



# Global TAKUAN project

the process of exporting prefectural products based on researching a foreign country~



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### Abstract

We thought about the process that makes prefectural products. In this research, we chose *Takuan* and Vietnam as an example. Then, we used a Taste Sensor scientifically to analyze the features of seasonings in Vietnam. As a result, we found that Vietnamese seasoning has stronger Umami than that of Japan. Furthermore, we can make some new seasonings by the following three ways: using the human tongue, computer programs, and calculations. The seasoning made by using the human tongue was closest to a certain Vietnamese seasoning. If our research works out, people can export prefectural products to several foreign countries by applying this process in the future.

### Background of Study

#### Research by interviewing

- One of the problems of Miyazaki is exporting prefectural products.
- Michimoto company in Miyazaki has been working on exporting "Takuan".

#### The problem

Takuan is not famous and disliked in foreign countries.

### Purpose of Study

- ① We will research in Vietnamese food culture, which taste Vietnamese people like and produce our takuan according to the taste that Vietnamese people favor.
- ② We will make a process that can be used across many products to distribute Miyazaki made items to foreign countries in a way that is easy for them to accept.
- ③ We can apply this system to other prefectural products. Additionally, we expect to expand to other countries besides Vietnam

### Experiment ①

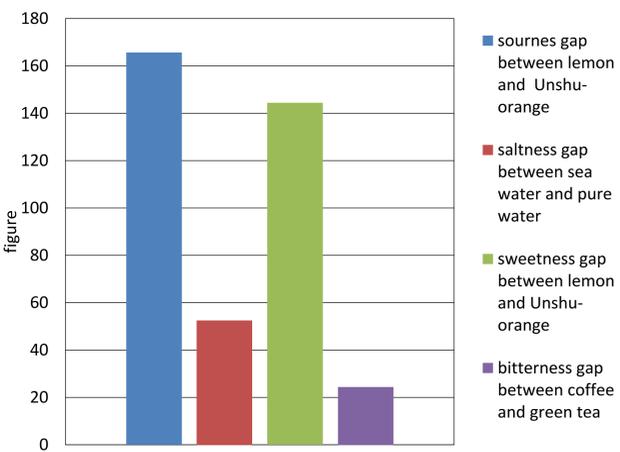
What is difference of seasoning between Japan and Vietnam ? (Comparison between Japanese seasoning and Vietnamese seasoning by Taste Sensor)

#### 1.purpose of experiment

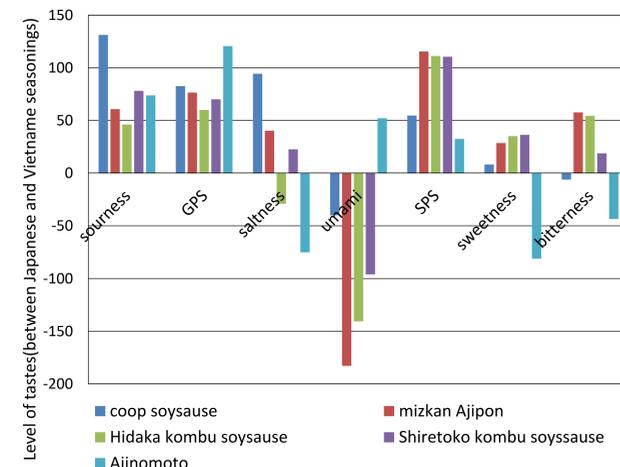
We find the difference basic tastes (sweetness, sourness, saltiness, bitterness, umami) of Japanese and Vietnamese seasoning.

#### 2.The method

We researched the seasonings diluted 10 times with water, by the Taste Sensor, ASTREE/S48.



Graph I : Comparison of various things we have



Graph II : Comparison between Japanese seasoning and Vietnam seasoning

### 3.Result of experiment

- Vietnamese seasoning has a stronger umami taste than the Japanese ones.
- Japanese seasoning has a stronger sour taste than the Vietnamese ones. (Graph II)

### 4.Experiment conclusion

- Vietnamese seasoning has a stronger umami taste than Japanese ones.
- Japanese seasoning has a stronger sour taste than Vietnamese ones.
- The concentration of salt water is highly connected to the umami flavor.

