Sustainability Innovation

How to effectively reduce the per capita meat consumption of Chinese residents？

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Summary

Meat, a type of food that brings joy and satisfaction to many, an important part of everyone's daily lives and an industry worth hundreds of billions of dollars. As the economy in China keeps getting better and as the resources are becoming increasingly available to more of the population, the consumption of meat is rising higher. In 2018, China consumed 41 kilograms of meat per capita. While easy access to meat may be good news, the meat consumption of many Chinese citizens is spiralling out of control, as more and more people are starting to tip over the balance on their diet, causing negative effects on their health, the environment, future resources, as well as animal rights.

As the problem of the over-consumption of meat would continue to worsen over time, a solution to this issue must be urgently formulated to ensure a sustainable future.

As we looked into this issue, we realized that there is a diverse range of root causes that contribute to the problem and that there are many potential issues that may stand between us and the solutions that we come up with, such as the lack of understanding and knowledge on this issue amongst the majority of the population, the stakeholders that profit from the current meat industry, cultural habits, as well as worrisome people who just want the best for themselves and their family but maybe unknowingly contributing to the issue.

After identifying these factors and limits, we started to generate solutions to bypass these obstacles and to cover and eliminate the root causes that contribute to the problem. Of course, there were many more things to consider. Can education really make a difference? Do we need ways to make a balanced diet more attractive to the general public? Is sympathy enough to drive the future in another direction? Can we use technology to motivate people enough to actually make effective changes? Is it possible and achievable to involve authorities to take this issue into their hands? Can we find ways to raise awareness about this issue so that people would have the incentive to make changes in their daily lives?

The uncertainties regarding these considerations are closely related to whether our plans would succeed in making a difference for a more sustainable future. Thus, we came up with a system to evaluate our ideas to select ones that are the most practical, most effective, and the most efficient. After taking these into consideration, we found one solution that elegantly covers all of the root causes of the issue. It also allows people to enjoy a balanced lifestyle, as well as letting people make better choices for themselves with a better and healthier option, instead of using more forceful methods.

The final plan consists of using technology to develop environmentally-friendly meat products that are a lot more resource-efficient and appealing to customers than traditional meat dishes as well as their existing alternatives, advertising them appropriately to make sure that the customers understand the difference between this new product and the traditional artificial meat, making the new product appealing to the general public, as well as suggesting government intervention or an addition to the current education program in primary schools. With this plan, all aspects of the root causes could be taken care of, a great plan that could ultimately guide people to a future of sustainable and healthy diets, without interfering with the current stakeholders of the industry.

We have evaluated this solution to be highly implementable and effective, however, flaws could still exist, as they do for everyone and their ideas, but that is what motivates us, as human beings, to keep innovating and coming up with better ideas to make improvements, and this is exactly why we believe this idea deserves the attention of highly reputable events like NCF-Envirothon so that we can contribute to society and the environment with our passion.

In conclusion, we strongly believe that we have carefully formulated a holistic plan that could be highly effective against the complex issue of the over-consumption of meat, and we believe that this solution can, and will, improve the lives of many people, now and for many more generations to come.

Identify the challenges

As for how to reduce the capita meat consumption, we will discuss the following five aspects of the challenges —— The balance between producer and consumer benefits, Worrisome tended of meat consumers, Environmental awareness, Government interests, and Health & development.

1. **The worrisome mindset of meat consumers**

The **psychological** perspective of why people choose to eat meat is that meat is much more **nutritious and tasty** than vegetables. Therefore, the challenges in influencing the ingrained opinion on meat among the **general population** is a difficult one to overcome.

2. **Environmental awareness**

Livestock and their by-products account for **at least 51% of global greenhouse gas** emissions. A large amount of the world's total food production is now used to feed livestock, taking up a significant portion of the world's **high-quality and healthy protein** resources. Meanwhile, there are more than 900 million starving people in the world. According to an FAO study, livestock farming is also accountable as the largest human use of land, and the expansion of livestock production contributes **greatly** to **deforestation**.

The first and foremost aspect of this challenge is to effectively achieve the aim of our solution, which is to **lower the environmental damage** caused by meat consumption. This challenge comes from **raising awareness** among the Chinese population regarding the topic in the first place, as our action will only be adopted once its objective is understood. The other challenge is to keep our solution as **eco-friendly** as possible, bringing **minimal harm** to the social and natural environment. Our solution will only achieve its purpose if it **limits environmental impacts** instead of causing them.

3. **Government interests**

From a legal and political point of view, our solution has to stay within the government regulations. The government could be a **helpful medium** when it comes to collaboration, yet it could also be **restricting** and ultimately fail our solution. While we consider our solutions, we also need to evaluate the interests of the government in order to better bring our plan to life and avoid unnecessary conflicts.

4. **Health and development**

From a physiological point of view, the **conceptual distinction** between animals and plants became clear only with the development of man and wisdom. Throughout the history of species evolution, omnivores that eat both meat and vegetables were motivated to eat as much meat as possible for survival, nutrition, and satisfaction. Eating meat is an **instinctive choice,** just as children prefer sweet to bitter. Objectively, in terms of nutrient and energy supply, all kinds of protein in meat, from energy to taste, can satisfy simple human needs. One of the differences between higher animal cells and plant cells is that higher animal cells have cholesterol on their membranes and plant cells have steroids. Cholesterol is responsible for regulating the cell membrane fluidity and is one of the basic components of the animal cell membrane. Therefore, protein intake is **vital** for animal organisms, including the human body, to maintain the basic components of the cell membrane. Our solution should be fulfilling the **major nutritional requirements** of the human body.
（information from https://www.zhihu.com/question/30412647 ）

5. **The balance between producer and consumer benefits**

In order to reduce per capita meat consumption, it is necessary to reduce the **production** of meat. However, it would mean that those who are dependent on livestock for their income will be more or less impacted. Thus, the question is, what can we do to ensure a **certain amount of profit** and income maintained with the average individual, as well as companies, **without severe fluctuations**? This leads to our first challenge, and that is how to lower the per capita consumption of meat without causing too many changes to people dependent on livestock for their livelihoods — such as the use of artificial meat, or mandatory limits on meat consumption per household, and some government subsidies for livestock workers. The reason why this factor is the most challenging one is that it affects two groups of people—a group of people who sell meat to **survive** and a group of people who buy meat to **live**. But balancing the profits of both sides is not an easy task. All of these solutions we give (e.g. limits on meat consumption, subsidies for livestock workers) require both **government** support and **civic** support. We need to reach these two premises in order to balance their benefits so that we will focus primarily on the last challenge.

