



"What a Waste" : Japanese and American College Student's Perceptions on Food Waste and Its Environmental Impacts

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Outline of the Study

- ❖ Significance of the Study
- ❖ Research Questions
- ❖ Research Background
- ❖ Research Method
- ❖ Research Findings
- ❖ Conclusion
- ❖ Limitations of the Study and Future Research
- ❖ Bibliography
- ❖ Acknowledgements

Significance of the Study

Judy
Kim

- ❖ With the pressing matters of climate change, I always wondered if there was something I could do.
- ❖ Throughout my time at CSUMB, I found that food waste is a problem people globally contribute to.
- ❖ I want to research the environmental impacts as well as the efforts being made to help alleviate this problem.

Significance of the Study

- ❖ As a college student, I tend to eat out a lot. I often neglect the leftovers in my fridge and end up throwing them out.
- ❖ This wastes the money I work so hard to earn and puts a strain on the environment.
- ❖ I would like to research how our own actions can help reduce food waste even in a society where that may be challenging.



**Alyssa
Powell**

Research Questions

Research Question 1

What are the perceptions of Japanese and American college students on the reduction of food waste in their own households and within their community?

Research Question 2

To what extent are American and Japanese college students aware of the environmental impacts?



Research Background Outline

**Overview of Food Loss
in Japan and the United
States** **01**

**Main Causes of Food
Waste in Japan and the
United States** **02**

03 **Greenhouse Gasses**

04 **Impact on the
Environment**

05 **Disposal System**

Overview of Food Loss in the United States



57%

57% of food waste comes from **businesses**

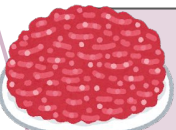
43%

43% of food waste comes from **households**

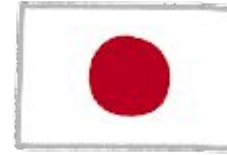
77%

77% of all food wasted was potentially edible

The most disposed of food products in American households are **meat** and **dairy** products



Overview of Food Loss in Japan



54%

54% of food waste comes from **businesses**

46%

46% of food waste comes from **households**

33%

33% of all food wasted was potentially edible, over $\frac{1}{3}$ less than America



The most disposed of food products in Japanese households are **fruit and dairy products**





Main Causes of Food Loss in the United States

Misunderstanding of Food Labels

→ More than 80% of Americans misunderstand expiration labels, so products are thrown out before they actually go bad



Food Portion Sizing

- American food portions are the largest of any country (Japan being one of the smallest)
- “Bulk Buying” results in waste from not eating all food before it goes bad



Extra-Flawed Product

- For food businesses, food is wasted due to flawed or unsold products
- “Imperfect” fruits and vegetables are not sold





Main Causes of Food Loss in Japan

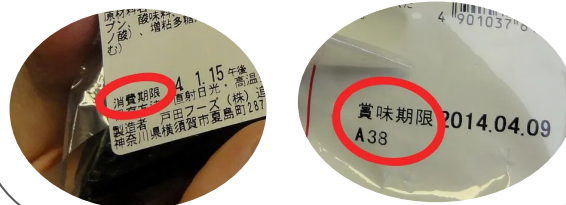
Grocery Shopping and Expiration Dates

→ Many shoppers choose to grab the product with the freshest expiration date, leaving older products to stock up and go bad



Misunderstanding of Food Labels

→ In Japan, “tastes best by” and “recommended to eat by” labels may confuse consumers, leaving them to throw out food that may not be bad



Extra-Flawed Product

→ If packaging is damaged or faulty or is not sold within one day, food will be disposed of even if the food is still okay to eat

→ This often occurs at convenience and grocery stores



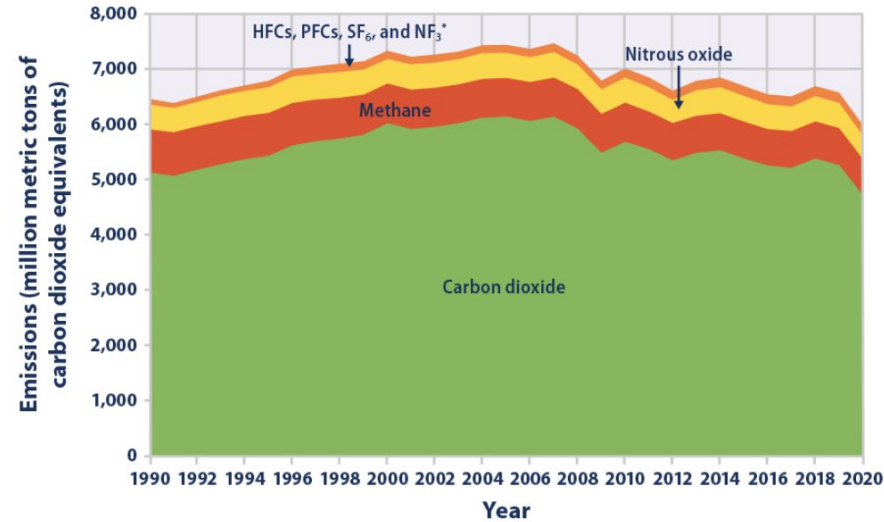
Greenhouse Gases Globally

- ❖ Definition: Gases that keep up the average temperature of the Earth up.
- ❖ Humans are contributing excess: Water Vapor, Carbon Dioxide(CO₂), Methane(CH₄), Ozone(O₃)and Nitrous Oxides(NxO).
 - Most concerning GHG: CO₂
- ❖ >95% of food waste end up in landfill where it converts to CH₄ & CO₂ through anaerobic digestion
 - Bacteria breaking down organic matter with no oxygen.

Greenhouse Gases in the U.S.

- ❖ 2007 – 2009: Emissions declined due to a drop in U.S. economic production.
- ❖ 2010-2012: Decreased due to growing use of natural gas / renewables to generate electricity in place of more carbon fuels.
- ❖ 2020: U.S. greenhouse gas emissions totaled 13.2 trillion pounds of carbon dioxide equivalents.
 - 7% decrease since 1990 + 20% decrease since 2005
- ❖ 2019-2020: 9% drop primarily due to COVID

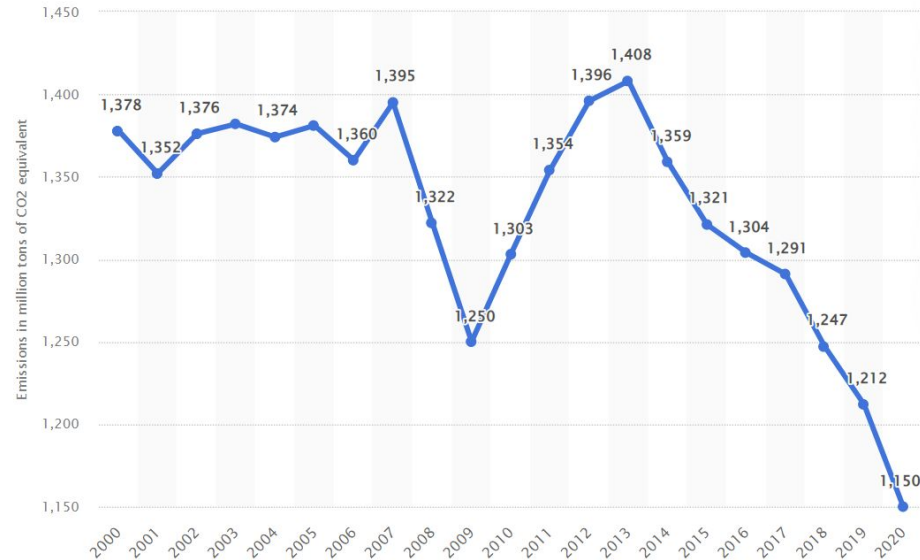
(EPA, 2022)



Greenhouse Gases in Japan

- ❖ 1997 Kyoto Protocol called for 6% GHG reduction, but it increased 6% by 2006.
- ❖ 2011: Nuclear disaster in Fukushima caused fossil fuels to replace nuclear energy, resulting in increased emissions shortly after the disaster
- ❖ 2020: Total emissions of greenhouse gases in Japan amounted to 2.5 trillion lbs of CO₂ equivalent.
- ❖ Currently focusing on using renewable and nuclear energy in place of fossil fuels.