### Experiment ②

Can we make a taste likes Vietnamese seasoning with Japanese ones ? ( Comparison between liquid seasoning we made and Vietnamese seasoning)

#### 1.Purpose of experiment

We will find a proportion of Japanese seasonings which is similar to the average taste of Vietnamese ones.

#### 2.Ingredients

- coop soysauce
- mizkan Ajipon
- Shiretoko kombu soysouse
- Vinegar
- Ajinomoto
- Hidaka kombu soysauce



We changed the proportion of the mixture of Japanese seasonings and made the new seasoning which was close to the average Vietnamese seasoning.

#### Vietnamese seasoning

- 1.Nuoc mam Phuquoc
- 2.Youki foods nuoc mam
- 3.Youki foods fish sauce
- 4.Megachef fish sauce
- 5.Thai-choice fish sauce
- 6.SB foods fish sauce
- 7.Flying goose fish sauce



#### 3. The method

We researched the seasoning diluted 10 times with water, using Taste Sensor, ASTREE/S48.

#### Method I : Computer program

We programed an automatic calculation system to find the proportion of mixtures.

(A,B,C,D,E)

	I	A	B	C	D	E
Ajino moto	30%	30%	25%	25%	25%	25%
Ajipon	5%	0%	30%	30%	0%	0%
coop soy sauce	15%	0%	15%	10%	10%	10%
Shiretoko kombu	35%	70%	25%	25%	40%	40%
Hidaka kombu	15%	0%	5%	10%	25%	25%

#### Method II : Human tongue

A member of our team used her tongue to find the correct proportion which is like Nuoc mam Phuquoc (1).

(F)

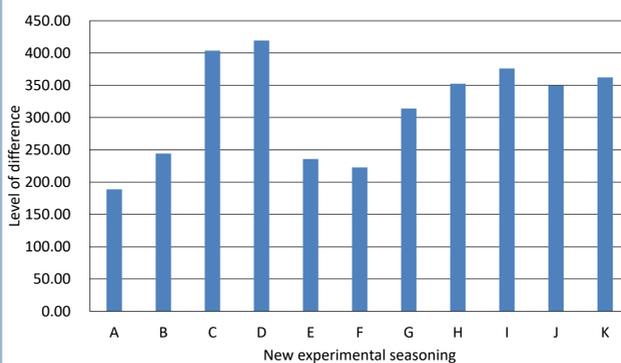
	II	F
Hidaka kombu		91%
Salt		4%
Vinegar		1%
Ajino moto		4%

#### Method III: Equation

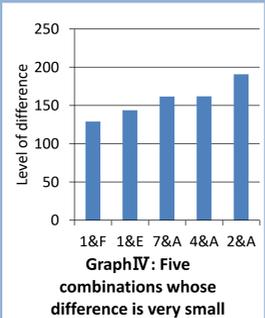
We created these five proportion levels using simultaneous equations in which the flavors were used as variable.

(G,H,I,J,K)

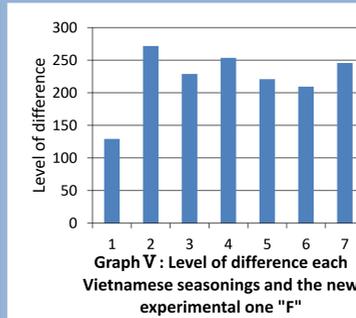
	III	G	H	I	J	K
Ajino moto	27%	27%	27%	28%	27%	27%
Ajipon	41%	35%	45%	30%	38%	38%
coop soy sauce	5%	5%	5%	6%	5%	5%
Shiretoko kombu	13%	22%	8%	27%	18%	18%
Hidaka kombu	14%	11%	15%	9%	12%	12%



Graph III : Level of difference between average Vietnam seasoning and the experimental new one



Graph IV: Five combinations whose difference is very small



Graph V : Level of difference each Vietnamese seasonings and the new experimental one "F"

### 4.Result of experiment

Original seasoning A is closest to the average taste of Vietnamese seasoning and the second closest seasoning is F. (Graph III) When we watch individually distance between Vietnamese seasoning 1 and original seasoning F is small. (Graph IV, V)

### 5.Experiment conclusion

Computer program and sensory evaluation are effective.