Identify a root cause

Taking a broader look at what we already know, then combining it with the knowledge we have gained from the interviews we have conducted across interviewees from multiple age groups and occupations, most residing within China and some who do not (data the group outside China is used as a controlled group of data to see how we can better focus our solution on the Chinese citizens), we have identified the following reasons as to why our problem, people in China are finding it hard to lower their meat consumption, occurs:

Culture and Habits:

- Many of the individuals whom we have interviewed tend to be reliant on meat-rich diets because of their **habits**, due to factors such as regional traditional dishes which may feature a lot of meat contents and the food they were exposed to as children (which is a factor highly dependent on the lifestyle of their family and the geographical location of where they lived, as traditional dishes tend to vary from every region across the land of China)
- **Lack of a religion**. Many religions, such as Islam and Buddism, discourage their followers from consuming meat, sometimes including other animal products. However, most residents in our target area, China, do not tend to practice such religions, leaving them with fewer reasons to reduce their meat intake. Some believers we have interviewed who practice religions which encourage their followers to follow a plant-based diet for at least once in a while tend to be significantly more open-minded about the idea of reducing their meat intake, however, most of the interviewed individuals who reside within China do not practice any religion at all.
- Some of the interviewed subjects grew up with the **false concept of meat being generally "the best" type of food** when compared to other food groups such as vegetables and soy products, causing them to consume a lot more meat rather than trying to have a balanced diet. This also means that they tend to get provoked when the idea of reducing their meat consumption is mentioned or suggested. A reason which contributes to this is that many people in China, especially older generations, have likely suffered **poverty and lack of resources** earlier in their lifetimes which made them **unable to afford meat**, a type of food that tends to be a lot more expensive than other food groups, making meat a resource that is precious and rare. These people tend to emphasize the value of meat, often also passing the perspective on to younger generations, making them believe that meat is something elite, and now that meat is more available to everyone, people with this type of perspective would generally believe that it is good and healthy to consume meat in large quantities whenever possible, which could, in fact, be harmful to their health. This could also be the reason why

people in many western countries are more open-minded towards the idea of eating less meat or even no meat at all, considering that western countries have a lower population which meant that the majority of the population there have not suffered from the lack of meat.

Summarising the above, the interviewees tend to associate the above reasons with an emotional reliance on meat consumption, claiming that reducing their meat intake would cause dramatic negative impacts on both their mental and physical health, and believing that meat is "elite" and should be consumed in large quantities.

Knowledge:

- Most of our interviewees were **not aware of the negative impacts** that meat can have on their health. Most tend to claim that meat is the "most nutritious" type of food and does not cause illnesses, which is not true according to our research.
- Our interviewees **do not seem to display an interest** in whether or not their diet has an impact on the environment, and when further questioned, their answers show that most of them do not acknowledge the negative impacts which meat can cause for the environment, while our research shows that this is a very urgent issue that needs to be addressed.
- In contrast to the above examples, our interviewees abroad seemed to understand more about these consequences of consuming too much meat and were more considerate about this as they decide how much meat they should consume, while the **interviewees in China seem to know and care significantly less** as long as they get to consume delicious cuisine.
- Many of our interviewees do not seem interested in trying artificial meat for a change, as a lot of them believe that artificial meat is just a useless attempt in replacing meat with something that tastes bad, is very overpriced for something made of vegetables, not natural and less nutritious. **Not many of them have done any research on artificial meat**, the amount of work, research and experimentation that have gone into these projects just to make the artificial meat contain the right nutrients and taste like real meat products. This makes them unwilling to try artificial meat, which could be a much healthier and more environmentally-friendly alternative, and instead just simply dismiss the idea with "Why can't we just eat actual meat when it tastes better and is cheaper?"

  Summing up the above section, the lack of knowledge about their diet choices caused our interviewed subjects to lack reasons to reduce their meat consumption and therefore caused them to question our goal of helping people reduce their meat intake.

Economical:

- Stakeholders of the meat industry tend to try to maximize their profit as much as possible, even if it means **filtering out the negative information about meat and promoting only the benefits** of meat so that they could sell more and therefore profit more.
- Massively reducing meat consumption of all Chinese citizens **would cause drastic economic loss** to all stakeholders, while the most vulnerable of them would lose their occupations, putting a group of the population in despair and a desperate need for economical support.
- China, being one of the most populated countries in the world, has a high demand for imported goods, while many other countries have businesses that try very hard to meet the demand of supplies so they could import their goods to China. As diet is an essential part of the demand, a change in the demand for meat **would cause supply chains to break down around the world** for a considerable period of time. The foreign stakeholders abroad would be impacted heavily just as much as the stakeholders within the country, and an **international trade issue could arise** from the sudden change in demand.
- As mentioned early in the Cultures and Habits section, **the fact that meat is expensive could cause many people to exaggerate the values of meat**, causing an illusion that meat is better than every other type of food, and the misleading price is causing many people to have an unbalanced diet when they are finally able to afford more meat since most people tend to believe that expensive goods are always better, when in fact the high cost of meat mostly comes from the amount of resources that the meat industry takes up in order to produce these unsustainable meat products.

  Summing up the above section, reducing meat demands for a large portion of the population suddenly could cause serious economical issues for all stakeholders. However, things cannot continue being the way they are now, as overly glorified meat products will only reinforce the problems addressed in the above sections of *Cultures and Habits* and *Knowledge*.

Nutritional:

- Despite how meat can be harmful to human health when consumed in large quantities, **it would be hard to replace meat with non-meat products**. While other foods such as spinach and soy do contain nutrients such as protein, iron, and fat as well as other nutrients that are famously found in meat, the concentration of these nutrients in meat is still hardly replaceable, and even more so when speaking of certain nutrients that only exist in certain types of animal products. Having a small portion of meat is a lot more efficient to have than a much larger portion of the vegetables that make up for the same amount of vegetables. This makes replacing meat entirely a hard mission but does not place a threat to the goal of allowing Chinese citizens to have a balanced diet.

This section, however, is not essential to our goal, as a balanced diet is what we are aiming for, instead of discouraging all forms of meat intake. This means that our project result must allow and encourage people to eat enough meat to keep them healthy, but not too much meat that their diet is unbalanced and unhealthy, which is the phenomenon we are trying to fix.

Foreigner views:

- In order to show the seriousness of the problem in China, we also interviewed some foreigners to see the difference in between. Compared with the interview results we got from the Chinese, the foreigners have a basic knowledge of the environmental impact of meat and artificial meat. Furthermore, they also stated that they will continue to follow up on the news about artificial meat and look forward to its new developments.

The above information makes up the tip of the iceberg. The combination of the root causes below is what we believed to be the most important **root causes** why citizens in China are having difficulties to reduce their meat consumption:

- The **lack of general knowledge**
- The **difficulty of finding a replacement** for meat.

These two root causes tells us what we need to take into consideration and focus on as we formulate our solutions, and solving these two root causes will help to fix all of the problems mentioned above to a certain degree.

Generate solutions

Solution #1: Advocating for artificial meat

Our first idea is to start a business that specializes in **artificial meat**. As a technology that already exists, this solution is highly doable, as mass research has already been conducted on this topic, and artificial meat is already a publicly well-known concept. There are existing solutions in the market, but they all have flaws, such as worries about health and safety, that prevent them from being effective or widely accepted by the Chinese population. A lot of customers find the concept of artificial meat difficult to accept. Compared to real meat, the texture and taste of artificial meat are different, the cost is high, and all of that leads the customers back to concluding that real meat is the only thing that could keep them well-fed and satisfied. However, our solution consists of the **promotion of artificial meat** made by the technology of **decellularized plants**, a creative method would be to decellularized plants (fruits and vegetables like apples, etc.), and use the scaffolding left from the plant to grow meat cells, in order to recellularize the vegetable scaffolding. (Inspiration for this method: https://www.youtube.com/watch?v=FaVHTd9Ne_s) This solution offers a clean fix on all of the root causes, touching on avocation, offering a healthy option, giving motivation for consumers to take their first step towards a sustainable diet, while also minimising the resources used to produce meat. This solution does not post restrictions on the current stakeholders of the industry and does not immediately have a drastic effect on them, allowing these stakeholders more time to consider switching their options.

