SUSTAINABLE FOOD SYSTEMS

Motivating Consumers to Choose More Sustainable Food Options

Research Question
How can we motivate consumers in China and the U.S. to eat less meat?

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Introduction

The U.S. and China are the largest consumers of meat in the world. The U.S. has the 2nd highest meat consumption per person. Chinese meat consumption per capita is about half that of the U.S., but China's total meat consumption is more than double the U.S.'s, and continues to rise.

Meat and animal products like dairy have the highest environmental impact of all food products. The environmental impact of livestock production includes:

- Using 30% of the world's ice free surface, making it the single largest user of land in the world (Steinfeld, et al., 2006)
- Emitting 18% of global greenhouse gas emissions (more than the transportation sector's contribution of 13%!) (Steinfeld, et al., 2006)
- Using ⅓ of the world's fresh water (Walsh, 2013)

The high environmental impact and high consumption of meat in China and the U.S. led us to the research question: How can we motivate consumers in China and the U.S. to eat less meat?

Approach

The team interviewed consumers in the Bay Area and Beijing and used what we learned to prototype interventions that would motivate consumers to reduce their meat consumption. The prototypes were field tested with consumers and a second iteration of prototypes was created and tested.

Interviews

The team conducted interviews in downtown Palo Alto and the Wudaokou block in Beijing. The interviews focused on consumer meat consumption patterns, motivations behind reducing meat consumption, and what existing knowledge participants had about the environmental impacts of meat consumption. The site of the Palo Alto interviews and observations is shown in figure 1 below.
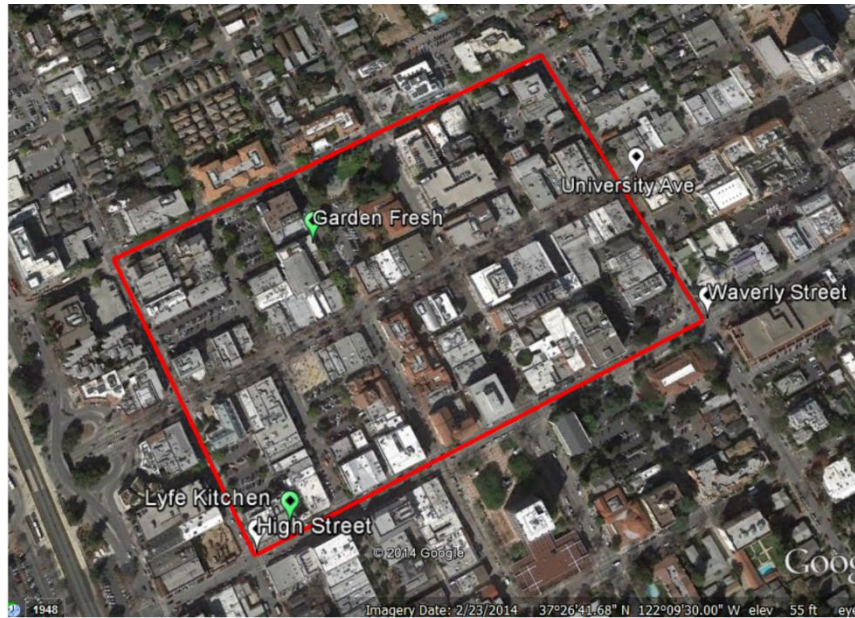
Figure 1: Interviews and observations were conducted in this area of Downtown Palo Alto. Two vegetarian restaurants out of 30+ restaurants were found in this area; they are labeled with a green place marker.

From our interviews we learned that consumers in the Bay Area and Beijing were quite attached to their consumption of meat, but some were already trying to cut back for health reasons. The majority of people interviewed did not understand how meat consumption impacts the environment.

