



Revitalizing Rice Cultivation

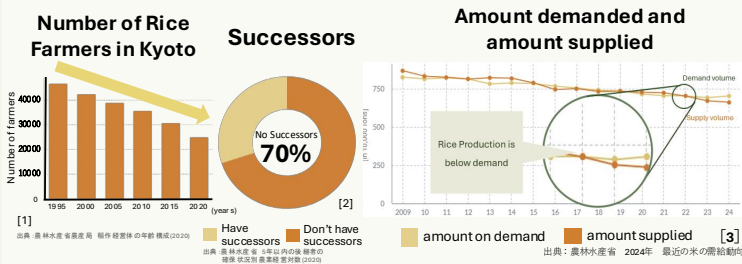
Addressing Japan's Farming Crisis and Inspiring the Next Generation

Kyoto University of Advanced Science Senior High School

1. Current Situation of Rice Farming

Do you think there will still be rice on your table in the future?

In Kyoto, a farmer in our hometown will end his rice farming this year due to the **lack of a successor**—a reality shared by many farmers across Japan. Over the past 30 years, Kyoto has seen a **decline of more than 2,000 farmers**, [1] with nearly **70% facing this challenge**. [2] Since 2021, rice production has **fallen below demand**, threatening food stability and reducing choices. [3]



Our Goal: To inspire the next generation to value agriculture and protect the future of Japanese food through **Share Farming**, a program we aim to expand from Kameoka, Kyoto, to the rest of Japan.

2. Solution "Share Farming"

Rice Cultivation Experience Program

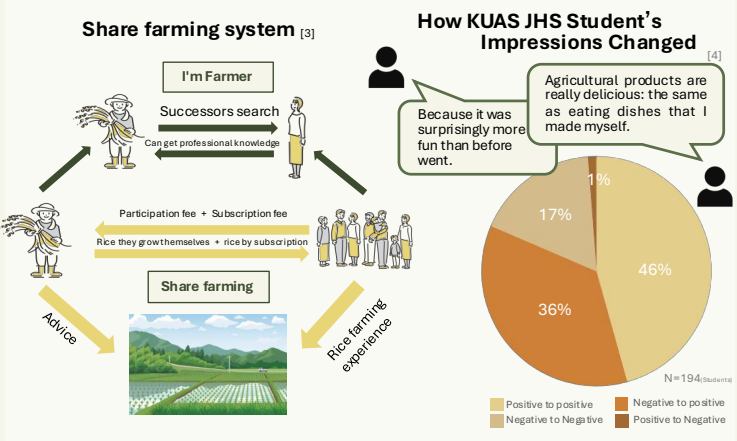
→ What is share farming?

- A shared rice field managed by participants who experience all stages of rice farming.
- The rice produced from this experience is split among the participants and given to each according to their own labor. [3]

→ Survey Insights

- **35.8%** of surveyed Kyoto junior high school students had a **positive change** in perception **after agricultural experiences**. [4]

This program fosters collaboration between participants and local farmers, creating a mutual support system.



3. Share Farming Course Options

Experience Course



Participants can directly experience managing a rice field while learning the basic operations of farming. They sign a contract with a farmer as advisor and experience rice farming from start to end.

Support Course

Participants can support farmers' businesses by supporting their production and by buying rice directly from them. Participants choose the amount of rice they wish to buy each month and receive rice at a price based on that amount on a regular basis.



Advantages for Both Parties



- Can learn about rice agriculture
- No need for frequent solo management
- Can connect with farmers and buy delicious rice



- Stable income
- Don't have to manage the farm → Unburdened
- Can secure successors

4. Our New App



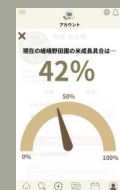
"Share Farming"

The app's purpose is to make Share Farming more efficient. There is a message board, a chat function, a calendar, a search system, a growing condition monitor, and a matching system to connect successors and farmers.



RICE GENIUS

Users can ask questions about rice farming to farmers.



Rice Percentages

Rice growth can be visualized as a percentage.



I'm Farmer

Participants can be matched with farmers in need of successors.

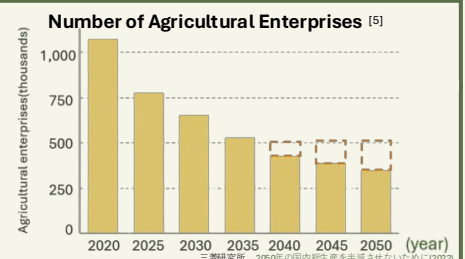


Rice Calendars

Users can manage shifts and time spent on farm equipment.

5. Conclusion

We hope to halt the declining number of rice production enterprises in Japan at 550,000. [5] Participants will learn about agriculture, the importance of eating rice, and will be more likely to adopt rice farming in their own lives in the future. By becoming familiar with rice farming, they can gain a new viewpoint. We hope that this activity will provide an accessible opportunity for them to do so.



• 京都府庁 京都府農業データ(2024) • 農林水産省 稲作の現状とその課題について(2015) • 三菱研究所 2050年の国内総生産を半減させないために(2022)
 • 農林水産政策研究所 e-Start 全国各地で農業経営継承の危機が深刻化—7割の経営体が後継者なし—全国の農家数の推移(2020) • 農林水産省 食料自給率と食料自給力(2020)
 • 農林水産省 図6-5農林漁業体験による変化(地域別) • 農林水産省 担い手の動向(2010) • 農林水産省 稲作経営体の年齢構成(2020) • 食生活及び農林漁業体験に関する調査(2020)

2024 年度 課題研究成果発表会 発表要旨提出フォーム（校内）

コース：国際		
発表者氏名	ヨミガナ	学 年
上ノ山 康馬	ウエノヤマ コウマ	1 年
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橋本 真衣	ハシモト マイ	1 年
発表テーマ： The Grobal Problem of Fruit Piracy		
発表要旨（日本語 400 字程度）：		
<p>世界でシャインマスカットのようなプレミアムブランドフルーツのシェアが 180 億 3000 万ドルまで増えている。一方で、他国によって自国のブランドフルーツが不正に栽培される「Fruits Piracy」という問題が発生し、シャインマスカットだけで 100 億円もの被害が出ている。シャインマスカットは、主に中国や韓国で不正に栽培され、別の名前として売買されたり輸出されたりしている。この問題は、生産者や国に大きな経済的ダメージを与える。日本ではすでに法律や不正行為への監視を強化しているが、実際の効果はあまり得られていない。そこで、私たちはこの問題を解決するために、「Fruits Diplomacy Day」を提案する。この取り組みでは、政府や生産者、会社、消費者が協力して不正栽培への取り組みを紹介したり、新たな取り組みを模索する。また、東京ビッグサイトで各国のブランドフルーツをブースごとに紹介し、より果物への関心を深める。</p>		
発表要旨（英語 200 words 程度）：		
<p>The global market share of premium brand fruits, such as Shine Muscat, has increased to \$18.03 billion. On the other hand, there is a growing problem known as "Fruit Piracy." This happens when branded fruits like Shine Muscat are illegally cultivated in other countries. These fruits are often sold or exported under different names, resulting in significant financial losses for the original producers. In the case of Shine Muscat alone, the damage has been estimated to reach as much as 10 billion yen. This issue not only affects the farmers but also the reputation and economic value of the brand, making it a serious concern for industry. Shine Muscat is illegally cultivated mainly in China and South Korea, where it is sold or exported under different names. This issue causes significant economic damage to producers and the nation. Although Japan has strengthened laws and monitoring, the results have been limited. Therefore, we propose the "Fruits Diplomacy Day" initiative to address this problem. This initiative will involve governments, producers, companies, and consumers working together to highlight efforts against illegal cultivation and explore innovative solutions. We will also hold an event at Tokyo Big Sight, where branded fruits from different countries will be displayed to raise interest.</p>		
発表におけるキーワード 10（英語）		
1.Fruit Piracy	6.Exotic Fruits	
2.Illegal Cultivation	7.Tokyo Big Sight	
3.Sunshine Rose Grape	8. Fruits Diplomacy Day	
4.Fragrant Jade Grape	9.Informed Choice	
5.Luxury Fruits	10.Japanese Kōbō Pear	

