member, a school, or another organization. This is true for nearly all western and developed countries. As soon we move away from our first home due to school or jobs, we must take on our own responsibilities of providing ourselves with appropriate food choices.

The first step is often to replicate food that was made at home. Something we know, something we are familiar with and possibly are able to cook. Even though the recipe and cookbook market is booming, we never stop referencing our memories and childhood food encounters. Unless we spend time on either exploring different ingredients or we let ourselves be inspired by recipes which we have never made, this usual pattern is unlikely to change.

Making our own food choice seems to be the most natural thing in the world. Since food is needed for survival we take these choices for granted. During my interviews I often heard from people that most food decisions are made during the time at the grocery store. So often there is no planning involved at all and, considering what is offered in today’s food environment, it takes a fair amount of discipline to stick to healthy food.
6.5 ONLINE PLATFORM

The product can be purchased online. Here the product is sold as an organ upgrade, helping the human being to become better than we currently are. The people can find information about each organ and what the differences are in their unique services they have to offer. (see example in appendix 10.5)

picture: ‘Online Landingpage’

Product Family
I have focused on the liver only to try to develop the interaction between user and liver-bot in more detail, but the liver-bot will serve as only part of a larger family of organ-bot products. This family will be available on the product page online.

cpyicture: ‘Orgument Product Packaging’
6.6 MOBILE PLATFORM

The human – organ relationship is mostly indicated by the verbal conversations through the earplug. As a supplement to the verbal conversations the mobile platform offers:

**push notifications**

This very simple gesture allows the organ to have its own mind and allows it to message in case of an emergency or organ mistreatment, and is meant to make the experience more human. This only takes place if the human hasn’t connected with the organ for an extended period or is ignoring the verbal warning given through the earplug.

**vital updates**

The vital updates are an abstract representation of the organs status and how the organ feels. The data shown is related to the individual user settings. The information displayed is again in a language for people to understand but rather than being only scientific, the data should make people think about their organ and its health.

- Fat on liver
- Toxins control
- Vitamin storage
- Overall health
- Renewal countdown

**following organ conversations**

The organs have their own little world. They can connect across the platform with other organs living in the bodies of other humans. This project is currently only representing the liver, but my concept could be applied to cross organ conversations as well. (see liver talk in appendix 10.6)
6.7 FOUR METABOLIC ORGANS

Nanorobot - Pills
For each organ I am offering a swallow-able robot that finds its way through BPS (Body-Positioning-System) to its belonging organ. Nanotechnology in the field of medical treatments is evolving today and will likely be available in this form by 2024.

For my project I have focused on a selection of organs which have to do with the metabolic system. Each organ’s function informs its personality. For this concept development I have chosen to focus primarily on the liver in more detail because it has a high correlation to energy rich foods such as sugar and fat. My idea is to give each organ bot its own personality based on its main functionality.

Liver
We can’t live without a liver. Due to its important role of providing the rest of the body with vitamins and energy, it definitely owns the top position in terms of priority. It’s unique functionality allows its characteristic to be very mature. Kind of like a professor or monk who is very knowledgeable, wise and believes in people. The Liver-Bot is patient with you and serves you with your wishes. It’s personality is adapting to you and has potential for a lovely friendship.

Since the liver is being created with its own intelligence, the interactions between your own liver bot and other liver bots can become very powerful. They will be able to exchange knowledge and learn from each other. They can have secretive conversations and discussions around the situation and can always be learning something new about the world. Being new will allow them to see the world with fresh eyes. All a liver knows is its own capabilities, but it is not prepared for the damage that we commonly inflict on it, so it will ask questions and exchange knowledge with other livers to get a quicker and better understanding of the world and how to best utilize its capabilities.

Pancreas
The pancreas-bot is a bit sensitive. Its emotions are fluctuating and it can react strangely to sugar. The food affects its personality similar to how we are affected by it only more exaggerated. It kind of represents a mirror for the humans experience and they have the potential to learn from each other.

Stomach
The stomach-bot is strong and is its own muscle. It is a hard worker. It doesn’t care so much about what food is coming down, but it is bothered by lazy chewing and by an unnecessary overload.

Kidney
The kidney-bot is trying to make you drink a lot, and if possible only water.
**6.8 CHARACTERISTICS**

What is kind of beautiful about creating conversations with our organs, is that we can create this internal conversation and develop a relationship or even a friendship with our own body. During the development of the characteristics, in my case mostly the liver, I started with having it being very bossy and almost negative, since it is kind of abused by us. Another direction I tried for a little bit, was to have it talking as if it was from the Stone Ages. By the end, the message of how this service can actually benefit us was leading the characteristic building.