Figure 2: Rainee interviewing a woman in downtown Palo Alto about how meat fits into her diet and culture

Surveys

A survey was sent out to consumers in the Bay Area and Beijing. The survey asked participants how often they consumed meat, what types of meat they ate, and if they thought meat production negatively impacts the environment. Participants were also asked how much money they spent on meat in a week, and if the price of meat effects the amount they eat. The surveys were taken by over fifty respondents in the Bay Area and Beijing.

Prototypes

With the information gained from our interviews the team decided to create two infographics and test whether the environmental or health effects of meat consumption were more persuasive in motivating people to eat less meat. Our first two prototypes are shown in figures 3 and 4.
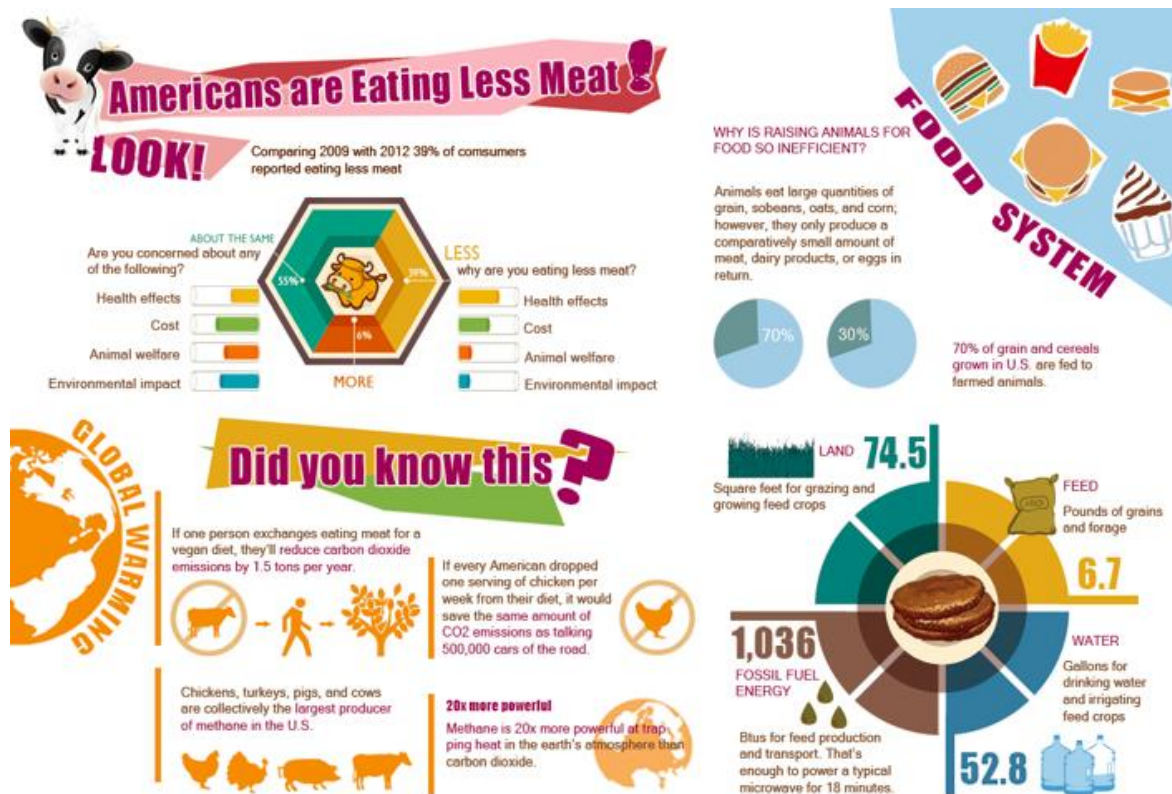

