Sugalactite

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Abstracts

This project deals with a question of the future development of food process with the example of home food and cooking at home. Modern development have heavily touched upon it. Before modern times, for our ancestors, food production was important to families and all family members had to work for getting food to survive. Comparing to these times, modern society is not urged to see growing crops and cooking as means of survival. We mostly work far from food production and often eat out, at a restaurant or supermarket for instance. In some country eating food outside, so called “street food” is very common. In such a food culture, people gather to eat every day at restaurants or cafes. Such a place functions as a modern kitchen in the society. People tend to eat and cook less at home. How will the situation surrounding home food alter if its nutritional function plays lesser role every day? Considering these developments, we study with this project how a kitchen product will look like in the future.

The food situation

-Past

Before the first industrial revolution, the amount of food was considerably limited. Besides, the reality of human life required self-sufficiency. Therefore, eating at home with family was a common thing.

-Present

With a change of lifestyle, we tend to live in a nuclear family or single. Especially in a metropolitan city, people tend to eat food outside because they are constantly occupied. Generally, eating out is just convenient for such a lifestyle. Moreover, there are various types of restaurant or place where people can get food. They can reach to such wide range of food easily. In this situation, the advantages of eating out overtake the ones of cooking at home.

-Future

With the advent of artificial intelligence, the workplaces of human will be rearranged to intelligent machines. This future comes into food production processes as well. That technological development assists the rise of production efficiency. Therefore, the food will be going to get cheaper. Eventually, at a point when we achieve technological singularity, due to the self-food processing cycle by AI, the food is going to be free. An advocate of singularity, V. Wadhwa[1] estimates that in 14 years energy and food will be free of charge. Sooner or later, the cost is going to get lower and people can afford high end foods and quality nutrition with little money.

Sub-effects of food toward human

According to Irving L. Janis[2] at Yale University, food makes people more affirmative. This research worked on two different experimental conditions. Subjects in each group were asked to read four types of communication topics. One was offered with substantial amount of food (peanuts and coke) to the subjects while they were reading a series of four perspective communications. In the other condition, the second group were not offered any food. The result indicated that food has a facilitating effect on the amount of opinion change.
Another psychologist, Gregory Razran, in 1938 he coined the term the "luncheon technique" when he found that his subjects developed a more favorable view of the people and things they experienced while they were eating.

The biggest factor of happiness in life

The 75-year-old study on adult development upon happiness and wellness factors in life by Harvard University showed that good relationships keep us happier and healthier. More precisely the social connections are significant for us. In contrast, loneliness is what kills us. In other words, people who are more socially connected to family, to friends, to community are happier, physically healthier and live longer. More isolated people are feeling happiness less.

Application example of food effects

- Kitchen politics

"Kitchen Politics" appeared in the Soviet Union and describes the social atmosphere of those days. During that time, people were controlled by government and deprived of freedom of speech. Therefore, to talk on social matters, people used to gather at home. While they were cooking and having a meal, they talked with friends about politics in low voices.

- Lemon squeezer by Philippe Starck

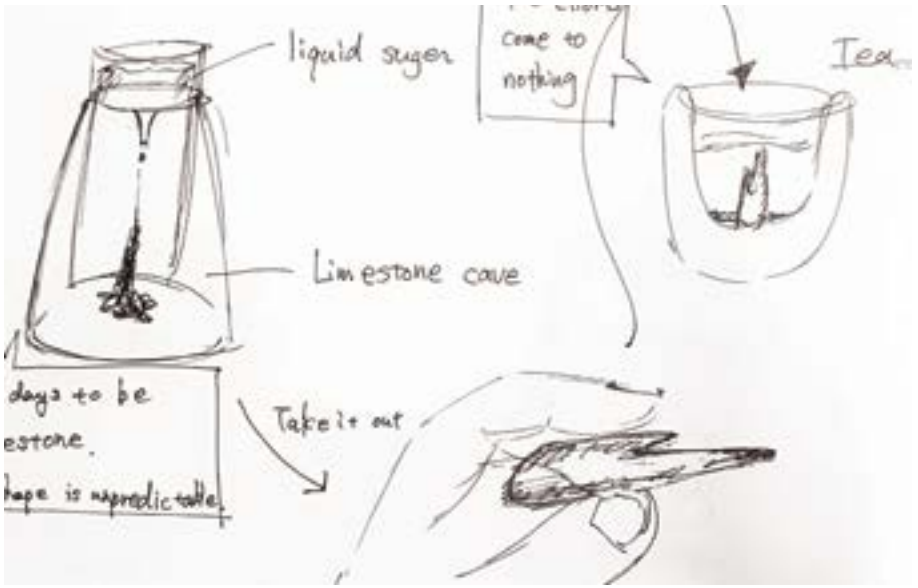
When the lemon squeezer was first produced in 1990, it was a controversial product. It does not perform its main function (to make juice) effectively and makes a mess. Other users celebrated it as an example of prevalence of form over function though. It has been acknowledged as great modern design and placed in the Museum of Modern Art in New York. The squeezer designer said, "It is not meant to squeeze lemons, it is meant to start conversations."