### Experiment ③

Which taste of Takuan is liked better? (The subjects eat Takuan and we take questionnaire)

#### 1.Purpose of experiment

We will make sure whether our original Takuan is really acceptable to people.

#### 2.The method

We asked to try Takuan and we took a questionnaire in Japan and Vietnam.

#### The kind of Takuan

- A: Takuan which is pickled in original seasoning A
- B: Takuan which is pickled in original seasoning F
- C: Takuan which is pickled in Nuoc mam Phuquoc
- D: Takuan, "Hinata-zuke" which is the product of Michimoto company

#### Questionnaire I

Place : University of Miyazaki in Japan  
Subjects : 10 Japanese people 3 Vietnamese people One American person

#### Questionnaire II

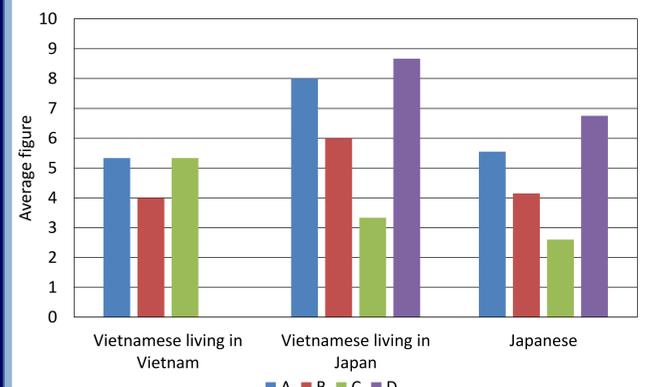
Place : Miyazaki Omiya High School in Japan  
Subjects : 10 Japanese people

#### Questionnaire III

Place : A restaurant in Hanoi, the city of Vietnam  
Subjects : 2 Japanese people 6 Vietnamese people

### Comments from answers to this questionnaire

- In Vietnam, the taste which is dependent on whether they are from northern part or southern part.
- northern part... People like hot flavor
- southern part... People like sweet flavor
- In Vietnam, Nuoc mam is not used for pickling.



Graph VI : Comparison between Vietnamese and Japanese

### 3.Result of experiment

- Evaluations by Japanese people and students studying abroad from Vietnam are similar : They ranked high in the order of TakuanD, TakuanA, TakuanB, TakuanC.
- In evaluations by people living in Vietnam, there are almost no difference.
- There is a difference in evaluation of taste between Vietnamese who live in Japan and those who live in Vietnam.

### Inference

- Although they are from the same area, Hanoi city, there is a difference in evaluating taste. We think this is depending on what they eat daily.
- Vietnamese students in Japan might come to have similar taste to Japanese
- There may be no use producing prefectural products by applying the evaluation of foreigners living in Japan.

### In the future

The second graders are going to take over this research. They will develop this research with the new point of view, "looking for the area where Takuan is liked by people". We expect that we can develop the taste for foreign countries with other prefectural products. We can also expected that prefectural products are easier for foreigners to accept using the way in this research.

### Acknowledgement

I would like to show my greatest appreciation to Mr.Sakakibara Mr. Itami, students, officers of Miyazaki university, Mr.Uehara, Mr.Takahashi, Mr.Matsuura, Mr.Kanai of Miyazaki Prefecture Foods Development Center and Ms.Fujita of Michimoto company who gave advice and comments. The support has been a great help in our research.



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