*Between Helpful and Agency*

Since this product is an actual extension of the human body to enhance our capability in navigating through the world it appears to be helpful in first place. On the other hand, this setup allows me to bring the critical view to the surface about what is taking place in the food industry and how scientific knowledge is used against us to sell unhealthy and unnecessary foods by taking advantage of our addictions. Having an independent mind in the organ will allow more provocative and critical conversations that can bring light to today’s overseen problems we often don’t think about.

**DIALOGUE**

The language of each organ depends on the nature of each organ. The way they talk is very human. Their characteristics will be a bit naive at some point since for them a food decision is a very rational and functional choice. All they want is to reproduce cells correctly and provide the whole body with the correct amount and proportion of nutrients.

Especially in the beginning of the relationship, the organ-bots realize that the rational and scientific way of understanding the organ function is not the way the human behavior with food works. Learning over time, the agency behind Orgument is becoming smarter and smarter and tries to negotiate and communicate with the users empathetically more often than technically.

They have to learn how emotionally attached humans really are, since there is a big difference between the understanding of liking sugar and being addicted to sugar. Learning how difficult it is to not eat the things that are bad for the body will develop over time.

How the relationship will evolve over time and how the bots will interact with the human includes a lot of variables. Whatever behavior a human will need is meant to be answered by the action of the artificial and targeted personality of each bot.

*Human in control over the organ*

As is the case today, we in control of what we feed ourselves and therefore in control over the well-being of our own body. Also when it comes to this relationship, the human is in charge of starting a conversation by taking the initiative of putting the earplug in.
6.9 VISUAL IDENTITY (SEMI FINAL)

Name
My project started off with the idea of ‘tangible nutrition’, which was fitting for most of the process. By the time I made my decision on the final concept I transitioned to ‘Body Language’ and I liked the idea of tying the essence of the project into the name itself. I spent some time looking at how I could combine other words that fit the same categories ‘Body’ and ‘Language’. That’s when I found the combination for ‘Orgument’ – having an argument with your organ.

Logo and Icons
The icons stem from the simplified functionality of each organ.
Liver = detoxifies us
Pancreas = produces insulin
Stomach = chops the food
Kidney = controls hydration

I aimed for a design language which is sophisticated yet simple. The association of the shapes references back to molecular shapes from biology.

Colors
I intend to keep the colors as gender neutral as possible. Colors that were in between red blue and green were the most neutral colors yet feel strong and inviting at the same time.

Shapes
Similar to the icons, the inspiration for the shape of the pills and earplugs comes from molecular shapes. The round corners give it the organic and soft look which will invite people to swallow it.

Packaging
The packaging presents the language of the product right away. The simple shapes and icons may not be immediately identifiable, but the overall look and feel should be as inviting and honest as possible.

Here I used an embossed paper where the shape of the pill is visible. This could also be done with a transparent bag.
6.10 USER SCENARIO

Script
The key factor in this scenario is for the viewers to connect with the actor in the video. I created two different users who each had unique interactions with the same product. The dialogues are casual and set in everyday situations involving interaction with food.

I chose to avoid special effects in my video because I believe that too many in-realistic elements could make it come off as an overly futuristic product. Orgument is designed for a time slightly in the future, but I wanted to affect people today. Because the concept is primarily about having a conversation, I needed to make sure the script was short, humorous and natural. With view frames and close up images of the ear, I aimed to express the link between the human and the organ.

Personas
For the video I wanted to show two different people who each have a different attitude towards the product. I wanted to show how their motivation is to understand the product and how the dialogues and their dynamics are different.

Frances, 32
Frances enjoys new things. She always wants to have the newest available item on the market. She believes most news about food and nutrition and jumps on them right away. She enjoys seeing all of the data about herself and really feels the need to know everything. She believes technology is the only way into a better life.

Frances thinks she knows a lot about food and believes she does everything right already, so she gets ‘Orgument’ to validate her knowledge.

Rhys, 27
He has no big interest in following a trend and doesn’t think the kind of food he eats is that unhealthy. At least he hopes so. The thought of actually knowing makes him curious enough to give Orgument a try.

With a more skeptical attitude Rhys enjoys testing it out, but gaining his trust towards a technology like this will take a little bit longer.

Rhys is mostly arguing with how good food tastes and why he should give up the delicious sensation of food at all.

