

GP-P35 (ECOP): How would different kinds of seafood traceability information affect people's MWTP?



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1. Introduction

- Objective: Identify effective methods for promoting seafood traceability and sustainability.
- Seafood traceability primarily aims at resource conservation, while agricultural and livestock traceability aims at improving food safety.
- Issues like illegal fishing, illegal imports, and mislabeling make it important to establish seafood traceability.
- Establishing traceability with multiple purposes is necessary to bring about changes in consumer behavior.
- This study focuses on identifying necessary elements for promoting seafood traceability, including information and consumer altruism.



Figure 1. Experimental site



Figure 2. Participants

2. Methods

- Face-to-face surveys with discrete choice experiments were conducted in Tokyo, Japan on August 26-27, 2022.
- Attributes and levels were set for Sea bream and Horse mackerel, including the freshness attribute as the most important quality factor for fresh seafood (Table 1).

Table 1. Attributes and Levels

Attributes	Sea bream	Horse mackerel
Price (yen/100g)	400, 550, 700, 850, 1000	300, 400, 500, 600, 700
freshness	A'-A, B-C, D	A'-A, B-C, D
Traceability labels	Yes/No	Yes/No

- Participants were asked to perform the choice experiment 12 times (6 times per fish species), with four options including "none of them".



Figure 3. Choice sets

- Participants were randomly divided into four groups (A-D) and presented with distinct information regarding seafood traceability and its benefits through a one-minute explanatory video (Figure 4).



Figure 4. Informational video given to participants

A. Food Safety Assurance

A traceability system for seafood is a system that enables you to confirm "who caught the fish, when and where it was caught, and how it was delivered to you". The implementation of traceability enables reliable tracing and blocking of problematic items on a lot-by-lot basis in the event of accidents such as contamination or food poisoning, thereby ensuring **food safety**.

A+B. Fisheries Resource Protection

In addition, the implementation of a traceability system has the added benefit such as **protecting resources** that are currently in a state of over-exploitation. Natural marine resources around the world have been declining year by year, and according to the FAO, 34.2% of the world's natural marine resources were already overutilized or depleted in 2017. The issue is that the status of the resource varies by region of origin, even for the same type of fish. For example, even natural horse mackerel and sea bream caught in Japan may have depleted stock status in some areas. Purchasing a product without a traceability label could mean that you unintentionally contribute to **overfishing and depletion of natural resources**.

A+C. Human Rights Issues

In addition, the implementation of a traceability system has the added benefit, such as **improving the human rights and working conditions** for those involved in the fishing and processing industries. Reports have shown that human trafficking, forced labor, physical abuse, and low wages are prevalent issues in the fishing and fish processing industries in Southeast Asia. In 2020, Indonesian crew members were forced to work for long hours and subsequently died on a Chinese fishing boat, with the bodies of three crew members being dumped at sea. Purchasing products without traceability labels could unintentionally contribute to such **human rights violations**.

A+D. Mislabeling of Origin

In addition, the implementation of a traceability system has the added benefit such as preventing the **mislabeling of origin**. In Japan, mislabeling of origin is often reported; in 2022, it was reported that most of the clams sold as domestic products were from foreign countries. Furthermore, a major company in the Toyosu market sold frozen bigeye tuna from China as coming from Taiwan. Buying products that do not have a traceability label means that you may be **buying mislabeled products**.

Figure 5. Information content given to participants

- The survey also included questions about participants' basic attributes (age, gender, occupation), and altruism, measured by a question about how participants would allocate 1000 JPY (≒7.5USD) between themselves and others.
- People who gave more than 100 JPY to others were classified as having high altruism (167 people).
- People who kept the entire 1000 JPY for themselves were classified as having low altruism (81 people).
- The mixed logit model was used for each group using the discrete choice experiment data, and the marginal willingness to pay (MWTP) for traceability QR codes was estimated.
- The estimation model had a basic form as follows and interaction terms were added as necessary for the analysis.

$$U_{ij} = ASC_j + \beta_0 Price_j + \beta_1 FreshA'A_j + \beta_2 FreshBC_j + \beta_3 Trace_j + e_{ij}$$

U_{ij} is the utility that participant i receives from option j ,

$Fresh A'A_j$ is a dummy variable that takes a value of 1 when the freshness is A'.

$Fresh BC_j$ is a dummy variable that takes a value of 1 when the freshness is BC.