Solution #2: App

Based on our interviews and surveys, we noticed that despite the frequent exposure to meat, around 70% of the participants, mostly adults, and seniors, possess little to no knowledge about the environmental impact of the ruminant meat consumption. A small percentage even believes that mass meat consumption benefits the ecosystem. Unless the Chinese population is educated about what's happening, whatever action that we take would later be meaningless. Our second idea is to develop an **app** aimed at reducing meat consumption by educating the Chinese population about the various environmentally harmful impacts caused in the production of ruminant meat, motivating and promoting less-meat or vegan lifestyle. The app should incorporate the following features: a **tracker** keeping track and reflecting on our users' meat consumption on a regular basis, a page for **education** with **colourful and aesthetic graphics** that visualize their efforts, and a **social media platform** for discussions, competitions, and sharing vegetarian recipes and feelings about the diet among users of all ages. All these features will be able to motivate our users by making this experience interesting and meaningful and building a better sense of community.

Solution #3: Government intervention

Our third idea is the involvement of the **government** as the government has the authority and rights to make laws and regulations. The first action that the government could do is to **subsidize the industries that make artificial meat** and thus increase the quality and efficiency of production so that more industries would be more willing to produce artificial meat since the cost of their production would be reduced by the government. The second action that the government could do is to **increase tax in excess of normal meat intake**, which means to raise the tax once the customer wants to purchase more than a normal amount of meat.

Solution #4: Ideological education

Our fourth idea is sending volunteers into local communities—we plan to train and send groups of volunteers to schools to help educate kids about the negative effects of meat and ways to healthily reduce meat intake, and making health and nutrition part of the **primary education programs**. According to many sources, the knowledge of a generation is formed in childhood, so a more sustainable way to solve the problem is by getting new generations of young people to voluntarily reduce their meat consumption. The old generations had increasingly higher meat consumption, and part of the reason is that they spent lots of their lifetimes in wars, and there was not enough meat to eat. They were taught that having meat is a kind of enjoyment and thus subconsciously thinks so as well. Similarly, if children are taught from an early age that consuming too much meat is bad for the environment and themselves, they will consume less meat every time when they go to the supermarket and will try to find other ways to meet their needs. That is why educating a new generation in thought can be a lasting aid to the difficult challenge of reducing per capita meat consumption.

Solution #5: High-tech chopsticks

Due to the fact that most Chinese people use chopsticks while eating, we believe that it's most straightforward to remind people to eat less meat by using **chopsticks**. According to our research, most Chinese people that we interviewed do not know what the normal daily intake of meat is. Even if someone knows what a normal daily meat intake should be, it's hard to measure the meat content of a meal at a restaurant without someone reminding you. We hope to develop high-tech chopsticks and promote the use of them. As the customers are having a meal, the chopsticks will automatically **detect and calculate the customer's meat intake** and will **supervise and alert** the customer if they exceed their daily meat consumption.

Solution #6: Alarming packaging

As humans are visually inclined, our first impression of a new product is largely derived from the packages of a product and further acknowledging that many people are not aware of the negative environmental externalities brought by meat consumption. By adding messages such as “how much do we have to lower our meat intake to reduce emissions?” with **exaggerated visual images** related to **animal cruelty, meat-related illnesses and climate change**, just like the “smoking is harmful to health” on cigarette packaging. Through **outer packing**, we aim to reach our educational purpose so that people are constantly reminded of the knowledge of the harmful impact of over meat consumption, therefore, they will subconsciously consume or simply buy less meat.

Solution #7: “USGreen” Website

Through our investigation and a further survey among the public, we have acknowledged that one of the main reasons for Chinese overconsumption of meat is the lack of knowledge about the negative impact of meat production on the environment. Therefore, our proposed solution is to establish a **charity website** called “USGreen’, aiming to **advertise the negative environmental and health impacts of both meat consumption and production**. For example, how overconsumption requires an overwhelming mass of grain, water, land, and other fundamental resources. Apart from this, we will also promote the healthy “non-meat” lifestyle on the website, to further educate the public about the advantages of less-meat or even vegetarian diet, which many Chinese people lack understanding of what it is actually like and thus having bias and misconception. The website will eventually fulfil its goal to educate the majority of the public, acknowledging the harmful effects of meat consumption, therefore, proactively starting to reduce their daily meat consumption.

Solution #8: FarmPets

Animal lovers tend to feel more guilty when eating meat. People tend to be more sympathetic toward animals that they spend time with. This solution is about **building empathy between humans and farm animals** that commonly end up on the dining table. Most Chinese urban dwellers have little chance to interact with farm animals and thus see them as nothing but meat, yet pets appear almost everywhere and are adored by their owners and strangers alike. Our solution, attempting to lower meat consumption without enforcing hard restrictions, is about the idea of **FarmPets**, genetic **modifications of farm animals in the size of small dogs and cats**, making them appealing to people and integrating them into average households. One may claim it ethically wrong to modify animals and defy the laws of nature, yet they should realize that most species of modern pets, even farm animals, come from a long history of cross-breeding. FarmPets are restricted from wandering off into the wild and causing chaos to the ecosystem, so there should be no worry about the ethicality and safety of our solution. The gene-editing technology, CRISPR, is readily available and thus proves the achievability of this plan. It also **brings no threat to existing stakeholders** (as no limitations are placed on the meat industry or the pleasurable process of consuming

meat) but rather **brings life to a new industry** by accelerating development in the pet and its related industries. This solution will be executed by allowing people to see from a new perspective, raising awareness about meat consumption, and bringing a small amount of social pressure to heavy meat-eaters, all to help people consider their daily choices critically. It may not be very expensive, as farm animals are easily accessed and the CRISPR technology is very **affordable**, yet the benefits of this plan could change the Chinese society, economy, health, and environment for good.

Solution #9: Promotion of vegetarian restaurants

Another way to approach our goal of reducing daily meat consumption is to **promote vegetarian restaurants**. Based on the information we obtained from the interviewees, 70% of the interviewees do not know the concept of vegetarian restaurants, while the other 30% either have tried the vegetarian restaurants before or have the preference to try. Those interviewees who have tried vegetarian restaurants before praised the taste of vegetarian food and enjoyed the experience. Acknowledging the situation in China right now is that there is still a lack of vegetarian restaurants even in large cities, and most of the vegetarian restaurants are Buddhist, opening large vegetarian theme restaurants will provide more variety for potential customers even the whole public. We hope to promote vegetarian restaurants more. In addition, we suggest that customers who order vegetarian food are able to get a 5% discount and add a 5% surcharge if they order an additional amount of meat, which will be used to subsidize the vegetarian restaurants and donate to animal welfare organizations.