Narrative #1
Frances just ordered Orgument. She is interested in living healthy and likes a modern lifestyle. This story will show how the initial setup of a liver-bot will look like. With no fear and almost no hesitation Frances opens the package and plugs in her earplug. With assistance from the voice of the liver she unpacks the liver-bot-pill and eats it. After a few seconds the liver-bot-voice notifies her and starts to build the relationship. By the human voice characteristic of the liver-bot, it is very easy for her to have a natural conversation. We leave her off to think about the possibilities of her new gadget and start a conversation with the liver whenever she feels like it.

Narrative #2
After a long night and full of alcohol Rhys is just getting up with a hangover and wanders into his kitchen. He got Orgument a couple of days ago along with some friends who all decided it would be better to change some bad habits together. His fridge gives a good impression of his type of food choices. With a chocolate bar and a soda he goes to relax in his living room. After a few bites his phone receives a warning message from the liver-bot. He is asked to plug in his earplug and gets into a personal discussion around his behavior. The liver shows frustration and tries to negotiate a deal with Rhys for a better future together.
The beginning of the scene is starting with putting the earplug into the ear. The pill is still just laying on the table.

LIVER BOT
(with extra timed down voice)
Please take the pill out of the package.

(OR)

TEXT VOICE
Welcome to Orgument. Thank you for taking your first step into a healthier life by upgrading your organ. When you are ready, please swallow the pill to start the process.

FRANCES
(swallows the pill, sucks on it a bit but finally swallows)
... quite and waiting

LIVER BOT
Hi, can you hear me? I made it, I am ready.

FRANCES
SCENARIO NUMBER 2
/PROACTIVE BOT

SCENE - AFTER THE WARNING V1

the warning was about a toxic overload. After a rough night and on top of that snickers and cola. just didn’t stop.

LIVER
(after Rhys puts in the earplug)
Did it happen again?

RHYS
Oh you mean the awesome night?

LIVER
You know its not exactly supporting your health (or wellbeing).

RHYS
Ok. before we do this again, one thing needs to be said. I am drinking alcohol every weekend, and you will hate me for it, I know that, but for me in order to change, your sissy health talk will not help.

LIVER
whatever you wish for. Fuckhead

https://vimeo.com/97029904
At the UID-Design talks as well as during the time of the DRS (Design Research Conference) in June 2014 I had the opportunity to present my project to a variety of people and to collect feedback and reactions to my project.

7.1 The exhibition
My exhibition was set up to make people believe my project is real and fully functional. It consisted out of a
- Poster
- Video Scenarios
- Liver – Liver conversation (see appendix 10.6)
- Comment cards (see appendix 10.7)
- Pills (see appendix 10.4)

Each of the elements contributed to make the concept appear real and to make people wonder if it is existing or not. This allowed visitors to start thinking about their own body and question what their organ would say.
7.2 User Feedback

The conversations at the exhibition elevated the concept to a new level of realism. Since my project was deliberately created on the fine line between realism and fiction, every feedback and reaction I could get from people with an outside perspective was priceless.

From having deep conversations around our human body to fun dialogues by impersonating the organs and even people that believed it was a real product and wanted to use it right away, I had a wide range of interesting feedback that validated my concept in different perspectives.

“I already have this voice in me, I just have to listen to it”
“My liver might tell me to stop drinking”
“My mine would say to get rid of this wife, .... (smile)”
After eating the pill one visitor pulled out his phone and seriously said “So how can I connect to it now?”

These examples are a short overview of visitor’s reactions and that I encountered both how easy people connected with it and how it triggered their minds to think about their bodies. The visitors were a mixture of designers and non-designers. People from design research or bankers and all different kinds of age groups made the feedback a diverse and interesting collection of thoughts.
8. Reflection

Choice of Topic
I started this project out of a passion for food and nutrition. During my time living abroad, food has always been the tie between people and places. The different perceptions of what people have about food and their habits and beliefs are always worth an observation. Growing up with food from the farmers around me I was very confused about how different that was in other countries. This interest brought me to my own journey of trying to understand food and nutrition. Working on several healthcare projects during my time as an intern at IDEO, I realized what a drastic impact food can have on us. Also, following the quantified self movement and recognizing how difficult the food part can be made me wonder why something so fundamentally important in our lives gets so little attention. I started this project with the hopes of creating awareness of food and to help people to think about their nutrition. At the beginning of the project I believed that there was some kind of a formula we could apply to make better food choices. Through the research I soon realized how young nutrition science is and how the discipline plays a much bigger role in our lives than I thought. This project made me more aware of my own food decisions and helped push me towards living a healthier lifestyle.