(Klein, 2022)



Impact on the Environment

- ❖ Food waste contribution to climate change
 - Rotting food in landfill creates methane
 - Methane = 25x more warming power than carbon dioxide (CO₂)
- ❖ Impact on reduction of greenhouse gases
 - Composting:
 - Food waste with other organic matter creates soil
 - Soil increases plant growth - Pulls CO₂ from the atmosphere
 - Negate the effects of numerous greenhouse gasses (e.g. Methane & Carbon dioxide)

(Awatashi, et. al 2020)

Environmental Education

America

- ❖ Some parts of the US does have environmental education within the middle and high school curriculum
- ❖ Not the best quality of education, but many Americans are aware of the impacts due to basic education

Japan

- ❖ Environmental education in Japan only emphasizes on doing eco-friendly tasks
- ❖ Japan's awareness is limited because their education on the environment is also limited
- ❖ SDGs are popular in Japan, but they are more action oriented, not much focus on scientific education

American Disposal System

- ❖ No general enforcements on what kinds of trash is disposed
- ❖ Common misconceptions on what waste should be thrown where.



- ❖ **Solid Waste:**

- Food wrappers/containers, glass, paper, disposables



- ❖ **Recyclables**

- Metals, paper, recyclable glass



- ❖ **Green Waste**

- Yard & Food waste



- ❖ **Hazardous Waste**

- Batteries, aerosol can, motor oil, etc.

Japanese Disposal System

- ❖ Waste disposal system varies depending on the city.
- ❖ Special garbage bags used for different kinds of trash



❖ **Burnables**

- Clothes, non-recyclable items, food waste



❖ **Non-Burnables**

- Metal items, glass, electrical appliances



❖ **Recyclables**

- Plastics, cans, papers



❖ **Oversized Garbage**

- Large items - Furniture & Household appliances



Survey Findings

Research Method

90 Total Study Participants

- **45 American University Students**
 - 23 Men
 - 16 Women
 - 6 Non-Binary/Genderfluid
- **45 Japanese University Students**
 - 15 Men
 - 29 Women
 - 1 Non-Binary



Research Instrument: Online Survey (Google Forms)

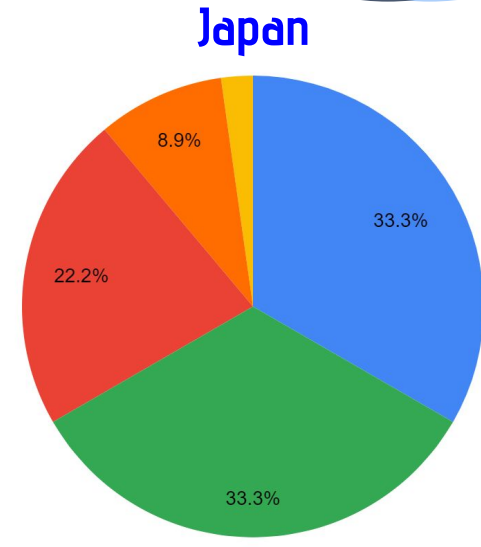
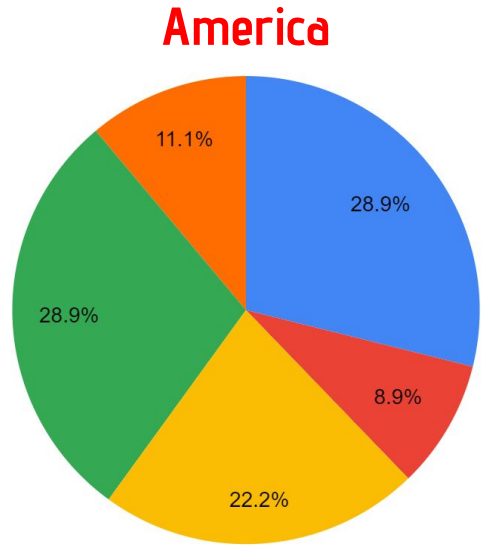
English Survey