Figure 3: Environmental impact infographic

Our environmental infographic informs people about the link between meat consumption and the environmental impact of the livestock industry. The infographic shows the environmental impact that comes from making a beef burger, and points out how many cars could be taken off the road if a person gave up one serving of chicken a week. This infographic aims to address the lack of understanding about the environmental impact of the meat industry that was observed during interviews. We wanted to test if explaining the environmental impact would be enough to motivate people to reduce their meat consumption.
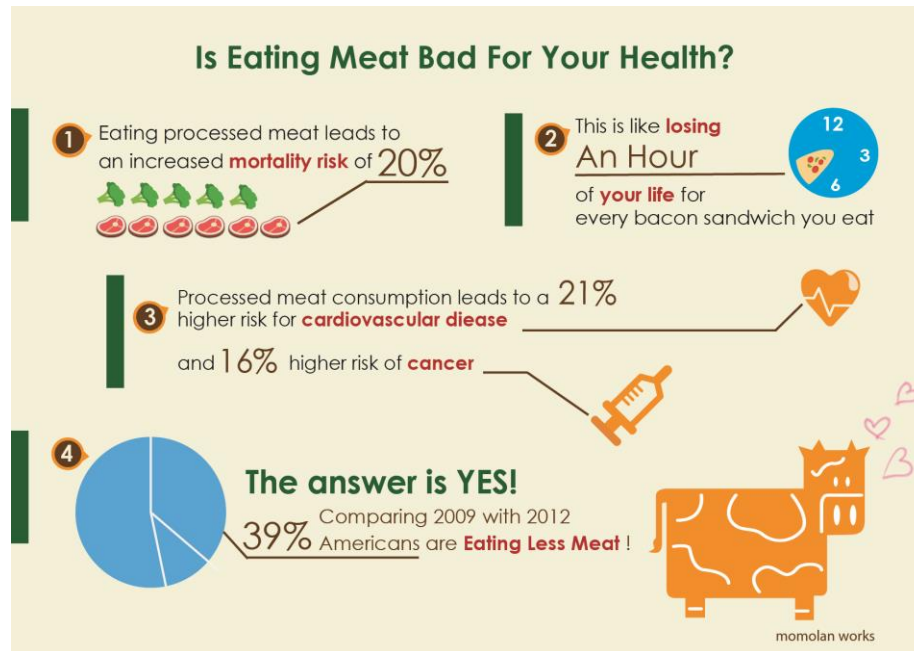
Figure 4: Health infographic

From our user interviews and surveys we found that people are motivated by health considerations to reduce their meat consumption. This prototype hopes to leverage users' health motivations and increase their knowledge about the topic even more. The infographic talks about the increased mortality risk associated with processed meat consumption, and the increased risk of cardiovascular disease and cancer.

The prototypes were tested at a food truck on Stanford's campus. Participants viewed the infographics while waiting in line, and filled out a feedback survey while waiting for their food. The study consisted of a control group, a group that viewed the environmental infographic, and a group that viewed the health effects infographic. Participants were asked how interested they were in reducing their meat consumption after viewing the infographics, on a scale from 1 to 5.

Figure 5: Participants viewed our infographics and filled out feedback surveys while waiting in line at a food truck at Stanford University

After collecting the feedback from this study four more infographics were created and tested on consumers. The feedback obtained from testing the first prototypes informed the design of the second iteration. One piece of feedback was that the participants would be more willing to reduce their meat consumption if there were better alternatives. This inspired the design of the Farm Fresh menu, shown in figure 6, which presents filling vegetarian meals as the default dish option under "Entrees".

Farm Fresh

Starters

Farm Fresh Sampler
$8

Entrees

Black Mission Fig & Roasted Rosemary Walnut
Salad w/ Lemon Lime Vinaigrette
$12

Broccoli Bean Quinoa Medly
$10

Farm Fresh Salad
$10

Lentil Edamame Patties
with Olive Tapenade and Kale Salad
$12

Cauliflower Chickpea Patties
with wild rice and cucumber salad
$12

Meat Options

Chicken
with kale salad and carrots
$15

Salmon
with salad and lentils
$16

Figure 6: Vegetarian options first menu

Some participants said they may be willing to eat smaller portions of meat rather than adding meatless meals to their diet. This led to the Customize Your Sandwich Menu shown in figure 7. This menu gives customers the choice of a "regular" or "large" meat portion size with an associated price difference.

