

Sustainability Innovation

Solutions To Encourage Individuals And Businesses To Consume “Ugly Food”

Shuang Hu, Ulink College of Guangzhou

Anran Dai, Ulink College of Guangzhou

Chulin Deng, Ulink College of Guangzhou

Ziye Xiao, Ulink College of Guangzhou

Wanying Chen, Ulink College of Guangzhou

Summary

As our group was trying to find a research topic, a movement caught our eyes. In that movement, irregular looking agricultural products are the protagonists, and volunteers organizing the movement are the directors. They are trying to introduce ugly food to the world. The concept of ugly food interested us, and we decided to work on that for our project. We would like to generate solutions that can promote people to accept ugly food. In researches we did, we found that ugly food actually is a big deal to our world.

Ugly food is agricultural products which have irregular appearances. Examples include an uneven spread of the red color of an apple, 90 degrees-bent cucumber, or a carrot with 2 extensions at the end. We find them funny when we see one of them in the market, yet they remained a minority in vegetables and fruits we can buy. We automatically accept that all products should look similar, but they can easily grow differently only because that a rock in the soil is on the way of their extension or they are unevenly exposed to sunshine during their growth.

We come towards the question - why can't we see them in the market?

On online surveys and offline field investigations, to begin with, there's a little approach for the public to know about ugly food. There are over $\frac{3}{4}$ of our respondents who never heard about ugly food. Going deeper into the research, we found that both sellers and customers have concerns about ugly food. Customers are worried about the quality and taste of the food and the amount of time wasted to deal with them. Sellers therefore wouldn't stock them since the market demand of them is too low. Producers had no choice but to discard them from the start.

Other than those two challenges we faced, abandoning ugly food contributes to serious environmental problems such as global warming. Those impacts are barely uncovered into the public's eyes, so there's little attention paid to this issue, yet it actually contributed massively to the danger our earth and we human beings are facing currently.

We then thought deeper about why this happened. We concluded the root cause - "entrenched aesthetics of customers". People won't accept ugly food because of the stereotypical opinions of linking the food's quality to its appearance. As the stereotype is implanted, it'd be hard to eradicate its effect. After summarizing the cause, we know what our aim is.

The solutions we generated were trying to tackle the root cause we summarized. We designed an Application and a Restaurant to change people's minds on ugly looking food. Online and offline promotions would proceed simultaneously, covering the widest range of public we can. Those include live streaming on social media platforms and fairs held in local communities. Additionally, to promote the

concept of ugly food to the younger generation, animation characters are designed and are shown in cartoons or made into peripheral products. We hope to change the young' s notion of ugly food in such ways.

In order to find the optimum solutions, different criteria are used to evaluate our solutions. We used 6 different criteria to evaluate them. Rankings from 1 to 10 are then given to each solution on each criterion. Weighted calculations are done to distinguish the importance of different criteria. The winners in all solutions are the APP and the Restaurant, so our action plan is generated mainly based on them. Ideas from other solutions are included while implementing those two solutions. Our action plan gives details on how those solutions can be implemented in reality. We provided ideas on the contact information, means to get an Operating License, and sources of capital for both solutions. It is a detailed introduction and proposal for our optimal solutions. Further details in designs are given as diagrams in our prototype design. The plan of the restaurant and how would the APP look like are given. Labels are made to clarify our thoughts in designing the Restaurant and the APP.

Reflections and improvements are made to further develop our thoughts.

Conclusively, our solutions and action plan is under deliberate measures and full efforts of our teammates. The APP and the Restaurant with the other solutions added to them direct the challenges and the root cause. They would be effective in tackling challenges both in short term and long term.

Identify the Challenges

1. Human nature

From a human perspective for both sellers and buyers, people like things that are convenient and quick and are afraid of trouble. Most people have difficulties in noticing things that are once ignored, such as the ugly food. Buyers may be reluctant to accept this unfamiliar concept since they are not willing to spend extra time and effort to research and test whether the food tastes good, or whether it has the same nutritional value as ordinary-looking ones. For sellers, even though the concept of not wasting food is publically recognized, they will still have to discard unmarketable food. Businesses are set up for profiting, so the most economically-feasible method to manage them would be throwing them away. Therefore, one of the biggest challenges of this project is to make people accept ugly food by heart so that they would consider lowering their profits to reduce the waste of ugly food.

2. Access to ugly food is limited

During summer vacation, our group went to a local market for field investigation. The market contains agricultural produce from different farms, and we asked to buy irregular-looking vegetables. The seller told us that they don't stock that kind of produce unless they grow their own ones. The same situations are found in several markets around Guangzhou and Shenzhen. We also observed that the good-looking vegetables are usually placed on top of the pile to show that the produce is of high quality. The ones under the pile aren't irregular looking though; they are just too large or too small in size. The shape and color are regular. We concluded that there's little access for ordinary people to access produce that has an irregular appearance. We constructed a questionnaire to research about people's opinions on ugly food. The questionnaire was answered mostly by students and some adults in Guangzhou and Shenzhen. According to our questionnaire, if the prices of these strange-looking vegetables are lower than the ordinary vegetable, 69.8% of people are willing to buy them, and 54.46% of people think that if given the same nutritional value, strange-looking vegetables should be priced the same as standard vegetables. This, however, shows that more than half of the people are willing to accept irregular-looking vegetables. Apparently, sometimes it is not the people who reject buying irregular-looking products, the truth is, most of the products are already preselected by the suppliers, so we barely see them in any supermarket or grocery store. Those suppliers are concerned that those irregular-looking ones may be rejected with the questioning of the quality of all the products he/she is selling. It'll be a larger loss comparing to abandoning them from the start. As sellers are worried about the customers' reluctance and customers had

some will but no access to buy ugly food, this turns to a cycle of negative impacts accumulating over one another.

