

THE FOOD CARE EXPERIENCE

FROM FOOD WASTE TO FOOD CARE

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CONTENT

00 ABSTRACT	7		
01 INTRODUCTION	11	06 CASE STUDY 02: WORKSHOP	85
BACKGROUND AND PURPOSE	12	MAKING BEESWAX WRAP	86
PROBLEM STATEMENT AND HYPOTHESIS	30	PLAYING VEGETABLES JENGA GAME	90
METHODS AND STRUCTURE	34		
02 LITERATURE REVIEW	29	07 DISCUSSION	95
03 THEORETICAL FRAMEWORK	41	MACROBIOTIC APPLICATION OF MACROBIOTIC	96
SMALL MODERN FAMILY	42	MACROBIOTIC EFFECTS OF MACROBIOTIC	100
DIETARY CULTURE	44	STORAGE OF FOOD VARIOUS STORAGE METHODS	102
FOOD WASTE	46	STORAGE OF FOOD EFFECTS OF STORAGE	104
04 ACTION RESEARCH	49	08 CONCLUSION	109
ETHNOGRAPHIC RESEARCH SURVEY	50	09 ARTEFACTS	115
ETHNOGRAPHIC RESEARCH INTERVIEW	54	INTRODUCTION DOCUMENTARY	116
TESTING THE HYPOTHESIS: MACROBIOTIC	56	I IDEA DOCUMENTARY	117
TESTING THE HYPOTHESIS: STORAGE OF FOOD	61	NTRODUCTION BOOKLET	118
CONCLUSION	66	IDEA BOOKLET	119
05 CASE STUDY 01: LEFTOVER FOOD MOVEMENT	69	10 BIBLIOGRAPHY	126
DESCRIPTION	70	11 APPENDIX	128
DESIGN CONCEPT	74		
SURVEY OF LEFTOVERS	80		
REFLECTION	82		

We eat, digest and excrete food. We feel, experience and enjoy food. We buy, throw away and waste food. But why do we waste so much food and how did this relationship with food develop?

A lot of food is wasted due to inappropriate storage methods and eating habits that are often not in tune with our contemporary lifestyles, such as the dietary mix, overeating or the aesthetics standards of food. Most of the food that we throw away, however, is still suitable for consumption. The project Food Care Experience aims to reduce everyday food waste by following a set of minimal and friendly rules. It employs the method of 'food caring' to allow for a conceptual shift in our relation to food. It provides an open and creative experience that allows small families to enhance their food storage capabilities and change their eating and consumption habits.

Wir essen, verdauen und scheiden Lebensmittel aus. Wir fühlen, erleben und genießen das Essen. Wir kaufen, werfen weg und verschwenden Lebensmittel. Aber warum verschwenden wir so viel Lebensmittel und wie hat sich diese Beziehung zu Lebensmitteln entwickelt? Viele Lebensmittel werden aufgrund unangemessener Lagerungsmethoden und Essgewohnheiten verschwendet, die oft nicht mit unserem heutigen Lebensstil übereinstimmen, wie z. B. der Ernährungsmischung, übermäßigem Essen oder ästhetischen Standards von Lebensmitteln. Das meiste Essen, das wir wegwerfen, ist jedoch immer noch zum Verzehr geeignet. Das Projekt Food Care Experience zielt darauf ab, die tägliche Lebensmittelverschwendung durch die Einhaltung minimaler und freundlicher Regeln zu reduzieren. Es verwendet die Methode der „Lebensmittelpflege“, um eine konzeptionelle Verschiebung unserer Beziehung zu Lebensmitteln zu ermöglichen. Es bietet eine offene und kreative Erfahrung, die es kleinen Familien ermöglicht, ihre Lagermöglichkeiten für Lebensmittel zu verbessern und ihre Ess- und Konsumgewohnheiten zu ändern.

BACKGROUND AND PURPOSE

I have been cultivating and growing food in small gardens in Korea and Switzerland since the spring of 2015. I first began doing so in a small plot on a shared garden in a Korean village. On the day when my experience of shared gardening started, I discovered an interesting fact. All the participants were single. That was not the only thing they had in common. They were all people who felt guilty about leftover food. Supermarkets in Korea usually sell fruit and vegetables in bundles, or packaged in bulk, rather than individually, so customer have to buy large quantities of food ingredients for a single meal. It was something that made me uncomfortable when I lived in Ko-

rea. Fruit and vegetables sold in batches, not individually, went straight into the fridge after purchase. I thought the solution was to keep large amounts of food in the refrigerator so that they could be used up over a period of time. I soon found mouldy tomatoes in the fridge and so had to start eating only tomato dishes for five days in a row. I was eating meals simply to save the food ingredients from spoiling. Even so, food in the refrigerator was going bad faster than I could eat it.

Three years ago, I moved from Korea to Switzerland. Unlike in Korea, supermarkets in Switzerland sell a lot of food ingredients individually. Finally, I was able to buy just the amount of ingredients as I needed. But a new and unexpected problem arose.

I was in a foreign country and everything was new and different; supermarkets and department stores were like heaven to me. Western vegetables I'd never seen in my life before and fruits I'd never seen in Korea, and all the different types of rice and pasta captivated my heart. I went to supermarkets and traditional markets every day. At that time, my tongue learned to taste the local food before learning the local language. My fridge became saturated and this habit of eager over-consumption lasted for about a year.

A turning point in came in August 2018, the month when I resumed gardening in Switzerland. Planting and caring for vegetables myself, my interest returned to the mindset I had in 2015. My priority was to eat the vegetables I had grown myself rather than food from

the supermarket. I still fell into the temptation from time to time but now, when there was food waste, I felt little little guilt because the waste could be thrown into compost boxes. One day I found a compost box filled with vegetable peelings. It was then I realized that the biggest cause of food waste was the excessive trimming of ingredients and indiscriminate habits of consumption. In his book *The Three Ecologies*, Félix Guattari says:

“The kitchen is a space of all kinds of flows, with food flow, water flow, fire flow, food flow, trash flow, and space of relationships where contract relationship, desire relationship and power relationship intersect.” It’s also a place where emotions such as excitement and expectation, joy and happiness, fill and satiety move.”¹

1. Félix Guattari, *The Three Ecologies*, Translated by Yoon Su Jong, (South Korea, Dongmunseon, (2013), 136-7

Eating is the most basic act. It creates our bones and flesh. Yet food is more than mere fuel for the body. It reflects culture, history, philosophy, art, politics, and economy. In the past, there were times when I thought philosophy should tell objective truths, as an accessory to science. Food itself is tremendous philosophical material, and the kitchen is a philosopher’s space. After amending my view of philosophy, I experienced reality very differently. I thought of the variety of beans while looking at soybean paste stew, thought of diversity while looking at tomatoes, thought of life’s inflatedness while looking at bread, and began to think about the ethics and aesthetics of invisible things while looking at wine. Each moment spent in the kitchen found me happy as a child first learning the new principles of the world. With my new philosophical approach to life, I began to question the place of the refrigerator in the kitchen. Since when had the fridge been there? Should food be stored in the fridge? Is someone making food for the fridge? Maybe the fridge is a funeral home for veg-

etables? I looked at my kitchen and food with these questions in mind and found a disconnect, not a continuity.

Modern kitchens and food need care. In this project, I decided to call the method of properly storing food ingredients and ingesting food in full ‘Food Care’. The ‘Food Care’ approach I propose is aimed at providing primary data, hoping to help small modern families reduce food waste through observing minimal rules.

PROBLEM STATEMENT AND HYPOTHESIS

Due to global warming, glaciers melt and the polar bear disappears. Furthermore, marine life such as whales and sea turtles live in pain because of plastic waste that humans have thrown away. Soon, not only humans, but the entire life of the planet will be threatened. The current global buzzword is the Zero waste movement. The Zero waste movement aims to create a lifestyle that does not make waste. The fastest way to do this is to target the aspect of our daily lives that creates the most trash.

It is the kitchen.

The Institute of Ecological Systems Design at ETH Zurich has calculated the environmental impact of avoidable food waste linked to food consumption in Switzerland:

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“Food consumption in Switzerland generates 2.8 million tonnes of avoidable food waste per year at all stages of the food chain, both in Switzerland and abroad. Moreover, an area equivalent to half of all the agricultural land in Switzerland is used to grow food that ends up being discarded at some point along the value chain. Approximately 556,000 tonnes of avoidable food waste is generated in agricultural production, accounting for 13% of the environmental impact of all such waste. Over 80% of this loss occurs abroad in the agricultural production of imported products.”²

2. Claudio Beretta, Stefanie Hellweg, LEBENSMITTELVERLUSTE IN DER SCHWEIZ: UMWELTBELASTUNG UND VERMEIDUNGSPOTENZIAL (Switzerland, ETH zürich, 2019), 6.

We all want to eat healthy food. The way to eat healthy food is to eat food without leaving anything else. Nature is a continuous cycle. The real beginning of food begins by making good soil, sowing seeds in the ground, planting, going through the seasons, harvesting and eating the harvested food. I decided on a research topic by focusing on the words ‘nothing left’ and ‘care’, and from this the following questions arose.

‘Can we eat food without leaving anything behind?’, ‘Can we make a kitchen without a refrigerator?’

The project’s hypotheses stem from these two questions. I will make three hypotheses, derive methods for testing them through theoretical research and experimentation, and find answers.

My first hypothesis is ‘Macrobiotics help create eating habits that do not make food waste.’

Macrobiotic is a compound word of ‘Macro’, ‘Bio’, and ‘Tic’ and refers to a dietary method or diet for health that considers life from a macroscopic perspective.

“Macrobiotics is a plant-based diet popularized in the early 20th century by George Ohsawa in Japan, and brought to the United States by one of his students, Michio Kushi. More than a diet, macrobiotics is fundamentally derived from a set of philosophical principles that were considered to promote a healthful way of living and prolonged life. The word macrobiotics is derived from the Greek makros meaning “long,” and bios, meaning “life,” or makrobiotikos, meaning “long-lived.” Michio Kushi considered macrobiotics to be a path through healthy, pure food to optimal health, and believed the adoption of its principles would lead ultimately to world peace. 2 While macrobiotics involves a lifestyle encompassing self-reflection and respect for the natural environment, the associated diet is the focus of this review”³

3. Robert H. Lerman, MD, PhD, The Macrobiotic Diet in Chronic Disease (Nutrition in Clinical Practice Volume 25.2010)

Macrobiotics began to gain enormous popularity among hippies and New Age devotees during the 1960s and 1970s, especially in the United States.