Customize Your Sandwich

Choose your meat portion: regular or large

Regular $8   Large $10

Figure 7: Choose your meat portion sandwich menu

Users also suggested that instead of promoting consumers to eat less of every meat, they may be more willing to reduce their consumption of one kind of meat. Because beef has the highest environmental impact of all meats, the health effects infographic was changed to focus solely on beef. The updated health infographic is shown in figure 8.
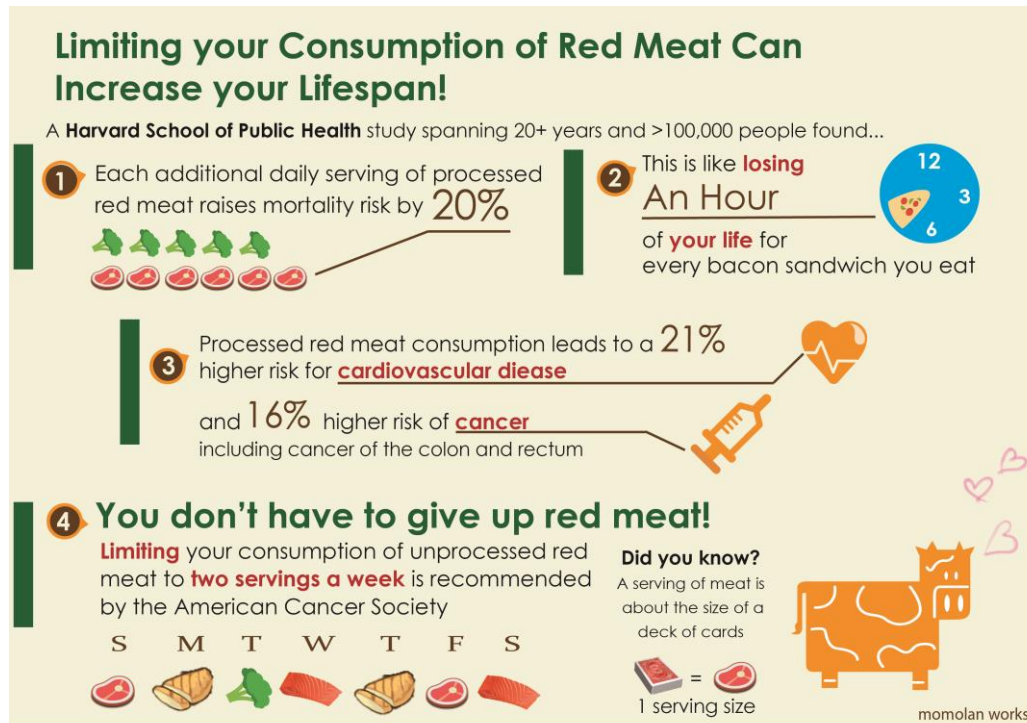