3. Concerns of the producers

Sellers also have a very important role to play in getting people to accept ugly food. For a supermarket or market, selling ugly food may not give customers a good buying experience or may lead to a permanent loss of customers. On the other hand, the sales volume is unknown, and there is a high possibility that ugly food will not be sold, leading to waste and loss. Individuals such as farmers may be worried about the cost of selling ugly food as they may face the risk of the food going bad and being wasted. An alternative would be selling it with lower prices, but most of them would still end up rotting unknown under the pile of "beautiful vegetables". The market isn't accepting them either, so farmers had to throw them or use them to feed livestock. There will be a large amount of energy wasted in both compromising options, so the waste of ugly food is continuously occurring.

4. Worried psychology of the retailers before and during the marketing

Food suppliers and supermarkets are responsible for the selection and packaging of food. In food factories, machines sift out food that is not the right size to ease packaging. For those ugly food that do not have a standard size, they will be made into fertilizers or fodders, and those only occur when the factory has enough money to manage them. Otherwise, they are usually discarded. As we can see, in supermarkets, vegetables are laid out neatly, and meat is wrapped in plastic wraps. To attract more customers as well as to give customers a better shopping experience, the vegetables are all packaged. If supermarkets still sell ugly food, it will be hard for packaging and may need to arrange a new area specifically for those strange-looking food. This would be unpractical and unprofitable. Also, in big cities, the competition between supermarkets is very common. Almost all of the supermarkets are owned by capital, and they need money to run their businesses. Therefore, every supermarket is trying to make its products look better and higher classed to earn more market share and profit.

5. Policies made by governments and authorities

Governments and related authorities play a vital role in the cause of food waste since it is them to make policies and rules. Started from European Union (EU) and the USA, the standards of vegetables and fruits of all countries in the world have been revised along with the progress and development of science and technology and gradually become unified. For instance, the European Union limits the curvature of a Class A cucumber to no more than 1 centimeter per 10 centimeters. In the first few stages of selecting products, vegetables that certainly wouldn't meet the higher standard would have to be disposed of. Not only the EU, Department of Agriculture of the United States, Food Standards Australia New Zealand (FSANZ), and many other authorities have made rules limiting the length, weight, and width

of vegetables and fruits. For some vegetables, their appearances are particularly required to have certain characteristics. For example, cauliflowers must have healthy and green leaves that are sufficient in protecting the entire curd. These regulations result in a huge waste of food that does not meet the relevant standards, which is the ugly food.

6. Consumers' concerns about ugly food

According to our survey, nearly 60% of people won't buy ugly food because of their irregular shapes, for which there is no need to choose harder ones to deal with. It not only wastes more time to get the same results but also is hard to gain experience when food has irregular shapes. Ugly food appears in different shapes which means they can't be dealt with uniform approaches. Consumers need to spend more time studying and getting experiences to be proficient when most consumers are greenhorns in this area. 50% of people suspect that environmental issues caused ugly food to be less nutritious, and those include radiation, sewage, and gene variation. It's reasonable to be concerned that ugly food has a lower nutritive amount compared with a normal one or might even be harmful to their health. The lack of reliable news and reports along with numerous gossips spread made the situation even worse. Additionally, 10% of people believe that ugly food is always too big, so it's not cost-effective in buying them when their prices are set based on their weight.

7. Environmental Impacts Unknown to the Public

According to official statistics, about 4 billion tons of carbon dioxide is released in producing the food we wasted. After calculations, the wasting of ugly food contributes to about 6 – 8 million tons of greenhouse gas released into the atmosphere each year. Moreover, the agricultural pollution produced during the growing phase of food has already damaged our environment, yet the energy that we should obtain from them is wasted because we dislike their appearance. This is a massive waste of energy. However, according to our research, about 60% of people have no idea what ugly food is. This uncovers a serious situation - people never realize they waste natural resources in such a way and how ugly food leads to serious environmental issues nowadays. Most citizens have the awareness to protect the environment, yet they know little about the wasting of ugly food and its environmental impacts. Too few journalists and reliable scientists uncover the situation and truth into the public's eye, so ugly food won't be taken seriously in society. Without intense attention and large quantity demanded of ugly food, markets won't pay much attention to it as it is not under unified management and seems unacceptable to the public. It makes ugly food a minority with little means to be known in the public. This is a vicious spiral yet to be broken.

Identify a Root Cause

The entrenched aesthetic of customers

The fixed pattern of aesthetics can cause stereotypical impressions on how we judge the appearance of everything around us including the food we eat.

Conformity is an important reason for this. With the influences of other people's words and what we see in the environment, we start to establish fixed images of things. Although sometimes we know that strange-looking vegetables are edible and are as delicious as normal ones, we will still choose the "beautiful" vegetables under our conventional thinkings implanted in our minds and the pressure for us to choose as the crowd does. According to psychological research, people are inherently biased and are unlikely to change original impressions on things. After fixed images of those foods are implanted in our minds via the Internet and in grocery stores, most of us will automatically judge the ones that look different from the original ones negatively. This is the solidification of the populace's aesthetic. For instance, almost all of the carrots we see in the supermarket have the same lengths and have a perfect orange color. If there are carrots that have different sizes or colors, most people will automatically judge that they have poor quality and taste terrible. Additionally, for Chinese teenagers, we were told to look at vegetables' appearance while judging their taste. The Chinese word for how a vegetable looks is called "Mai Xiang" , and we are taught by the elderly to choose products with good "Mai Xiang" since we were young. The stereotype and fixed aesthetic solidified our ways of evaluating objects and ideas.