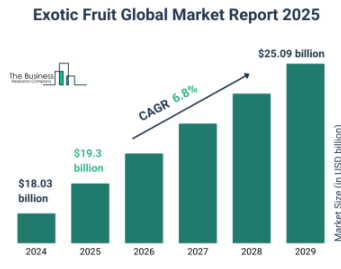
The Global Problem of Fruit Piracy

-Protect Premium Brand Fruits-

The First Year of KUAS High School IC Students

Introduction

The global market for **luxury fruits**, often categorized as **exotic fruits**, is experiencing significant growth. In **2024**, the exotic fruit market was worth about **\$18.03 billion** and is expected to grow to **\$19.3 billion** by **2025**, with a growth rate of **7.1%** per year.



Problem

These fruits are at risk due to "fruit piracy"

Annual Loss Due to Piracy:

Shine Muscat → ¥10 Billion

Japanese Kōbō Pear → ¥10 Billion



Shine Muscat is a high-quality grape developed in Japan. However, it has been taken to countries like **China** and **South Korea** without permission.

In **2020**, the area used to grow Shine Muscat in China was about **53,000 hectares**, which is **30 times** more than in Japan. In China, they sell it under names like "陽光薔薇" and "香印翡翠."

These products are also **exported** to other countries.

Why this is problem

- Loss of Economic Value** : When other countries grow and sell premium brand fruits without permission, the producing country loses potential income from exports and licensing fees.
- Market Competition**: The fruit grown in other countries is cheaper, so Japanese farmers can't sell as much.
- Damage to Reputation**: If the fruit from other countries is not good, people might think all fruits are bad.
- Stealing Ideas**: The fruit is made in producing country, but other countries use it without permission. This is unfair to original country.

References

THE SANKEI SHINBUN, EDITORIAL | Japan Loses \$690M in Premium Brand Fruits Stolen by Other Countries, October 11 2022. <https://japan-forward.com/editorial-japan-loses-690m-in-premium-brand-fruits-stolen-by-other-countries/>
THE BUSINESS RESEARCH COMPANY, EXOTIC FRUIT GLOBAL MARKET REPORT 2025. <https://www.thebusinessresearchcompany.com/report/exotic-fruit-global-market-report/>
印南志帆 : 東洋経済 記者, 損失100億、シャインマスカット「中国流出」の痛恨, September 10. <https://toyokeizai.net/articles/-/616796/>
South China Morning post, Agence France-Presse, Japan battles to protect premium US\$100 a bunch grapes 'stolen' by China, South Korea, December 10 2023. <https://www.scmp.com/news/asia/east-asia/article/3244534/japan-battles-protect-premium-us100-bunch-grapes-stolen-china-south-korea/>

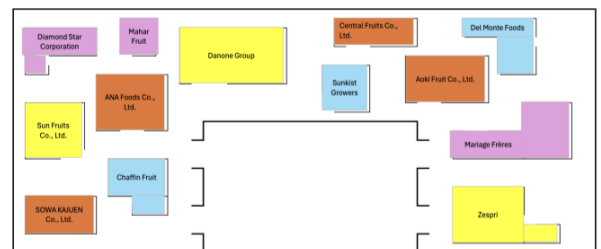
Existing Efforts in Japan

- Stronger Laws**: Japan changed a law in 2021 to protect plant varieties better. This law stops people from taking seeds or plants without permission.
- Controlling Exports**: Japan's government now controls the export of agricultural products more carefully, including fruits like Shine Muscat grapes, to stop unauthorized exports.
- Working with Other Countries**: Japan is talking with countries like China and South Korea to create agreements that protect Japanese crops and stop illegal farming abroad.
- Monitoring and Punishment**: Japan is watching the global market to find illegal grapes and is taking action, including legal steps, when needed to protect its crops.

Our New Solution

"Fruit Diplomacy Day"

We propose "**Fruits Diplomacy Day**." This day aims to raise awareness about the impact of fruit piracy and promote sustainable practices through **education**, **cultural exchange**, and **consumer involvement**. By deepening the understanding of these fruits' uniqueness and advocating for ethical cultivation methods, **Fruits Diplomacy Day** will become a platform to preserve their legacy for future generations. This project encourages collaboration between **governments**, **producers**, **businesses**, and **consumers** to protect the legitimacy of premium branded fruits worldwide.



Provisional Floor Plan for Tokyo Big Sight

Conclusion

"**Fruit Diplomacy Day**" is a global initiative to fight against the **illegal growing of premium fruits**, with countries working together. Through education, promoting cooperation, and encouraging ethical farming, the event aims to protect fruits like Japan's Shine Muscat from illegal cultivation and export. It helps consumers make **informed choices** and encourages governments and businesses to **focus on protecting** agricultural products. In a world that is becoming more connected, "**Fruit Diplomacy Day**" offers a way to keep the value of these special fruits safe for future generations.

