

Research Note**Acceptability of Vietnamese Rice Noodle by Japanese**

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ABSTRACT There are noodles in both Japan (UDON) and Vietnam (PHO), but the ingredients are completely different: the former are made from wheat and the latter are made from rice (Indica rice). Japanese rice (Japonica rice) has strong adhesiveness and is not suitable for making noodles. Currently, wheat is mainly imported to Japan from North America, so if Vietnamese rice is used, the cost of transportation will be much lower. However, since Japanese noodles are traditionally made from wheat flour, we do not know whether noodles made from rice would suit Japanese tastes. This study was conducted to clarify the question. The dish used in this test was "Kitsune Udon," which is the most popular noodle dish in Japan. The subjects were 53 students from a women's university in the Tokyo area. Three surveys were conducted. The first was on the experience on eating noodles, the second was a sensory test of Japanese-style noodle dishes and the third investigated whether UDON can be replaced with PHO. Most of the subjects had not eaten rice noodles previously. The results of the sensory test showed that concerning aroma, appearance, texture, compatibility with fish and kelp-based broth. UDON was evaluated a little higher but the overall taste ranking was similar or both kinds of noodle. About 60% of the subjects answered that they could replace UDON with PHO. In conclusion, Vietnamese rice noodles will be accepted by Japanese, especially if they become more commonly available and familiar.

Key words: noodle, udon, pho, acceptability, Japanese young women

INTRODUCTION

In Japan and Vietnam, the main source of carbohydrates is rice. Noodles are common dish in both Japan and Vietnam, but the ingredients are very different. Japanese noodles (UDON) are made from wheat, while Vietnamese noodles (PHO) are made from rice. Japanese rice is not suitable for making noodles because the rice is too sticky. Rice contains two types of starch; amylopectin and amylose. Amylopectin contributes strongly to viscosity due to its branched chain structure of glucose chain, and amylose has a linear glucose chain that contributes less to viscosity. The ratio of amylose to total starch is called the amylose content. Amylose-high, -medium, and -low content rice contains amylose about 22-28%, 16-18%, and 15% or less amylose (1). High-amylose rice is not sticky but crunchy. On the other hand, glutinous rice consisting only of amylopectin is very sticky. Generally, Vietnamese rice is medium-amylose in content and is suitable for making noodles. Japanese rice is low-amylose rice (amylose content less than 15%), which is too viscous to make noodles. For this reason Japanese UDON is made from wheat. Currently, wheat is mainly imported from North America, so transportation costs are high. In Vietnam, rice can be harvested two to three times a year, so the price is low and the transportation cost to Japan is also low. PHO is a popular dish among Japanese tourists to Vietnam. However, PHO is rarely seen in Japan. We suspect the reason for this is that Japanese people have a long tradition of making UDON from wheat and therefore do not think of making noodles from

rice. In this research, we tried to see how well Vietnamese PHO is accepted by Japanese.



Photo 1. Japanese noodle UDON Sources:
<https://www.photo-ac.com/main/>



Photo 2. Vietnamese noodle PHO Sources:
<https://p-pho.com/shop/archives/473>

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METHODS

A sensory test was conducted with 53 female panelists from 18 to 22 years old at a university in the Tokyo Metropolitan area. Menus with the popular Japanese dish noodle Kitsune were served, except that the noodles were either UDON or PHO. First, we conducted a survey of panelists' experience eating noodles by asking 5 questions: 1. do you like UDON, 2. how frequently do you eat UDON, 3. have you ever eaten PHO, 4. do you like PHO, and 5. how frequently do you eat PHO.

Secondly, we did a sensory test of UDON and PHO scored on a 5-point scale (very good:5, good:4, neither good or bad:3, poor:2, very poor:1) to evaluate acceptability with regard to aroma, appearance, texture, compatibility with fish and kelp UMAMI-based soy sauce broth and overall taste.

Finally, we asked the panelists whether they would replace UDON with PHO using a 5-point scale; (strongly agree: 5, agree: 4, neither agree nor disagree: 3, do not agree: 2, strongly do not agree:1. Panelists were informed of the survey method and responses were gathered anonymously so that personal information was not identified.

Statistical analysis was conducted by paired Student t-test. Significant differences were evaluated by p values less than 0.05 and 0.01.