Japanese Survey



Demographic Questions

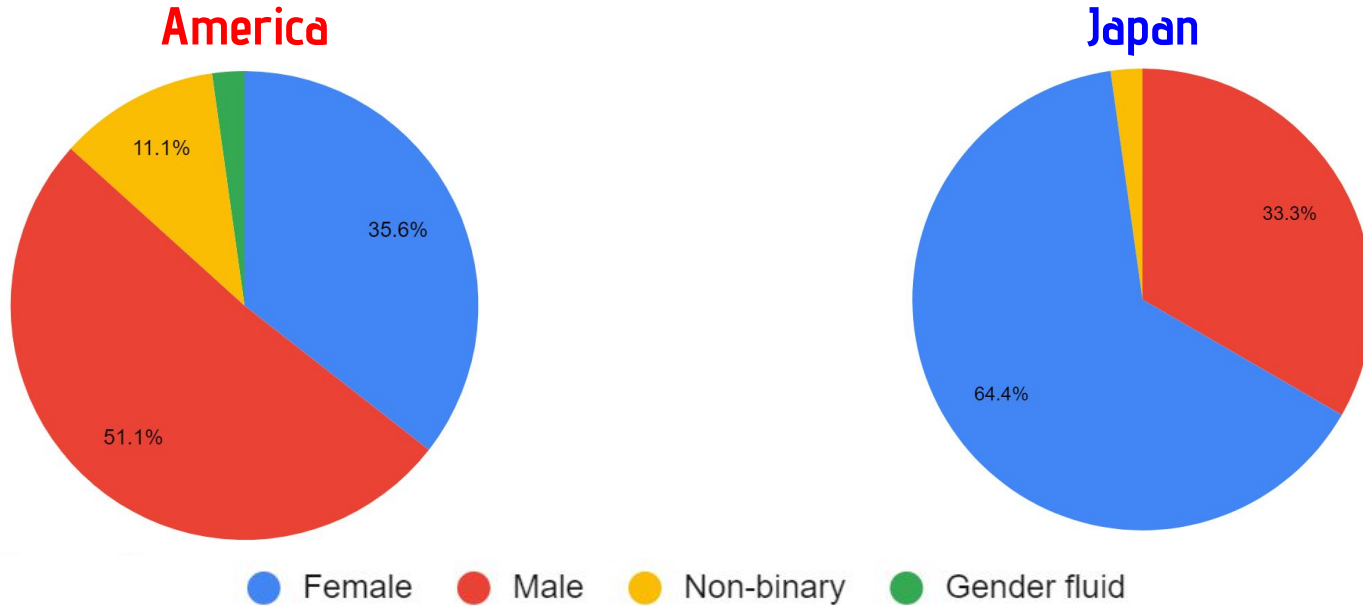
Respondents' University Grade Level



● Freshman ● Sophomore ● Junior ● Senior ● Other

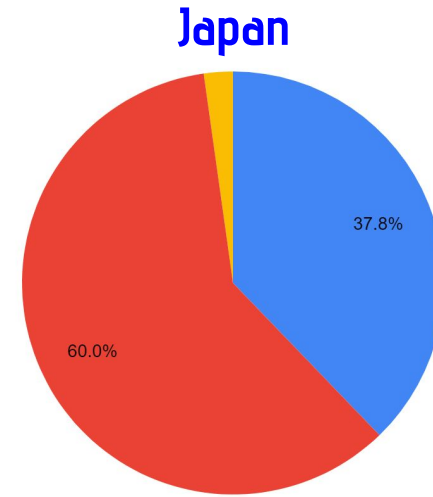
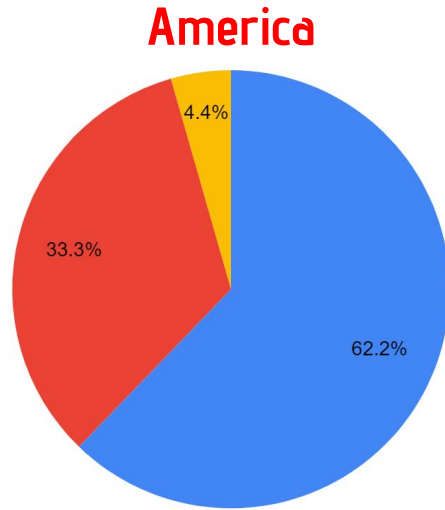
A majority of university students from both countries are currently **junior** and **senior** standing

Respondents' Gender Identity



Over half of **American** student respondents identify as **male**, while around 64% of **Japanese** student respondents identify as **female**

Who mainly provides the finances for everyday food?

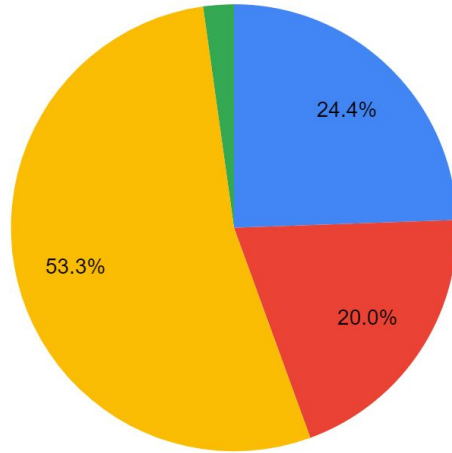


● Myself ● My parent(s) ● My partner/significant other

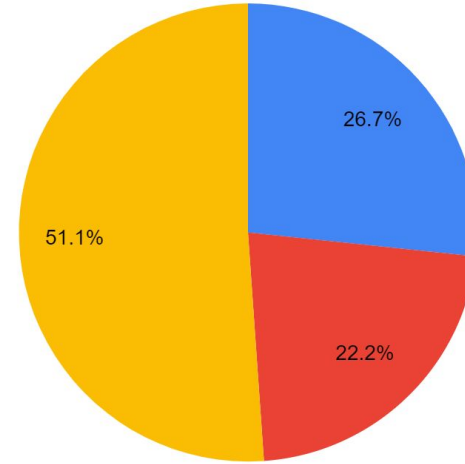
About 60% of **American** respondents are **their own** source of financial income, while 60 % of **Japanese** respondents' **parents** are their main source of finances

How financially comfortable do you feel regarding purchasing daily food products?

America



Japan

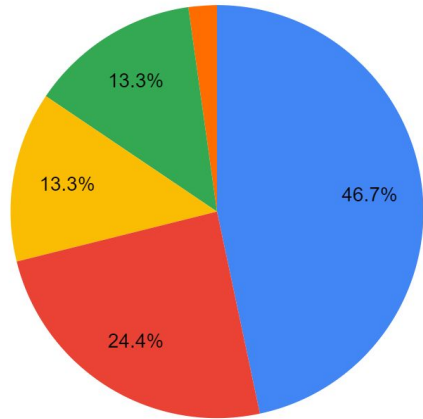


- Very Comfortable
- Somewhat Comfortable
- Not Very Comfortable
- Not Comfortable At All

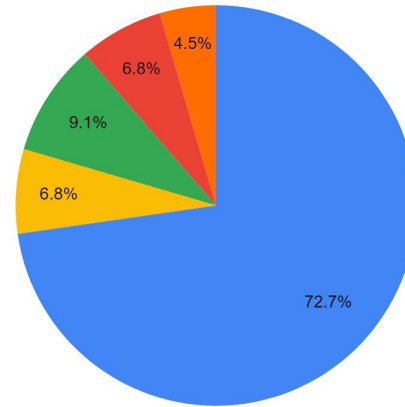
Respondents feel similar in their financial comfortability, with over 50% from both countries feeling **somewhat comfortable**

How many people do you normally cook for in your current living situation ?

America



Japan



- Myself Only
- One Other Besides Myself
- Two to Three Others Besides Myself
- Four or More Others Besides Myself
- I Do Not Cook

Both **Japanese** and **American** respondents mainly **cook for themselves**;
however, more **American** students **do not cook** at all

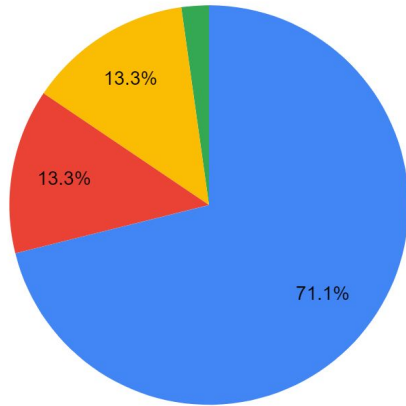
Research Findings 1

Research Question 1:

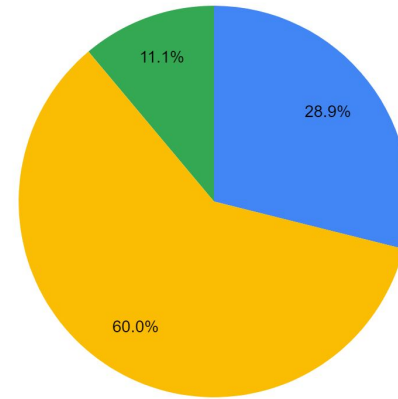
What are the perceptions of Japanese and American college students on the reduction of food waste in their own households and within their community?

When you eat out and have leftovers from eating out, what do you usually do with it?