Generate Solutions

Solution 1: 'Ugly Delicious' Restaurant

We plan to run an 'Ugly Delicious' Restaurant using weird-looking produce we collected from farms and agricultural businesses where they usually throw those food away since the acceptability of them in the market is rather low. Those produce would be displayed in the ordering area where the customers can pick particular vegetables that will appear in their meals. Those vegetables are then cooked by the talented chefs we hired. They aim to make those vegetables and fruits into dishes in which the shape of the original vegetable or fruit can be an advantage. For instance, a pumpkin can be boiled with its original shape maintained and other flavors or ingredients added in the middle. Dishes that the shape cannot be seen are provided as well. In this way, customers can see how their meals originally look like and compare them with the final dish. After tasting the dishes, they are meant to realize that food that looks differently tastes the same or even better than regular-looking ones. They are welcome to talk with our chefs about recipes of the dishes and share their thoughts on our APP introduced in Solution 2 or other social media. Our team along with the chefs will regularly create new dishes and thoughts on how to cook our ingredients.

Solution 2: Application

An application is designed and published to target our challenges. The APP contains various functions including acting as a platform to buy and sell irregular-looking produce at low prices, selling toys and products in the appearance of irregular-looking fruits and vegetables, and providing users with advice on how to peel and cook them with available tools. We cooperate with farmers or agricultural businesses to obtain free or cheap products that cannot reach the market because they look weird. Those products are then sold in our APP at prices lower than in local markets. Delivery service as well as offline shops work together with the APP, ensuring the efficiency of delivering between the producers and customers. A clock-in system will be set up for customers that buy our products continuously for several days, and gifts and vouchers will be given to them. The application is also used to sell toys introduced by Solution 8. Moreover, there will be an online-interactive community running in the APP that allows users to post their ways to cook ugly-looking food for their meals. Courses in managing those fruits and vegetables are also given daily by our official accounts. Talented and well-known chefs are also invited to create an account and share their experiences and thoughts on managing ugly food.

Solution 3: Experiencing Farms

"Farms" for customers to grow vegetables on their own can promote the acceptance of ugly food. We provide customers with soil and pots, and seeds of a vegetable or fruit. They can choose to grow them at home or keep them in our "farms", which is a piece of land outdoor, providing the plants with sufficient light intensity. They can come in daily intervals to water them or we can help them grow their products. They observe the changes in the plant while growing. As the plants mature and are ready to eat, the customers can pick them and bring them home. Those products can't always be in perfect color or shape, and it would help them to know that maybe irregular looking products are sometimes more natural than the ones which all look the same. We can inform them about why the product is smaller than others in size, is bend from the middle, or has different colors on different sides. This would provide ordinary people with access to ugly food and alter their aesthetics to some extent.

Solution 4: Live Video Streaming

With the development of technology, people nowadays have more access to different kinds of information through different means. An industry of live video streaming is emerging, and you can see them on various websites such as Taobao, Tiktok, and many other platforms. This is a simple method to introduce ugly food to people and also makes people more receptive to it since people of almost all ages watch live shows. For example, in China, a simple live stream can attract thousands of people. Our team can also sign up for an account and make our videos. We can talk about the benefits of ugly food such as its nutritional values and inform the audiences about the negative environmental impacts of wasting food. Also, a kind of live video streaming is called "Mukbang" which means network anchors cook and eat food in live videos. Mukbang is popular now on the internet since more people are viewing their phones while eating. We can show audiences how to cook ugly food and also how delicious the final dishes are in our own account.

Solution 5: Social Media and Advertising

Social Media is becoming increasingly common nowadays. Almost everyone is using it frequently each day. Therefore, our team has a plan to use it as an advertising tool. We are signing up for accounts on different social media platforms such as Instagram, Facebook, YouTube, Weibo, and so on. We would publish photographs and videos about how to cook irregular-looking products as well as information about our online and offline activities. Those activities include new peripheral products released and where we are going to have our offline speeches recently. The aim of this is to make people familiar with us and with how to cook dishes with irregular-looking vegetables and fruits as raw materials. According to our research, only 24.8% of people have heard about the concept of ugly food, so the remaining 75.2% of them don't even know what is it, including how they are wasted or how to cook them. Our team will promote our APP of ugly food on our

social media accounts as well. Social media platforms provide us with the perfect means to demonstrate our thoughts and products to the public and gain more publicity.

Solution 6: Offline Speeches and Fairs

In order to reach out to more people of all ages, our team came out with the idea of offline presentations and activities, aiming to raise awareness of ugly food. We can go into the communities, schools, or even shopping malls to give speeches or hold fairs. Those activities include tasting cooked ugly food comparing with ordinary looking ones and inform the audiences about why agricultural products would have differences in size, shape, and color. We choose different locations to achieve a wider public effect because people of different age groups have different places for activities. According to our research, people seldom buy ugly food for two reasons: the irregular-looking shape and worries about quality. Long-term influences of the Internet and culture have responsibilities for their worries. Therefore, the purpose of our speech is to change people's stereotypes of ugly-looking food and to change their perception of ugly food. Our root cause of entrenched aesthetics is targeted by offline activities in such way. We would like to see people gradually understanding that ugly food has the same nutritional value as other foods and that there is no difference in the taste between ugly and ordinary food.

Solution 7: Animations

Animation has become a popular way of entertainment in modern society, but it is also a good source of information. We can cleverly insert the elements of ugly food in multiple cartoon characters so that ugly food can appear in the public's vision and subtly make the public know more about the current situation of them in a gentle way. Those characters are represented with positive appearances and high morals. In this way, starting with children or teenagers, the new generations' first impression of it can be changed. Changing the impression of ugly looking food during the stage of primary socialization can change his/her aesthetics in judging, so as the new generation grows up, they would have different values on whether to judge an object, particularly vegetables and fruits, only by their appearance. It would be a positive lifelong impact. As the characters of ugly food become popular, they can be used for endorsement or cooperation with other companies as well. The money earned is used to support the running of our whole project.