How personal the topic itself is, frequently made me think that I might not be able to reach the people at all, since the impact of food was so personal and nobody wants to be told in any way that they could do better. Seeing the impact of the action seems to be an important factor for a design, and in this topic I struggled a lot with the thought of how impossible it seems to design something where the impact is only on our bodies and in the distant future. My frequent doubt through this process kept me going and hoping that if I find the perspective where this doubt falls away, I found something I can work with.

Research
Conducting interviews with people from the field as well as talking to athletes was a huge inspiration to take on some self studies and use this project as a test of giving up one of my biggest passion: working with dough. This was definitely hard but at the same time, I gained so much more from it as a person and as a designer. I was able to understand that we as designers, often design for habit change and that actually attempting to make the change ourselves is a good empathetic study.

Reading books and being lost in the world of secondary research was something I have never experienced before like I have in this project. I really enjoyed to dig into so many different aspects of the topics branches and trying to connect the dots along the way.

Decision making
Working on my own was definitely the biggest challenge in this project. I have not been working on my own individual project for about 2 years prior to this project. I think what I missed the most was being able to talk to people and validating ideas without explaining where in the process I was. Having just one mind to circle thoughts around made the decision making process much tougher. At the same time I think I really used this opportunity to trust my gut and my intuition and improve my skills and confidence as a designer.

Critical Design
This was one of the most interesting learning experiences for me as a designer. I knew that for this kind of project I wanted to go critical for the reason of stepping away from trying to find solutions and telling people how to do things or trying to help them managing their lives. I don’t think this project is going to make an immediate or dramatic difference in the world, but seeing people be interested to think a little bit more about what we actually eat and what it could possibly do to us, is all I was hoping for. Exploring this space through a critical lens allowed me to step back and see the problem from a wider angle.

The process
During the whole time of this project I told myself to trust the process. Learning how to survive in an uncertain state and to not jump to conclusions right away. This was definitely hard for me. Not working with human centered problems made it so much harder to hold on to something to believe in and to see the meaning behind it. I had to write out my goals and wishes multiple times to keep track on what the purpose of this project really was. The journey was rich and emotional at some points but I learned so much of how I would like to work in the future from both the good and the bad experiences of this project and feel that it has strengthened me as a person.
One aspect of why I wanted to create a more conceptual thesis project was to give my creativity space to explore. I wanted to push myself to see how far I could go and if I could apply that imaginative thinking to my project. Another reason that I wanted to explore a new way of working, was that I wanted to learn how to trust the process and let it guide the design. Doing the things that feel right and move on with them. My own set boundaries allowed me to explore rather than apply fixed methods.

**Between Human Centered and Critical Design**

Being trained as a human centered designer and knowingly that human centered design is what I want to do for life, I chose to tap into a new area of design and was open to the possibilities it could give me. While I was in the process it felt more like a struggle, but reflecting on it, I realized that the hard parts pushed me and my designer gut to its limits. I couldn’t fully hold on to what would be best for humans, I couldn’t hold on to insights completely. It all required a certain touch of the unknown. Leaving it open for people to interpret of what they would do with it. Making the design just enough so people feel its real, so people had an easy time to relate was my goal after awhile during the process.

**8.1 SELF STUDIES**

This project has been led by very strong personal interests in food and nutrition. Being health conscious came naturally to me even as a child. After experiencing personal health changes due to divers environmental changes and the influences of living abroad, I became very interested in the facts of what caused it and where our understanding for food even comes from.

Go no sugar!

While I was conducting my research I started slowly quitting sugar. First thing off my diet was chocolate, after admitting a serious addiction of eating a bar of chocolate every day about 5 times. Even my friends could realize it and it was hard to let it go. Interviewing athletes was very inspiring and I just said, I want to try how much willpower it really takes. I just quit chocolate first and slowly over a two week period I stopped eating pasta, bread and as many refined grains as possible. Of course it was and is a challenge, but since exploring always had a fun factor for me, I enjoyed finding new ways of eating. For the first time, maybe even in my life, I stuck to my shopping list every time I went grocery shopping. The joy and pride I have to see the load of vegetables and proteins in my refrigerator made me happy. Almond Butter became my life saver. I already ate a lot, but after quitting chocolate, the amount increased and I ate one kilogram of almond butter in 9 days. I love it. So yes, nuts became my best friend along with my nutribullet and the healthy smoothies I can create for breakfasts or snacks.
9. REFERENCES

Articles

Jessie C. de Witt Huberts, 2013
“Because I Am Worth It”
A Theoretical Framework and Empirical Review of a Justification-Based Account of Self-Regulation Failure, Jessie C. De Witt Huberts1, Catharine Evers1, Denise T. D. De Ridder1


Websites


Books


10. APPENDIX

10.1 WORKSHOP 1 - CARDS

**Individual Needs**

- Physical need vs. Mental need?
  - Can identify physical needs through quantified self, how do we start justifying for mental needs?
  - What would we describe as food for physical health and food for mental health?
- How to measure?
  - How could this procedure look like in an integrated lifestyle? Will they need to be prescribed?