2024 年度 課題研究成果発表会 発表要旨提出フォーム（校内）

コース：国際コース		
発表者氏名	ヨミガナ	学 年
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発表テーマ：Chicken instead of Broilers		
発表要旨（日本語 400 字程度）：		
<p>鶏肉は日本で最も広く消費されている食肉だ。特に、短期間で生産し販売するために少ない餌で大きく成長するように飼育されるブロイラーに注目した。また、ブロイラーは成長ホルモンや抗生物質などの多くの化学物質が使用されている安価な種類の鶏である。また、自然光がほとんどまたはまったく届かない窮屈な環境で飼育されている。そのため、病気にかかりやすく、死んでしまうことがよくある。</p> <p>私たちはこれを止めるべきだと考え、ベターチキンを提案した。</p> <p>成長率が適度で、広いスペースでストレスなく生活できる品種であるベターチキンは、鶏にとっても消費者にとっても良い品種と言える。また、多くの企業がベターチキンを使い始めている。特に、海外で普及が進んでいる。</p> <p>私たちの解決策は、学校の様々な場所を使用し、鶏の足跡のプリントを階段の踊り場に貼ることそして壁にポスターを貼ることだ。決めた範囲のマス目にブロイラーの飼育密度を再現するように、鶏の足跡の写真を張ることで狭いスペースに鶏が過ごしていることが視覚的に分かる。そして、私たちの目標はブロイラーとベターチキンについてすべての人に理解してもらうことだ。</p>		
発表要旨（英語 200 words 程度）：		
<p>Chicken is the most widely consumed meat in Japan. We focused on broilers, an inexpensive type of chicken bred to grow larger in a short period with little feed, can be produced quickly and are treated with many chemicals such as growth hormones and antibiotics. They are also raised in cramped conditions with little or no access to natural light. This makes them susceptible to disease and they often die. We think this should stop so we propose Better Chicken.</p> <p>A breed with reasonable growth rate and the ability to live in a large space without stress, the Better Chicken is good for both the chicken and the consumer. Also, a lot of companies are starting to use better Chicken. Especially used by non-Japanese companies.</p> <p>Finally, our solution is that we use the places in various areas of the school and put posters on the wall. Especially, we use part of the floor, and looking at the chicken footprint images, you can easily understand how many chickens are spent in a small place. Our goal is to make everyone understand about broilers and better chicken.</p>		
発表におけるキーワード10（英語）		
1. Broiler	6. Cardiopulmonary functions	
2. Better Chicken	7. Animal Welfare	
3. Jidori	8. Days to ship	
4. Chemicals	9. Growth hormones	
5. Unhealthy feeds	10. Antibiotics	

Better Chicken for the Better Future

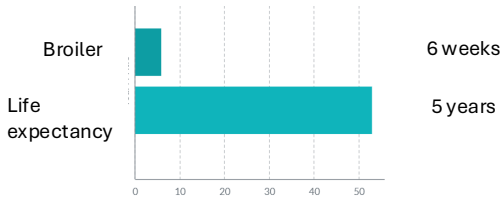
Kyoto University of Advanced Science Senior High School International Course 1st year

1. What are Broilers?

Chickens to produce large quantities of chicken cheaply and quickly.

This graph shows that age at which broilers are slaughtered vs. life span of chickens

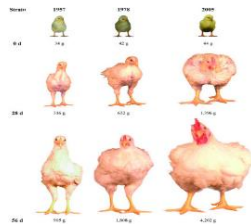
Fig1: Average life expectancy of broilers and chickens



2. Broilers have two problems

1. Environmental

- Use unhealthy feed
- Some companies also use slaughtering methods that are pain.



SOURCE: ZUIDHOF ET AL., (2014)

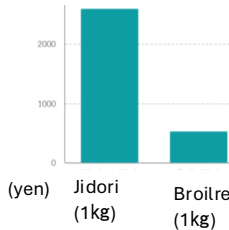
2. Body function

Develop leg disorders that cannot support their own weight.
Broilers is that they develop disabilities, due to their inability to support their weight.

3. Jidori as an alternative

These native species must have a blood percentage of 50% or more, proof of birth, rearing period of 75 days or more, free-rearing after 28 days of age, and rearing density of 10 birds or less per square meter after 28 days of age. Chickens that meet these breeding conditions are called Jidori.

Fig2 Comparison of Jidori Chicken and Broiler Prices



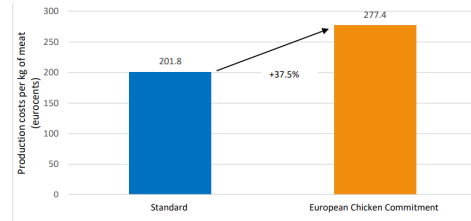
The price of a Jidori chicken is expensive, about 5 times that of a broiler.

4. What is Better Chicken?

At 30 kg per square meter, it can be raised with more space than broilers, which are raised on average at 59 kg per square meter.

5. Better Chicken has demerits

Fig3: Comparison of prices for 1 kg of broilers and Better Chicken



- 1: 20% price increase per bird
- 2: 40% decreased number of birds

6. Better Chicken results

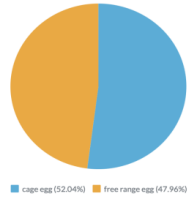
Over 200 companies using Better Chicken such as Kentucky Fried Chicken, IKEA and Burger King.

7. Merits of Better chicken

Consumers are expected to be able to eat chicken with peace of mind that it is animal welfare friendly.

8. Success Stories

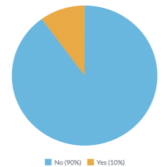
94 out of 196 people always buy heirloom eggs, despite the fact that heirloom eggs are three times more expensive than gauge eggs, so we think Better Chicken will be a success too.



9. Awareness

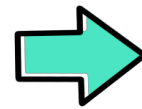
Fig4: Of those who know more about broilers out of the whole class

According to our research, only 10% of respondents were well-known with broilers.



10. Solutions

We thought that placing chicken footprints in a small partitioned space, especially on the flooring, and actually visualizing them would give a sense of how many chickens are being raised.



11. Our goal

- 1: Everyone understand about Broiler
- 2: Convey about Broiler and Better Chicken

References

https://www.maff.go.jp/j/pr/aff/1612/spe1_02.html
source : Japan Chicken Association Domestic brand chicken handbook 2003
Viewed date: November 1, 2024

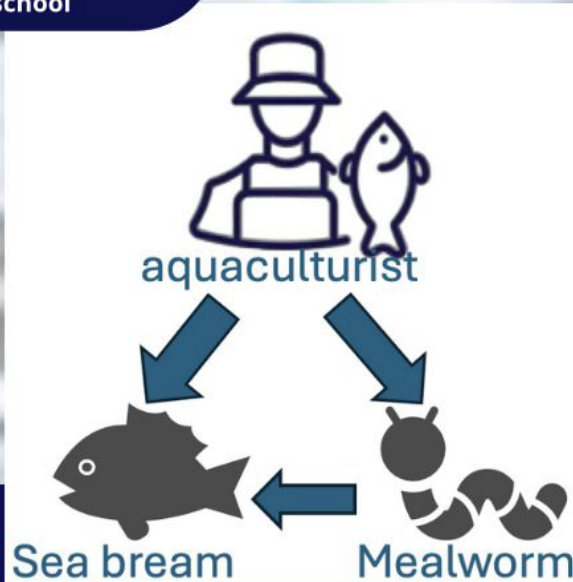
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source: AVEC Viewed date: November 1, 2024

https://www.maff.go.jp/j/pr/aff/1612/spe1_02.html
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Viewed date: November 1, 2024

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source: AVEC Viewed date: November 1, 2024