Solution 8: Blind boxes

In recent years, young people have become the main group in the consumer market. Making young people accept the concept of ugly food is one of our main targets. Young people are generally curious about new and unknown things, so our team thinks that we can make visual peripheral products about ugly food. We came out with the idea that the characters we designed in Solution 7 can be further developed into 3D toys and put into blind boxes. This not only follows the trend of

the market but also gives young people a chance to learn about ugly food. Each character would have their own "life story" written on the card that comes with the toy. The story would be about how they became irregular in appearance. According to what we observed from peers around us, they are very interested in collecting the toys from blind boxes. Many of them see it as a hobby. Therefore, our team believes that we can raise the curiosity of young consumers by making the appearance of ugly food into peripheral products and blind boxes for them to gradually accept ugly food.

Identify the Criteria

Practicability

Is the plan feasible? Do we have enough time and effort to conduct it? Can we find all the equipments and tools needed to implement the solution? Is there an essential issue ought to be tackled which would halt the progress of our implementation? Are we able to persuade capitals to join by the details given? Are we able to persuade the social sectors (e.g.: neighbourhood committee, school, etc.) to cooperate with us?

Environmental Friendliness

Would there be harmful substances (e.g.: untreated sewage, poison gases, unbiodegradable wastes, etc.) released into and pollute the environment? Would our plans affect the lives and survivals of other living organisms (e.g.: animals habitats around the construction site, beneficial insects living in the area, etc.)? Will our solutions intensify the existing global environmental issues (e.g.: global warming, deforestation, etc.)? Will the implementation of our plans cause excess noises and light pollution which affects human and wild lives?

Profitting

Is the profit higher than the cost? Taking in consideration of the salaries of workers, the transportation fees of products, and the purchase of equipments and raw materials, etc., will there be unexpected costs in our plans? Are the cost and the profit balanced so that there won't be a gap in the finance flow? Are there alternative incomes that would make up for if the capital chain ruptures?

Sustainability

Will our customers be continuously interested with our plans? Are there spaces for consistent innovation and creation so that our customers wouldn't be bored? Is it following the current trend of consumption but could be easily outdated? Or is it creating a new trend that can last for a long time? Will we have continuous profit inflowing so that it can support itself's running? Will the operation of this solution wear out raw materials so that there will be insufficient of them in the future?

Efficiency

Is there a lag time between start implementing and getting results? Will the lag time cause negative effects (e.g.: using too much money, losing customers, etc.) to the implementation of the solution? Are we looking for short-term or long-term effects? Will the protracted time and money use eventually lead to the failure of

implementing the solution? Will the preparation last for too long so that the money are all spend in pre-implemental phase?

Publicity

Is the public widely accepting the plan? Will there be enough customers to support and pay for our solution? Will there be rude and offensive message given out to minority groups? Is the solution generally friendly to all social groups (e.g.: gender, ethnicity, social class, age groups, etc.)? Is the promotion effective in targetting a wide range of the public and gain more potential customers? Are the aspects of the solution (e.g.: location, usage, language, etc.) designed or decided in the convinience of the general public?

Evaluate the Solutions

 [Evaluation](#)

Make an Action Plan

1. Introduction

The Evaluation phase concluded that the 1st and 2nd solutions we generated had the highest rankings. Their most remarkable characteristic is mainly Sustainability. Both the Application and the Restaurant can make money and support themselves in daily operation. Other than these two, the solution "Peripheral Products and Blind Boxes" received a high ranking in Sustainability as well, and "Offline Speeches" had a high ranking in both Cost and Practicability. On the other hand, Solutions 1 and 2 received rather low marks in Practicability and Complexity.

In order to optimize our action plan in running the solutions, in reality, we decide to combine the designs of the APP and the Restaurant with the good aspects of the other solutions and make an action plan with fewer limitations. We hope to make up the weaknesses in the APP and the Restaurant solutions with others' strengths adding to them. Therefore, details given below would not only refer to Solutions 1 and 2 but also combine with the creations and ideas of different solutions.

Both Solutions have a high proportion of preference according to our survey. They also firmly tackle the challenges of low public awareness as well as consumers' concerns on if the quality of vegetables would be affected by their irregular shapes. Both the APP and the Restaurant spread publicity and increase trust in the quality of ugly food.

2. Solutions Design

2.1 APP

2.1.1 Sale of blind boxes

There will be a section of our app dedicated to sell ugly food peripheral products. People can purchase peripheral products, such as buying blind boxes in the restaurant or online. Buying products online can greatly reduce customer's costs, make it more convenient for them, save their time, and provide them with a wider selection of products to choose from.

2.1.2 Selling ugly food

With the rapid development of online shopping, buying food online has become an option for many people. The app has also introduced a function for buying ugly food online. Customers just need to select "Shop" in the app, and the app will automatically recommend the freshest vegetables or fruits of the season for customers to choose from. Once customers place their orders, they can choose whether to pick those food up at the store or have it delivered to their homes.

2.1.3 The Forum

In order to meet people's different needs on ugly food, our app will also provide a forum for people to use. In this forum, people can freely express their opinions on ugly food. For instance, they can discuss how to cook ugly food, and even popularize innovative ugly food so that other people can better accept or buy it. At the same time, the app will hold some cooking competitions and debates about related topics to encourage people to express their opinions by giving them rewards such as blind boxes.

2.1.4 Animation

With the significant development of the internet, more people tend to use their cellphone for getting information and news. As a result, we are going to put our promotional videos and animations in this APP. There will be a button at the bottom of the homepage. People can view different kinds of videos after clicking the button. The content of these videos will be methods of cutting and cooking irregular-looking vegetables or fish, introduce the concept of ugly food, and how to use this APP. Animations with the characters from our blind box can be found in the APP as well.

2.1.5 Snapshot

Nowadays, there is technology that can identify objects by taking photographs. We will use this function in our APP. There will be a camera button on the top right of the homepage in the APP which customers can use it to take photos of ugly food. Then the APP will identify that kind of strange-looking food and give out a lot of methods to cook it. Besides, customers can also use that camera to take photos and post them on the forum.