Solution #10: Vegan fashion shows

With the development of technology, people are now paying more attention to the field of fashion than decades ago. It's worth noting that fashion fads tend to drive groups of people's minds because of FOMO (fear of missing out), which is a type of social anxiety stemming from the belief that others might be having fun while the person experiencing the anxiety is not present. In order to reduce the meat consumption per capita to a certain extent, we could hold an **environmental fashion show**, mainly about the serious negative effects of eating lots of meat (e.g. Greenhouse gases, desertification caused by Animal husbandry, etc.) In fact, there have been many successful environmental shows. For example, this season, Stella McCartney collaborated with biotechnology companies DuPont and Ecopel to develop the world's first plant-based artificial leather Koba. In addition, 75% of their designs are made of environmentally friendly materials, including recycled polyester and rayon. To a certain extent, this show played a leading role. In another example, Louis Vuitton presented a nostalgic collection that fused the past. As a show of pinewood from the sustainably managed forests of France, which will be recycled after the event. With greater publicity, more people will be attracted to the “new fashion” and use less animal products.

Criteria

Efficiency (10)

- The accounting period of **time**（productivity) that the proposed solution will take until its completion: (3)
    - A projection of average meat consumption per family for at least 20 years is needed for the proposed solution, in order to assess its period of time
- Whether the solution is **well-organized**: (2)
    - Each proposed solution should contain a specific detailed plan with step-by-step instructions.
- Whether the solution's effort and expense is **balanced** with its result given: (5)
    - A projection and finance estimated cost sheet is needed for every proposed solution, including both proposed (or invested), implemented and maintenance fee, in order to compare the financial cost for each proposed solution. The projection may also include its estimated manpower cost.
    - The projection of cost may be compared to its projection of meat assumption per family in ten years, in order to find the ratio or relationship between, determining how balanced is its effort and expense.

Feasibility (10)

- Does the proposal fit in the local **legal system** or is it in conflict: (1)
- In terms of **technical feasibility**, whether the company or nowadays technical advancement has the potential to complete the proposed project: (3)
    - The technology involved (for example, the invention of impossible meat or creating an environmentally friendly environment for meat consumption)
    - The present technical resources are able to fulfill the requirements.
- Considering the **current market** and present situation within the community: (3)
    - The availability of inputting the proposed solution into the current situation, considering local culture, religion, and politics on meat consumption.
    - The availability of land and manpower
- In terms of **financial feasibility**: (3)
    - The cost of the proposing period
    - The cost of implementation and investment, whether the local organizations or the government are able to afford
    - The cost of maintenance, whether the local organizations or the government are able to afford, maintain the proposed solution for a long period of time until obtaining the satisfied result

Evaluate the solutions

Evaluate solutions

Solution #1: Advocating for Artificial Meat
Efficiency: 2+2+5=9
We believe that this solution is **highly efficient**, as **the technology is readily available** and already **been researched by multiple recognized organizations and individuals**. Plus, we have already easily visualized **a detailed step-by-step plan that is reliable and realistic to this solution**. Furthermore, we also believe that this solution has definite **long-lasting effects** that will impact the meat industry for good in the future. This plan works like a traditional business model, with advertising steps, but the technology is already existent and simply pending more adjustments. The promotion steps can be **easily done** with help from the right people, and we know for a fact that there are many capable and passionate individuals who are interested in investing in this type of solution, which makes this solution **require little effort but has huge potential**.

Feasibility: 1+3+2+3=9
This solution **does not involve infringing any law** and **does not necessarily require the government to step in** and make any harsh regulations, though that could help increase the efficiency of the solution, it is not required as the solution itself is already effective and efficient on its own. As mentioned above, the technology has already **been proven to be feasible**, with **significant results that are already edible** and successful. This solution does not require resources such as vast areas of land, as the entire idea behind this solution is that it should **take up significantly fewer resources and land than the traditional meat industry**. Also, this solution **would not be difficult to implement**, especially if all the promotion steps are done correctly, the markets would be happy to welcome a new product that is new and popular, especially if it has a cheap and affordable price that is attractive to customers. Many individuals, (for a small and true example, Bill Gates has funded a company called Eat Just which makes eggs from plants and chicken nuggets from chicken feathers) are known to be constantly looking for and investing in sustainable alternatives to traditional diets, making our project **financially feasible**. However, we do notice that the current market in China may not be very open-minded about the idea of such a product, especially when it is such a **foreign technology** that was initially designed for making organs more available for transplanting, so we would have to be mindful about this issue when formulating our solution, but we believe that this is an issue that **can be worked around** and solved if all the steps to this solution are carried out properly.

Total:18 (**highly effective and feasible**)

Solution #2: App

Efficiency: 3+2+3=8

As technology is made to become increasingly easy and affordable for the average population to access, applications are now **very easy to produce**, even when one does not know much about the basics of coding. Our team members who are more experienced with coding managed to code entire functioning complex applications from absolute scratch in the matter of a few hours, without using any money or other resources, which proved just how efficient this solution is in terms of **minimizing the required time and resources it takes** to create the application. The plan can be easily visualized as the steps to this solution is simply to create the application and publish it so that the general public can access our project, which makes it **simple to implement**. However, we **highly doubt that the effectiveness** of this solution, as our research showed that most people are not interested in switching their diet mode and the app can only do as much as helping those who already intend to make a change on their diets, and **cannot give other people any good reasons or motivations to start seeing the issue from a new perspective.**

Feasibility: 1+3+2+3=9

The creation of this application **would not infringe any laws or human rights**, as the solution is only a tool to help voluntary people to reduce meat intake, nor does the solution require help from the government. Our experiments with creating applications and websites showed how **feasible and affordabl**e it is to put this solution in motion, even unprofessional people like us could easily do this with **no cost and low effort**, and we believe that it would prove even more true if a professional team is to help us work on this solution. This solution can also be **easily pushed out to the market**, as there are many platforms such as App Store that support creativity and therefore allow applications to be published there as long as they are appropriate. However, as claimed above, the solution **would not be effective** given the state of the current Chinese society and market, as most people would not have an incentive to download the application in the first place if they were not willing to change their diet, and would therefore have no chance of being educated about the issue they are contributing to, thus rendering this solution futile.

Total: 17 (**Very easy to implement but not very effective**)

Solution #3: Government Intervention

Efficiency: 1+1+3=5

This solution would definitely **take a lot of time and effort** to implement. Legal regulations take a long time to pass, after careful consideration by the government, especially when it comes to an issue related to the environment, as it is not commonly seen as an issue that has an urgent need to be fixed. The solution is **well-thought-out** in terms of what the government should do in order to help but **needs more details** on how exactly we could bring this issue to the attention of the Chinese government, and may need a lot more time and effort for us to figure out ways to convince the

government that this is an urgent issue that needs to be addressed with harsh regulations. This solution would be **highly effective**, as laws have the ability to strongly encourage the entire population to reduce their meat consumption, and the solution **would not take up vast amounts of physical resources**, as it mostly exhausts time and money instead of resources such as land.