America



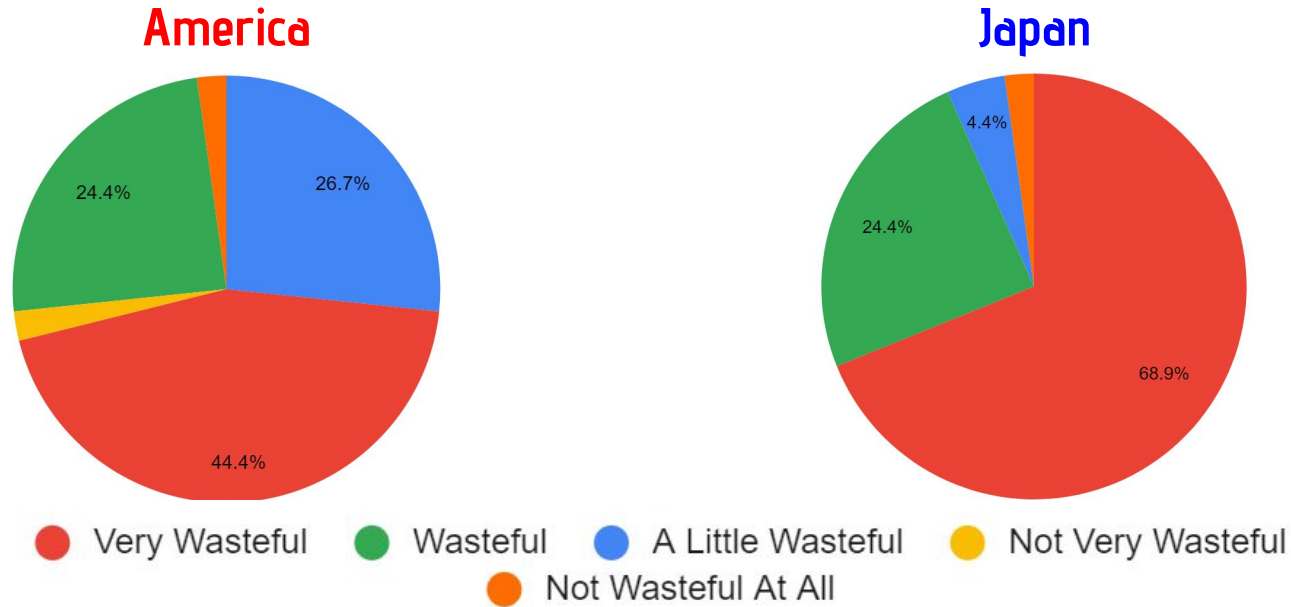
Japan



- I take it home; store it and then eat it
- I take it home; store it and throw out
- I leave on plate at eatery
- I don't produce leftovers

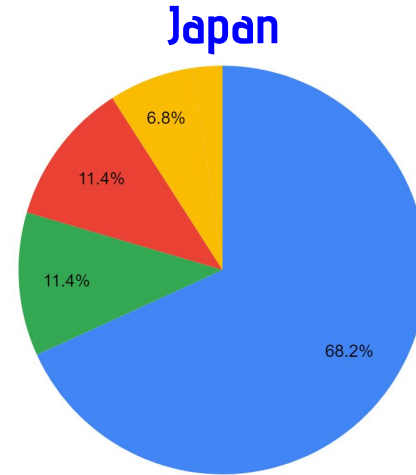
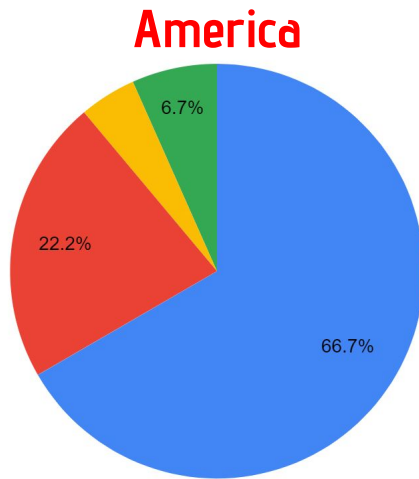
About 71% of **American** respondents usually **take their leftovers home**; however, 60% of **Japanese** respondents **do not produce leftovers** at all

How wasteful do you feel about throwing away leftovers?



Both **American** and **Japanese** respondents concede that they feel **very wasteful** throwing away leftovers

How often are you able to eat all food items bought during grocery shopping before they go bad?



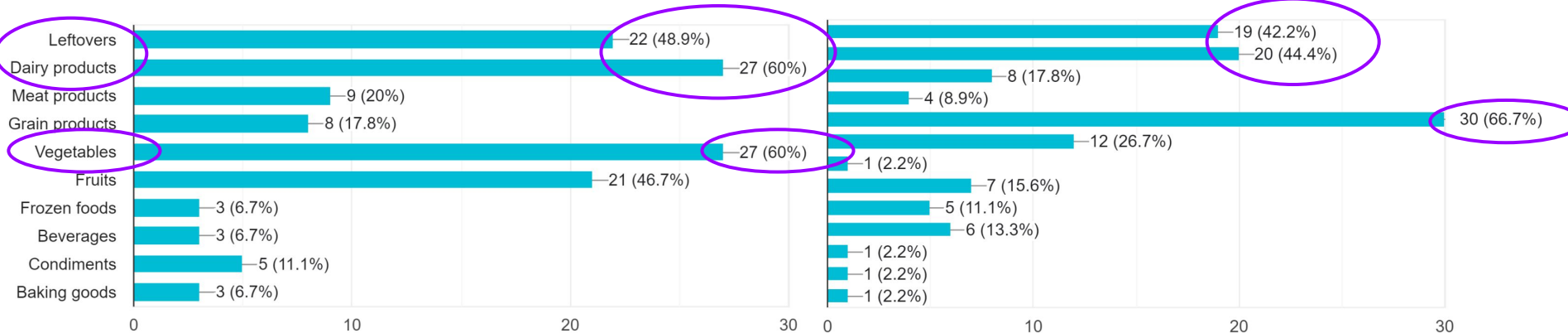
● Always ● Usually ● Sometimes ● Seldom ● Never

Both **Japanese** and **American** students feel that they are **usually** able to **eat all food** items they buy before the food goes bad

What types of food do you notice you often throw out? (Top 3)

America

Japan



Both **American** and **Japanese** students mainly throw out

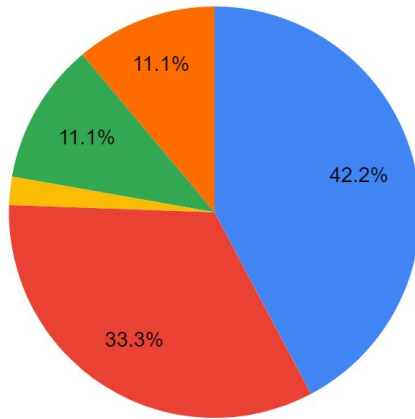
1: **Vegetables** (USA: 60% JPN: 67%)

2: **Dairy products** (USA: 60% JPN: 45%)

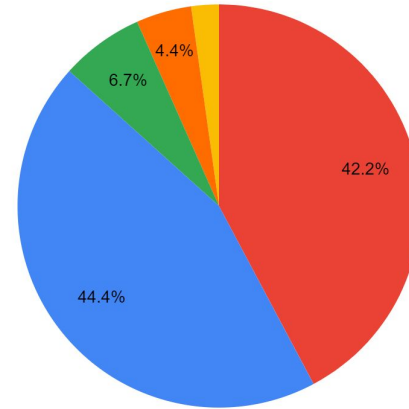
3: **Leftovers** (USA: 49% JPN: 42%)

How significantly do expiration dates impact the way you shop for dairy and meat products?