**Nutrients**

- Shape
  - Ecosystem?
- How might a production look like?
- Extract nutrients from real food?
- Growing vs. Buying?

**Social Rituals**

- Please feed each other!
- How would you describe the experience?
- Food Preferences?
  - How would we create preferences in a generic environment? Or can Nutrients be personalized?
- Food Cravings?
  - Will we have them for ‘unhealthy’ ones?

**Take them to us**

- Eating Alone / Snacking?
  - Ceremony and Timing?
- Tools?
  - What tools and bodyparts do we want to include in this act?
- Addictions?
  - What and how would they exist?
People's bodies are all different. The chemical complex is individual and leads to individual needs. In order to function in optimal health, the personalization of nutritious feeding requires targeted solutions. Fueling of a body is done more efficiently through building blocks of individual nutrients. By measuring the physical needs through biotechnology, we are able to be updated at any minute of what deficiencies we are having in our bodies. Regulated eating times will no longer be required. Daily breaks are not curated around food breaks but facilitate social interactions and rituals.

Grocery shopping and the concept of fixed meal times are taught in history classes. Real food is used only for the purpose of extracting nutrients instead of shipping them around the world for direct consumption. Food distribution will be exchanged with the direct distribution of light weight nutrients directly to the individual.

Making healthy food decisions has nothing to do with the weakness of humans willpower. Are your desires for unhealthiness so big you can consciously decide to sabotage your body yourself?
10.3 MAKING OFF - MOVIE

Planning
Since the video was the key element to make the story complete and to make it seem real, it was important to me to have authentic actors. For the girl I was lucky to find a match for my character in school and it was great to have a more friendship relationship and people who understood the process to work on this. I was quite fortunate to have the newly build ‘sliperiet’ across the street to create the environment I was looking for. For the guy I wanted to experience how it is to work with a professional actor and so I hired one for a few hours. The shooting was very different from shooting with friends and it needs to be very well planned in order to best use the paid hours. I enjoyed directing and filming.

The script was very crucial in my video making. Reading about film making and hearing how difficult it is to make a great dialogue work, I figured this would be my first try and I just have to do what I can. With both actors and their liver voice partner it was important to me that they would feel comfortable with their lines, so luckily I had native English speakers that helped me making the script sound right.

pictures:
‘filming the first video’
10.4 CULINARY PROTOTYPES - PILLS

The process of creating my nano-bots started with 3d printed pills which were then molded into a negative silicon shape. Thanks to Bjorn Norén, from Umeå university school of restaurant and culinary arts, I was able to try out different variations of edible materials until I made my final decision. He made it possible for me to produce 100 chocolate pills (colored and whitened) which were created for my exhibition. This gave my display at the degree show an even more realistic touch.

pictures:
'making off pills and getting ready for exhibition'
10.5 ONLINE PLATFORM (LIVER PAGE EXAMPLE)

The page is meant to invite people and make them curious about Orgument. The landing page is the selected liver bot, where an introduction to the product is given through a video. Buying the product is made available right away. The page gives information about the product and its usage with simple catchy text phrases and pictures.
10.6 WEB APP - LIVER TALK

Livers from different humans talking to each other over the online platform. This is an example of what was running at the exhibition podium.

For the first time in 3 months my human contributed actively to provide the blood with vitamins.

Do they even know about what we do? Should I tell the human? I am mostly shocked about their disbelieves. Can’t they see what we are here for?

Frustrating. Frustrating. Frustrating.

Alarm! What is MJ29?

Overdose last night, and I don’t know how to deal with it.

How often do you send a notification to your human? Are they annoyed by that or does it actually work?

My human is so happy and we have the best time when we go grocery shopping. I understand more and more why humans have such a hard time to stay on track with their diet.

I just explored a newcomer into the toxins family. It took me awhile to break it down. I am so exhausted now.

Can somebody tell me what T40981 is? It feels very alien to me.

Today I found out that humans cheat and lie. Seems to be extremely hard for them to stick to what they plan to do.

Mine went overboard. Just completely too much.

I wish I could help them better.

Yes, It is indeed very frustrating to be locked up in here and obey on the humans behalf.
What would your organ say?

Please pick an organ:

- Liver
- Pancreas
- Stomach
- Kidney

picture:
‘filled out cards form the exhibition’