Feasibility: 0+3+1+2=6
First of all, this solution would have to **involve the government** and maybe believed to **infringe on the rights of the general population**. As we found out about how meat consumption is a controversial topic amongst the Chinese population, this **may also bring a bad reputation to the government**, which could have serious negative consequences. However, this solution **does not require any new technology**, which makes it one of our few solutions that do not require developing new products. However, we know that **the public would not respond very well** to this sudden change in their daily lives and that the government would take into consideration that the consequences of negative public feedback could prove to be serious, making it **difficult for the government to accept this idea**. This solution would not be hard on the financial aspects, however it may require professional lawyers and similar advisors to be hired in order for this solution to be accepted by the government, which **could be costly**.

Total: 11 (**Highly effective but extremely difficult to implement**)

Solution #4: Ideological Education
Efficiency: 2+2+4=8
This solution is **easy and quick** to set up, but the process of educating one or more generations across the entire country **could take up a lot of resources**. Despite that, this solution could be **extremely effective**, as changes to the mindset of children of one generation could have an impact on many more generations to come, allowing more people to be aware of the consequences of their daily actions.

Feasibility: 1+3+3=7
This solution is **legal** but will **require the cooperation of the ministries of education** from all across the country. **No new product or technology would need to be developed**, but a **new educational program** would need to be created and planned for. However, it is **not easy to find educators** who are passionate about the issue, and less so when it comes to **parents who may be upset** about how their children would receive an education that is contradictory to their own beliefs. This would, however, also be **financially feasible**, as the educational staff should already have a set and stable income, and therefore do not need to be paid extra.

Total: 15 (**Quite feasible and efficient**)

Solution #5: High-tech Chopsticks
Efficiency: 1+1+4=6

As much as this idea could be **helpful in terms of raising awareness**, we are **not so clear** on how exactly this could or should be done, which means that we do not know if the technologies required for this to be achievable already exist, nor can we make or visualize action plans until we are certain of what needs to be done. However, we do know the aim of our product, which is a good place to start, but this still **does not help very much in terms of saving the time, money, and material** that would be used on the experimentation stage of production, though we still believe that this could be **an easy way to raise awareness** on the issue of meat consumption and its negative health effects on the human body once the product is designed.

Feasibility: 1+1+3+2=7
This solution is completely **legal and requires no involvement of authority figures**. As seen above, we do not know where to start with this product or what type of technology would be required, and therefore we have **no way to determine whether it is currently achievable**. The final product should look and function like normal chopsticks, and those are **in high demand** in the Chinese market since chopsticks are the most commonly used utensils used by the Chinese population, meaning that this solution **has the potential to be widespread across the population**. We are unsure of how much money the production stage would take, but like any business, **finances should not be a big problem** once we propose our final design to interested investors.

Total: 13 (**has potential but is highly unpredictable at the moment**)

Solution #6: Alarming Packaging
Efficiency: 3+1+2=6
This solution should be **quick and easy** to implement, as all we need is to design new packagings for meat then contact stakeholders so that the designs could be used on the packaging of all meat products. However, **more planning may be needed** to be done when considering the stakeholders that may need to be convinced. However, this **may not be extremely effective**. Our inspiration for this solution is based on the warnings that exist on cigarette packagings, but people who smoke would not usually give the alarming packaging any second-thought, but those who are determined to start smoking now have a higher chance of giving the idea a second thought before trying cigarettes. We expect a similar result from this solution, but as meat is already an important part of almost everyone's diet, it may only have small impacts on certain individuals, and maybe not so much on the rest of the population.

Feasibility: 1+3+1+3=8
This solution is **legal** and **technically feasible** as designs are easy to apply to package nowadays, and the designs can be made by professionals and passionate activists alike. However, as mentioned before, this solution **may not have a significant impact** on the current market, and the stakeholders may not be willing to adjust their products in such a way that customers may be discouraged from buying them. However, once this solution is set in motion, which **does not require much financial support**, **there will not be a need for maintenance**, as the alarming meat packagings would become a custom for the entire Chinese population over time.

Total: 14 (**easy to implement, but may not have a significant impact**)

Solution #7: "USGreen" Website
Efficiency: 3+2+3=8
Similar to solution #2, we have proven that the creation of websites and apps to be **simple and effortless**. We also have a very detailed vision of how the website should look like. The reason why we **don't think that the effects would be balanced with the little efforts required** is that we don't believe that many people would be curious or passionate enough about the issue to visit the website and carefully read the information there, but it would be **very educational** for those who do take the time to read through and can be very helpful if the users could recommend this website to one another after being more aware of the issue.

Feasibility: 1+3+2+3=9
There is **nothing illegal about this solution**, and it **would not be time/resource consuming** by any means. Websites and internet-related media are very popular at the moment, which means that the website **has the potential to be reached to a big audience**. However, as mentioned above, **people may not have any incentive to visit the website**, which means that the solution may not work at all.

Total: 17 (**Easy to implement, unlikely to have significant results**)

Solution #8: FarmPets
Efficiency: 2+2+5=9
This solution is average in terms of time consumption. The cross-breeding and gene-editing **technologies are already readily available**, which means that research may not need to take a long time, but there is still a lot to consider when designing the details of FarmPets. We have a **detailed idea** as to how this solution can be implemented, and we believe that the power of adorable pets can certainly be **effective**.

Feasibility: 1+1+3+3=8
This solution is **legal,** as the cross-breeding between livestock and between pets is already a custom in modern society. Despite CRISPR being highly researched, some professionals of this field are **still concerned about the reliability** of this technology, however, the technology is still **inexpensive**, and is predicted to continue to become less costly in the future. However, this solution would be **widely accepted by the public** as new adorable pets appear on the market.

Total: 17 (**Uncertainties exist with the technology, but would be effective**)

Solution #9: Promotion of Vegetarian Restaurants
Efficiency: 2+2+3=7
This solution may **not be very time consuming or take up a lot of resources**, but it is worth mentioning that the results may not be worth the effort, as vegetarian

restaurants already exist, some even being famous and recommended by celebrities, but people **still have doubts about changing their diet habits**, and even if they were to find vegetarian restaurants attractive, meat-eaters are still more likely to only having vegetarian meals once in a while, which mean that the **impact may not be as significant as we would expect**.

Feasibility: 1+3+2+2=8
This solution is quite **feasible**, however, as claimed above, **the public may not be as responsive** as they need to be in order for this solution to have significant results. We **may not have the financial ability** to promote all-vegetarian restaurants either, which means that more consideration should go into this solution.

Total: 15 (**not very efficient and may not have good results**)

Solution #10: Vegan Fashion Shows
Efficiency: 3+1+3=7
These fashion shows **can be added onto television channels that already exist**, and therefore only require as much planning as normal fashion shows. However, we **do not have clear plans** as to how we could make this popular, as **the public may not be interested** in vegan fashion, as animal products are normally known to be better and have higher quality.

Feasibility: 1+3+2+2=8
All aspects of the solution are highly feasible except for factors such as public interest and finances. Famous celebrities that can bring attention to the shows are hard and expensive to hire, and as far as we can foresee, it is not very likely for someone to invest such a television program, and thus **the financial aspects of this solution would be quite difficult**.