Concept

Through the research on the functions of food at home, we propose these trends for future kitchen-related tool development.

- Fun first design
- Bring forth a chance to start conversation to the tool holder

We are entering the times when we do not need to produce a meal ourselves if not as a hobby. In these times the only reason behind meal production will be "fun" and as a human use object, it should contribute to make life glorious. We presume that improving social connectivity can achieve it. And to make it, we consider implanting the function of conversation starting. With an idea of the lemon squeezer, we think, in order to catch the attention of people and start conversation it need to accomplish to bring out a dramatic surprise with a commonly known object. In the lemon squeezer case, the object is a lemon. We think sugar is also a common object and it also exists in every kitchen. In this project we decided to play with sugar which anybody knows, to create dramatic fun and make a chance to start conversation.



Example of food-toys

These food-toys are joyful to use and funny. However, these types of fun are specially oriented at the children. In order to be fun for an adult, it needs a twist of refined taste and utility with which a user can take advantage of a chance to start conversation in a group. A kitchen tool which amazes people at the first instance and is fun to cook with is product that can serve these two functions. Based on that, we propose a kitchen device which creates sugar-limestones. This creating process takes a few weeks for one crystal to emerge. We are expecting a user to create sugar stones each of which will be unique in shape and show them to visiting friends or guests at a party. The uniqueness of shapes gives it a treasure-like image. And sharing that moment will be a starting point of a conversation.

Sausage octopus In Japan, the cutely shaped sausages are made for kids. My mom used to cut it to the octopus-shape and put them into a lunchbox.

Flowing noodles (Nagashi-Somen) The noodles are put into a long bamboo flume with clear, ice-cold water. Catch the flowing noodles with chopsticks and eat!

Sugar experiment 01

Starting the sugar experiment, we checked the ingredients of candy art as a reference. We followed the recipe below:

Sugar : Syrup : Water = 7 : 3 : 5
Temperature = 140~160 degree

In addition to this recipe, we tried out several temperatures and different amount of sugar. However, the low temperature of sugar did not harden so well and it just became sticky liquid.
The sugar in the recipe above could harden enough. However, we found such a high temperature of sugar to be potentially problematic, because sugar can get stuck in the machine and keeping the temperature continuously high requires lots of energy.

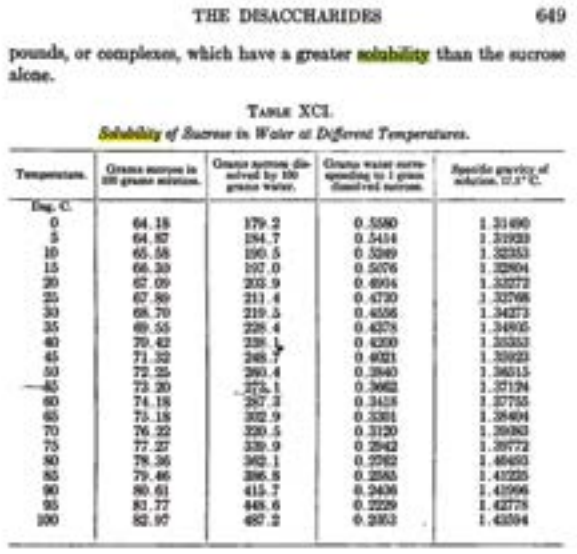
Sugar liquid at 100 degrees
We tried several types of sugar at the same temperature. however all of them did not harden. And the sugar did not dissolve well.

Sugar liquid at 140 degrees
This experiment worked well. This sugar can harden immediately.

Sugar experiment 02

After we tried sugar experiment 01, we searched for a method to make liquid sugar harden in low temperatures. As we researched on the industry, we found a key in crystal sugar production (known as rock candy). In the process, tiny crystallized sucrose (table sugar) which is called seed crystal, is grown in a hot sugar liquid. (50 ~ 60 degree). After a few weeks they will reach a certain size. On industrial levels, it is also possible to accelerate the growth process.