RESULTS

Experience on eating noodles of panelists:

The results of frequency of eating noodles were: at least once a week 14.8%, more than once a month 75.9%, more than once in three months 5.6%, rarely eat not 3.7%. On the experience of eating PHO, 68.5% of panelists answered "yes", and 31.5% of panelists answered "No". Furthermore, 81.6% of those who have eaten PHO said that they liked it. Many of them commented that the reason was that they were healthy, light, easy to eat, and unique slick texture. About 4% of panelists answered that they usually use PHO in their meals", the others like but don't use PHO because there not easily available and few restaurants.

Sensory evaluation of UDON and PHO:

Each panelist tasted UDON and PHO, and according to 5-point scale (very good: 5, good: 4, neither good or bad: 3, poor: 2, very poor: 1) ① aroma, ② appearance, ③ texture, ④ compatibility with soy sauce soup and ⑤ overall taste. The mean score of UDON was higher than that of PHO, but overall taste scores were similar ($p>0.05$) (Table 1).

Table 1. Comparison of taste evaluation between UDON and PHO

	Aroma	Appearance	Texture	Compatibility with fish and kelp based soy sauce broth	Overall taste
Japanese noodle	4.39±0.56	4.52±0.61	4.72±0.49	4.81±0.39	4.41±0.53
Vietnamese noodle	3.44±0.77*	4.02±0.81*	3.93±0.89*	3.60±0.97**	4.33±0.93

Values are mean±SD n=53

*, ** Significant difference from Japanese noodle by paired Student t-test at $p<0.05$ and $p<0.01$, respectively.

Possibility to replace UDON with PHO

Figure 1 shows the answer to a question whether they would replace UDON with PHO. The panelists answered strongly agree: 15.1%, agree 45.3%, either agree or not 34% and disagree 15.7%.

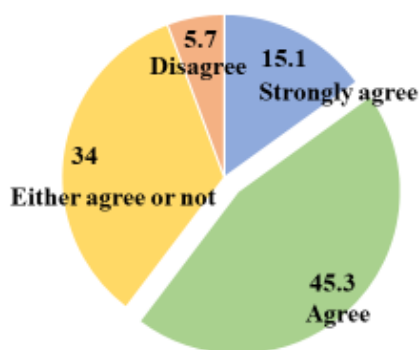


Fig 1: Evaluation for PHO by Japanese cooking method (N=53)

DISCUSSION

In this study, the acceptability of Vietnamese rice noodles PHO by Japanese women students was high. These noodles were prepared using the same method as for Kitsune UDON (noodle dish with fried tofu). As a result, there was not a big difference in preference between the PHO and the UDON, suggesting that PHO may be well accepted by Japanese.

For Japanese people, PHO is not an ingredient they consume on a daily basis. Many of the subjects in this study had never eaten PHO. On the other hand, UDON is a familiar ingredient for Japanese. It is easy to get and is an ingredient that they have been accustomed since their childhood. Not many people can eat unfamiliar foods like PHO without any hesitation. However, the evaluation of tastiness in the present study was similar, and about 60% of the subjects answered that they could use PHO instead of UDON. This result is considered to be a fairly high evaluation for PHO.

UDON does not have the smell of wheat, whether it is fresh noodles or dried noodles, but PHO has a unique rice smell. The subjects were not accustomed to the combination of the aroma of PHO and the scent of soy sauce soup with UMAMI of kelp and dried

bonito flakes. However, such reaction to differing aromas may decrease as subjects become accustomed to eating PHO.

In terms of texture, UDON was evaluated as chewy but PHO was soft, which is thought to be the result of the preference for UDON over PHO. In this study the UDON was made from fresh noodles but the PHO from dried noodles because it was imported from Vietnam. This difference is the great limitation of this study. For a fair comparison, both noodles should be in a similar condition.

From an economic point of view, about 80% of the wheat used in Japan is imported from North America (2). The distance to Japan is about 10,000 km, but it is only about 3,865km from Vietnam to

Japan. In Vietnam, rice can be harvested two to three times a year, so the price is low. From the economic point of view, PHO is much superior to UDON. PHO could be common and familiar food in Japan by proper promotion.

REFERENCES

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