Total: 15 (**Not effective and hard to implement**)

Concluding the above, we have chosen our solution #1 for our final plan, with the optional combination of elements from solution #3 and solution #4, for its efficiency and feasibility.

Make an action plan

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1. Introduction

1.1 The superiority of this plan

As a result of the Solution Evaluation part, “Advocating for artificial meat” has scored first with its 18 points out of 20, therefore, we decided to prioritize this proposed solution to deal with the overwhelming meat consumption problem in China and make it much more sustainable. The solution is essentially a reformation of the artificial meat market, making a network between the manufacturer factories and local restaurants with benefits from social media and the internet.

1.2 Survey results & action plan

According to our previous research, generally, people lack understanding of the presence of artificial meat. There is also a large number of people saying that although they acknowledge the presence of artificial meat, they still would not like to try it, seeing it as “fake” or associating it to awful taste. However, after years of testing and investing in artificial meats, many of these products now possess similar taste and flavour as meat, which is different from people’s original concept. Some people who have tried artificial meat before also claim that the texture of artificial meat does not taste like real meat, and they would therefore stick to real meat and discourage friends and family from trying artificial meat. Therefore, our plan is aiming to advocate artificial meat to let people step their first step by creating a new and improved version of artificial meat then cooperating with various local restaurants and internet applications to maximize our promotion and advocacy of artificial meat.

2. Solution design

2.1.1 Standardized artificial meat

Since we aim to create a holistic system, which covers various fields in the society, the quality of artificial meat should be firmly established and controlled to meet a certain standard so that it reaches the public’s expectation and gains satisfaction. Therefore, our first step is to investigate the current artificial meat market, selecting artificial meat manufacturer companies that fulfil our standard to supply the artificial meat to our system and project, noting that we are only providing a new retail channel for them instead of generating profits. We will also hire a group of specialists to conduct further research on making decellularized plants into meat, making them more affordable, tasty, and healthy.

2.1.2 Sorting the various artificial meat

As there are various types of artificial meat existing in the market, we will sort them out by not only their manufacturer companies but also different kinds of ingredients. This will benefit our further steps of sending these artificial meats into our system, and best serve our potential customers who are trying the artificial meat for the first time, knowing more about the one they are going to try.

2.1.3 Label
After the sorting, we will label the different artificial meats into our system, labelling by ingredients, origins, manufacturer factories, and calories tables, for the benefit of future research, and again maximize our customers' experiences. Design advertisements (such as posters, videos, pop-up online advertisements, and popular TV programs) that introduce the benefits of artificial meat as well as weighing them against the negative impacts of actual meat. Hiring trendy celebrities to star in the advertisements could encourage more people to be more interested in artificial meat.

2.2.1 Contacting food markets
Contacting food markets and convincing them to add artificial meat products to their collection of meat, perhaps with advertisements near that section to highlight the artificial meat, encouraging the consumers to purchase them. Also giving more benefits to the market managers who often hold special discounts for artificial meat products, allowing the customers to be encouraged to buy such products. Possibly, for some local food market event, we will hold a special artificial meat counter, so that it promotes effectively free giving artificial meat and advertisement for future discounts.

2.2.2 Contacting local restaurants
Restaurants could also be contacted, and it would be a great opportunity to collaborate and design attractive and reasonably priced dishes using the newly created artificial meat to attract more customers to try the healthy meat alternative since trying is the first step towards acceptance. Our artificial meat will also appear on the menu as an alternative meat choice, which will be an extra discount for customers' bills, and also we will give discounts to the local restaurants if they successfully let more customers try our products.

2.3 Conclusion
Overall, as a holistic artificial meat system, we separate the process into two main stages -- a selection of qualified artificial meat, promotion of the artificial meat, which will make the conversation easier going and more accessible information for customers, and the last sending the artificial meat into the current market by cooperations with food markets and local restaurants.

3. Implementation plan

3.1 Promotion

3.1.1 Advertisement

We would be collaborating with graphic designers to create appealing advertisements, such as pop-up advertisements, website pages as well as short video advertisements that are appropriate for TV advertisement breaks, bus and train stations, social media, and popular phone applications that allow advertisers to promote their products. Famous and trending celebrities, especially those who are related to the food industry, would be hired to star in these advertisements, as this will attract more customers to try our new product. Depending on the vessel of advertisement, the content of the advertisements would vary. For example, for advertisements on television and in applications, the contents should take up a maximum of 20-30 seconds, and thus can only feature short clips of the stars enjoying the product and including a general introduction to it, unlike how in our website, we could have entire web pages dedicated to the details about the product, the science and technology behind the innovation, as well as educational pages about why our product is a good option that is worth trying. Supermarkets would also be contacted and encouraged to offer this artificial meat in the meat section, placed somewhere highly noticeable, preferably with signs near it that highlight the benefits of this product.

3.1.2 Collaboration and Partnerships

Famous and popular cafes and restaurants would be contacted to feature our product in new dishes, and these new dishes would be recommended on the menu along with discounts, further encouraging customers to try the product. We would cover all sorts of food outlets, from high-end restaurants to cheaper outlets where the common public hang out, from western food to local delicacies, and we would try our best to make sure that these partners would offer discounts on the dishes featuring our product. This will ensure that everyone would have access to this sustainable alternative to their daily meat intake at an attractive and affordable price. Famous chefs, such as chefs who have earned Michelin stars, would also be involved in the advertisements, either in forms of quotes or starring in the videos themselves, showing that they approve of this new product, and perhaps advertising for their new dishes created using the new artificial meat, which benefits both their businesses and the popularity of the product. These methods of advertising would motivate the general public, no matter what type of food they enjoy, to try the new product, and to be able to incorporate this meat alternative into their diet without making any disruptive changes to their lifestyle.

3.2 Government Intervention

Even though this solution is meant to be a “soft” one that does not place any hard restrictions on meat consumption, as that would highly discourage a high percentage of the population from accepting the solution, government intervention could still help us achieve our goals more easily, which is why we decided to keep this as an optional back-up plan to supplement our main solution.

3.2.1 Price and tax adjustments

Placing less tax on this new artificial meat could help encourage more food outlets to offer our product and more customers to purchase it as well. The government could also add an additional tax on meat products if one was to purchase an excessive amount of regular meat. If the government would be willing and able to subsidize our

project, such as the research process and the marketing process of the new artificial meat, it would greatly benefit the quality of the final product and its effects. Although this may not be necessary, this solution could be much more effective if the government could offer help and support with methods such as the ones listed above. They should also help by putting the below education program in place.

3.3 Education

Education could make a big difference if we could start teaching children about the positive and negative effects of meat, allowing them to understand what is best for them and the environment they live in, thus making them voluntarily prefer a balanced diet. This educational program should be incorporated into the existing education in primary schools. The information the students should learn in this course should include:

1) Why a balanced diet is important
2) How to maintain a balanced diet
3) Positive and negative health and environmental impacts that meat can cause

This course would equip children with the knowledge necessary for them to make good decisions on their own, as the artificial meat does not directly help people to balance their diets or solve any health issues that meat causes, but is only a method of loosening up the resources and helping the environment as well as promoting animal rights, which means that education is still necessary in order to form a holistic solution that would have long-lasting impacts and cover all of the root causes.