Figure 8: Updated health infographic

Part of our strategy for the second iteration of prototypes was to create many representations of this information so consumers can be exposed to it through different media channels and see the information on a regular basis, which could increase the likelihood of consumers internalizing the information and therefore the impact the information could have on their daily diet choices. The poster shown in figure 9 is another representation of the environmental and health effects of meat consumption, made by our Tsinghua team mates.
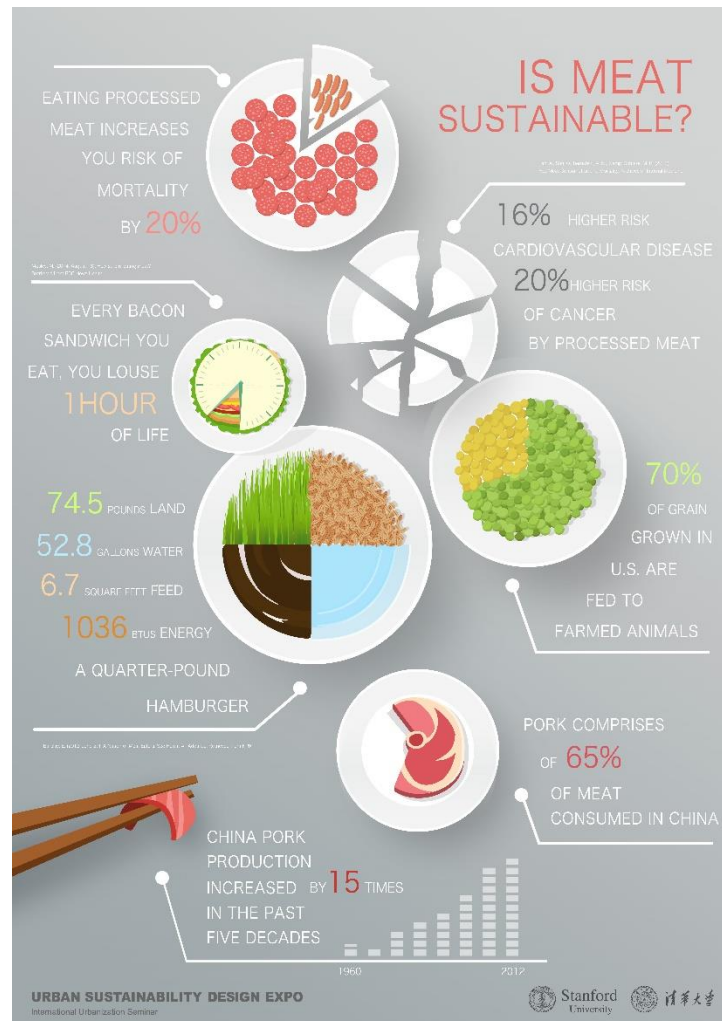
Figure 9: Environmental & health effects poster

RESULTS

Interviewing

The results were similar on both sides in Wudaokou and downtown Palo Alto. People tended to think that meat consumption was closely linked to regional cultures: While some cultures enjoyed a huge variety of meat selection, other cultures had very limited meat choices. Culture also had an impact on the amount of meat typically consumed. In addition, most people said the most important reason that might lead to a reduction in personal meat consumption was concern for health. The majority of people did not know how meat consumption is connected to environmental issues.

Survey

The survey results showed that income and prices were not significant factors influencing people's meat consumption choices. Different from our interview results, the majority of people indicated that they understood there was a connection between meat consumption and the environment. This difference could be possibly explained by the possibility that people thought there might be a link between meat consumption and the environment, but they did not know what the exact

link was so they were not able to explain it in the interviews. This discrepancy inspired us to design our prototype to better inform people about that link.

Prototype version 1

Results

Part of our feedback survey was asking participants how interested they were in reducing their meat consumption, on a scale of 1 to 5. This was asked to our control group, environmental impacts, and health effects groups. We averaged the answers of each group and our results showed that people in the experimental groups were slightly more willing to cut their meat consumption than people in the control group, but it might not be significant enough to indicate that reading the infographics had an actual impact on participants' diet behaviors. In addition, there were almost no difference between the results of the two infographics, leaving it unclear which concern would be more effective in motivating people to reduce meat consumption.

Feedback:

Environmental Infographic

Positive

Participants said that the information on resource consumption was compelling, specifically the statistic that 70% of grain and cereal in the U.S. are used for food for farm animals, and only 30% is grown for people to consume. Another well-received statistic was "If every American dropped one serving of chicken per week from their diet it would save the same amount of CO2 emissions as taking 500,000 cars off the road". People said they liked this statistic because it wasn't asking them to go vegan, cutting out one serving of chicken per week isn't too hard for a person to do, and relating it to car emissions is understandable.