Macrobiotics was influenced by Oriental thought because its originator George Ohsawa was based the concept on Japanese food law and Chinese customs. Even when considered from the perspective of Western nutrition, the skin and seeds of fruit and vegetables have various nutrients that are not found in the peeled flesh. Recently, even among dieters, it is recognized that processed grains, such as white rice or white flour, are mainly composed of sugars that are quickly absorbed and decomposed, and lack essential nutrients, including dietary fiber. Both brown rice that has not had the husk removed ('whole wheat') and oatmeal are gaining popularity. In Macrobiotics, all natural ingredients are considered to be most nutritious when intact. After washing ingredients, those following a macrobiotic diet eat the whole food, using recipes that do not require trimming and peeling.⁴

So, a macrobiotic lifestyle produces very little food waste. The purpose of this project is to theoretically analyze the effects of macrobiotic eating habits, to find out how far it is possible to reduce food waste when using various recipes.

Second hypothesis: 'Purchasing excess food using the platform aims to reduce food waste .

Food waste also leads indirectly to wastage of other resources. About 550m³ of water is used worldwide to grow crops that will never reach consumers. Moreover, meat production requires 20-50 times more water than the same amount of vegetable production. It is estimated that by 2050, the amount of water required for food production will reach 10-13 trillion m³, which is 2.5-3.5 times greater than the volume of water currently used by mankind. Therefore, food waste is likely to intensify the global water shortage. According to the Insti-

4. Kushi Michico, The Macrobiotic Way: The Complete Macrobiotic Lifestyle Book (USA: Avery a member of Penguin Group Inc. 1985), 2-11.

tute of Mechanical Engineers, "If you reduce the amount of food that is wasted before it is consumed and supply 60-100% more food than it is today, you can also save farmland, energy, and water at the same time."⁵ Do not forget that food waste is also a waste of land, water and energy resources.

It turns out that about 2 billion tonnes, half of all the food produced in the world each year, is thrown away even before it reaches the table . The main culprit is consumer demand for cosmetically perfect food. The 2013 Food and Agriculture Organization of the United Nations report summarized this as follows:⁶

5. The Institute of Mechanical Engineers, Manufacturers lose one tonne of food for every 35 produced, <https://www.imeche.org/news/news-article/manufacturers-lose-one-tonne-of-food-for-every-35-produced>

6. Food and Agriculture Organization of the United Nations, Food wastage footprint ; Impacts on natural resources, (FAO 2014), 6.

“30-50% or 12-2 billion tons of food is discarded before it is cooked. 30% of UK-produced vegetables and crops are not even harvested because they do not meet the “cosmetically perfect food” demanded by consumers. In addition, about 50% of food consumed in Europe and the United States is headed to trash bins by consumers. In particular, consumers in rich countries throw away more food waste than the amount of food they eat. The amount of food waste they throw away is about 220 million tons per year. It is equivalent to the food production of 230 million tons in southern Sahara.”

Food waste is a significant problem in wealthy countries. In order to address this problem, some countries are adopting new regulations on the discarding of edible food.⁷ In February 2016, legislation was passed in France to ban food that had passed its expiry date in large supermarkets with a store area of 400m² or more from being thrown away.. After the legislation passed, the date-expired but still edible hypermarket food had to be donated to food banks or charities, or used as compost or animal feed. Firms can be fined for putting such food in the trash.

The Swiss chain of Coop supermarkets uses the name ‘Unique’ to sell and promote vegetables that have insufficiently perfect appearance at a low price. In 2018 Migros, Switzerland’s largest retailer, supported the Madame Frigo⁸ project pioneered by two young women. This involved installing a communal refrigerator in city centres allowing local residents to make unused edible food available to others free of charge.

In 2014, food rescue expert Katy

Barfield witnessed the enormous amount of food waste generated by the food industry. Subsequently, she developed a surplus food sales platform called Yume.

7. Elina Närvänen and others, Food Waste Management - Solving the Wicked problem (Finland: Palgrave Macmillan, 2020), 4.

8. Livia Fischer, Jetzt kommt der soziale Kühlschrank für alle. last modified 10, May, 2020, <https://www.blick.ch/news/schweiz/aktion-gegen-food-waste-gibts-schon-an-22-orten-jetzt-kommt-der-soziale-kuehlschrank-fuer-alle-id15516077.html>.



Figure 1 - Madame Frigo recently expanded in the city of Zurich, 2020

Yume's solution is simple and clear. Food suppliers often have numerous surplus foods due to order cancellations, order errors, lack of warehouse space, or failure to predict demand. Yume helps to showcase excess products by providing a sales platform for companies that lack the time and capacity to resell vast amounts of food. Buyers can search and sort the products by food-type and price, shelf life and quantity, and receive new food alerts. All products are priced at least 20% lower than the wholesale cost.

Since the product is food, speed is of the essence so Yume coordinates delivery at a convenient time for both sellers and buyers. Food that has not been sold by the expiry date is donated to registered institutions or delivered to those in need. In this way, Yume's platform helps traders sell food that is either surplus to requirement or almost obsolete, buyers can buy food at low prices, and unsold food is delivered to hungry people in the community instead of becoming food waste. It is a groundbreaking system. In addition to Yume, mobile appli-

cations are emerging that offer to buy unsold food at half-price. Launched in Stockholm in November 2016 by its four Swedish founders, Karma has some 400,000 users signed up to its app, which aims to connect consumers with surplus food from retailers at a low cost. As of March 2020 Karma has a record of reselling more than 580,000 foods.

Since serving its first meals in Copenhagen in 2016, the Danish start-up, Too Good To Go, has become a popular application for "finished discount sales" in eight European countries including Belgium, the United Kingdom and Switzerland. To reduce restaurant and buffet, the company has developed a platform application that connects food providers and customers, providing left-over food at a discounted price. Recently, the company has been expanding the range of provider members not only to general restaurants, but also to bakeries, hotels, flower shops, and supermarkets. It also sells alcohol such as beer or wine that has not been sold due to label or packaging defects. In addition, consumers

are preparing their own bags or containers to prevent additional waste.

Various other types of business model, such as the UK platform Olio, offer special opportunities to solve wider environmental problems. Some people may believe that food not made by the individual is not the individual's responsibility. In this mindset, 'social responsibility'⁹ is limited to corporate responsibility. But individuals should also have a sense of social responsibility and help to reduce the level of food waste generated in society.

The final hypothesis is, 'Fridge control and understanding how to store food ingredients can keep food fresh and reduce food waste.'

The refrigerator is a device for storing food at a low temperature to prevent it from going off. It is comparatively recently that refrigerators have become part of everyday life. The refrigerator first appeared in the United States in the 1910s and gradually spread to general households

with the economic growth of the twentieth century. Refrigerators are now considered a necessity, but if we look back in time, humans managed their lives without one.

Food storage culture has developed throughout history, and there are countless sources of advice on how to keep food fresh. Nowadays, when building a house, the kitchen is designed with the refrigerator in mind, but in the days when there were no refrigerators, the house design would usually include food-only cupboards (larder), or basement cellars. Now we leave the food in a machine called the refrigerator. When we open the refrigerator door, we find an assortment of items. We never stop to reflect that each food item has a different storage requirement.

Consumers store foods sold at supermarket room temperature 24 hours a day, 365 days a year,

9. Elina Närvänen and others, Food Waste Management - Solving the Wicked problem (Finland: Palgrave Macmillan, 2020), 90.

in refrigerators that run electricity.

Are we needlessly storing food items in this way? In most cases, the reason we store food in the refrigerator comes from our mindset and lifestyle. People blindly believe that refrigerators can keep food in good condition and manufacturers have encouraged this thinking with new, larger and more sophisticated products. In addition, consumer society promotes an inefficient buy-today, throw-it-away tomorrow, repurchase-it-tomorrow, and throw-it-away-again mentality. The most important thing to sustain a consumer society is consumption. The social cost to produce food in a structure that cares for food that is thrown away and encourages it to carry on and off is not important information to inform consumers. Rather, the further away the information is from people's attention, the greater the consumption. As such, consumers have become slaves to these consumer societies and to refrigerators that can be filled with shrewd.

What if we do not have a refrigerator? Or what happens if we have to refrain from using the refrigerator? Will consumers continue to buy large quantities of groceries even without refrigerators? Bigger, better refrigerators do not necessarily make better kitchens and food. The food that keeps our lives and environment healthy is made outside the refrigerator. The cheese was created because there was no refrigerator, and yoghurt and kimchi were created because there was no refrigerator. The ancestors found and kept food ingredients through a variety of storage methods during the absence of a refrigerator. Life without a refrigerator is an opportunity to ponder our relationship with food. Can we live a life without a refrigerator? We have a hard time imagining life without one, not because it is challenging to endure life without a refrigerator, but because it is difficult to imagine what that life would be like. We are easily afraid of what we do not know. It is difficult to imagine unfamiliar things because we are so set in our ways. If contemplating life without a refrigerator is terrifying to us, this

shows a poverty of imagination. Through this hypothesis, I aim to discover how much living without a refrigerator affects me.



Figure 2 - Using Too good to go, 2020



Figure 3 - Storing vegetables in the basement warehouse, 2020

This project is action research conducted to improve the food waste problem of small modern families through the ‘food care experience’. Action research focuses on problems of food care in the kitchen and develops and implements various action plans to address them.

This is a research aimed at improving the lives of both food care designers and small modern families.

Some research has previously been done on the food waste problem and its resolution to volunteer food waste that has already been conducted.¹⁰ However, it is very difficult for modern families to conduct research by isolating and controlling variables.

Therefore, action research can be suitable for insight into environmental issues as it can lead to positive changes occurring in the process by acknowledging and accommodating the complexity of modern household as they are without controlling them.

This project summarizes the theory surrounding the concept of family and the theoretical framework for the characteristics of food culture in Korea and Switzerland, with special reference to macrobiotics and food storage methods. Through action re-

10. Cho, Young Moo, A Study on the Utilization of Leftover Food for Domestic Animals, (PhD diss., Sunchon National University, 2003), 6-7

search, it identifies problems of food waste in small modern families and seeks solutions to these problems. It was conducted in the order of execution and evaluation. In order to solve the problem of food waste in the small modern family, I set the research remedy as ‘food care to reduce food waste’ and started a literature search.

In order to understand the specific problems of food waste in small modern households, a survey was conducted on the eating habits of selected households from October 9, 2019 - November 7, 2019 (30 days). In addition, from October 23, 2019 to October 25, 2019 inclusive (3 days), a demonstration was given to show how to make new food using the leftover food, and a survey was conducted to find out the perceptions of those who participated in the demonstration.

As an action research method for multi-faceted analysis, I visited the families of modern families from December to January 2019 to conduct interviews and recorded and analysed their meal prepa-

ration process with photographs and observations. In addition, hypotheses for food waste reduction methods were established and tested.

The Three Ecologies by Félix Guattari is important to me personally, and to this study.

I bought the book before coming to Switzerland and have reread it multiple times.

The reason it made such an impression was because of his ecological concept.