4. Response to challenges and root causes

4.1 Response to challenges

4.1.1 The balance between producers and consumers benefits

One of the hardest challenges is the balance between producers' and consumers' benefits. Without the same amount of profits as before, the producers may not be willing to produce and consumers would be unwilling to purchase. Indeed, the initial price of artificial meat will be relatively expensive, but as soon as the scale starts to expand or even become globalized, the price of artificial meat will surely decline, so that we can guarantee the long-term profits of producers and consumers. In addition, the government's subsidies will reduce the costs of production to a great extent.

4.1.2 Worrisome psychology of meat consumers

Our research shows that the biggest concern of most meat consumers is the nutrition and taste of artificial meat, which becomes the main reason why they are not willing to try artificial meat. However, the statistics clearly show that technology is able to solve the problem in the near future.

4.1.3 Environmental awareness

Our aim is to protect the environment as far as possible, which means that our final solution should not cause as much pollution as traditional animal husbandry. According to the scientific figures, the advent of artificial meat would reduce greenhouse gas emissions by 78-96 percent and require 7 to 45 percent less energy and 82 to 96 percent less water. Though the energy consumption of producing artificial meat is higher than what we expected, such energy consumption would reduce significantly once mass production happens.

4.1.4 Government interests

By actually applying the solution, we need permission from the government. Fortunately, our idea of implementing artificial meat would not cause conflict with the Chinese government's rules and regulations. Nowadays, more plant-based "fake" meat products are popping up onto the Chinese restaurant's menu. Fast-food chain KFC said it will also start trialling fake chicken nuggets from next week. We are really glad to hear that more and more people are beginning to pay attention to the food that can substitute meat. Although it's not artificial meat yet, it will definitely appear in the Chinese market in the near future with the development of technology.

4.2 Response to a root cause

4.2.1 Culture and Habits

One of the major causes of the issue is culture and habits, including family traditions, religion, and personal experience. In terms of habits and people's preference of traditional dishes in various regions, our artificial meat will aim to achieve similar taste and dishes to what people used to enjoy, yet at the same time, we will also bring innovative dishes to the market that challenges the traditional forms of meat. On the other hand, speaking of the Chinese population's exaggerated and misguided belief about the values of meat, our solution will be able to fix this problem by incorporating knowledge about health issues and environmental impact regarding meat consumption into early education. Although our solution is unable to change our customers' experience and beliefs, it is within our reach to compromise with our customers' needs and guide meat consumers into the right path when it comes to the impact on nature and the human body.

4.2.2 Knowledge

The lack of awareness among the population, and even the interest to become aware, of the negative impacts of meat consumption on both their health and the environment, speaks a lot by itself. It tells us that executing a solution that simply reduces meat consumption only solves half of the problem. The other half, the education is more urgent and has to somehow be achieved through education about exactly why this issue is so urgent and significant. Our method is to embed it into children's early education so that they do not grow up with a lack of knowledge or the wrong information about the impacts of meat. When children share that understanding with their parents, awareness is no longer limited to classrooms but spread within and between families. Although there might not be an effect in the short term, the long term benefits of education will be remarkable.

4.2.3 Economical causes

The economical costs, such as the financial loss to producers, the risk of unemployment, supply issues within the country, and trade issues international-wise, are all things to take into consideration. Our solution is not perfect, and simply promoting artificial meat and providing education doesn't quite touch upon this issue. However, that is exactly why we include the government's intervention as part of our plan. The sustainability and long term benefits of our solution could be appealing to the government as it helps the country move towards a more sustainable and competent future. And with the government's support and reallocation of different resources, the cost to the economy will likely be minimized.

4.2.4 Nutritional causes

It is hardly possible to replace all meat with non-meat products with equal nutritional value. However, noticing that we are not aiming to substitute all meat with artificial meat, which will be unhealthy for the human body, our solution consists of the standardization and promotion of artificial meat created from decellularized plants and other forms of artificial meat. In the process of experimenting and bringing our products to the market, the safety, healthiness, and nutritional value of our products will be assured. And through advocacy including graphic advertisements and collaboration with celebrities, the value of our products will be acknowledged.