America



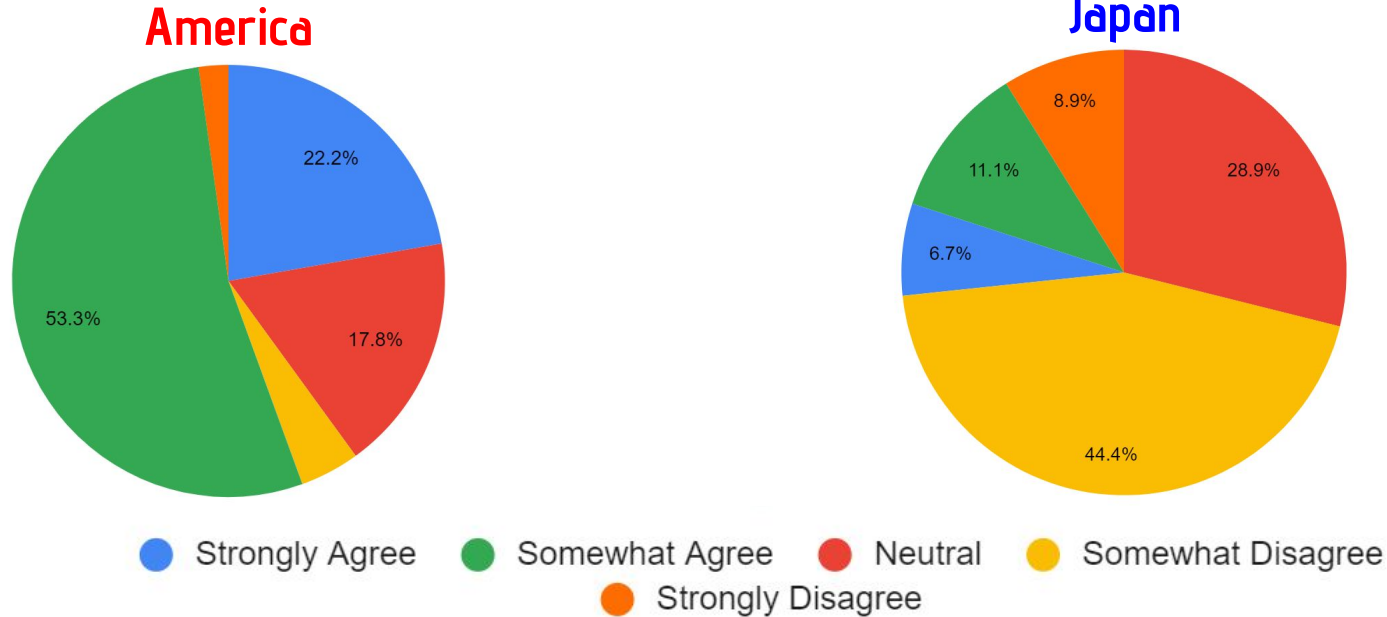
Japan



- Very Significant Impact
- Somewhat Significant Impact
- Not Very Significant Impact
- I do not notice/check for expiration dates
- I do not consume dairy or meat products

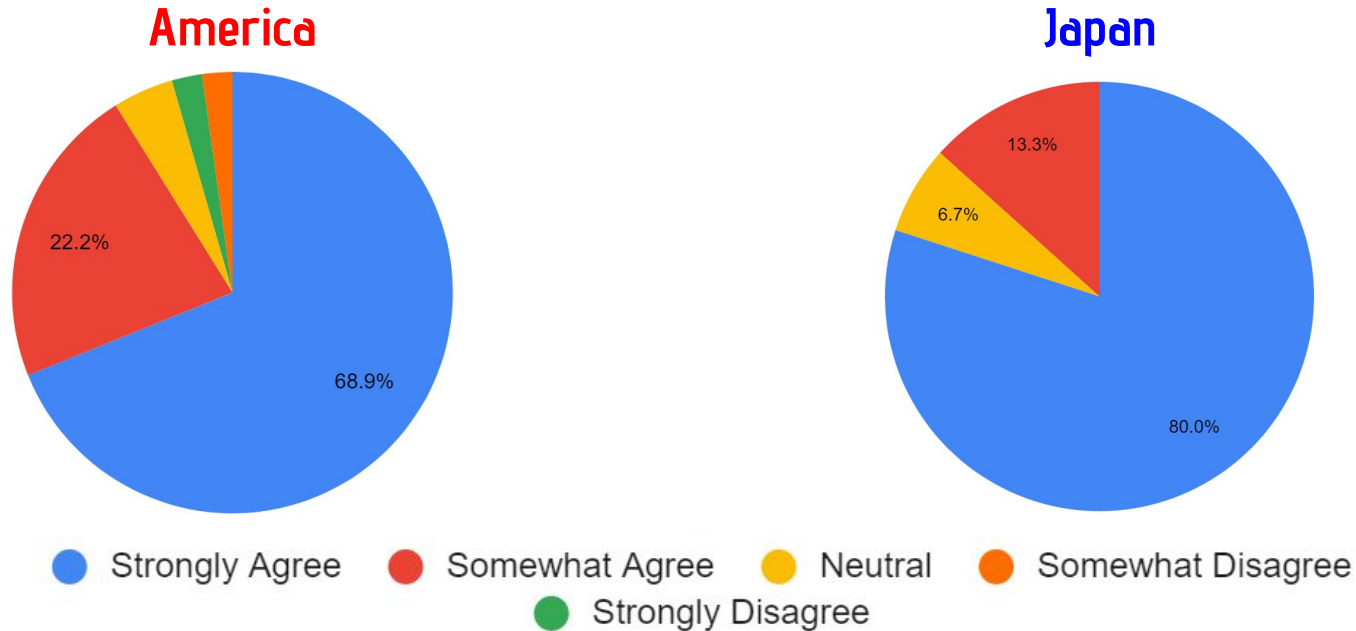
Both **Japanese** (87%) and **American** (76%) students feel that expiration dates have a very or somewhat **significant impact** on the way they shop

"Portion sizes in my country are too large to finish eating in one sitting."



About 75% of **American** students feel that **U.S. portion sizes are too large**, whereas about 53% of **Japanese** students feel that **Japan's portion sizes are just right**

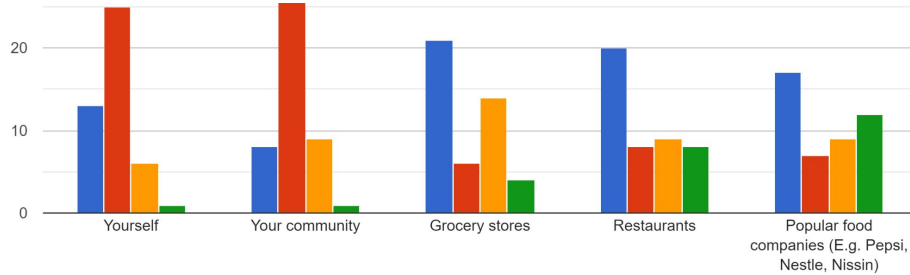
“Reducing food waste is important for the future of my country.”



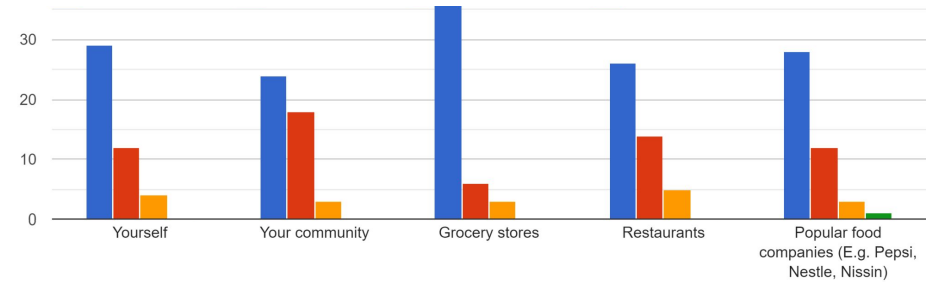
Both **American** (69%) and **Japanese** students (80%) **strongly agree** that reducing food waste is important for the future of their country

How responsible are the following groups in your local community towards reducing food waste?