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コース：国際		
発表者氏名	ヨミガナ	学 年
川端悠愛	カワバタユメ	1 年
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発表テーマ：Lowing the cost of farmed sea bream		
発表要旨（日本語 400 字程度）：		
<p>近年、減少傾向にある天然鯛を維持するためには養殖鯛の消費割合を増やすべきだと考えた。私たちが取ったアンケートによると、全体の 60%の人が「普段は鯛を食べない」と回答した。また、「普段食べない」と回答した人の 70%が「価格が下がるのであれば食べたい」と回答した。そこで、養殖鯛の価格を下げるため養殖鯛についてリサーチを開始した。リサーチの結果、養殖鯛における主な課題は餌の高コストと病気の蔓延であることがわかった。現段階でミルワームを鯛の飼料として使用することで、安定した育成が可能であるという知見が得られている。餌の生産を外部業者に委託するのではなく、漁師自ら生産することで人権費を含めたコスト削減を測ることを提案する。私たちは、この方法が実験可能かどうかを養殖業者の一日の予定と照らし合わせて実験をした。その結果、簡単にミルワームを育てることはできた。しかし繁殖の上で問題点が見つかった。これらの結果から、考察や結論を追求していくつもりだ。</p>		
発表要旨（英語 200 words 程度）：		
<p>We believed that the consumption rate of farmed sea bream should be increased to maintain natural sea bream, which has been declining in recent years. According to a survey we canvassed, 70% of the total polled did not eat sea bream. Seventy percent of those who didn't eat said they wanted to eat it if the price went down. So, we started researching farmed sea bream to see how to lower the price. The main challenges are the high cost of feed and the spread of disease. At this stage, it has been found that the use of mealworms as feed for sea bream can provide stable breeding. Rather than entrusting food production to other companies, we propose that fishermen produce their own food, to reduce costs, including labor costs. From now on, we will grow mealworms and experiment to see if this method is appropriate. As a result, we could raise them easily; however, on mating, we found some problems. Based on these problems, we are going to pursue the considerations and conclusions.</p>		
発表におけるキーワード 10（英語）		
1. mealwarm	6. wild caught sea bream	
2. Tenebrio obscurus	7. labor cost	
3. overfishing	8. fishers	
4. artificial	9. aquacultures	
5. wholesale	10. Farmed sea bream	



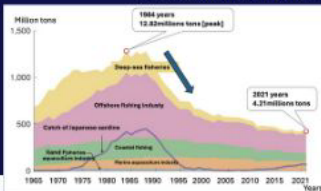
Lowong the cost of farmed sea bream ~Exploring Sustainable Solutions with Mealworms~

Research Objectives

Our goal is to reduce the cost of farmed sea bream. To make it possible, we are going to use mealworms as a feed for farmed sea bream. This is because the price of fishmeal, the food for farmed sea bream, has been getting higher and higher recently.

Introduction

- Sea bream has been eaten by Japanese people for 2500 years And sea bream is loved by a lot of Japanese .
- Sea bream population is in danger from the changing climate, environmental pollution, and reduction of habitat.



Experiment & hypothesis

Contents of this experiment

The purpose of this experiment is to find out if it is really possible for aquaculturists to grow mealworms.

- we check the aquaculturists' schedule.
- we have to prepare an environment in which mealworms can live considering temperature, humidity, place and bait.

Hypothesis

We hypothesized that by raising these worms, we could reduce labor costs, reduce transportation costs, and lower the price of the mealworms.

An aquaculturist schedule

05:45	Going to work
06:00	Fishing or feeding with a fixed net
08:00	Feeding or shipping farmed fish
12:00	Lunch break
13:00	Preparing for the next day, repairing nets, feeding
15:00	Leaving office

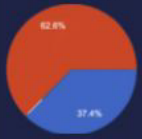
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- March 2023 World's first! Insect "mealworms" mixed with cultured sea bream bait makes the fish less susceptible to disease <https://newsdig.tbs.co.jp/articles/itv/384405?display=1>
- June 2024 Current status and challenges of sardine aquaculture: Toward sustainable aquaculture <https://fuji-feed.com/fish/post-5401.html>
- June 2024 Is it OK to catch baby sardines? <https://suisanshigen.com/2019/12/>

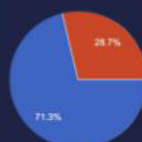
Conclusion

We suggest that conduct an aquaculture by fishermen themselves. To do that, we can improve the cost

We surveyed for 14 to 70 years old.



Do you usually eat sea bream?

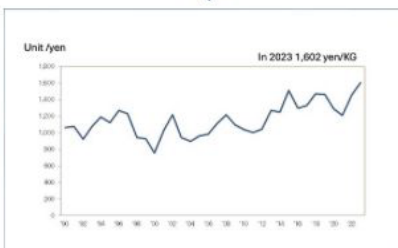


If sea bream cost decreased, do you want to eat sea bream?



Farmed sea bream has been increase cost for 5 years.

Why??



Anchovy (sea bream's feed) slightly increase from 2000

2024 年度 課題研究成果発表会 発表要旨提出フォーム（校内）

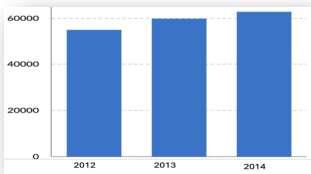
コース：国際コース		
発表者氏名	ヨミガナ	学 年
村田和香	ムラタ ワカ	1 年
山田由歩	ヤマダ ユア	1 年
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谷俊輔	タニ シュンスケ	1 年
内田陸翔	ウチダ リクト	1 年
発表テーマ： Revitalizing Japan's Yellowtail Industry ~Promoting 'Fruit Yellowtail' to Attract a New Generation~		
発表要旨（日本語 400 字程度）：		
<p>今日、鰯は日本の重要な食用魚であり、出世魚と言われるほど日本で長年愛されてきた魚の一つである。現在、養殖鰯産業では生産コストが利益を上回ってしまう赤字状態が続いている。また近年では若者を中心に魚離れが進んでおり、この原因として魚臭いにおいが多くの人々の魚離れの原因となっていることがわかった。私たちはこの二つの問題点の解決策として、「フルーツ鰯」という餌にフルーツを混ぜることで魚臭さを解消することができるという付加価値のついた鰯の養殖に注目し、フルーツ鰯専門のウェブサイトを作ることを考えた。またフルーツ鰯の餌に加えるフルーツの成分は本来廃棄するジュースの搾りかすを使っているため、環境に優しい付加価値もある。このことからフルーツ鰯をエシカルシーフードまで展開させていくことができる。そのウェブサイトをより多くの人に見てもらい、買ってもらうために AB テストというマーケティング手法を行い、より注目してもらえそうなウェブサイトを作る。私たちはフルーツ鰯の利点を生かし、鰯の養殖産業に貢献することを提案する。</p>		
発表要旨（英語 200 words 程度）：		
<p>Today, yellowtail is an important fish in Japan. However, many of these farms are losing money. Young people are eating less fish, which is also a problem. One of the problems is the fishy smell. To solve these issues, we would like to focus on farming a kind of yellowtail called "fruit yellowtail". Fruit yellowtails are raised on feed that contains fruit, making them environmentally friendly and to solve the fishy smell. We plan to create a website just for fruit yellowtail. Therefore, we also did AB testing to make the website even better. The AB test compares the performance of two versions of content to see which one appeals more to viewers. From there, we will expand to include ethical seafood. By showing the benefits of fruit yellowtail, we hope to encourage people to try it and support the fish farming industry. And to use other ways such as advertisements, assorted yellowtail and introduction of fruit yellowtail pet food. Cats can also eat yellowtail, including the skin, and yellowtail in particular does not contain unnecessary chemicals. In this way, we will get a lot of customers. Our goal is to make yellowtail more popular and help fish farmers businesses.</p>		
発表におけるキーワード 10（英語）		
1. deficit	6. ethical seafood	
2. fruit yellowtail	7. seafood labor	
3. amberjack	8. subscription service	
4. consumption	9. AB-test	
5. farming process	10. manufacturing process	

Revitalizing Japan's Yellowtail Industry

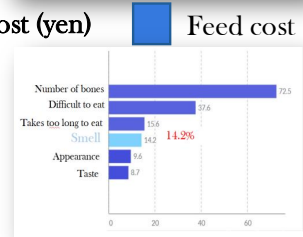
~Promoting 'Fruit Yellowtail' to Attract a New Generation~

1 Challenge

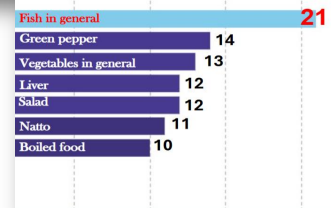
• Yellowtail, or buri, is an important part of Japanese diet, with **60% being farmed**. However, the industry competition with low profit margin and declining interest in fish for young people.