Félix Guattari was the only person recognized by the two pillars of the French social-ecological movement: The Green Party and the Ecological Generation. However, little is known about the days of the Green Party movement, at the time Guattari was active. The reason is that Guattari was committed to creating invisible movements. Bringing change about invisibly was more important to him than to be known in the media. When I read this book for the first time, I thought 'Why is it three, rather than two?'. Probably not just from an obsession with the number three. The advantages of three are that, unlike two, there is the possibility of having combinations that can lead to multiple horizons. After rereading the book, I took away three things: "natural ecology", "social ecology", and "heart ecology". If

we look closely, we can see the ecological wisdom in it. Ecological wisdom can also be seen as 'relationship development' where creative relationships create something unique. Each thinker has a little bit of political colour. Félix Guattari was green in his last years. He was listed as a Green Party local council candidate. The book covers both left-wing and right-wing ecology. Indeed, the fact that ecology goes beyond the axioms of left and right is the aspect of Félix Guattari's book that most resonates. The three areas of ecology -- natural ecology, social ecology, and mind ecology -- are aimed at environmental managementism, social ecology, and fundamental ecology at the same time. Environmental managementism, referred to as 'natural ecology', means movements such as environmental preservation and preservation, checks and monitoring of environmental pollution by companies. Social ecology, referred to as 'social ecology', is a movement to pursue social transformation and reappropriation of science and technology.

Fundamental ecology, referred to

as 'heart ecology', is a movement to reject life-destructive ways of life, pursue changes in life, and move to an alternative lifestyle according to ecological spirituality. Félix Guattari overlaps three diagrams as if they were drawn in math class, then draws them on a single picture. The complex ecological landscape becomes a circular diagram of mind ecology, social ecology, and natural ecology. Perhaps mathematicians are satisfied with the integrated image drawn by this picture and think about its meaning. However, Félix Guattari drew a diagram of three overlapping circles in an attempt to make the ecological philosophy three-dimensional and rich. Movements that seemed to be separate from each other may overlap and resonate. These three domains represent the problems of subjectivity, social relations, and the relationship between nature and humans. Throughout the book, Félix Guattari particularly emphasizes the importance of 'mainstream production', noting the unusual potential created by relationships in the areas of ecology and the life of human contact. This was to note the progressive

processes of animals, plants, ores, microbes, and humans beyond modern responsibility and humanism, the flow of interaction, the network of human beings.

Every year, I talk to my husband about what we need to do. After doing this and doing that, there are many things still to do. However, in confronting the question of who should do those things, we just look at each other quietly. Still, I think the story was meaningful. It is because I am producing myself that way. The problem of subjecthood production is the question of how to create an unusual movement. Every life is unique. The ecological network produces something unique. It is very important that unusual movements are formed in communities and networks, such as ecological networks. Because it is the beginning of change like a life phenomenon. Small changes can make a significant change by sticking together like a snowball in an interconnected network. I thought it would re-create the world by making small odds and differences. Red must meet green. It was an essential proposition in the practice

of Félix Guattari. Why is that? The reason is that red is a way to be free from growthism and developmentism. Red must escape from a developmental perspective and meet life, children and minorities. When we do that, we get out of the fixed frame of adult-white-native-human-human. Meeting with green is essential if the content of red progress is to deviate from capitalist progress and offer a different alternative. I heard that progressive camps in Korean and Swiss society are also forming a trend that values meeting with green. It is a tiny move, but it is suitable for both red and green. Green is the future of red. Antonio Negri pointed out that “the empire, a unified world capitalist, has no outside.” However, if we look closely, we can see that there is an inside. Minorities like children, life, and madness are capitalist, but they are external to capitalism. That means the green alternative. The encounter between red and green circulates the movement of social development and another movement. It is a different kind of softness called ‘becoming a minority’. It is also a stream of love and desire. The sol-

idity between the anti-capitalist struggle and non-capitalist makes the alternative society a search within the community within it, not as a result of its development. When red separates from utopian communism, it approaches green. It is because we find alternatives in existing non-capitalist communities. The ecology of Félix Guattari is not about staying in nature. The principles of ecology are applied to society and even the mind. More than 50 trees that are connected and form a forest ecosystem can meet more external conditions than 100 trees that are separated. And in this forest ecosystem worms, animals, mushrooms, and other life can be created. The idea that the mind, society, and nature make ecology is a difficult concept. However, if we think about the network, we can quickly compose a picture. Ecosystems are woven and connected like a network. And it is a creative network of connections that constantly produces something unique around its edges. The network is invisible, like trees and the sun, wind and water, butterflies and flowers, animals and humans. If you lie quietly

in the woods, you can see that even minute changes stimulate the mind. The forest is a quiet but invisible intense flow. So, the forest makes life. Félix Guattari referred to this principle of “ecological wisdom” as the concept of “subjective production”. In social networks, desire, matter, and energy circulate. Even the kitchen is an opera space. It is where water flows, fire flows, food flows, and waste flows. The flow can move in a different direction than capitalism. It is when an unusual movement is made. Unusual movements deliver unusual energy and power to the network. In doing so, they make the network completely different from the previous one. It is the same principle that when people meet on the network, people are interested and spread. All life phenomena are products of something unusual. Therefore, the moment when the peculiarity appears in the community and the network is the moment of revolution, like the moment when the wildflowers of life ignite. Networks and communities are sensitive to small changes. So, the movement of different subjectivity, such as molecular revolution, determines

the path of the whole community in the future. Changes in very fine domains can spark unprecedented changes in the entire network and community.

Collecting ecological wisdom for such a flash-like change is what The Three Ecologies says. This is a book that teaches ecological wisdom in a time of ecological crisis. Félix Guattari, although not a revolutionary, did not hesitate to propose a revolution because there is a revolution everywhere, even without a revolutionary movement. Such a different desire creates the future. It is not an exaggeration to say this research project started from this book. As a result of Félix Guattari’s theoretical search, I have developed a practical interest in constructing a new aesthetic paradigm by releasing desire from the existing movement that clings to ideology. I fully agree that Félix Guattari’s conventional ecological movement has been questioned and dissatisfied with the so-called “environmental problems (focused on the natural environment)”.

Under the theme of ‘Small Mod-

ern Family's Food Waste Reduction Method Research', this paper looks at how our eating habits should change when looked through an ecological prism. It reorganizes this through the composition of Félix Guattari's *The Three Ecologies*. It consists of a process.

Just as an acorn revolutionizes the oak tree in the forest ecosystem, the beginning of change begins with the occurrence of unusual parts.

THEORETICAL FRAMEWORK 03

SMALL MODERN FAMILY

We live in groups as soon as we are born, and the groups are families. Previous societies were formed of large families. Grandparents, parents, brothers, aunts, and uncles lived together in one house. 'Family' refers to a community that shares daily life through external factors such as marriage, adoption, and acquaintances or internal factors such as blood relations, and is known to be the oldest grouping of human beings. In Korea, the family is '()', which means home. It is a compound word of '()', which stands for the same kind, and is used to

mean a clan that shares life in one house. The word 'Family', which is used in the English American region to mean family, is said to represent the love of the family after the first letter of 'Father And Mother I Love You'. However, experts say that this story is only a myth and that the actual Family is an English word derived from 'famulus' in Latin, meaning servant or slave. This word is known to have changed to the current word after 'Familia', which means the brush of the community that lives together.¹¹ Over the past 2000 years, families have evolved

in various forms, from clan society with large families to modern societies with single households. The 'nuclear family' is a term coined by an American anthropologist, G. P. Murdock, who used it to mean a small family of three to four members. The modern nuclear family is defined as "a group consisting of couples and their children, sharing housing and economic cooperation, and featuring childbirth." For the purpose of this research, the 'small modern family' refers to a family of four or fewer members, including couples, nuclear families, non-resident families, single-parent families, and elderly families.

11. Sabine R. Huebner, Geoffrey Nathan Mediterranean Families in Antiquity: Households, Extended Families, and Domestic Space, (Wiley-Blackwell, 2016), 96-7.

DIETARY CULTURE

All human food-related life is deeply connected to 'dietary culture'. The dietary culture is a historical product that is a mixture of new needs with traditions that have been passed on through the process of the learned experience.

The factors that shape the dietary culture can be considered in term of natural requirements, human skills, and social norms. The factors that form these dietary cultures do not act separately but are closely linked to each other to form a person's eating behavior. A country's natural environment strongly affects the region's dietary and food preparation styles. Also industry, commerce,

family system, people's values and beliefs and international relations at different historical periods can all have an impact. In other words, the ethnic personality and specificity of the food culture are formed by repeating traditions gradually forming a common and universal eating pattern in international conflict and harmony with the eating habits of other countries. Thus, the dietary life of each era expresses the social and environmental factors inherent in that era.

* Korean dietary culture: three meals a day as a rule, with staple food and subsidiary food clearly distinguished - unlike Western and Chinese foods, in which the main and subsidiary foods are often mixed together. As a result, there are many subsidiary foods in Korea. Due to the distinct differences in the climate of the four seasons, various food storage methods have been adopted, according to what foods are prevalent each season.

* Swiss dietary culture: heavily influenced by Germany, France and northern Italy. For example, in the south of Switzerland, adjacent to Italy, dishes such as spaghetti with tomatoes and onions are the centrepiece. The French side of the country uses cheese or fish, while nearer the German border potatoes and sausages will be in use. As in Korea, three meals a day is the principle, and muesli (dried fruits and grains served with milk and/or honey), bread with jam/honey, and ham are served for breakfast. Due to the influence of the region and in particular the prevalence of dairy farming, much Swiss food is dairy-based, including cheeses.

FOOD WASTE

The types of food waste generated at home originate from food handling, food storage, cooking, consumption and shopping. In particular, food waste is most often generated during unintentional shopping, the wrong storage of food, the failure to control food quantities, and during meal preparation. Food waste can also be generated in two stages. The model below represents the process of food waste occurring in the home and the dotted line represents the re-movement.

In the past, people used to dry food and salt it to keep it for a long time. Salting not only improves the taste of the food but also prevents odour and bad smell. This

was at a time when we did not know exactly what the microbes were, but the way to store and eat them was called 'salting', and the change was called 'fermentation'. Most of the decaying microorganisms did not grow well due to the lack of osmotic pressure in a high-salt environment, and the microorganisms that endured in high-salt areas were mainly lactic acid bacteria or harmless microorganisms. There are also fermentations for purposes other than storage. The most typical is alcohol and bread fermentation using mold or yeast, mainly with grains or fruits that are high in carbohydrates. In addition, vinegar is a fermented liquor that has been used for a long time and has

been used as a seasoning. All fermented and stored foods created through this process were created in the days when there were no refrigerators.