America



Japan



Very Responsible Somewhat responsible Not very responsible Not responsible at all

Although **American** students feel that **individual** and **community** efforts are the most responsible in reducing food waste, **Japanese** students feel that **industry** efforts hold more responsibility

Research Question 1 Findings

Due to larger food portion sizes, **American** college students tend to **produce more** leftovers than **Japanese** college students

Due to time constraints college students have, both **American** and **Japanese** students mostly waste **perishable** food items with **short expiration date periods**

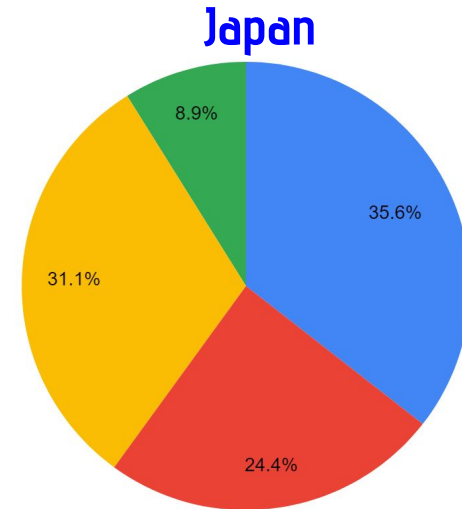
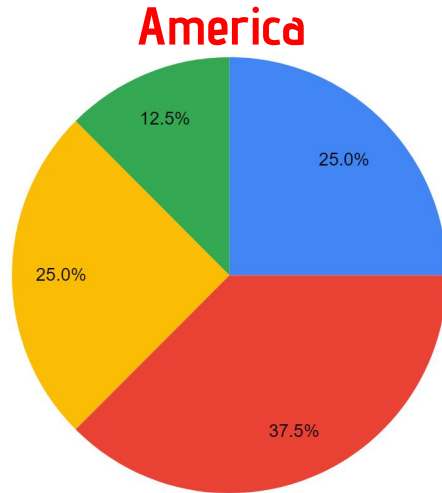
Both **Japanese** and **American** college students believe that reducing food waste is important, but feel that a **large-scale reduction of food waste can not be done** only through individual actions



Research Findings 2

Research Question 2: To what extent are American and Japanese college students aware of the environmental impacts?

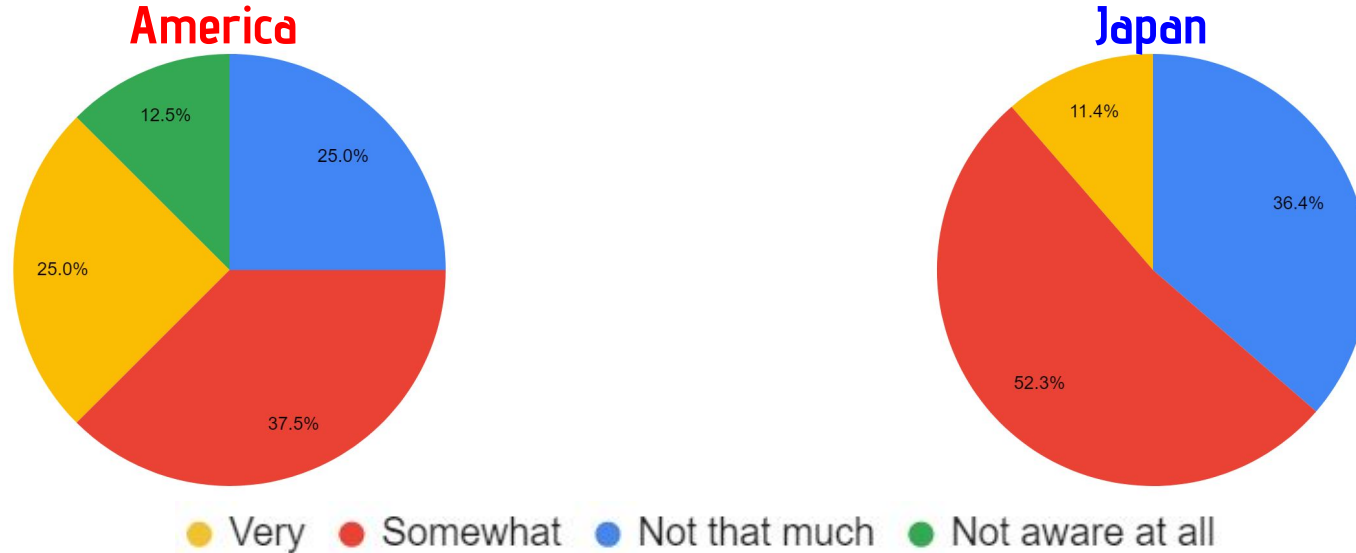
How aware are you of the effect food waste has on climate change?



● Very ● Somewhat ● Not that much ● Not aware at all

Both respondents had mixed levels of knowledge

“My own food management habits have a big impact on the Greenhouse gas emissions from food waste”



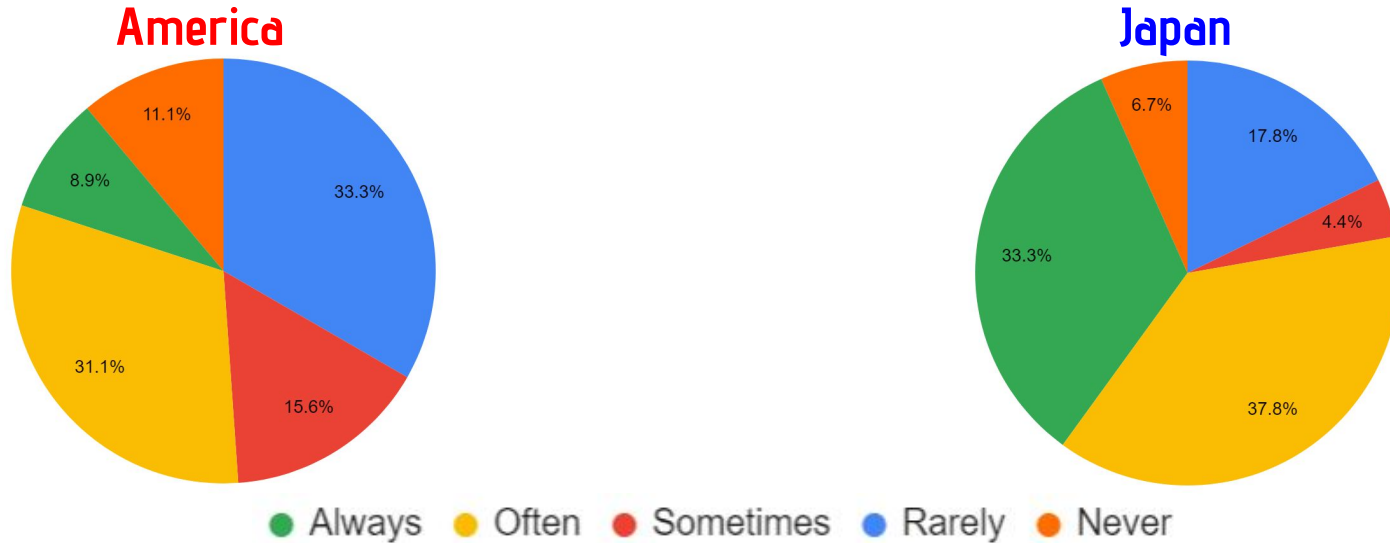
While a majority of the Japanese and **American** students agreed they have an impact on GHG emissions, none of the **Japanese** students disagreed

“The food industry contributes to 20% of the total greenhouse gas emissions”