And, Feed costs and feed fees are putting a strain on yellowtail farming businesses.



Year	Yellowtail total	Yellowtail	
		Natural yellowtail	Cultured yellowtail
2018	2387	1004	1382
2019	2457	1093	1364
2020	2438	1063	1375
2021	2283	946	1337
2022	2065	928	1137



We thought that one of the why reasons the yellowtail industry continues to be in the red is that children are turning away from fish.

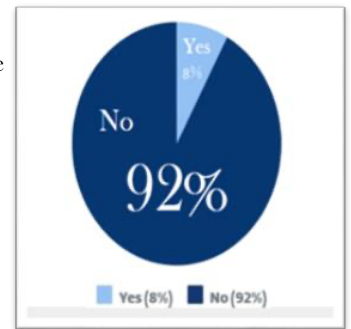
The reason people are turning away from fish is because of the **fishy smell**. So we think that fruit yellowtail is the solution.

2 Yellow tail

In our survey, we randomly surveyed 100 people, and 92 out of 100 people answered that they had never heard of fruit yellowtail. So, we would like to start by focusing on raising awareness.

Fruit yellow tail could be seafood label called **"ethical seafood"** that is environmentally and socially conscious.

However, because ethical seafood covers a wide range of categories, such as organic farming, fair trade, and animal welfare, **it is difficult to know what constitutes ethical food, and the concept has not yet been widely adopted by Japanese consumers**. Therefore, by developing a dedicated sales site, further revenue expansion is expected.



3 Creating website

photos will show the various types of fruit yellowtail, along with their prices, and will also include a link to a purchasing site, allowing visitors to buy directly at a low cost. We will also introduce the producers' photos and the farming process in detail. By doing so we believe that we can build trust and increase repeat custom.

4 Advertisement

By displaying advertisements for a website specializing in fruit yellowtail on other websites, we hope to increase awareness. We conducted an **AB test** on the advertisements to see which of the two was more interesting to about 40 people. The photo on the below shows the advertisement that was created based on the results of the survey.



- simple
- can understand what fruit it is.

5 Future

Cats can also eat yellowtail, including the skin, and fruit yellowtail in particular does not contain unnecessary chemicals, so it can be given to them safely.

So from now on, I'd like to target people who have cats as well, and make the website something that can be used by both owners and their pets.

Source:

Ministry of Agriculture, Forestry and Fisheries「Fishery management survey report」(2012)
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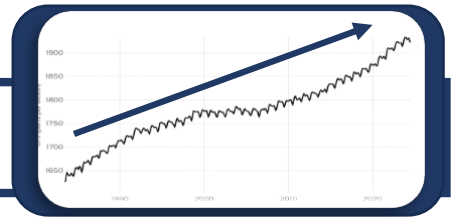
コース：京都先端科学大学附属高等学校 国際コース		
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吉田 一翔	ヨシダ イチカ	1 年
齋 天澄	ユ テンチン	1 年
和木 葵	ワキ アオイ	1 年
発表テーマ：牛肉生産過程でのメタン排出を確実に減らすためにカギケノリを用いた税金制度を作る提案		
発表要旨（日本語 400 字程度）：		
<p>現在、牛の出すメタンガスは地球温暖化に大きな影響を与え、地球温暖化をより促進させている。そして今のままメタンガスが増え続けると永久凍土の融解や生態系の変化、それに加えて正のフィードバックが発生する。このような問題を解決するために多くの案が出された。例えばニュージーランドでは農業から排出される温室効果ガス排出削減のために農家に対して直接課税する計画を立てた。しかし農家の反発や、技術不足が問題で失敗している。また、NASA によると年々排出量が上がっていることがわかっていることから、たくさんの解決策がある中で、排出量が増えている事から実際に取り組んでいる農家は少ないと考えられる。この事から私たちは、メタンガスの排出を大幅に削減できるカギケノリ（アスパラゴプシス）という海藻を使った飼料の導入への取り組みにつながる税制度の導入を提案する。</p>		
発表要旨（英語 200 words 程度）：		
<p>Recently, methane gas is emitted by cattle in the process of making beef, and the amount of methane from cattle is increasing year by year. If methane increases in the current way, it can cause a big acceleration of global warming and ecosystem changes. While methane affects the environment, there are some ways to reduce methane from cattle, and we will introduce one of the solutions to this problem. According to a University in Australia, methane emissions can be decreased up to 98% by feeding cattle red seaweeds called “Asparagopsis taxiformis”, so we want farmers to bring asparagopsis into their farming. However, asparagopsis is so expensive that most farmers might not use asparagopsis due to its financial disadvantage. Then, we will create a tax system in order to make farmers buy and use asparagopsis. The tax will be called “cattle burp tax”, and charged by the government to farmers. However, if farmers use asparagopsis to grow cattle, they will not be in need to pay burp tax. Cattle burp tax is more expensive than asparagopsis, therefore farmers will begin to adopt the seaweed. Through this project, we are expecting that producing beef will be more sustainable.</p>		
発表におけるキーワード 10（英語）		
1. cattle	6. Asparagopsis taxiformis	
2. agriculture	7. farmer	
3. methane gas	8. microbe	
4. greenhouse gas	9. burp tax	
5. global warming	10. New Zealand	

Burp tax × Asparagopsis taxiformis



BACK GROUND

Recently, **methane gas** emitted by cattle has **big** influence.
 more and more... Melting of the permafrost / Changing of the ecosystem



PREVIOUS RESEARCH

October 11th in 2022, **Jacinda Arden** who was prime minister in **New Zealand** planned to make a system of **tax** for farmers who have cattle and so on that emit greenhouse gases by livestock's burp.

However, farmers against to the government

"It will be difficult to keep business continually!"
 "No farmers no food"



May 11th, 2024
 This plan was **canceled**

We propose a **favorable treatment** program that reduce the burdens of farmers.

Asparagopsis taxiformis which can reduce methane

METHODS

1. Asparagopsis taxiformis

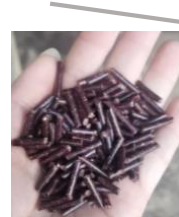
It is one of red algae and it has phycoerythrin which is red cell, and it affects a **lumen** which makes methane.