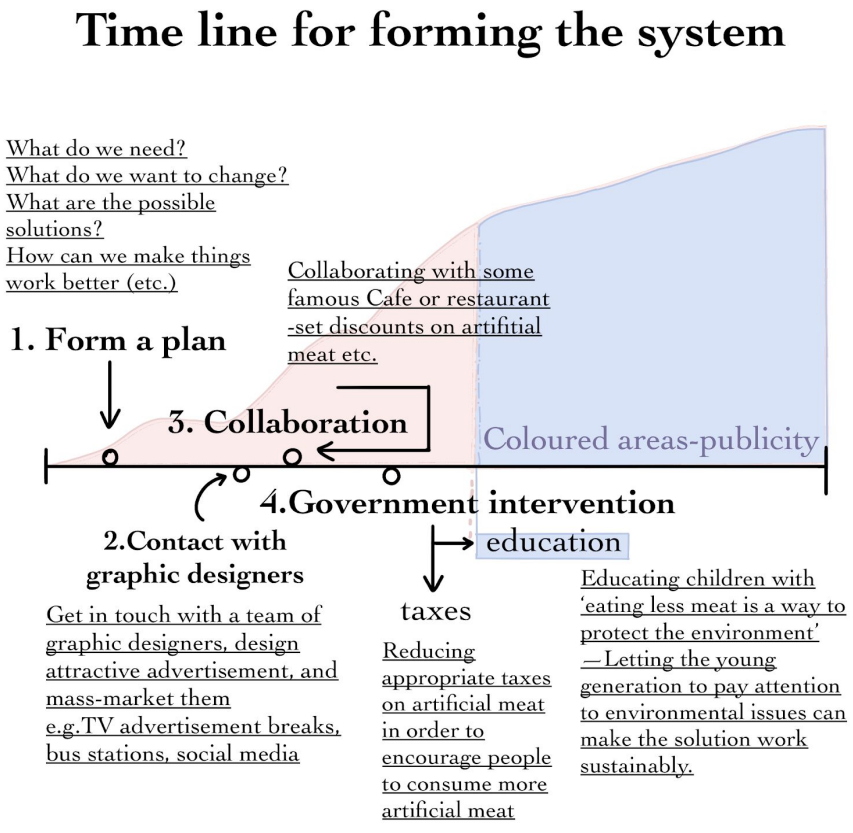
Prototype and Test

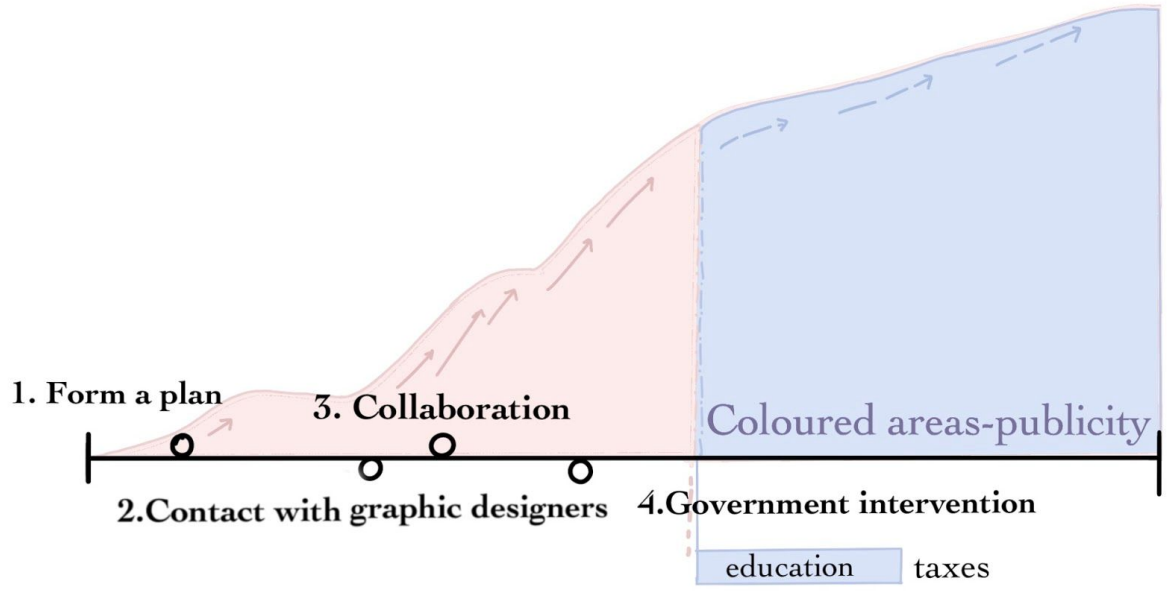
| Prototype design

Promotion on artificial meat to establish artificial meat consumption system

For our system, after the **investigation** of the current market, **identifications** of artificial meat factories which meet our standard and the final step setting up our **cooperations with those factories**, in addition to the **advertisement and cooperation** with **local restaurants** in order to promote our product in a local scale which just mentioned above, we are also going to use **attracting advertisements** created by famous graphic designers, make the advertisement more **eye-catching** and attracting, especially for the younger generation; invite and **collaborate with celebritie**s and influencers in order to further increase page views and clicks and become generalized to **maximise our promotion** of artificial meats and make our consumption system reaches its **maximum effectiveness**.

The artificial meat interaction system：





Due to how **changes to minds are permanent** for younger generations through education, we used different colors to distinguish between solutions that work overtime and solutions that work overtime. As the timeline progresses, **more and more** people will **be aware of** the many environmental impacts of eating too much meat and will choose artificial meat to reduce meat consumption.

proponent → take action

-Follow the pioneer and contribute on how to reduce the capita meat consumption
-with more and more proponents join, this porblem with too much meat consumption will be taken more seriously.
-As it becomes better known, there will be a trend and then the government intervention might invovle.

lead

The system

Pioneer

-Come up with the idea and get started with the plan

Government

-When the government begins to focus on the excess meat consumption, there are 2 possible solutions for government. One is to reduce taxes on artificial meat, and the other is to educate the younger generation ideologically.

Collaborater

find

-the collaborator e.g.restaurants and cafes, they give discounts to artificial meat and put them into recommend meal.
-also the collaborater could be some NGOs who support the idea.

| Feedbacks learned from users

We elaborated our prototype design into an online survey form and shared it with the people we interviewed before. Our respondents are of different ages, genders, and jobs (students, company employees, etc) in order to guarantee the diversity of our users' pool and accuracy of the results.

1. **Quantitative feedback**

1.1 86.7% of the respondents believed that the advent of artificial meat would significantly reduce meat consumption per capita.

1.2 85% of the respondents would like to go to the restaurant and try the artificial meat, but some of them worried that the price of the artificial meat would be unaffordable.

1.3 63% of the respondents still worried about the taste and nutrition of artificial meat, but turned out to be less worried when we assured them that the artificial meat would be made out of real meat cells, meaning that their nutrition intake would not be compromised.

1.4 34% of the respondents had a concern about the promotion of artificial meat as they believe that there would be a small percentage of the population would not even know the existence of artificial meat.

2. **Qualitative feedback**

2.1 Most of the respondents liked the idea of artificial meat and would like to give it a try.

2.2 Some respondents worried about the taste and nutrition of artificial meat.

2.3 Some respondents worried about the price of artificial meat.

2.4 Some respondents were concerned about the promotion of artificial meat.

| Improvement for next iteration

Based on the users' feedback, we come up with some improvements in different aspects.

#Feedback 1: Some survey takers worry about the **taste and nutrition** of artificial meat.
Improvement: Making the advertisements more clear on how the products are made of real meat cells that would not lower the nutritional value of our product. Put the taste of

artificial meat is the same as that of real meat in the advertisement and displayed as a focal point or highlight. As more and more people try it, we can give feedback to those who have tired the artificial meat, and collect the data and post it.

#Feedback2: Some survey takers are concerned about the **affordability** of artificial meat.
Improvement: With the development of science and technology, the cost of artificial meat will be reduced to a certain extent, and now the cost of artificial meat is basically the same as that of ordinary meat, so there is no need to worry. And we'll try to get the government intervention, e.g. subsidies or lower taxes. We are also certain that, as this product takes up less resources than traditional meat (due to the lack of need to feed or take care of livestocks), it will make meat more affordable and available to everyone.

#Feedback3: Some survey takers worry about the **promotion** of artificial meat.
Improvement: We will try to collaborate with more influencers and celebrities, and put more advertisements on websites, popular phone apps such as TikTok and other video gap advertisements.

Team Credits

甄锦华 Jinhua (Jenny) Zhen is responsible for organizing the team, deciding the topic of the project, scheduling the overall assignment timeline, contributing in the writing of generating and evaluating the solutions, response to challenges and gathering the feedback from the interviewees.

华姝媛 Shuyuan (Nicole) Hua is responsible for the summary, identifying the root causes, generation of the solution about decellularized plants artificial meat, writing about the FarmPets solution, helping to evaluate the solutions, as well as the implementation plan of the final action plan. She is also responsible for double-checking the documents for grammar and vocabulary mistakes.

庞岚 Lan (Cindy) Pang is responsible for the identifying challenges, generation of the solution about vegan fashion shows, as well as the alarming packaging; designing and graphing the artificial meat interaction system for prototype, analyzing feedback for the improvements for next iteration and well as adjusting the formatting of the document.

朱菡琪 Hanqi Zhu is responsible for the generation for solutions about the App, “USGreen” Website and Promotion of vegetarian restaurants, setting up the criteria, as well as the introduction, solution design and implementation plan of the action plan. She is also responsible for adjusting the Prototype section of the document.

余佳疃 Jiatong (Vanessa) Yu is part of the decision of topic and our final choice of solution. She is responsible for collecting our survey and personal interviews, generating the App solution, identifying the root challenges and causes, and revising over other teammates’ work in terms of structure and language. She is also in charge of editing the final layout of the document.

Judge Comments