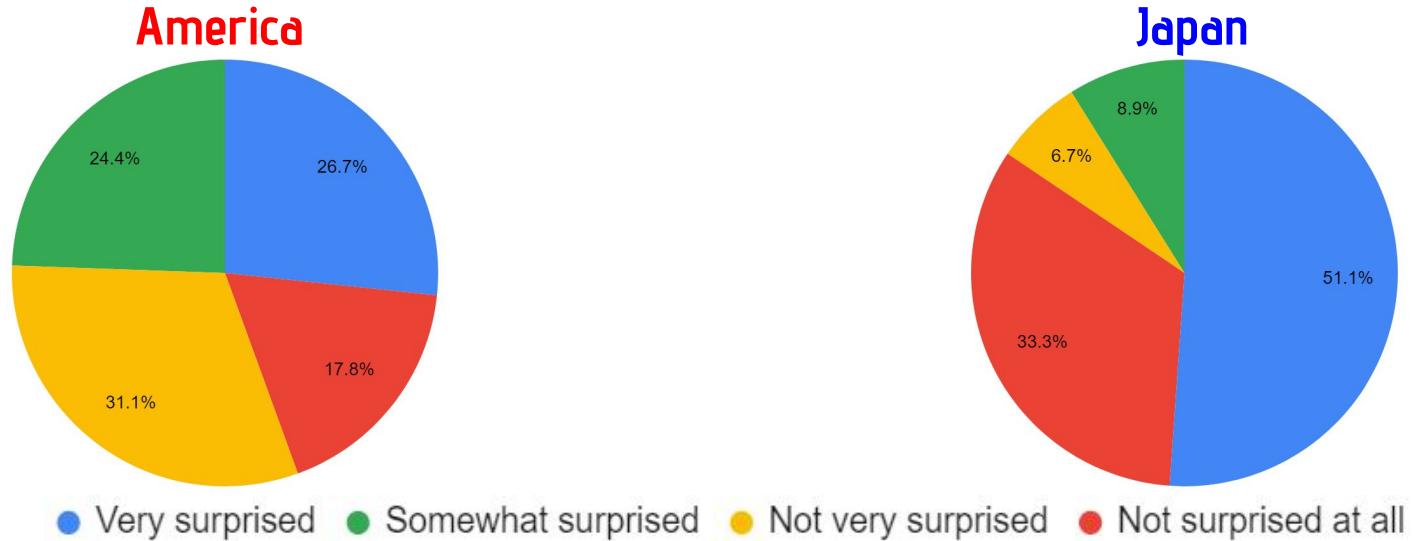
A majority of **Americans** were not surprised at the amount of GHG emissions food industries create, however a majority of the **Japanese** were surprised

How often do you use plastic bags while grocery shopping?



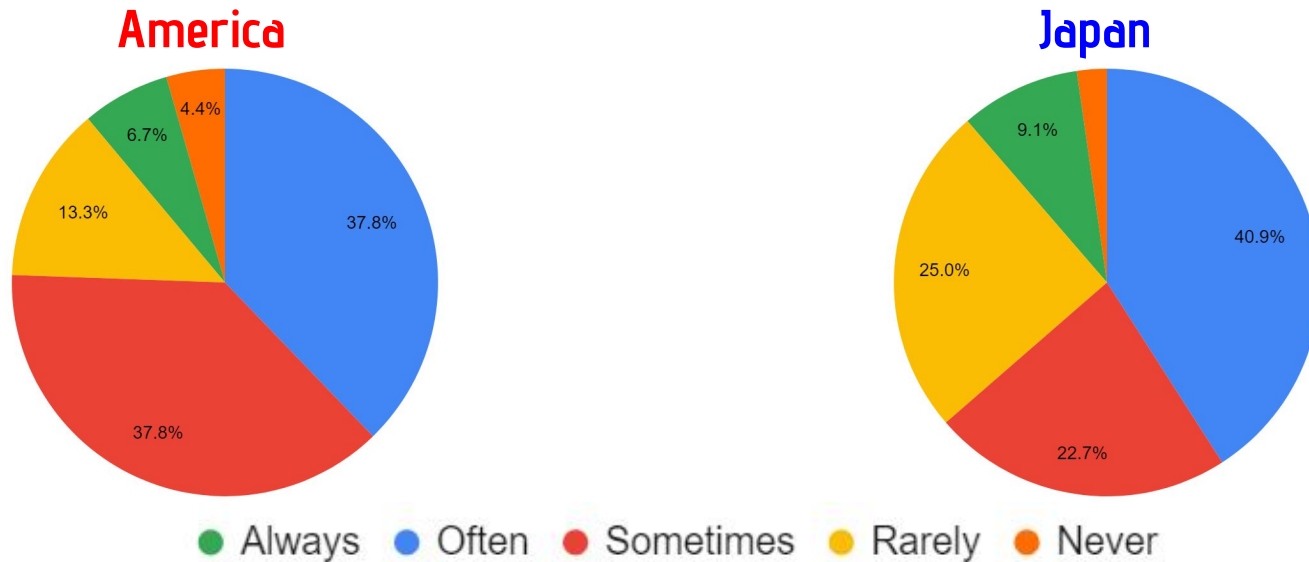
A majority of American and Japanese respondents reportedly use plastic bags, but significantly more for **Japanese**

“1.3 billion tonnes of food was wasted in 2007, which was $\frac{1}{3}$ of the food production for human consumption”



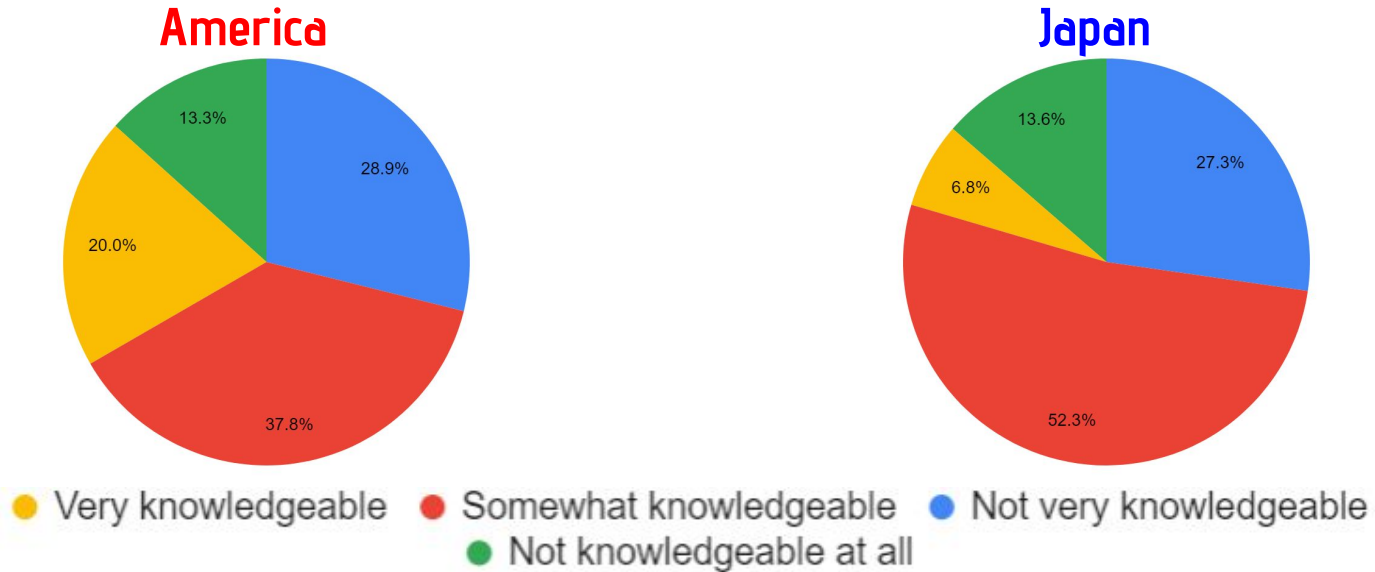
American students had a more varying view on this topic while the **Japanese** were more opinionated with 51% of the students being very surprised

How often do you take active measures to combat food waste?