It is revealed to reduce **98%** of methane by including Asparagopsis taxiformis for **0.2%** in cattle's feed.

However, there are difficult problems

- The development of aquaculture technology for stable production.
- The supply and assessing the impact of feeding on livestock.



(ShiLai tm Asparagopsis taxiformis Feed)



2. Burp tax

Methane gas will be reduced by introducing Asparagopsis taxiformis at farms, but this system will be a **big strain** for farmers. Thus, we think most farmers do not work on this system, so we suggest tax system.



However, the government makes a system of tax free if farmers use Asparagopsis taxiformis, but if they do not use the seaweed, they have to pay tax. In more detail, this money will be used for laboratories of Asparagopsis taxiformis .



Therefore...
Pay burp tax ← **Use Asparagopsis taxiformis**

Judging from cost, using seaweeds is more effective to reduce the burden.

CONCLUSION

We believe it is mandatory to make burp tax and it is possible to decrease methane emissions. Also, we are sure that production of Asparagopsis taxiformis will get better, so the price will be cheaper than now. Thus, the burden on farmers will go down, too. Finally, we want to set more concrete the amount of tax.

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2024 年度 課題研究成果発表会 発表要旨提出フォーム（校内）

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前澤 歩	マエザワ アユム	1 年
Charlie Pfeiffer	チャーリー ファイファー	1 年
発表テーマ：Spreading Matcha around the world		
発表要旨（日本語 400 字程度）：		
<p>世界において抹茶の輸出量と輸出額は上がっている。日本は抹茶の輸出国でよく知られているが海外で多く売られている日本の抹茶をさらに広めたい。抹茶を輸出している日本以外の国の抹茶の売り方は様々である。例えば中国では安さを売りにしている。だが、中国の抹茶は安い安全面でのリスクが多々ある。反対に、日本の抹茶は高品質を売りとして販売している。日本の商品の高品質を強調することで、高くても購入者から関心を得られると考えている。さらに、私たちは新しい市場を開拓したい。中東では抹茶はほとんど知られていない。サウジアラビアは高所得者が多く、茶を飲む文化があるため、日本の抹茶はサウジアラビアで有名になるだろう。また今は円安であり、サウディ・リヤルではさらに安く購入できる。私たちは新たな市場で利点を得ることと、抹茶の質の高さや伝統を確立することを実現させたい。</p>		
発表要旨（英語 200 words 程度）：		
<p>The export volume and value of matcha around the world has increased. Japan is known for matcha but is becoming less relevant in its exports in comparisons to other countries. We want to spread Japanese matcha even more, to keep up with competitors. Different countries have different marketing strategies, such as China. Chinese matcha is comparably cheaper however, it can pose a health risk due to bad farming and production. In contrast Japanese matcha is very healthy, pure and of high quality, but the price is high. We think that by highlighting the good qualities of Japanese goods, we can gain interest from possible buyers, even with a higher cost. On top of that we want to explore new markets as well. In the Middle East matcha is hardly known. Japanese matcha could become very popular, especially in Saudi Arabia, because Saudi Arabia is a high-income country with an established tea culture and a growing understanding of health foods. Also, the Yen is weak now, making buying products in Saudi Riyal cheaper. We hope to have an advantage in a new market and establish Japanese standards for matcha and share its culture.</p>		
発表におけるキーワード 10（英語）		
1.exclusively	6.outstanding	
2.artisanal	7.distinctive	
3.hyperglycemia	8.carbohydrates	
4.arteriosclerosis	9. absorption	
5. oxidation	10. antioxidant	

Expanding the Global Reach of Japanese Matcha

Matchatcha - KUAS IC 1st year

Overview of the World Matcha market

Global market

Both the **volume and value** of Japan's matcha exports are increasing. However, the volume of matcha exports from **other countries** is also increasing.

Impressions of Matcha

Japanese: "It is a **Japanese style**, elegant and expensive."
Foreigners: "It is a **symbol of Japanese culture**, good for our health and bitter. The bright green colour is beautiful."

The reason why Matcha is healthy

Matcha has these nutrients, for example...
Catechin: prevent **high blood sugar** and **obesity**
Vitamin E: prevent **aging** and **arteriosclerosis**.

Japan

Production Limitations

Japan's matcha production is **limited** due to available land, making it hard to **compete on volume** alone.

Post-COVID Opportunity

Domestic production **declined after COVID**, but the fields are still usable. Increasing production levels to former rates can strengthen market presence.

Favorable Exchange Rate

The **weaker yen** means that Japanese matcha is now more **affordable for overseas consumers**, making this a prime time to **increase exports**.

Quality

The quality of Japanese matcha and Chinese matcha is very **different**. The flavor, functionality, tradition, and **safety** of Japanese matcha are good.

Marketing

Japan can advertise its tea as **excellent and original** as many think of it as the original. By rebranding it as a luxurious good of high standard, it will attract other customers. The promise of **quality and safety** is very convincing for most consumers.

Potentials: Explore the Middle East

The main importing countries and regions of Matcha are the US, Taiwan and the EU, the Middle East is not a big importer of matcha. This makes it possible for Japan to explore a new market.

Conclusion

1. volume & value of matcha exports are increasing (not only Japan)
2. Japan's strengths: quality, safety, the weaker yen (good opportunity)
3. ex. China: cheaper & lower quality than Japanese matcha → bad effects for our body
4. our target: Saudi Arabia focus on thinking of health, high income and culture

We thought about the opportunities of the Japanese matcha market in the world. Our goal is to achieve more popularity and market share of Japanese matcha, which has a very good chance to happen at the moment, because of the product's strengths and the weak yen. As a key element we decided to explore the Saudi Arabian market, because of its benefits such as the economy or established tea culture. This way we hope to spread matcha around the world and share our fascination with this traditional good.

Competitors: for example China

Lower Price, Lower Quality

Chinese matcha is **cheaper** and often of slightly **lower quality** than Japanese matcha. The reason for the lower price is that China has **lower production costs** than other countries and can produce matcha in large quantities due to its **large land holdings**. A reason for the low quality is that the procedures required to produce sweet and flavorful Matcha are not in place.

Health dangers

For example **pesticide regulatory standards** in China are looser than in Japan. This sometimes results in **pesticide residues**. Pesticides can cause headaches, visual disturbances, psychiatric symptoms, and neurological disorders.

Marketing

Matcha marketing strategies in China include offering matcha that **matches the needs of the exporting country**, promotion on social networking sites such as **WeChat** and **Weibo** and **in-store POP ads**, and online sales. This allows for an effective approach to target markets and increased sales.

Saudi Arabia

Thinking of Health

Drinking tea is already a big part of this practice and because of matcha **rich nutritious and minerals**, it's a healthy supply. Many people in Saudi Arabia think of their diet as very important.

Japanese foods increase interest in Saudi Arabia as a healthy image but those are almost always not Japanese style and made in Japan. They don't know real Japanese foods. It's good opportunity to spread Japanese foods to use their health trend.

High income

Saudi Arabia is **high-income economy**. Especially, about 30 to 40 years old people have a highest income. Furthermore, those people are most interested for healthy food.