$Trace_j$ is a dummy variable that takes a value of 1 when there is a traceability label.

3. Results and discussion

- The study received 248 responses over two days, with a slightly higher number of female respondents and the largest age group being between 30 to 40 years old. The majority of respondents were company employees (Figure 5).

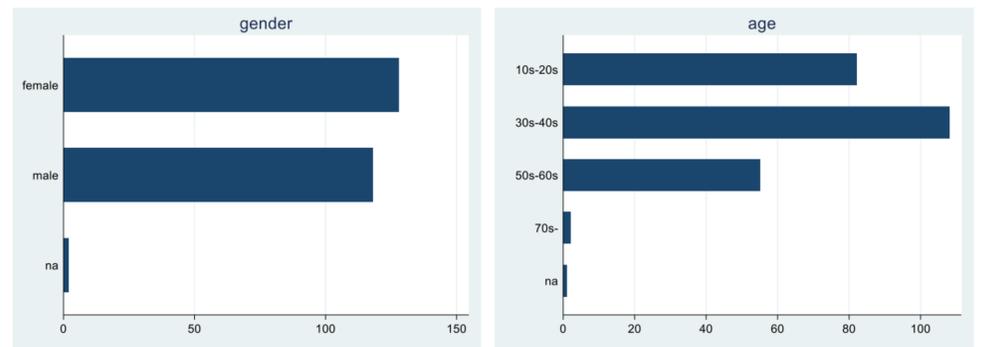


Figure 5. Attributes of participants

- Positive WTP was observed across all groups for seafood traceability, with the highest WTP observed in the group provided with information related to **human rights issues (Group C)**, followed by the group provided with information on **mislabeling of origin (Group D)** (Figure 6).

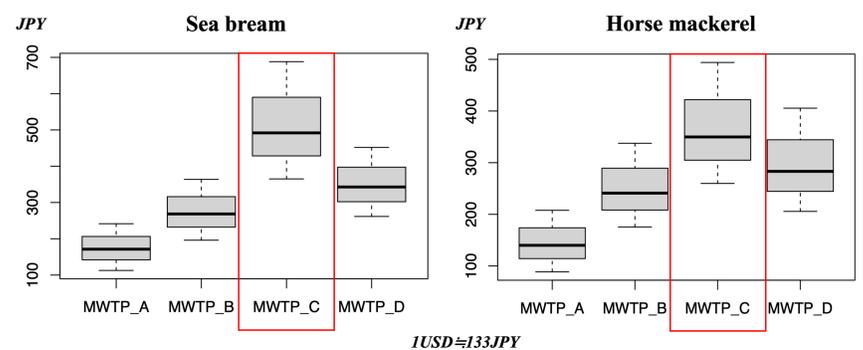


Figure 6. Information and MWTP

- People with high altruism had a higher WTP when given information on human rights violations, while people with low altruism had a higher WTP when given information on origin mislabeling.
- Human rights violations are information related to the welfare of others, while origin mislabeling is information related to one's own welfare, which reflects the difference in WTP.

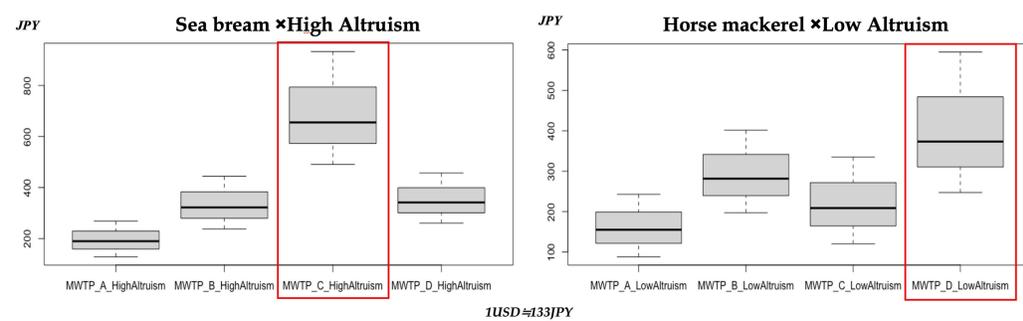


Figure 7. Altruism, Information and MWTP

- Highlighting the advantages of seafood traceability, particularly as a solution to **human rights issues** and **mislabeling of origin**, is likely to be an effective strategy in promoting the implementation of seafood traceability system in Japan.