2.2 Restaurant design

2.2.1 Themed Restaurant

Employing experts or amateurs to start open classes to teach how to deal with the ugly food. Teachers can do demonstrations first and teach consumers with proper guidance by monitoring them during classes. We can plan 10 minutes of themed speeches during the rush time to fill costumers' waiting time after ordering dishes or set as background music and give some small gifts to customers to let them know more about ugly food. Besides, table decoration can play an important role in the attraction of consumers.

2.2.2 Decoration

Since this is a restaurant with the theme of ugly food, the restaurant will be full of ugly food elements. For the overall decoration, the restaurant will be like a real farm that makes customers feel they are surrounded by organic vegetables and fruits. Different kinds of strange-looking food will be put next to each table, such as carrots and cucumbers. Also, cartoon characters of irregular-looking food will be

put in front of the restaurant, and on the wall, this can attract children and increase people's acceptance.

2.2.3 Selling ugly food

This restaurant is also used to sell ugly food. After customers order on our APP, they can pick up the food in the restaurant because the food that sells in the restaurant is fresher. There will be shelves near the kitchen. When people are watching the chefs cook, they can buy vegetables, fruits, or fish they like at the same time. The shelves will be divided into small cells to put different kinds of food, and fish will be put in a refrigerator. However, to make all food fresh, there will be just a few vegetables put on the shelves, and most of them are kept in the storage where has a temperature around 10°C and humidity of 85%.

2.2.4 Open kitchen

The kitchen is set at the entrance of the restaurant or in the middle of it. This arrangement made the smell of food spread. Therefore, this can attract more consumers and reduce the distance between chefs and consumers. Placed the kitchen connected with the dining area and separate by a firm and transparent acrylic board. It demonstrates the food- making process directly and also shows the sanitation of the restaurant when the conditions of the kitchen are transparent to costumers.

3. Implementation Plan

3.1 How to get customers' approval

In China, using APPs on people' s phones to buy groceries and all kinds of things we need in our daily life is normal. Since people can have more choices on food by using APPs, an increasing number of people start to use APPs like JD and Tmall Supermarket to buy meat, vegetables, and fruits. The delivery in China is much faster than in other countries. Some express companies such as SF and JD established a specialized service for delivering fresh product. Therefore, customers usually can receive their food within several hours and will not longer than two days. During the delivery process, fresh food is sorted into insulated containers with ice packs to keep it wet and fresh. After customers order on our APP, our team members can send the ugly food off immediately. For those customers who are in Guangdong province, they can receive the package after about five hours, and this depends on their living area. For the rest of China, customers can receive their food in two days as our team will choose courier companies with well-developed fresh food delivery service. Other functions in our APP are easy for people to use, for example, discussing on the forum and watching videos are common in most of the APPs they use in their daily life.

Our team will open the restaurant on the first floor of a residential building which is close to the street and surrounded by other buildings with a lot of people. Since the theme is ugly food, the restaurant can attract a certain number of customers at the

beginning and our team needs to solve various problems to get the endorsement from them. Customers do not need to concern the restaurant hygiene as we will put licenses on the walls. The kitchen is open, so all customers can see how the chefs deal with ugly food. The chefs our team hired will all be graduated from culinary schools, maybe they don't have much experience, but they are creative and willing to help protect the environment. Therefore, the restaurant can become popular in that area because it is unique and there is an increasing number of people start to care about our planet. Our team also decides to donate half of our profit to environmental organizations.

Based on our research, currently, there are no APPs that focused on ugly food in China. So, our APP will make people feel novel and unfamiliar. Although the pages may not perfect or beautiful, all the functions are showed clearly, and all of the users can be an expert on using this APP quickly. Nowadays, there are no restaurants that specialize in ugly food in China, the restaurants that cook ugly food usually just open for a few months or cooperate with some big restaurants. The chefs of a restaurant in Los Angeles use strange-looking vegetables and fish to cook delicious meals, but they also use normal food. Our restaurant will use only ugly food from local farms and there will be cartoon characters of ugly food in front of the restaurant and on the walls. There is also an organization in Taiwan which cooperates with over 40 restaurants and bring ugly food onto the table. This kind of restaurant just uses irregular-looking produce for a short period as a special event that is used for promotion. Our restaurant's advantage here is that it will open as long as it can and always use ugly food. The speeches that hold in the restaurant and all things in it can tell people the importance of protecting the environment and reducing the waste of food. This is a better way to educate people and customers can feel the beauty of ugly food in that environment.

3.2 Government

To operate a restaurant and launch an APP for people to download both need permission or licenses from related authorities. Therefore, we need to keep in touch with the Guangzhou Government and check the websites of the People's Government of Guangdong Province. Those websites provide detailed information about how to get food operation approval, including the place that can get a permit and the necessary materials we need to bring. There are two ways to contact related authorities which are online and offline. The related laws and rules on the website show the conditions a restaurant need. The hotline is 020-37690333 and some information is shown in the attached file.

3.3 Investment

Preparing presentations and speeches to persuade big companies or famous environmental organizations for investment is important. To operate an APP and a restaurant need fund to start and maintain daily running. Here are some reasons the advantages that big companies can get by investing in our project.

1. This plan is feasible and can help to solve serious waste problems that existed these days. This project seems like a trial, after our team become successful and have positive influences on food waste, there may be more ugly food restaurants in the future. In China, over 70 million food waste during production, processing, and storage every year. This is why all people should work together to solve this problem and reduce the food crisis.
2. Since we buy all our vegetables, fruits, and fish from local farmers, they do not need to throw those strange-looking produce away and they can sell ugly food on our APP or in the restaurant. So, they can earn more profit and improve their living standard because there are still a large number of farmers who are living in poverty.
3. It uncovered the social issue to the public. There will be more and more people who realize food waste is a serious problem and start to work for it. Buying and eating ugly food can be managed as a trend in 21century. In this area, there are still lots of things that can be discovered to reduce food waste and make our environment better.

3.4 Corporations

3.4.1 Advertisement

Short videos and live streaming are popular today, and most of the young people spend nearly all their free time on those APPs. This kind of APPs makes it easy and convenient for people to create an official account to share our development and interesting stories about ugly food.