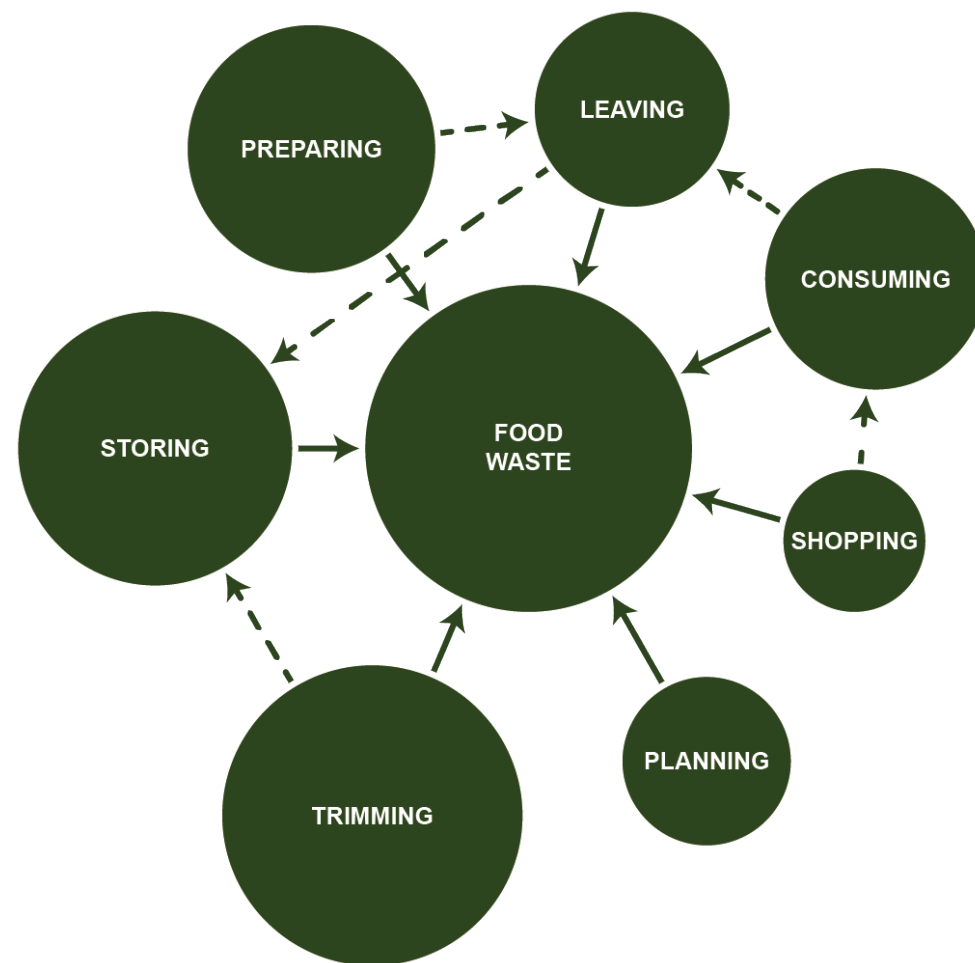


Figure 4 – Food waste movement model, 2020 ©

ETHNOGRAPHIC RESEARCH

- SURVEY

This survey was conducted as follows to investigate the diet and eating habits of small modern families to identify problems and requirements and to suggest suitable food care methods.

Title

Questionnaire on modern family eating and eating habits

Purpose

It was conducted to find out issues of dietary culture and eating habits affecting the small modern family and to find a suitable food care method for this family unit.

Survey period

08.10.2019 - 07.11.2019 (30 days)

Subject

Modern family of 4 or fewer living in Korea and Switzerland.

Survey Method

A structured questionnaire was conducted.

Survey contents

The participant's family composition, awareness of macrobiotics, type and form of meal, type of food stored in the refrigerator, type of food stored in other ways, type of food left after eating, type of food waste, etc.

Survey Analysis

As a result of a survey conducted on fifty modern families, more than 30% were found to have more than one child, with 50% for couples and 20% for singles. 4% of all respondents said they knew about macrobiotics, and the rest did not know at all. More than 90% of all respondents reported eating more than two meals a day, and 5% of respondents reported eating only one meal per day. 100% of the respondents said they did not make a separate diet plan. When asked about type of meal, 88% responded traditional food, and 10% tried foods from other countries. More than 44% of all respondents said they enjoyed eating out or having take-aways. 31% chose homemade food and 19% chose convenience and ready-to-eat food. In the survey question on how they purchased groceries, 69% of respondents purchased food directly themselves, and 31% bought online. Regarding factors that influenced their purchasing choices, 63% answered that price is important, and 20% chose the freshness and shape of the food items. 92% of respondents said they would keep all purchased in-

gredients in the refrigerator, and only 5% of respondents chose not to keep all ingredients in the refrigerator. 31% answered that they knew how to store each ingredient well, and 11% chose no interest. 71% of respondents said they did not know much about the types of food stored in the refrigerator, and 19% said they knew a little. When asked about the types of food stored in the refrigerator, 43% of respondents chose vegetables and fruits, 23% or more chose dairy products, and 30% chose frozen foods. 12% of all respondents said that they would eat all the edible skins, and 89% said they would remove and cook the skin and hard parts. Regarding the reason for leaving food uneaten, 40% said it was because they were full, and 39% said it was because they had made too much. 65% answered that they kept the remaining food for their next meal, and 21% said that they would throw it away. 44% of those who responded to how food was wasted said that it was during the preparation process, and 29% said it was due to food spoiling during storage. As a result of this principle-based di-

etary, small changes in everyday life gathered and changed into a lifestyle that thinks about nature and the environment. That is why I think Macrobiotics is a lifestyle that is easier to practice than the public thinks and a good way to reduce food waste. Macrobiotics is a concept that extends beyond eating and lifestyle, and macrobiotic dietary eating naturally leads to a lifestyle that coexists with society and nature.

Survey conclusion

Based on the survey results, conclusions were drawn as shown in the following chart (figure 5- food care system).

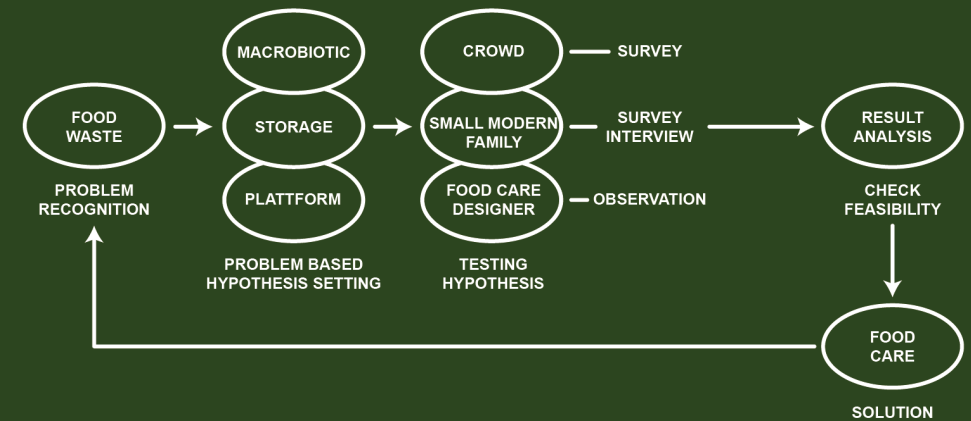


Figure 5 - Food care system (survey conclusion), 2020 ©

ETHNOGRAPHIC RESEARCH - INTERVIEW

This interview was conducted to investigate the level of 'small modern family' dietary knowledge. The interview revealed that the family prefer to eat according to mood and convenience rather than at set times of day, and it was found that the refrigerator is used as a storage space for a wide range of food types with little regard to the advised storage method. Through a small modern family interview, we were able to identify the practical problems facing the modern family and provide solutions.



Figure 6 – Small modern family interview 1, 2020



Figure 7 – Small modern family interview 2, 2020

TESTING THE HYPOTHESIS: - MACROBIOTICS

One day, as usual, I peeled the potatoes and cut the stems of broccoli. Potato peelings and broccoli stalks were discarded in the food waste bin. I made just one meal for two people, but the food waste bin was quickly filled. Of course, food waste from my home was used to make compost, but the things I threw away were still edible. I decided to eat all the ingredients and started the 'Macrobiotic' method.

'Macrobiotics' is a system of eating habits that do not result in leaving aside or wasting food. Macrobiotics has three principles. It is difficult to explain succinctly. It is not as straightforward as saying vegetarianism excludes

animal foods. However, there are recommended principles. Before explaining my hypothesis, I would like to explain one of the three principles. One of the basic principles of a macrobiotics is the notion of whole food - the concept of eating all the seeds, roots, stems, leaves, fruits, and peel of the ingredients. Someone on a macrobiotic diet eats seeds, roots, husks, and flesh - all parts are connected and have unique energy and vitality. The basic principle of macrobiotics is to eat the raw energy of the raw material without unnecessary processing, and as much as possible without discarding anything.¹²

12. Yun seo Lee, *The table that resembles Nature ; You are what you eat*, (South Korea Publication, Wisdom, 2013), 8-9.

Maybe it is very new and surprising to someone. It is the right concept to eat everything without throwing away, but it does not mean we should eat the parts that are clearly inedible. It does not mean that we should eat the banana peel and grape stem. It is a concept that focuses on the part that we can eat. For example, instead of eating white rice peeled from rice, the central part of broccoli or cabbage, sweet pumpkin peel, root vegetable peel, etc., which are discarded even if we can eat or eat brown rice that is eaten together is used as food.

I like the process of figuring out how to cook delicious food without having to throw away what we cannot eat. The hard core of a cabbage or the base of asparagus can be sliced or chopped and used for food. Just crush the steamed sweet pumpkin peel and mix it with other vegetables to complete the sweet pumpkin salad. When cooking, eat the cores and roots of the vegetables, leaving the shells of the ingredients as they are. The onion peel left after trimming onions serves as a natural seasoning for soup.

It was in the 1960s and 1970s that the Farm-to-table movement began to emerge, bringing fresh food to the table with least distance. California's Chez Panisse began to realize Farm-to-table in earnest as a restaurant, and in the 2000s, the number of participating restaurants exploded. The chefs started shouting that there was something more important to cooking than meticulously decorating the plate with tweezers in the kitchen just to impress the customer. Soiled on the hands and face, and sweating from the farm to the farmer level, one dish of food was becoming more special and guests were willing to pay more. It was not surprising at all when a restaurant where vegetables were the main ingredients received a Michelin 3-star. Dan Barber, a leader in the Farm-to-table movement, author of "The Third Plate" and owner of Blue Hill at Stone Barns in New York, produced several crops on the farm to produce good wheat for the restaurant. The clad crop is a crop that is sacrificed for fertile land and for producing small quantities of quality wheat. Taking issue with this, Barber came round to think-

ing it was time to make a menu for limited food ingredients beyond looking for good ingredients. He began to make and showcase a new menu called Rotation Risotto, a risotto made of grain and beans grown from covered crops. This menu is a eco-friendly and uses a single ingredient from root to skin. The concept is to use only crops from the farm for cooking. Dan Barber's culinary philosophy is, in fact, a Macrobiotic concept. Macrobiotic life began with a kind of challenge to eat only the whole of the ingredients. The experiment, which began with the research, has raised health and nutrition issues as well as the reduction of food waste. Thus, macrobiotics contribute greatly to the environment as well as to personal health. Although changes in individual eating habits may not seem to contribute much to wider social issues, even minor changes can have positive effects on an individual and then on others around them.