Negative

The environmental infographic shouldn't mention veganism because it puts people off. Committing to being vegan is a huge step that most people aren't willing to take, and they'll focus on that instead of reducing meat consumption if we mention veganism. The environmental infographic had too much information on one page, and some parts were confusing. The part that showed the survey results on why people were eating less meat was unclear. Also people wanted to know where the information came from; we should include the sources for our information on the infographic to increase the legitimacy.

Health Infographic

Positive

For the health infographic participants found the statistic about losing an hour of your life for every bacon sandwich eaten compelling. Some participants thought it was convincing to learn that 39% of Americans have begun to eat less meat in the last few years. Also compared to the environmental infographic people responded better to the amount of information on the health infographic.

Negative

People didn't understand what mortality risk is, or what a 20% higher risk of mortality really means. Jumping from 1 to 2 on the health infographic was possibly too much of a jump; people didn't know how we got from a 20% mortality risk to losing an hour of life. Participants wanted to know what

kind of cancer has a higher risk of occurring with processed meat consumption. Participants didn't think 3 led to 4, Americans eating less meat doesn't prove that eating meat is unhealthy.

General feedback that helped us update our prototypes

In general people were suspicious of our information and what we were trying to accomplish. One suggestion was to focus on one specific type of meat, like beef, which has a much higher environmental impact than the other meats, and tell people that they don't need to give up completely to make a difference, which helped us to update our health infographics focusing on persuading people into eating less red meat. In addition, one feedback was suggested that people tended to choose options they saw first or well-marked, and another feedback was to come up with good alternatives. Combining these two feedbacks together led to the veggie options first menu prototype with more vegetarian options shown on the top. Another suggestion was that although people might not want to give up meat consumption completely, they might be willing to choose smaller portions of meat for their meals when possible, which led to the meat portion option menu that allowed people to choose how much meat they want on their sandwich.

Updated Prototypes

Results

For both the veggie options first menu and meat portion option menu that we updated and tested again, respondents tended to choose the health-friendlier options more. The majority of participants chose the veggie options and the smaller meat portion for their sandwiches.

Feedback

Veggie options first menu

Positive

Participants said they were more likely to choose the veggie options because they were the main entrees on the menu. They also liked that the veggie options looked filling and like substantial meals.

Negative

Respondents said there were a lot of salad options, so this was adjusted for the second version of the menu that is shown in Figure 6.

Meat portion option menu

Positive

Participants valued the option to choose more or less meat, and the price difference associated. Many participants chose the less meat option to save money. Some respondents chose the smaller portion just because they don't eat that much and liked having the option of a smaller portion.

Negative

Some people liked the option to get more meat since they would always like their sandwiches to come with more meat, which is the opposite of the desired result, though not everyone felt like this. It was hard for some people to tell the difference between the two sandwiches, and some felt the price difference wasn't large enough to affect their decision.

CONCLUSION

Conclusion on project

It was both challenging and exciting for us to work on a project from brainstorming a topic to testing real prototypes. Our approach helped us to achieve our goal gradually. By first researching what type of food has the most significant effect on environmental and human health, we found meat a very intriguing topic. By further researching the meat consumption in China and the U.S., we realized that if people in these two countries could be convinced to eat less meat it would have a huge impact on the entire world. After all our background research we decided to focus our project on persuading people in China and the United States to eat less meat. We then conducted interviews and online surveys to explore how well people understood the link between meat consumption and the environment and what motivations they thought would be most convincing to persuade themselves to eat less meat. The results inspired us to design our infographic prototypes to help people better understand the exact link between meat consumption and the environment. After testing our first version of prototypes, we updated our prototypes to address the suggestions and critiques we received from our prototyping. Finally, we tested our updated prototypes again, which gave us more positive reviews.