Tik Tok is an appropriate social media for our project as we can post related videos on it and get attention from people of all ages. Also, it will be very effective in the development of our projects.

3.4.2 Courier Companies

One of the functions in the app is to sell ugly food, it is necessary to establish long-term corporation with courier companies. We will cooperate with those companies with fresh food services in the whole country. That could keep our products fresh, and make our customers feel reassured. Our team will also put a little card with every product about where the ugly food comes from and when it was picked. It is no need to deliver every product to consumers' houses, instead, food can also be delivered to convenience stores to keep it fresh. The options of the delivery companies include SF Express, JD, and so on.

3.4.3 Supply of food

The food that the restaurant use will all come from local farms or other big farms nearby. Our team will go to the countryside and have conversations with local framers about buying their produces and introducing the APP that can sell ugly food. Besides, our team will communicate with local farmers to prevent the waste of those kinds of food and try to have long-term corporations with them to achieve a win-win situation.

Our team contact with two farms and ask them for some information. The first one is a small farm which only provides food for several communities. This farm will directly deliver food to the residents, so the amount of food is small. According to the manager, although their farm does not follow the standard of the supermarket, workers still throw away the vegetables that are too small or too big. The reason is that they do not want to receive complaints from customers about the size of food and food with similar sizes can make them look better. There are about 10% of ugly food that is wasted because farmers will bring them back to cook. The second farm is bigger. It supplies several community supermarkets with vegetables in Guangzhou. Since the food is sold in the supermarkets, it has to follow the standard set by related authorities. One of the managers told us when they are collecting the ugly food, they throw away irregular-looking vegetables immediately. They will then throw about 15% from the rest of the food because some of the vegetables do not have a standard size and this will make it difficult for packaging. Based on the data from each farm, there will be enough ugly food for our restaurant and the shop on the app. A small farm that has 3.3 acres can produce about 46.5 kilograms of ugly food per week. Both managers told us that at least 90% of ugly food has the same quality as normal food. However, the quality of those food depends on the farm, and we will keep in touch with those farms to ensure the quality of ugly food.

4. Operation details

4.1 APP

4.1.1 Source of funds

To keep operating the APP, we need to have funds. Firstly, sponsors are the most important source of income. Venture capital company or other famous environmental organizations can put their advertisement on the coming page of this APP for about 5 seconds, but users can close it during these 5 seconds. Before playing the videos posted by our official account, there will be an advertisement for about 15 seconds, users need to buy ugly food, send messages in the forum, or share their experiences to close it.

4.1.2 Courier Companies

For delivering our products, we are going to cooperate with some delivery companies such as JD, SF EXPRESS, YTO EXPRESS, etc. More details are shown in the Cooperation Platform part above. For the packaging, our target is to let people accept ugly food, save the environment, and reduce the waste of food. Therefore, to package those products, we are going to use degradable and recycled boxes and bags that are environmentally friendly. Another factor that needs to be considered is the surface area and space required to prevent the over packaging problem. Therefore, packages that we use have to be less surface area and consume smaller spaces.

4.1.3 Protection of user' s privacy

The protection of customer's privacy is also important. An increasing number of people start to pay attention to individual privacy. For example, every user has to create an account for signing in our APP which has to bind with their cell phone number. Our team promises we will try our best to protect every customer's privacy and give them a comfortable using experience.

4.1.4 Technical support

Design

All the interfaces, pages, and functions are designed by our teammates. They will draw all the details using the iPad.

Maintaining

Since no one knows how to write code, so our team will employ some programmer who knows how to create an APP by looking at our layout and maintain it. We may also find help from some other students in the school. If we do not hire skilled programmers, there will be a lot of bugs appear while users using them.

Management

Our teammates are the managers of this APP, especially those who designed it. When a user writes to state or request, managers will be the first ones who receive this, and they will decide whether to accept this request or not, then tell the programmer what to do.

4.1.5 Promotion

Advertisement

Different types of advertisements are essential. The main advertisement method is social media. Due to the development of the internet, people of all ages use social media to communicate with others and share their own life. The advertisements are presented in various ways, such as electronic posters, short videos, and so on. We are going to post videos and posters on our accounts, so people can see them after clicking into our homepage or following us.

4.2 Restaurant

4.2.1 Chef

We are more likely to employ young chefs who may not have lots of experience but creative and willing to protecting the environment. Chefs are the most important role in a restaurant, they need to do their best and innovate continuously to get customer's satisfaction.

4.2.2 Waiter and waitress

We will invite some volunteers to be our waiter. Lots of students from our school are willing to do voluntary works, so we will let them "work" in our restaurant and give them volunteer hours that we need for the graduation of high school. People

who also want to protect the earth can join this restaurant. However, to keep the restaurant running perfectly, we will still employ skilled workers to do some difficult work. Those skilled workers can also teach some basic skills that student volunteers may need to use in the future.

4.2.3 Cashier

The cashiers may also be employed from our school as this is a good opportunity to get in touch with society. This is a good way for them to communicate with others and be more open. At the same time, we will still hire an adult who has experience in this. That person can help student volunteers to do better and make sure that there are no mistakes.

4.2.4 Other posts

For the rest posts, our restaurant will still employ both students and skilled workers. If they cooperate well, this can be an advantage to our restaurant as students can explain related knowledge to customers and skilled workers help to ensure the running of the whole restaurant.

4.2.5 Supply of ingredients

All of the food supply will come from the farms we cooperated with. Details can be found in 3.4.3.

6. Response to Challenges and Root Causes

6.1 Response to Challenges

6.1.1 Human nature

Human nature always likes to avoid hassles and likes things that are quick and easy, but if people see the benefits of things and understand that they can benefit from them, then the problem is solved. In our scenario, for buyers, they are bothered because they only see the surface of things and don't see the inside. As long as our team does a good work of promoting ugly food and make people understand that ugly food is a type of green food and good for health the same as a normal food, then they will accept ugly food. For sellers, as long as there are buyers and markets, when more people tend to buy ugly food, then sellers will naturally be willing to sell because they see the business potential.