Figure 8 – Blue Hill at Stone Barns in New York 1, 2016



Figure 9 – Blue Hill at Stone Barns in New York 2, 2016



Figure 10 – Blue Hill at Stone Barns in New York 3, 2016



Figure 11 – Blue Hill at Stone Barns in New York 4, 2016

TESTING THE HYPOTHESIS: - STORAGE OF FOOD

Before the existence of refrigerators, a small cupboard, usually made of wood, and with plenty of air holes for good ventilation, was placed under a window with little sunlight in Swiss kitchens and served to keep food cool. If it was not possible to install under a window, a box made of nets on three sides was made to store food. Also, a shelf was built to store food ingredients in the basement of the building, principally for keeping items with a long shelf life.

In Korea, ice would be gathered from frozen rivers and stored beneath ground in stone jars for use in summer.

Put simply, refrigerators are used

to increase the amount of time food ingredients can be kept for before going off. We have developed a view that vegetables and fruits can be eaten fresh at any time, so long as they are stored in the refrigerator. However, vegetables in the refrigerator lose moisture and begin to dry out. Vegetables or fruits that are not eaten before they spoil are thrown into the food waste bin.

Typical refrigerator temperatures range from 1°C to 4°C. Garlic, onions and potatoes - vegetables with an ideal storage temperature of over 5°C - should be preserved in a place where there is good airflow and the sunlight is not in contact with them. Tomatoes and

zucchini pumpkins begin to suffer in temperatures below 10°C. Eggplants, native to India, also begin to suffer from low-temperature disorders below 7°C. Galvanization of ginger occurs below 7°C. Refrigerators are also too cold for tropical fruits such as pineapples, mangoes, avocados and bananas. Today, people keep nearly all freshly harvested food in the refrigerator, but in fact, many items they put there do not need to be in the refrigerator at all, and would be better off not being there.¹³

When storing food at room temperature, the characteristics of the food in question should be considered.¹⁴ Ethylene gas producers should be identified, especially when there is a wish to delay ripening (Bleecker and Kende 2000). Taking advantage of Switzerland's traditional food storage method, an experiment was conducted to store food ingredients by stacking two wooden boxes on a balcony. Depending on the characteristics of the food, some ingredients were stored in underground cellars, and potatoes and radishes harvested in June 2019 were stored in underground sand-

boxes. Due to the effects of temperature and humidity affecting balconies, vegetables that are difficult to store underground were dried, salted, and bottled. Bottling stewed fruit and vegetable is a method of food storage that uses the principle of air cooling and shrinking to form a tight seal when the bottle or jar is sealed after being filled with hot contents.

¹³ Watkins, Chris B.; Nock, Jacqueline F., Cornell University, Production Guide for Storage of Organic Fruits and Vegetables (NYS IPM Publication No.10, October 2012).

¹⁴ Anthony B. Bleecker and Hans Kende, "ETHYLENE: A Gaseous Signal Molecule in Plants", Annu. Rev. Cell Dev. Biol. 2000. 16:1-18. doi/pdf/10.1146/annurev.cellbio.16.1.1.

*"If you want to eat the hardened cheese, you can just put it on the shelf and harden it. It's a simple solution; but then shelf smells of cheese ever afterwards. I used to put cheese in the refrigerator automatically because I thought of it as a dairy product. But then I realized cheese is essentially an invention devised to allow us to eat milk for a long time. Until the beginning of the 20th century, special chapters for storing cheese were commonly used throughout Europe. To prevent worms from twisting, the leftovers, as well as cheese, were often stored in a shade of a well-ventilated wooden cabinet with a mesh door. In the past, storage methods were different for each type of food, and people who understood it used simple and customized tools accordingly, and now we have only one method. That is the refrigerator. In just 100 years, this refrigeration technology has taken away all the knowledge we have built up with our hands and eyes."*¹⁵

¹⁵ Jihyun, Ryu. salam-ui bueok (South Korea: Naj-eunsan, 2017), 96.

For effective storage of dairy products at room temperature, a reference research was conducted. Butter applied 'beurrier Breton' from France in the late 19th century.



Figure 12 - beurrier Breton, 19c



Figure 13 - Old storage box, 1930



Figure 14 - Alternative refrigerator experiment, 2019

CONCLUSION

Through two hypothesis experiments conducted in Action Research, I researched the 'food care' method suitable for small modern families and drew conclusions as follows:

First, the food culture and eating habits of small modern families should be incorporated into the Macrobiotic principle and based on a detailed understanding of the approach. At the same time as saving food waste, the tastes of modern families should be considered important. The most critical part of Macrobiotics is taste. No matter how difficult and demanding the diet is, small modern families will be interested if Macrobiotic-based food is delicious. As such, when you use a Macro-

biotic diet as a food care tool, you should provide a delicious and diverse Macrobiotic set of recipes.

Second, we should propose a way of reducing our use refrigerators, not doing without them entirely. I suggest a scientific way to keep food ingredients fresher without having to keep them in the refrigerator. Traditional storage methods and natural storage methods were food care methods used by our ancestors who valued food ingredients. By incorporating scientific knowledge with clear causality into these traditional storage methods, we can arrive at a new method of storing food ingredients suitable to the structure of modern society.

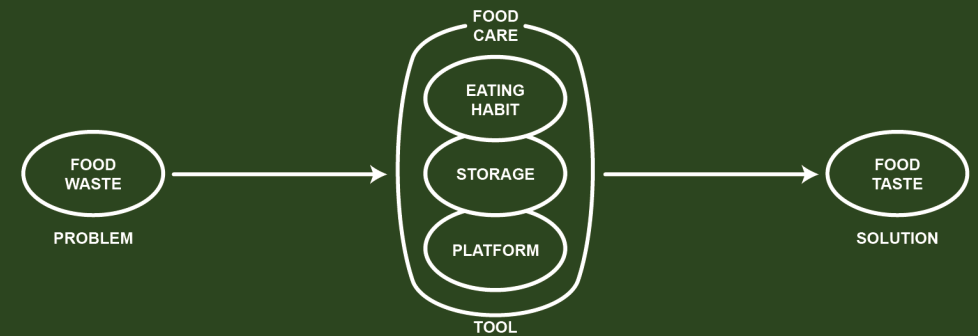


Figure 15 - Food waste to food care model, 2020 ©

CASE STUDY 01: LEFTOVER FOOD MOVEMENT

05

LEFTOVER FOOD MOVEMENT - DESCRIPTION

<Leftover food movement> is a pop-up restaurant performance that recycles leftovers. I mix and prepare ingredients and 'leftover food' brought by people to make and introduce 'Kimbap', a traditional Korean food. This pop-up restaurant proposes a way to recycle leftovers without throwing them away, as well as planning to understand traditional Korean food.

The performance took place on the 23rd and 25th of October 2019 at ZHdK.

Kimbap is a convenient Korean dish that makes rice and laver the main ingredient. Because it is cut into bite-sized pieces, it does not require a separate dining tool and is simply a finger food form that can be eaten by hand. It is known for its portability and is known for its convenient food, and is usually eaten outdoors in Korea. The reason why Kimbap was chosen as the menu in this performance is because of its specificity. Kimbap is made by putting the desired ingredients between rice and seaweed. Therefore, it is possible to eat leftovers by wrapping them all at once. It is also possible to change the composition of ingredients in kimbap according to individual tastes.



Figure 16 – Making Kimbap with leftover bread, 2019



Figure 17 – Leftover bread, 2019



Figure 18 - Kimbap with leftover food, 2019

*"If the food you left is dumped in the trash, it is food waste. But if your food is back on your table, can you still call it food waste? If you bring your leftover food to my Kimbap (Korean rice rolls with seaweed) restaurant, it is never trash. I'll show you how to recycle with your leftover food to make Kimbap - to think about how our eating habits affect the environment."*¹⁶

16 Hyeon Jin, Seo.
Preface to the exhibition (Leftover food movement), 2019

LEFTOVER FOOD MOVEMENT - DESIGN CONCEPT

The theme of the demonstration was 'Recycling leftovers'. I wanted to convey the two words 'leftover food' and 'kimbab' positively and clearly, showing a pleasing encounter between 'leftover food' and 'Kimbab' and given visual manifestation in the shape of the 'Kimbab' corss-section.

I designed a menu board so that participants could choose various ingredients of ‘Kimbab’. By giving participants the opportunity to choose ingredients, I wanted to paradoxically show that “leftover food” can either become “food” or “food waste,” depending on our choice.