In the long process of this project, we encountered many obstacles mainly due to our lack of experiences in designing and testing prototypes. However, we learned a lot from this valuable experience. For instance, we learned the importance of designing user-friendly prototypes. We learned to think more from our respondents' perspectives instead of only focusing on the desired outcome. Furthermore, we saw how we could use different research methods to help us focus on our topic and dive further into it step by step. Now, we also understood the importance of using both techniques together: "Broadening things up" by asking "how might we," and "narrowing things down" by focusing on the most feasible and meaningful topics and solutions.

Memo for cross cultural collaboration lessons learned

What makes this whole project unique and exciting is that it provided us with cross-cultural collaboration experiences. We had four teammates from Tsinghua University in China. Our Tsinghua teammates were very easygoing and cooperative. They were both talented and productive in graphic designing and video editing. Through this cross-cultural collaboration, we learned three valuable lessons: creative communication, efficient allocation, and cultural exchange.

As for creative communication, our Tsinghua teammates were in Beijing while we were at Stanford, which means between us there were 10,000 kilometers and 16 hours of time difference. More importantly, our Tsinghua teammates tended to speak Chinese during group meetings and Carol doesn't speak Chinese. At first we found it rather frustrating in our communication. First of all, our video meeting through Skype was often interrupted by bad internet connections. Secondly, it was hard to find a time that worked for both sides. Thirdly, the language barriers slowed our progress down, because we often needed to repeat and translate what each other said and clear up confusions. Finally, it was also difficult to share documents between the Tsinghua and Stanford students due to firewall issues in China. Facing these obstacles, we did not give up. Our Tsinghua teammates were very cooperative and productive in solving these problems one by one with us. We agreed on meeting once every week in

early evening of Stanford time on Sunday, so that we could update our information and project timely. We also decided to meet at the Huang basement on our Stanford side so that we would have good network connections. After trying to encourage our teammates on Tsinghua side to speak English, we found it would be more productive if they spoke Chinese and Rainee translated between both sides. Furthermore, we discovered that by using more memos and notes to record what happened in each meeting and share with each other, we would save more time in our oral communication and be more efficient in clearing up confusions. Our Tsinghua teammates also found a way to deal with the firewalls, which allowed us to share documents on google drives. Overall, it was very different from communicating with someone sitting in the same room. All the team members needed to have patience and motivation to propel the project to move forward and conquer the obstacles from distance, time difference, and language barriers. We tried to share our thoughts freely with each other and discuss together through video meeting, google docs and WeChat to reach an agreement. Our Tsinghua teammates helped to broaden our horizons and enrich our discussions in a more artistic perspective.

As for efficient allocation, our Tsinghua teammates and we had very different skillsets. While they were very good at graphic design and video editing, we were relatively skilled at researching and data collection. Thus, we figured it would be very helpful if we could allocate our tasks in an efficient way so that we could get the most out of each other's strengths. Following this thought, for each part of project, we decided that after agreeing on what our task was, we on the Stanford side were in charge of researching and providing data, while our Tsinghua teammates were responsible for creating visual demonstrations. For example, when we created our infographics, we provided them with the data of how meat consumption would have huge impacts on human health and the environment, and then they used this data to create and design the infographics.

As for cultural exchange, we learned a lot about cultures (not limited to food culture) from the other side. For us, we learned what university life was like in Tsinghua and China, and the hot spot social issue in Beijing. We also explored together what food systems and meat consumption were like in China. We realized how important pork was for Chinese food culture, and how meat consumption behaviors were different in some minority nationalities. Our Tsinghua teammates also gained a better understanding of what university life was like in Stanford and America, and how the patterns of meat consumption in America are different from those in China.

In short, the cross-cultural collaboration experience was very valuable for all of us. Not only did we learned many academic and design skills by working with each other, we also learned how to cooperate in an efficient way to conquer barriers set by distance, time, and language. More importantly, we also built our friendships through our close collaborations!

Works Cited

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