Referring to the industrial process, we made a prototype that we tried out several levels of solubility of sugar liquid to grow a sugar crystal. First, we tested the sugar liquid temperature of around 50 degrees. In these conditions, liquid can be hardened easily at a room temperature. Therefore, it did not work well. Afterwards, we tried with room temperature of sugar liquid (around 25 degree). Nevertheless, this was too liquid and it just melted the crystal.



THE DISACCHARIDES 649

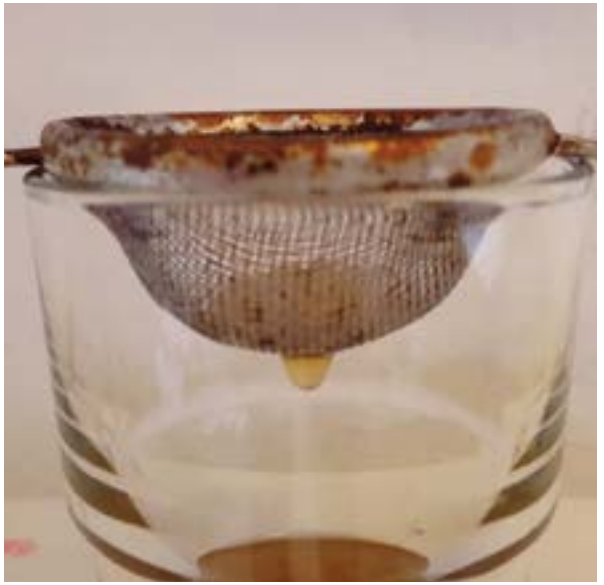
pounds, or complexes, which have a greater solubility than the sucrose alone.

TABLE XCI.

Solubility of Sucrose in Water at Different Temperatures.

Temperature.	Grams sucrose in 100 grams solution.	Grams sucrose dissolved by 100 grams water.	Grams water corresponding to 1 gram dissolved sucrose.	Specific gravity of solution, 17.5° C.
Deg. C.				
0	64.18	179.2	0.5580	1.31490
5	64.87	184.7	0.5414	1.31933
10	65.58	190.5	0.5249	1.32353
15	66.30	197.0	0.5076	1.32804
20	67.09	203.9	0.4904	1.33272
25	67.89	211.4	0.4730	1.33766
30	68.70	219.5	0.4556	1.34273
35	69.55	228.4	0.4378	1.34805
40	70.42	238.1	0.4200	1.35363
45	71.32	248.7	0.4021	1.35923
50	72.25	260.4	0.3840	1.36515
55	73.20	273.1	0.3662	1.37124
60	74.18	287.3	0.3418	1.37755
65	75.18	302.9	0.3301	1.38404
70	76.22	320.5	0.3120	1.39083
75	77.27	339.9	0.2942	1.39772
80	78.36	362.1	0.2762	1.40493
85	79.46	386.8	0.2585	1.41235
90	80.61	415.7	0.2406	1.41996
95	81.77	448.6	0.2229	1.42775
100	82.97	487.2	0.2053	1.43594

Sugar crystal
In the industry, 1 cm of sugar seed can be 3 to 4 cm in a few days.



Sugar crystal growth
experiment (prototype)Liquid sugar drops onto the sugar seed and grows bit-by-bit.

Prototype machine

From the process of sugar experiments, we drew the conclusion of conditions to grow crystal sugar;
- Sugar liquid should drop often enough for the crystal growth
- The sugar liquid needs the same temperature as in industrial production (50~60 degree)

Based on these conditions, we have built this device. The candle fire heats up the liquid sugar in order to maintain the temperature around 50 degree. Therefore, this system can use high solubility of sugar to accelerate the growth of crystal sugar. Next page shows how it works.

01 - Pour liquid sugar into the bowl

02 - Light a fire

03 - Let liquid sugar drops fall

04 - Wait for a few weeks until it becomes a sugar crystal

Final Product

In the glass case, a tiny and sweet treasure grows bit-by-bit over eternal time. The random shape of sugar-stalactite made by law of nature brings an ancient feeling of fairness. Nonetheless, the ephemeral moment is terminated in a cup of tea.

"sugalactite" is a coined word which is consists of two words, stalactite and sugar.
The body of the product is made of glass. Sugar liquid tank, a net and bed for sugar-stalactite are placed inside of the glass case.
We argue that in the near future, these kinds of seemingly impractical tools will get of more and more usage and normality.

Acknowledgement

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Reference

1 Wadhwa, V. (2014) The coming era of unlimited - and free - clean energy

2 Yanis, I.L (1965) “The facilitating effects of “Eating-while-Reading” on responsiveness to persuasive communications”, Journal of Personality and Social Psychology, 1 (2), pp.181-186

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