42% of **Americans** and 50% of **Japanese** are taking little or no action against food waste.

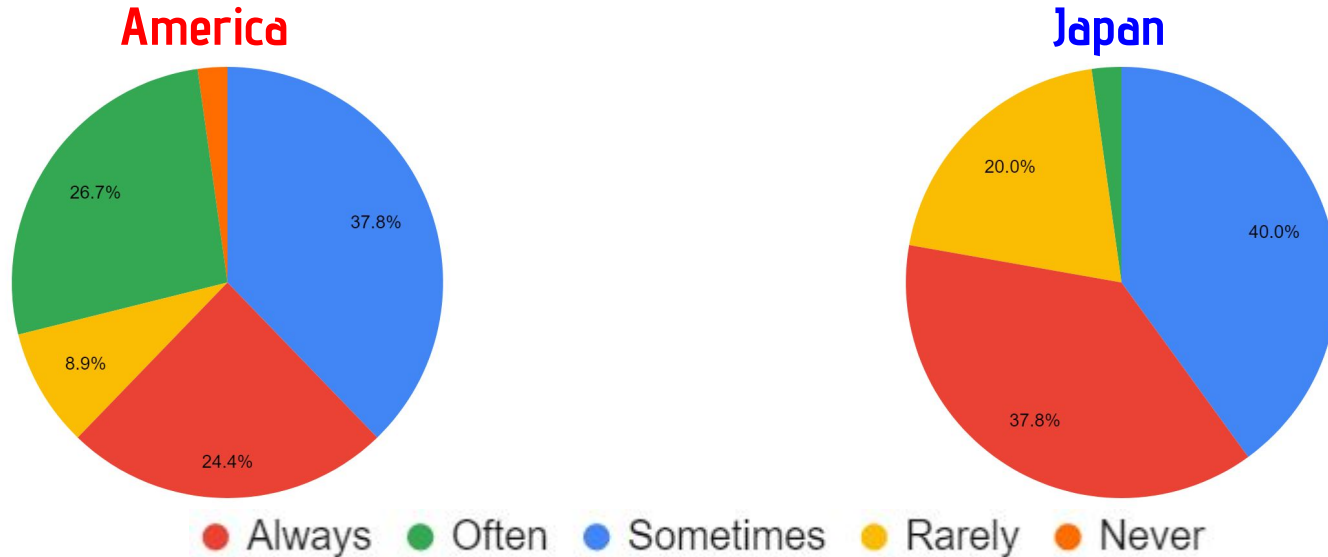
To what degree are you knowledgeable of how to properly store foods?



58% of the **American** students had some knowledge of proper food storage, whereas the **Japanese** students had 34%

Graph 16

When you're able to, how often do you freeze your food to make it last longer?



A great majority (78%) of the **Japanese** students freeze their food, while just over half (51%) of the **Americans** do the same

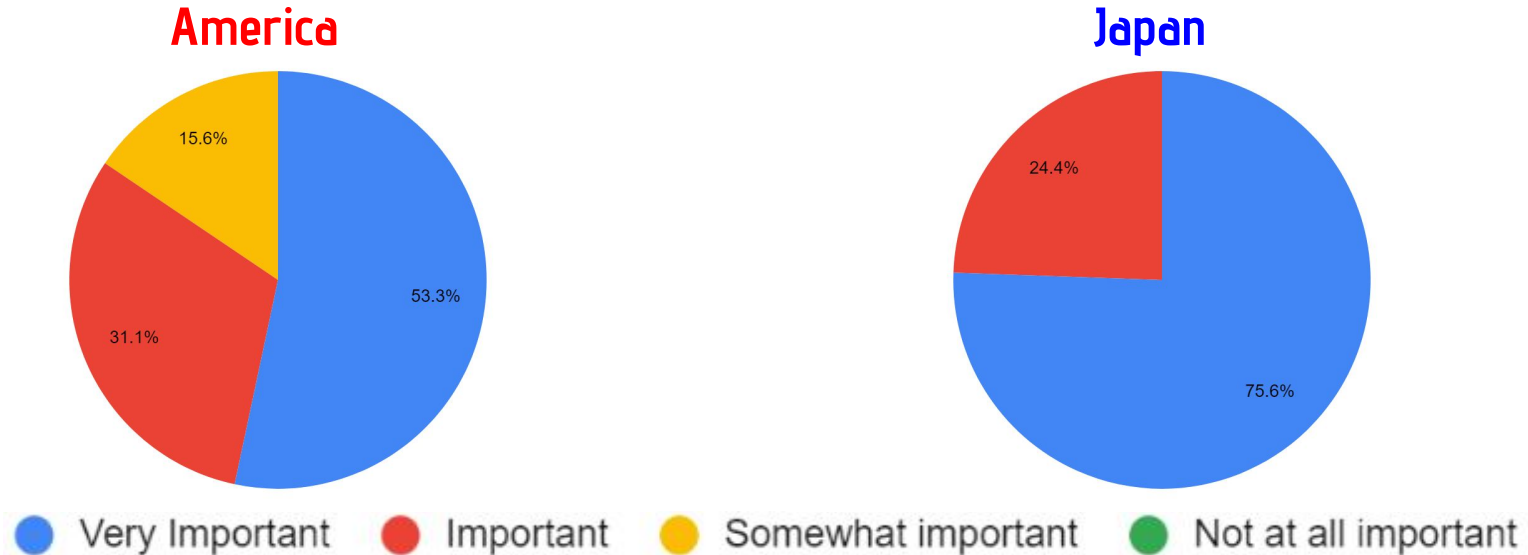
What is the biggest challenge for you that prevents you from eliminating food waste in your life?



71% of the **American** students' **forgetfulness** prevented their food waste.

The **Japanese** results had more varied reasons

How important do you feel it is to reduce your own food waste to prevent environmental damage?



84% of **Americans** responded that it is important to change their habits to prevent environmental damage, whereas **100%** of the **Japanese** responded that it is important

Research Question 2 Findings

American students have **more knowledge** of the environmental effects food waste has caused by food industries than the **Japanese** students due to their respective education systems

Japanese students take more actions to prevent food waste due to the eco-friendly action focus within their education

The biggest challenge for the **American** students to prevent food waste was largely due to their own **forgetfulness**, however the **Japanese** students had evenly various reasons as to why they found it challenging

Conclusion of Results & Discussion

Shared Opinions Between Japanese and American College Students



- Reducing food waste is important
- Perishable foods are the most wasted food items
- There is not enough knowledge on food labels and storage



Cause of Different Perspectives Between Japanese and American Students

- ❖ **American** students are more prone to wasting food than **Japanese** students due to **America's** large food portion sizes, misunderstanding of food disposal and storage, and companies disposing of 'imperfect' or 'day-old' foods
- ❖ **Japanese** students waste less food than **American** students due to smaller food portion sizes and strict rules about trash separation including food waste; however, **Japanese** grocers and companies likewise dispose of 'imperfect' foods
- ❖ This is a result of limited food health education and food waste not being a prioritized issue within local and national governments

Limitation of the Study and Future Research

- ❖ Both a majority of American and Japanese students attend a university in California, a state known for its environmental efforts. Results may not reflect a general perspective of these two groups on environmental issue awareness
- ❖ Due to many university students currently living in dormitories, results may not properly reflect opinions of those who do not currently have kitchens or kitchen appliances
- ❖ In the future, we would like to survey students outside of California to analyze how perceptions of food waste vary by different states or countries
- ❖ We would also like to have a more balanced ratio of male to female respondents

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