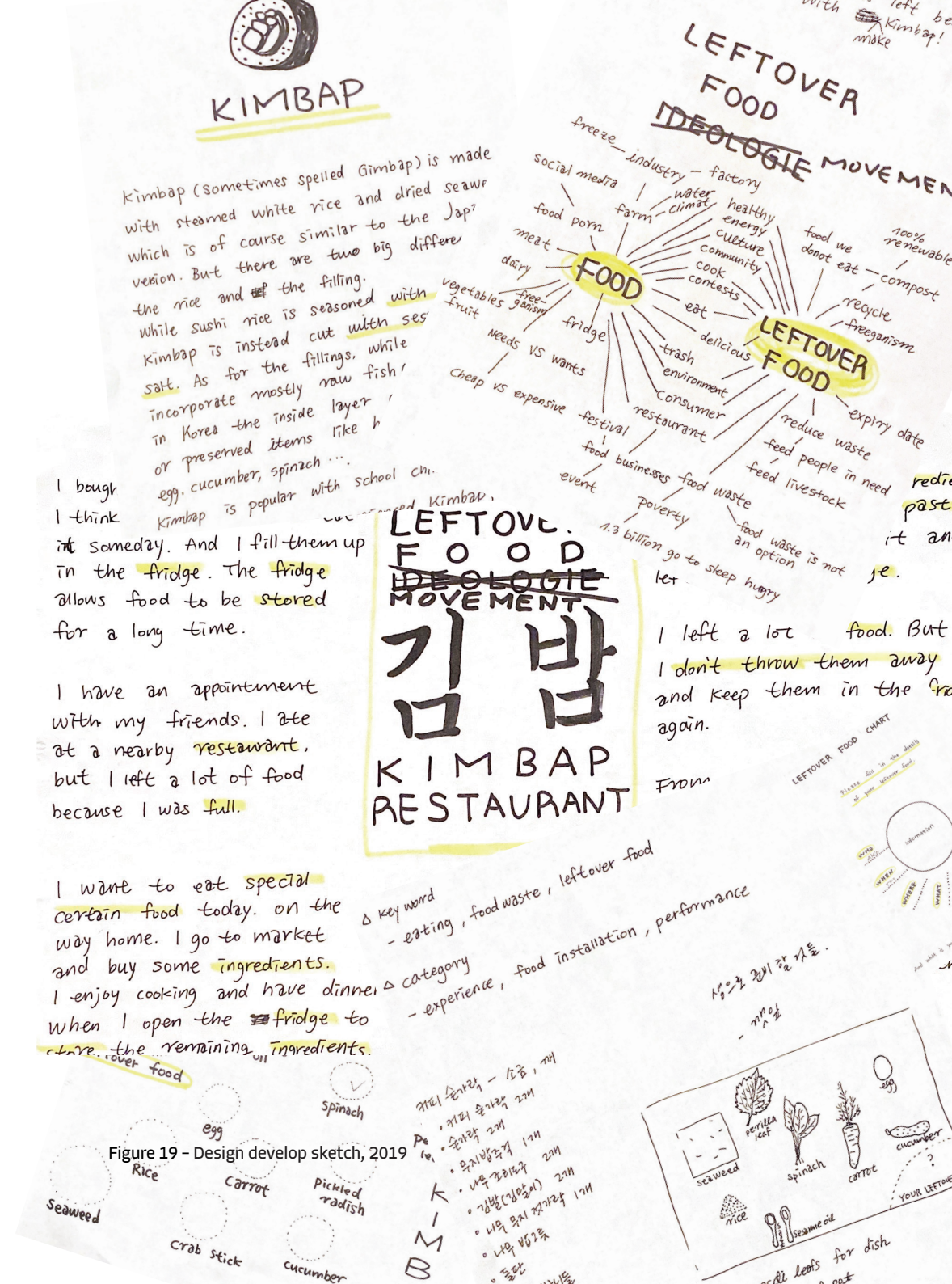
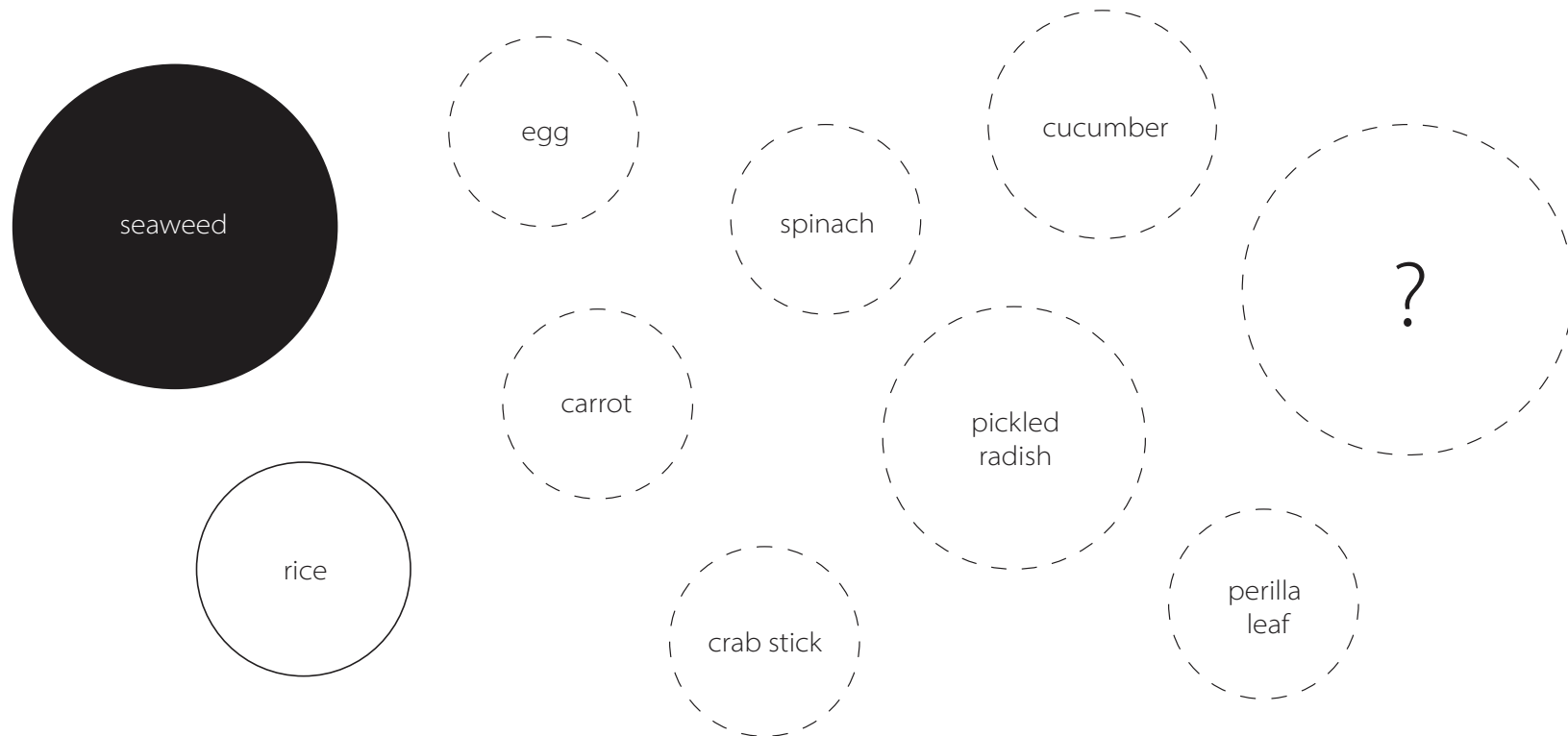


Figure 19 – Design develop sketch, 2019

menu



no. _____

먹고 싶은 김밥 재료를 체크해주세요. 만약 남긴음식을 가지고 왔다면 저에게 주세요.
Please check the ingredients of Kimbap you want to eat. if you bring any leftover food, give them to me.

Figure 20 – Leftover food movement menu board, 2019

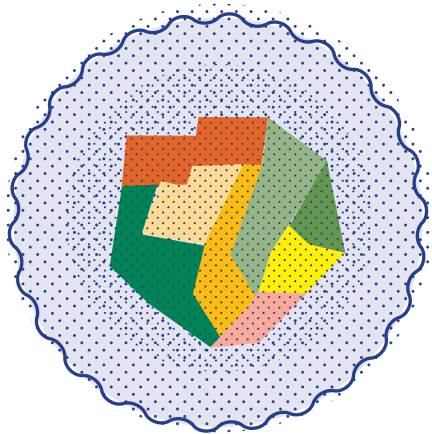


Figure 21 – Kimbap Icon, Design by _Itay Blaish, 2019 ▲

Figure 22 – Leftover food movement Poster, Design by _Michael Simic, 2019 ►



LEFTOVER FOOD MOVEMENT - SURVEY

The survey was conducted on the 69 people who participated in the demonstration(performance).

Title

Leftover food chart

Purpose

Information on food waste and environmental pollution is being communicated to the public through the mass media, but not being put into practice sufficiently. This survey aims to identify problems and countermeasures by measuring people's awareness and of and practical responses to the challenge of reducing food waste.

Survey period

23.10.2019 – 25.10.2019 (3 days)

Subject

Leftover food movement participants

Survey Method

A questionnaire was conducted for participants who participated in the demonstration using a structured questionnaire.

Survey contents

The survey contents relating to food waste were based on prior research. The parameters measured and recorded were: Participant Gender, Date of Remaining Food, Date of Remaining Food, Type of Remaining Food, Reason for Remaining Food, Recycling motivation.

Survey Analysis

A total of 69 participants (33 women and 36 men) participated in this survey. 80% of all respondents said they had leftovers the day before, 12% said within the past two days, and 8% said within a longer time frame. 63% of respondents came from home, 12% from restaurants, 11% from friends, 1% from dumpster diving, 3% from surplus food platforms, and 10% from others.

In the survey of the leftover food types, 51% said vegetables, 35% grains, 5% meat, 4% snacks, 1% fruits, and 4% others. Asked to give an explanation for the leftover food, 67% said they cooked too much, 31% said they were full, and 2% said they had to stop eating because they had no taste. When it comes to food waste, 43.9% of respondents take it seriously and 48% take it seriously. 59.3% respondents said that the most serious problem caused by food waste was environmental pollution, followed by 24.1% of food waste. Asked to self-assess as to whether they had been trying to reduce food waste, 49% of respondents said

they had, and 22% said they had not.

89.5% of all respondents chose to recycle leftover food and 10.5% did not. This corresponds with the 89.5% of all respondents who felt positively about recycling leftovers, and 10.5% who did not.

Survey conclusion

Most of the leftover food was found to occur at home, and the food type found to most frequently 'leftover' was vegetables. Regarding the seriousness of the food waste problem, the majority of respondents said it was severe. The reason given for the generation of waste food by most of the respondents was that the amount cooked was too large. In order to reduce the occurrence of food waste, the development of recipes for smaller helpings, with precise ingredient measures, should be the basis for effective food waste reduction for the modern family.

LEFTOVER FOOD MOVEMENT - REFLECTION

Before the demonstration, I anticipated some of the 'leftovers' that the participants would bring, but bread, sweets and fruit were a unexpected ingredients for making Kimbap. In addition, some participants brought wet ingredients to use for sauce, but due to the nature of Kimbap, it was not easy to make use of these wet ingredients. Making Kimbap with unexpected leftovers was a great challenge. Most of the participants who participated in my demonstration brought withered vegetables or vegetable peels as leftover food. In order to clear the preconceptions about 'leftover food', I recommended ingredients for Kimbap that would go well with 'leftover food' brought

by participants. In particular, I was very embarrassed by the remaining food of the participant who brought the leftover carrot peel and the over-aged banana after trimming. However, it was a fresh experience for both me and the participant. It was once again imprinted that vegetable peels, which can become food wastes, can also be great ingredients for Kimbap.



Figure 24 - Leftover food movement participant menu board, 2019

CASE STUDY 02: WORKSHOP

06

WORKSHOP

- MAKING BEESWAX WRAP

As mentioned above, there are various methods for storing food ingredients. Among them, it is suggested to make and use a wrap made of Beeswax (rather than disposable a disposable product) when storing ingredients. Hepburn, H.R. explained

“Beeswax is a complex mixture produced by the bee’s abdominal tissue, which is purified and made into wax.”¹⁷

Beeswax has moisturizing and antibacterial properties and is used by bees to build houses and plays an important role in keeping the beehives sterile. When the wax is melted, coated on the fabric, and dried, it becomes a

natural packaging material with a waterproof effect and adhesion. For this reason, it has been widely used in letters, book covers, raincoats, since ancient times. Before the workshop, experiments were conducted on how long the ingredients wrapped in beeswax can be stored and kept fresh. A banana with good browning was prepared and cut in half to check the state of the banana stored at room temperature for 24 hours. One banana cut in half was sealed with beeswax and the other half was stored in a regular container. The banana stored in

¹⁷ Hepburn, H.R., et al., „Synthesis and secretion of beeswax in honeybees (Apidologie Volume 22, 1991), p 21.

the wax wrap hardly browned at all, whereas the banana stored in the general container browned a lot. As a result, it was confirmed through experiment that beeswax could protect food ingredients from air and moisture and keep them fresh as if wrapped in a natural shell. In this workshop, I provided participants with information on ingredients that do not need to be stored in the refrigerator, the process of making wax wraps, and precautions when using them.