6.1.2 Worried psychology of seller, food suppliers, and retailers

The main reason why sellers are worried is that they don't see the benefits of selling ugly food, in other words, they are not sure whether selling ugly food will lead to profit and business opportunities. So, sellers can try to put a small part of ugly food into the market, and when they find that people start buying ugly food and even start going after it, then sellers will naturally be relieved of their worries. In our scenario, the concern of the food suppliers will not affect the promotion and acceptance of the ugly food very much, the food suppliers are responsible for

selecting and packaging the ugly food, they are just responding to the demand of the market and when the market changes, they will naturally respond the change.

6.1.3 Policies made by governments and authorities

The policies of the government and the authorities are not something we can easily change, and it is true that policies greatly affect the way irregular-looking food enters the market. However, that does not mean our programs cannot continue. More and more farmers in China are selling their home-grown food directly, which means that a large part of the ugly food will skip the processes in the factory and directly into the market. The market here does not have to be a supermarket, it can be a local market and the farmers have their own stalls. We will also be working with some farms to sell ugly food on our app.

6.1.4 Consumers' concerns about ugly food

The main reason why people are prejudiced against the ugly food is that there is no coverage and news to popularize and explain, which causes misunderstanding and people even misled by rumors. In order to make our program better, we will put more effort into publicizing it, because only when ugly food is popularized and people know more about it, customers will no longer look at ugly food with colored glasses. Also, there will be a lot of instructional videos available on our app, which can help customers to solve these problems.

6.1.5 The current state of the ugly food and the impact on the wider environment

The public's environmental awareness has played an encouraging role in reducing waste. Fortunately, this data is largely unaffected by the implementation of our programs. If people are unaware of these environmental impacts, our program can help them to know more about the existing problems. The most imperative is that people learn more about ugly food and change their bias in irregular-looking food through our promotion, then they may accept it, and buy it.

6.1.6 Limited access to ugly food

More and more farmers in China are selling their home-grown food directly, which means that a large part of the scandal will go beyond the factory and directly to the market. The market doesn't have to be a supermarket, it could be a local market or a farmer's own stall. We will also be working with some farmer farms to sell Scandalous Food on our app. This means that even if we can't change the existing rules for buying from the market, we can create new ways to buy Ugly Food to meet the needs of our customers. After our campaign, ugly food will likely become a new topic of conversation, and when it becomes a topic of conversation and there is greater consumer demand to buy it, suppliers will naturally see the opportunity and they will no longer screen out the irregularities, so more and more ugly food will flow into the market.

6.2 Response to the Root Cause

The entrenched aesthetic of people

People's ingrained aesthetics aren't formed in a day, and they are largely due to the long-term influence of the internet as well as culture. That's why we promote it in various ways, such as through speeches, products, apps, etc. Our main goal is to break people's stereotypes and their perception of what things look like. Our main goal is to break people's stereotypical thinking and stereotypical image of what something looks like and to change their perception of "ugly food" in a subtle way. Although people are born with prejudices and it is hard to change their impressions, if there are benefits in front of them, for example, ugly food is a kind of green food, it is a representative of healthy food, and it is good for health, people will weigh the pros and cons in their mind. According to the internet and many news reports, with the development of the society and the country, people's life is getting better and better, and they don't only care about appearance like before, but also pay more attention to the nutritional content and health benefits when they choose food.

 [_government](#)

Prototype and Test

| Prototype Design

APP Logo design principle

The logo of our app is an ugly food. It's a carrot with two "legs" . Our team choose the carrot for our logo because it is a very common ugly food in our daily life. It's also very iconic. What' s more, carrot is cute and simple enough for app icons.

Restaurant design principle

The design totally follows the action plan to illustrate the layout of the restaurant. The entrance is on the left side of the restaurant. Some cartoon characters of irregular- looking food are put in front of the restaurant. Also, all the decorations are indicated by orange color. Some seats and tables are set around the open kitchen which is separated by the acrylic board. Shelves for selling ugly food are distributed next to the open kitchen. The teaching area is located at the innermost part of the restaurant.

 [logo](#)

 [homepage](#)

 [forum](#)

 [restaurant design](#)

| Feedbacks learnt from users

Our team gained feedbacks from our potential consumers, ugly food suppliers (farmers), and some chefs. We used questionnaires and interviews as methods to obtain their opinions on our action plan.

From the result of the questionnaire facing potential consumers, there are almost 3 times the amount of females than males that are interested in our action plan. People from teenagers to 30-year-old are most likely to visit our restaurant. For the APP, we detect a peak of preference in people of 50-60 years old. They claimed that the reason for downloading the APP is the low pricing of vegetables and fruits. We also asked them to rank both the APP and the restaurant from 1 to 10 in their consideration. The result was that the restaurant' s ranking was negatively skewed – more people ranked higher marks. The peak of the APP' s ranking was at 8.

Overall, the APP was favored by more potential consumers. We believe that the APP is more appealing to the older generation. The respondents pointed out that they would like to know the nutritional values of ugly food both in the APP and the restaurant. Many people also hope that the APP should be designed to understand and find certain functions easily, or else it would be difficult for users, especially older people, to use them effectively and conveniently.

We also did a telephone interview with a large local farm that supply many local markets. The person in charge said that the ugly looking vegetables could be sold to the markets at lower prices once, but those retailers are less and less acceptable, so he usually discards them or eat them. Most of the time, his family cannot eat them all, so most of them end in the garbage can. He is supportive of our plans as he can get profits by selling them to us. He is concerned as well, that is, how to deliver those produce to us and the customers. He wouldn't want to spend extra money to deliver the food to us since they are already reducing his profits. He thinks the restaurant is an ingenious idea, but the vegetables supplied each day may not be used up, and some would be wasted as well.