Cultural Similarities

Saudi Arabia has a **distinctive tea culture**. Saudi Arabia is a muslim country, so alcohol is prohibited. This means that more people choose alternatives such as tea. **This style is same as Japanese style.**

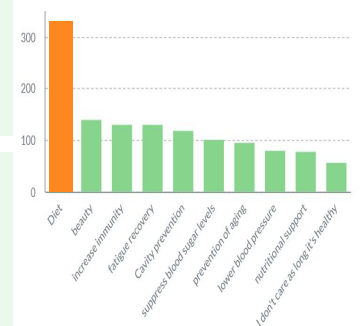
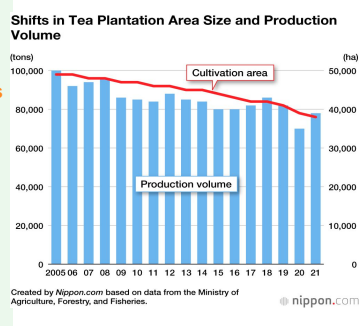
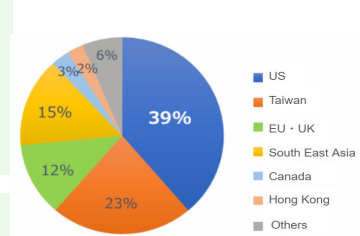


Exporting Matcha of Japan from 2006 to 2023

	A cup of Matcha	A cup of Sencha
Tea catechins (polyphenol)	150mg	70mg
Caffeine (alkaloid)	48mg	20mg
Theanine (amino acid)	20-40mg	2-20mg
Lutein (carotenoids)	1mg	0
Vitamin K (fat-soluble vitamins)	44µg***	0

Per 70mL of standard matcha (1.5g matcha used) *Sencha extract (100mL per cup) ***Equivalent to 29% of the recommended daily intake/nutrient labeling standard value)

By Nikkei, 2021



Sources: 農林水産省 <https://www.aff.go.jp>
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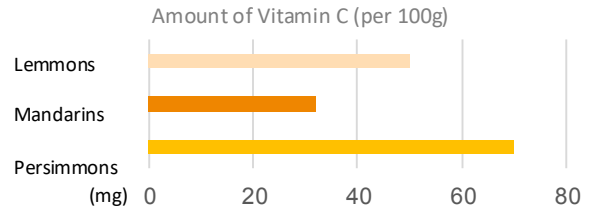
2024 年度 課題研究成果発表会 発表要旨提出フォーム（校内）

コース：国際コース		
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発表テーマ：柿渋染で子供と柿を救うプロジェクト		
発表要旨（日本語 400 字程度）：		
<p>柿は漢方や染め物に使われる貴重な果物ですが、収穫や輸送過程で多くが廃棄され、日本では年間 18 万 8,000 トン生産される柿のうち約 9%が廃棄されています。未熟な渋柿に含まれるタンニンには消臭・抗菌・抗ウイルス効果があり、食品廃棄物削減に役立てられる可能性があります。私たちはタンニンを豊富に含む廃棄される渋柿を染料として利用し、古着を染め直して子ども食堂や困っている家庭に提供するプロジェクトを考えました。このプロジェクトでは、クラウドファンディングで資金を調達し、公共の場所に古着回収ボックスを設置して素材を集めます。柿渋染めは衣類の寿命を延ばし、抗菌作用で清潔さを保つ効果があり、着替えが少ない環境でも活用できます。将来的には、貧困層や疫病流行地域への提供を目指し、食品ロス削減や環境保全、経済的支援の実現を目指しています。私たちの活動を通じて、持続可能な社会に貢献したいと考えています。</p>		
発表要旨（英語 200 words 程度）：		
<p>Persimmons are valuable fruits used in traditional medicine and dyeing, but a lot of them are wasted during harvest and transportation. In Japan, about 188,000 tons of persimmons are produced every year, and around 9% are thrown away. Unripe astringent persimmons contain tannins, which have deodorizing, antibacterial, and antiviral effects, making them useful for reducing food waste. We have come up with a project that uses tannins from discarded persimmons as a dye to re-dye old clothes, which will then be given to children's cafeterias and families in need.</p> <p>In this project, we will raise money through crowdfunding and collect used clothes by placing donation boxes in public places. Persimmon tannin dye can extend the life of clothes and helps keep them clean due to its antibacterial effects, making it especially helpful for children who don't have many clothes to change into. In the future, we plan to expand this project to support people in poverty or areas affected by disease outbreaks. Our goal is to reduce food waste, protect the environment, and provide economic support. Through this project, we hope to contribute to creating a sustainable society.</p>		
発表におけるキーワード 10（英語）		
1. Tannin	6. Deodorant	
2. Impression	7. Antiviral	
3. Nutritious	8. Antibacterial	
4. Discarded	9. Antimicrobial	
5. Dye	10. Epidemics	



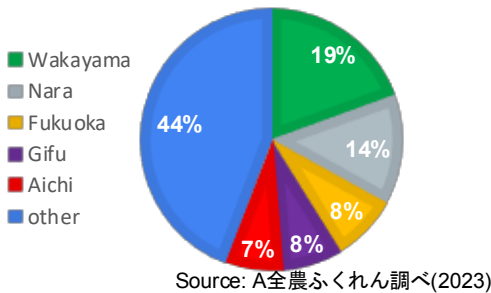
1. PERSIMMONS

Persimmons have many positive points, like preventing colds, recharging batteries, slowing aging, and whiten the skin. This is because its vitamin content is approximately **twice** that of mandarins and higher than lemons. They are also rich in beta-carotene, which may help prevent cancer, hardening of the arteries, and heart attacks.



Source: 文部科学省科学技術(2022)

2. CURRENT SITUATION



According to the 2023 Japanese Food Composition Database, about 9% of a 200g persimmon, or around 18g, is thrown away as waste, including the peel and seeds.

EX. Fukuoka Prefecture is Japan's third-largest producer, but about **1/3** of its harvest is thrown away. They are around of **7000t**.

Extreme heat and heavy rain caused by global warming

3. PERSIMMON FERTILIZER

According to the 2021 issue of the monthly magazine Gendai Nogyo, it was found that persimmon tannin can react with iron to create "tannin iron," a substance that acts as a helpful fertilizer for plant growth. When crops were grown with tannin iron compared to those without it, there were differences in iron content, flavor, root spread, and growth. This shows that tannin iron could be useful as a new material to support crop growth.

EX. The experiment conducted by Nara Medical University demonstrated that the condition of patients with COVID-19 can be improved, and the spread of the virus can be controlled.

4. KAKISHIBU

The astringent persimmons are crushed, their juice is squeezed out, and the dye is made by aging the juice. there are some benefits.

EX. Deodorizing effect, Antibacterial effect, Antiviral effect, Insect repellent effect.

5. TANNIN

It causes the astringent taste in persimmons, especially in unripe, astringent persimmons. It solidifies when it comes into contact with alcohol. While strong tea has a tannin concentration of about **0.1% to 0.2%**, astringent persimmons contain a high concentration of about **3% to 10%**. Kaki tannin has strong antioxidant and antibacterial effects, and it also helps to reduce the rise in blood sugar levels after eating carbohydrates.