Following the workshop, participants said that their methods of food storage had changed, and that they were able to keep food fresh for longer than before the

workshop. In addition, the amount of food waste was reduced because less food was spoiling.



Figure 25 - Beeswax wrap, 2020



Figure 26 - Beeswax wrap workshop, 2020

WORKSHOP

- PLAYING VEGETABLES JENGA GAME

This workshop was aimed at improving children's food receptivity.

Parents who have infants want their children to eat a broad diet. The workshop started with an acquaintance's concerns. The acquaintance's child (3 years old) had a strong refusal to eat vegetables.

“Infants learn knowledge, attitudes, and various skills about things or situations through real-life environments and everyday life experiences. Cooking activities where children experience the process of seeing, touching, smelling, and tasting food that they often encounter in their lives can be said

to be very effective in cooking guidance. In addition, food experiences and familiarity with food that has not been encountered can improve the preconceptions and avoidance of existing foods.”¹⁸

Having researched various methods to improve early childhood diet, I developed a food game that can be played by children aged 3 to 5 years. Inspired by the wooden block game 'JENGA', the playing pieces of food game are made of blocks consisting of vegetables such as radish, pumpkin, sweet potato, and carrot.

¹⁸ Kyung-mi, Ko, Action Research on the Operation of Cooking Activities to Improve Young Children's Picky Eating, (South Korea, Ewha Womans University, 2012), pp. 3-84



Figure 27 - Vegetable sticks jenga game workshop 1, 2019



Figure 28 – Vegetable sticks jenga game workshop 2, 2019

At the beginning of the workshop, children did not recognize the vegetable blocks as a game pieces and ignored them. I invited the parents to start playing, and the infants observed this. They began to show interest in their parent's play activities and then participated themselves in earnest. This game is played to the rules as JENGA – the only difference is using vegetable blocks in place of wooden blocks. While observing the infants' at play, it was noticeable that the act of handling the vegetable blocks during play positively changed the prejudiced and negative view children previously held with regard to the vegetable. The infants began to eat freely, touching and observing the blocks of vegetables that fell from the vegetable tower.

Infants do not want to eat food they have previously formed a dislike of, even when very hungry, because of memories of when they have eaten the food in the past. Therefore, in order to counter this experience, it is necessary to provide an opportunity for children to participate in food play and accumulate positive experiences convincing them that the food they have eaten is 'delicious', thus positively changing food perceptions. Vegetable block play does not contribute to reducing food waste right away. However, balanced eating habits established in infancy affect lifelong eating habits, so various food play methods need to be explored in the future to improve the infant's dietary habit.

MACROBIOTIC

- APPLICATION OF MACROBIOTIC

Diet and eating habits were identified, and the macrobiotic lifestyle was applied considering the eating habits of small modern families.

Prior to starting the research, the academic data on macrobiotics were investigated, and the survey analyzed how much the small modern family knew about macrobiotics. According to the survey, most modern families in Korea and Switzerland were unaware of macrobiotics. It was found that the skins of potatoes, carrots, sweet potatoes, and radishes, which can be consumed in the shell, was removed before cooking, and the centre of cabbage and broccoli were also discarded.

The reasons for removing and not eating the skin and hard parts of vegetables were mainly habitual. The small modern family said they thought onions and green onions were not edible, but they were taken after removing the roots.

The majority of the surveyed small modern family members in Korea and Switzerland responded that they would try more than twice a week to see if the macrobiotic method helped reduce food waste and improve their eating habits. Therefore, the research consisted of developing some easy recipes based on existing macrobiotic recipes that would be easy to apply to the diet of small modern families.



Figure 27- Macrobiotics meal 1, 2019



Figure 28- Macrobiotics meal 2, 2019

MACROBIOTIC

- EFFECTS OF MACROBIOTIC

Small modern families in Korea and Switzerland have changed their perception and behavior toward macrobiotics and have developed a new level of interest in nutrition and food waste issues. The following are the effects of this research on small modern families in Korea and Switzerland. First, through this research, the perception of macrobiotics in small modern families in Korea and Switzerland has changed. Previously, families had an instinctive and negative prejudice with respect to eating whole foods. However, the amount of macrobiotic cooking increased during the period of research and perception of whole food changed positively in the process of repeatedly en-

countering the same ingredients. In particular, families with infants were previously reluctant to eat food containing ingredients that infants did not like or had refused to eat in the past. However, as the experience of tasting it positively accumulated, they became aware of it as a familiar and delicious food. The perception of the neglected environment has also changed as the ingredients, which they thought could not be eaten, are mixed with various ingredients and have experienced a good change. In addition, modern families, who had previously stuck to the same recipes, actively participated entire range of macrobiotic recipes and ingredients. As these small modern families ex-

plored the whole food ingredients and prepared their own meals, they gradually became more interested in macrobiotics and the amount of food waste decreased by at least 10% and in some cases by up to 90%. In the case of Korea, which applies the food waste standard system (the method of charging fees based on the weight of food waste emitted by households),¹⁹ the economic effect was also a factor due to a decrease in the amount of food waste after the macrobiotic introduction. This suggests that when improving lifestyle to reduce food waste at home, the family's eating habits should be analyzed first and then reflected on the macrobiotic principle. Second, interest in how to reduce food waste has increased. A small modern family recognized that food waste reduction was possible only through improvements in eating habits. This led to the process of finding more diverse ways to reduce waste, and an active engagement with searching for communities where people can share their knowledge and experience. As such, through macrobiotics, the modern family has become more interested in

the environment and food. In addition, as they shared their experiences in macrobiotics with the public in SNS, these eating habits naturally led to a significant effect on society.

¹⁹ Zero Food Waste, Seoul 2018, Seoul Solution, last modified May 5, 2020, <https://www.seoulsolution.kr/ko/content/3438>.

STORAGE OF FOOD

VARIOUS STORAGE METHODS

In order to effectively operate without a refrigerator to reduce food waste, the types and actual conditions of food ingredients stored in the refrigerator were identified, and traditional methods of storage were applied. In addition, the aesthetic elements of storing food were considered and various elements of food ingredients incorporated.

Ever since beginning the research we had found that food ingredients stored in the refrigerator were often found to be capable of stating fresh outside the fridge, and a large number of foods found inside a fridge should not be so stored. Also, we checked the use of refrigerators by small modern

families in Korea and Switzerland and found that it was not clear correctly what ingredients were stored in the refrigerator. Living with refrigerators is creating unnecessary social and environmental problems at home. Refrigerators consume unnecessary power storing things that need not be there. The serious food waste problems this way of life leads to has led to the recognition of the need for this research.

Based on this need, various storage methods considering the characteristics of food ingredients were attempted and implemented as follows:

First, the classification of

vegetables and fruits that are sensitive to ethylene gas. Second, storage of water-based food ingredients and increasing aesthetic effects. Third, traditional food storage methods.



Figure 29- Banana Experiment 1, 2019
 Figure 30- Banana Experiment 2, 2019
 Figure 31- Banana Experiment 3, 2019
 Figure 32- Banana Experiment 4, 2019

STORAGE OF FOOD

EFFECTS OF STORAGE

I made some extreme choices in order to proceed with this research. In order to distinguish which food ingredients can be stored without a refrigerator, an experiment was conducted, with the following results.

First, a change in mindset reducing the approach of reckless consumption. Buying unnecessary food ingredients in households without refrigerators can cause another food waste production. After stopping the actual use of refrigerators, indiscriminate purchases of food ingredients were reduced, which also had a positive impact on the household economy. Life without refrigerators encourages effective buying.

Second, food ingredients can taste better when not refrigerated. Many food ingredients distributed to supermarkets are harvested and sold before their natural seasonal harvest time. Therefore, these foods require longer to ripen. However, if these foods are put in a refrigerator, it is highly likely that they will not reach their optimal nutritional content and taste. In addition, a degree of dormancy could be chosen using ethylene gas emitted by food ingredients.

Third, interest in traditional methods such as drying, salting, and bottling has increased.



Figure 33- Disconnect the refrigerator power, 2019



Figure 34- Drying pumpkin and onion peels, 2019



Figure 35- Drying pumpkin and onion peels, 2019

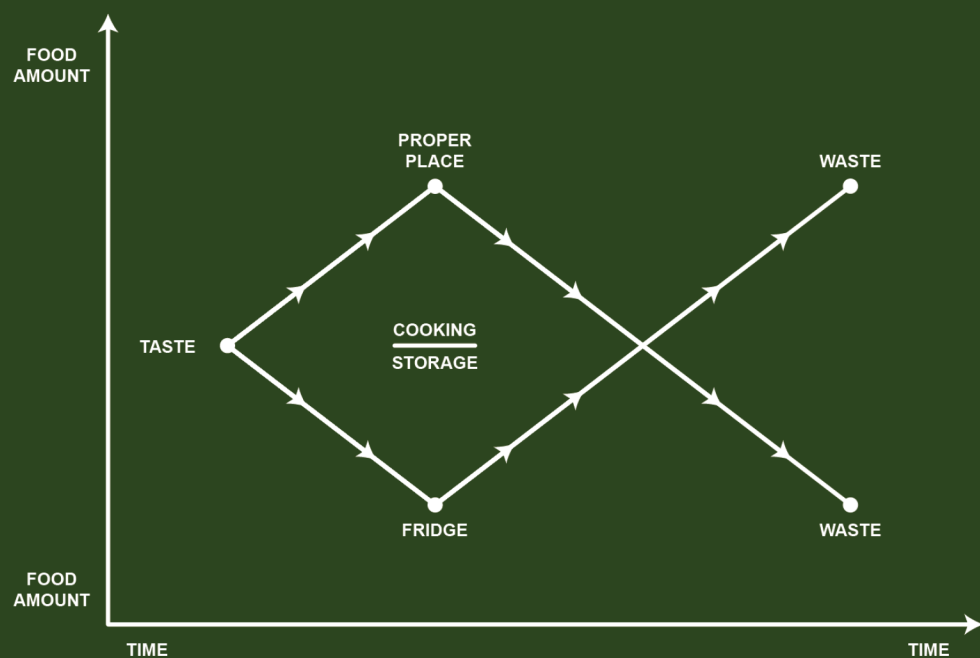


Figure 36- FISH model (conclusion), 2020 ©

The conclusions obtained from this project are as follows.