One of our teammate's parents has a friend who is a chef. We interviewed her and asked for her opinion. Quote to quote she said that "If you offer me enough money, I may consider working there(Ugly Delicious Restaurant). It seems like a quite tiring job for me." Details she mentioned was that the chefs not only have to cook, but they also need to satisfy the curiosity of the customers by answering questions from them. The job also requires them to think critically in managing those vegetables. Each dish requires a different method used, which would be exhausting for the chef. After that, chefs would also need to set up accounts in social media and our APP and share their ideas. She felt that the chefs are playing a too important role in our action plan, so if we can't find any that are willing to work here, she's not surprised, and she's worried about if we can continue to implement our plan if we do not have our chefs. She suggested that designers, managers, or other relevant workers could be hired to relieve some of the chefs' responsibilities.

| Improvement for next iteration

Feedback 1: Suppliers are worried about spending the extra money to deliver ugly food to customers and not making a profit. Also, they are concerned about the possibility of wasting too much food by providing us with too much food.

Improvement: First of all, even though it may seem like a loss of profit to provide us with the ugly food delivery service, we can adjust the price according to the cost of

delivery and the selling price of the ugly food to ensure that the supplier is always profitable and that we can meet the demand of our customers. Some companies may also be willing to provide some financial support to ensure that this project goes well, and show they are environmentally friendly. Besides, we will conduct a trial run before we officially open the restaurant, which will give us a better idea of the amount of ugly food we will need each day to prevent waste. Also, to ensure raw materials are fresh, we will start discounting unused ugly food from the restaurant at 8 pm and give it away for free after 9:30 pm. This reduces food waste to a large extent.

Feedback 2: The chef is playing too many roles in the restaurant and probably not up to tasks.

Improvement: If funding allows, we would consider building a professional team dedicated to promoting, running, and managing the app. They could help the chef with the app account, help with updates, and daily sharing. If we do not have enough money, we can try to get some help from communities, such as recruiting voluntary waiters and cashiers. Our team may also ask other students for help since some of them are also good at computers and writing promotional articles. Our team members will be in charge of daily sharing on the app to reduce the work of chefs. This will lower costs and may get a lot of meaningful ideas for improvement. It is said that a master chef is not always necessary to have a chef's certificate to make delicious meals. We may also hold some activities on the weekend for customers to try to cook ugly food on their own. Our team will adjust the tasks timely according to the chef's work.

Feedback 3: Customers want to know more about the nutritional value of irregular-looking vegetables and fruits. Older people think the app is not clear and simple enough for them to use.

Improvement: Based on the survey, a specific mode for old people will be added to the settings in the app. The font size will be bigger, and the pages will be clearer for old people to see. An instructional video will also be put on the homepage as older people always find they do not know how to use those apps when they want to know more about modern technologies. Apart from the special mode, our team will add a page in the app to show the nutritional values of different kinds of vegetables and fruits. There will be pictures of various food on that page and people just need to click each food to see their nutritional value. A table which includes the nutritional values of normal vegetables will also be put next to the pictures. Therefore, customers can compare normal food and ugly food, this is a way to show that irregular-looking food is as nutritive as standard food.

Team Credits

肖子烨Ziye (Jada) Xiao is responsible for formulating and participating in writing challenges, solutions, criteria, action plan, improvement. What' s more, Jada designs and modifies the app's logo, as well as participates in literature search, offline research, and online publicity projects. Jada records and summarizes several meetings.

戴安冉Anran (Anne) Dai is responsible for researching and helping to choose the project' s direction. Anne analyzes the advantages and disadvantages of the team' s topic. Anne joined every online meeting and always come up with new ideas. Anne is also responsible for writing part of the solutions, challenges, criteria, and action plan. She designs the page for the forum in the APP.

邓楚霖Chulin (Carina) Deng is responsible for doing a questionnaire and collecting data. Carina writes part of the root cause, solutions, criteria, and action plan. She also draws the layout of the restaurant and designed the homepage of the APP.

陈宛莹Wanying (Rebecca) Chen is responsible for writing all of the summary and evaluation. Rebecca also writes part of the challenges, solutions and feedback. She helps the team to correct the language mistakes and modify the texts based on critiques.

胡双 Shuang (Tiya) Hu is responsible for organizing all the tasks and remind other team members to finish their tasks. Tiya writes part of the root cause, challenges, solutions, criteria and improvement. She also checks the format before upload.

Judge Comments

" Review Comments:

I commend the team on the level of desktop research and field research. Good field research, but how many people did you survey, and who? It's important to understand the audience and if they represent the broader population.

Very thoughtful and detailed approach at challenges. You have captured the challenges comprehensively and thought at the ground-level as well as at the policy level. Good understanding of supply chain challenges, human psychology, and very clear quantification of climate change impacts.

Great variety and depth of solutions, they are both innovative but practical. Criteria are very well thought-through, and incredibly inclusive. Love that you have considered social groups, equity and long-term feasibility. It would have been good to see the team consider if 'ugly food' can be diverted to support social causes like food banks, homeless shelters, feeding the hungry etc. It would also be helpful to consider how some percentage of ugly food can be incorporated into existing systems - chance of success of integrating ugly produce into existing restaurants that are doing well might be higher than setting up a whole new restaurant based on the theme of 'ugly food'.

Consider including awareness-building and education potential as a criterion, as that will determine whether ugly food is accepted and applied beyond your app and restaurant. Larger scale adoption is required to make a real impact on the environment. Some of your other proposed solutions such as speeches, social media etc. would have also scored a bit higher on that metric.

It is good to see the benchmark study against your competitors in China and Taiwan. It's important to evaluate the market before proposing a business solution. Consider looking at existing, similar solutions that already exist outside China to understand potential challenges and avoid potential copyright issues.

I hope the team continues to develop their understanding of this market and continues to take this important work forward.

"