6. PROJECT

- Using discarded persimmons, persimmon tannin dye is made, and collected old clothes are dyed with it.
- The dyed clothes are then delivered to people in need.

The funds are raised through crowdfunding.



7. FUTURE

The final goal is to deliver persimmon-dyed second-hand clothes to people in impoverished areas around the world.

大豆

2024 年度 課題研究成果発表会 発表要旨提出フォーム（校内）

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中塚光	ナカツカヒカリ	1 年
吉田実怜	ヨシダミサト	1 年
発表テーマ：大豆ミートの展望 —Prospects for Soybean Meat—		
発表要旨（日本語 400 字程度）：		
<p>大豆ミートは健康や価格の面で注目され、他の食肉に比べて生産に必要な水の量が大幅に少ないため環境にも負荷が少ない。しかし、日本での大豆ミートの認知度は高いものの、実際に継続して食べている人は少ない。これは、日本の食文化にまだ大豆ミートという食品が馴染んでいないことが原因である。本研究では、京都市内の小学校 1～6 年生を対象に栄養士や調理師と協力して、子供たちが受け入れやすい美味しく栄養バランスの取れた大豆ミートメニューを開発し、二ヶ月に一回給食で提供してもらう。このプロジェクトのゴールは、子供たちが幼少期から大豆ミートに慣れ親しんでもらい従来の豚肉、牛肉、鶏肉に加え、「大豆」という新たな選択肢を日常の食生活に取り入れることである。そして、味覚評価や受容性のデータを収集するほか、環境や健康に関する教育プログラムも実施して理解を深める。これにより、大豆ミートの定着と普及に向けた課題を明らかにする。</p>		
発表要旨（英語 200 words 程度）：		
<p>Soy meat has gained attention for its health and price, and it is also environmentally friendly because it requires much less water to produce compared to other meats. However, although soy meat is widely known in Japan, few people eat it regularly. This is because it has not yet become familiar in Japanese food culture. In this study, we will work with nutritionists and chefs to develop delicious, nutritionally balanced soy meat menus that are easy for children to accept. We provide school lunches once every two months for first to sixth graders at an elementary school in Kyoto City. The goal of this project is to familiarize children with soy meat from an early age and to have them incorporate soy into their daily diet as a new option in addition to the traditional pork, beef, and chicken. These soy meat dishes will be served experimentally in school lunches, and we will collect data on taste preferences and acceptance. Additionally, educational programs about the environment and health will be conducted to increase understanding. Through this process, we aim to identify the challenges of promoting and integrating soy meat into daily life.</p>		
発表におけるキーワード 10（英語）		
1. Soy Meat	6. Dietary Fiber	
2. Awareness	7. Low in Fat	
3. Consumption	8. Protein	
4. Alternative Meat	9. Familiar	
5. Acceptable	10. Nutrients	

Prospects for soy meat

KUAS 1-1 International course

~ Bridging the gap between awareness and consumption ~



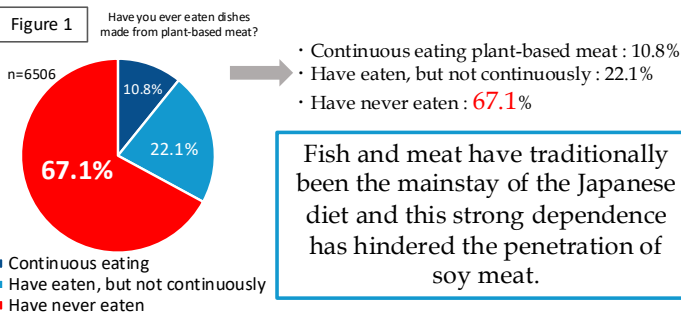
Introduction

Soy meat is one of the **alternative meats**, mainly made from soy beans, that has gained a lot of attention in recent years due to its **health benefits** and **affordability**.



Problem description

There is a large gap between perception and consumption



Why it's a problem

Reason 1

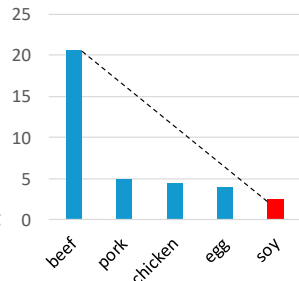
Water consumption for producing 1 kg of beef is approximately 20.6 tons, which is about **eight times** the amount needed to produce 1 kg of soy, the main ingredient of soy meat.(figure 2)

Reason 2

According to a survey by the Ministry of Finance, per capita meat consumption was 2438 g of beef (up 10.3% year-on-year), 7781 g of pork (up 9.0%) and 6359 g of poultry (up 11.5%). This is because the supply of meat is said to be **insufficient** if this situation persists.

Figure 2

Amount of water required for the production of protein-rich foods (t/kg)



So, the consumption of soy as a meat substitute can reduce the consumption of animal meat and is expected to solve the above problems.

Benefits of soy meat

Soy meat is **low in fat** but has as **much protein** as meat. It provides a high amount of **dietary fiber** that you can't get from other meats. (Figure 3)

Figure 3

	Cattle	Pig	Chicken	Soy meat
Protein(Per 100ml)	20.2g	13.4g	23.3g	46.3
Lipids	12.2g	40.1g	1.9g	3.0g
Dietary fiber	0g	0g	0g	13.3g
Fat per 50g Protein	30.2g	149.6g	4.1g	3.2g

Why people don't choose soy meat

Japanese food culture does not **feature** soy meat prominently because the Japanese diet frequently includes other **soybean-based foods** such as tofu, soy sauce, and natto. Many people feel **they get enough** soy in their diet and therefore **do not choose** soy meat.

Solutions

Introduction of Soy Meat School Lunch

We therefore **propose** to introduce soy meat in **school lunches**. We will then investigate its effectiveness and potential for dissemination (this time, we assume that it will be implemented in primary schools in Kyoto).In addition, **model cases** can be built to suit the characteristics of the region and schools to make it easier to approach. In cooperation with **nutritionists** and **cooks**, they will develop a tasty and nutritionally balanced soy meat menu that is **acceptable** to the children. As an example, collaboration with Kyoto's specialities, such as Kyoto vegetables, is being considered. These are more accessible and familiar methods.

Soy meat

×

School lunch

×

Kyoto vegetables

Expected effects

Expected to contribute to SDGs solutions



Livestock meat supplies are in **short supply** as the world's population grows. To prevent these, soy meat is attracting attention as an alternative protein.

[World Population]	
2024.	2050.
8.2billion	9.7 billion

From (UNIQ)



Around **2 billion** people in the world are said to be **obese** while around **700 million** people are suffering from **hunger**, two contradictory problems. Soy meat is high in protein and low in fat and is expected to solve these two problems simultaneously.



Soy meat is expected to help reduce climate change and environmental pollution. It is also expected to reduce **greenhouse gas** emissions from cattle burping and excrement, as well as improve soil and **water pollution**.

Conclusion

The consumption of soy **as a meat substitute** can be expected to solve various environmental problems by reducing meat consumption through livestock production. Furthermore the benefits of soy meat - high protein and low fat - also contribute to solving **health problems** such as world **hunger** and **obesity**. Increasing consumer and soy meat consumption can help solve these global problems.

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