First, from research on the Effective Method of Improving Eating Behavior to Reduce Food Waste: Macrobiotics is the most fundamental way to improve the eating habits of small modern families and reduce food waste. Until now, modern society has focused only on the development of energy industries and technologies for food waste disposal, recognizing the generation of food waste and handling it as a given end-product to be managed. In order to improve the food waste problem, macrobiotics was presented as a means of changing the the food-buying and meal-making habits of small modern families, by providing them with easy macrobiotic recipes that reflect the characteristics and eating habits of modern families and help to reduce the generation food waste.

Second, research on the Storage Method of Food Materials through Non-Energy Proper storage methods tailored to the characteristics of food ingredients, proved that there are

III

sustainable ways to increase the taste of food and reduce food waste. The use of refrigerators can increase the storage period of food ingredients, but it also encourages reckless consumption and undermines the taste and nutrition of food ingredients. Thus, the people should reduce the generation of food waste by utilizing traditional storage methods considering the characteristics and esthetics of food ingredients. As a result, they will be able to prevent the proliferation of food ingredients that get thrown away without having been eaten, and improve the the taste and nutrition of the whole food ingredients that are used in their place

Based on the results and limitations of this research, I would like to propose the following for further research. First, implementation studies should continue to be conducted to present specific measures and convenient recipes so that the macrobiotic method of reducing food waste can be effectively followed by reflecting the eating habits characteristic of small modern families. Second, studies should be conducted to

implement long-term measures in which the fundamental problem of food waste can be gradually improved. Long-term results this research could not be measured because the research was conducted only on small groups. It is hard to say that the eating habits and attitudes of small modern families have changed completely over a short period of time.

DOCUMENTARY INTRODUCTION

What I am trying to do in artefact making is to present a deficiency in this paper.

Artefacts are produced in two forms.

First, I will produce artefacts that are contrary to “creative power,” the second way that activist groups crave. The documentary is produced in a way that approaches problems rather than the ones that present society has. This artefact will be a documentary that shows a utopia ideal and an experimental composition that excludes awareness.

DOCUMENTARY IDEA

Various references have been collected from the start of this research process. The videos on the theme of the environment often forced the viewer to feel anxiety about the future that has not yet come or to compel anxiety factors that have been produced so far. The start of the idea started with this dirty feeling. The documentary to improve social problems has always been depressing and dark. The documentary, mixed with emotional direction, eventually leads to a new drama. My documentary is a series of experiments and failures. A perfect documentary cannot exist in this world. The documentary must be a real documentary.



BOOKLET INTRODUCTION

Second, based on this research and empirical knowledge, I will produce a booklet that does not have a sense of purpose. Publications that do not have a clear purpose orientation will give the reader a unique sense of purpose. This artefact is also produced in a form opposite to the books that have been published. This is a paradoxical approach to 'Macrobiotic' related cookbooks that emphasize countless principles and publications describing food storage methods entirely refrigeration.

BOOKLET IDEA

In this research, the booklet appeared in the middle. The reasons for the sudden appearance are as follows.

Can type and image replace technology for food and taste?

If we look at food books made in the past, we cannot imagine the taste. So that the reader will move on their own. The reason is that we want to reproduce the taste drawn in the books. My artefacts also consist of very abstract piles.



CABBAGE KIMCHI 배추김치

1-2 Chinese cabbage
1 radish
2 scallions
1 apple
10 cloves garlics
20g ginger
50g flour
200g kosher salt
230g red pepper powder

1

cutting
the Chinese cabbages



cutting the radish
into matchsticks
shape



cutting the scallions into 4cm

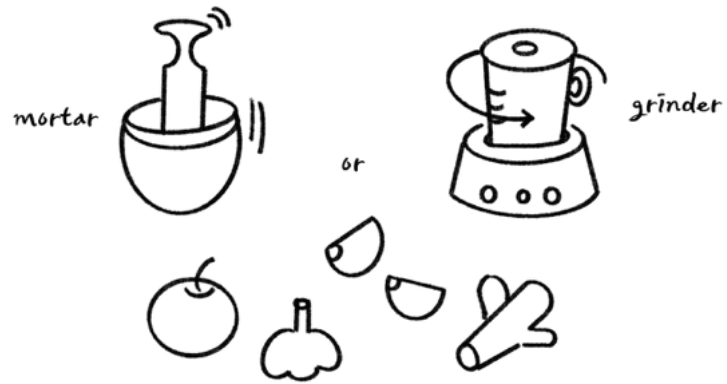
tip.

All ingredients use without removing skin and roots.

4

122

56



Mince the garlic, ginger, apple and Add water.
Stir into a smooth paste.

tip.

Sweet Taste: Other sweet-tasting fruits are also available instead of apples.

123

57

5



Add 50g of flour to 200g of cold water and stir well.
Boil the flour water over low heat until it becomes sticky.
Cool down the Kimchi flour porridge made.

tip.

Gluten-free : Glutinous rice flour and boiled potatoes can be used instead of flour.

HEAT AND DEHYDRATE

Cooked rice



When there is a lot of cooked rice, bake the rice in a frying pan to dramatically reduce the moisture content. Cooked rice that has been removed from moisture can be stored for a long time.

vegetable, fruit



If there are many vegetables and fruits, cut them into small pieces and bake in the oven or dry in the sun to evaporate moisture. Dried vegetables and fruits have very high preservation.

grain



Grains are fried in a frying pan without oil to increase the flavor, and then granola cereals are made.

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10

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09.01.2020. Bulle, Switzerland, Julia Lee

Hello (Interview started 12 minutes behind appointment)

I'm sorry. I can't keep my promised time because of my child. Always faster or later than expected. Of course, it is very rare. Would you like some drinks? What kind of drink do you want?

Just give me a glass of water. Thank you.

(Handing over the glass of water) I'm worried about having an interview with my son. I don't know how to speak well because I'm new to an interview.

Fine. It's a new year, did you set a goal this year?

My goal is to reduce food waste and not to make as many leftovers as possible this year. There are too many things that haven't been eaten at all. So I plan to cut them down and use more of the ingredients in the fridge. And can I tell my personal goals? One of my personal goals is to spend a year making me a little better. I need to prepare lunch now, but can I prepare meals during the interview?

Of course. What is your lunch menu today?

(Takes out potatoes) I have to eat potatoes. Since I bought potatoes for a long time, I'm going to cook potatoes today. The potato has already sprouted a lot. (take out 4 potatoes) I think about 2 people eat it, and I think 4 potatoes would be fit. Potatoes, salads, and sausages are today's menu. (Washing potatoes) If I don't make a plan on eating a meal, and I see a little old ingredient, I tend to set a menu with it. (Shaping the potato) I'm scared of this potato knife.

What is your usual daily schedule?

The day begins when my son wakes up and ends the day when my son sleeps. Usually, my son wakes up around 7 am, and I prepare for breakfast. I make the breakfast menu as simple as possible. I have breakfast with bread, yogurt, or cereal. And when my son starts playing, I then prepare lunch from then on. It's my job to make and organize food every day and make and organize food again. I should eat lunch and think about the dinner menu.

Do you make a lot of food waste?

In fact, there is a lot of food waste. I don't know what kind of food my son likes and dislikes, so I prepare various meals every day if possible. When I make many kinds of food, one of his favorite foods comes out. Perhaps, for this reason, more food waste is coming out. In fact, there is a lot of food waste due to leftovers. People who prepare food can't eat much when they eat food. Because I'm tired of the smell of food. Usually, I eat the leftovers by my son. However, the leftovers don't look delicious anymore. So one day, I started to throw away the food left by my son. It is true that more food waste is generated after my son is born.

Was there little food waste before you had children?

I can't say no. But it was less than now. My husband and I have different tastes. I have a typical Korean taste, and my husband doesn't eat Korean food. So I always make my own food. So, there are cases where the ingredients you want to eat are duplicated. In that case, I try to eat the ingredients first, but it is difficult to eat the same ingredients every day. I don't go shopping with my husband. Because our taste buds are different. For example, I want to eat Korean food, but my husband wants to eat Swiss food. Most of these cases do not motivate me to shop together. Because this routine is repeated, we do not interfere with eating each other.

You told me that you want to reduce food waste for this year's goal, have you ever thought of ways to reduce food waste?

I haven't thought about it yet. But starting this year, I want to make a point of going shopping with my husband on purpose. Of course, we still don't eat the same menu, but sharing our own menus will help us plan our shopping list. If I plan and make a list and do shopping, I may be able to reduce food waste to some amount.

Which food does your son favor, Korean or Swiss food?

Currently, my child prefers Swiss food over Korean food. To be precise, he tends to prefer western food. I cook for my son. So, I make two things, one for me and the other food for my son. If I like Swiss food, there is no need to cook two dishes. If one day my son loves Korean food, I don't have to cook two dishes any more. But will such a day come? (laugh)

Thank you for preparing the meal.

(Hands the plate) Somehow, today's lunch menu is Swiss food. Bon appetite.

Today's menu will be good for your son.

My son likes salty food. He likes salty foods as well as stimulating foods except for spicy foods. In particular, my son doesn't even try to eat vegetables except for potatoes.

Is there a reason why your son's eating habits have been formed like this?

There was a time when he had a lot of colds. The more he got sick, the better he should eat, but he didn't want to eat any food. So, since then, I have been making food that he eats well regardless of the type of food. Probably since then, my son's eating habits were formed like this. At that time, the food like to eat was sausage, cheese, potatoes, yogurt, and milk. When he was well, I made Korean food for him, but he refused all Korean food. In fact, I think Korean food is

nutritionally healthier than Swiss food. So I want to make more Korean food for my son than Swiss food if possible. However, I don't have any way, because he doesn't eat Korean food.

Does the whole family eat together?

I am ashamed to answer this question. We do not eat together. It is my job to feed the child at my house. So I eat with my child, but I don't eat the same menu except in special cases. In short, I am eating a different menu at the same time as my child, and my husband is eating alone.

Do you think this meal structure is also related to food waste?

I can't say no. Cooking small amounts of food is more complicated than large amounts of food. The reason is the amount of control. When I first prepared my son's food, I couldn't count how much the child eats. So, I always have leftovers. My husband always cooks a lot of food. And he has a lot of leftovers. We all make a lot of food and leave a lot of food. Having said this, I seem to be an environmental destroyer. (Laughs)

If I give you tips for saving food waste, do you think you can do it?

Of course! I can't make food waste zero from the beginning, but I want to try. But I expect it will not be easy. Still, food waste reduction is one of my goals this year, so I definitely want to try it.

So finally, is there anything you want to say?

(Pointing to the leftovers) The menu for dinner is sausage, salad, and potatoes.

FOOD CARE EXPERIENCE
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