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RESEARCH ARTICLE

# Indonesian Food Neophobia Scale and Its Application on Ethnic Food Study

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**ABSTRACT**
Indonesia is rich with traditions and ethnicities, including the ethnic foods. The acceptance of ethnic food to consumers, especially with regards to culinary tourism, should be fully considered. However, food neophobia can be one of the traits that determine consumer acceptance of ethnic food. Measurement of food neophobia has been developed in the form of Food Neophobia Scale (FNS). Nevertheless, the cross-country application of this scale could impact in result bias as different language and cultural perception of each item in the questionnaire could be perceived differently. This study aims to develop a suitable and reliable Indonesian version of FNS and evaluate it among respondents on several ethnic foods. Results showed that the FNS was reliable and valid. Application of FNS to measure the degree of neophobia in ethnic foods, namely *pempek Palembang*, *sayur umbut rotan, ayam betutu,* and *sate ulat sagu*, to 100 respondents showed the variety of neophobia levels that could be due to the respondents' familiarity to the ethnic foods. We therefore propose the Indonesian FNS could be be applied to assess food neophobia trait in Indonesia.

**KEYWORDS:** *Ethnic food, Food neophobia, Indonesian cuisine, Translation*

## Introduction

Indonesia consists of thousand islands that cover hundreds of tradition as well as cultural ethnicity. Wijaya (2019) revealed this diversity affects significantly to the establishment of unique exotic cuisines. In addition, the author expected that the richness of Indonesian cuisine will increase market awareness, especially for the tourism industry. However, people in a particular region might experience a sense of unfamiliarity when encountering ethnic food. The acceptance to a new food may differ between individuals and therefore the food neophobia can play an important role when exploring the opportunity to introduce the richness of Indonesian cuisine.

Food neophobia becomes one trait that influence consumer preferences especially towards food from different ethnicities (Mascarello et al., 2020). Food neophobia is a psychological state related with the reluctance and/or avoidance of novel food (Previato & Behrens, 2015). Novel food could be perceived as a literally new kind of food, or an ethnic food originated from a certain culture and region that is unfamiliar to the consumer. Recently, it was demonstrated that food neophobia varies across meat and plant dimensions. Meat neophobia is a larger barrier to the sustainable food option than are plant neophobia or unidimensional food neophobia (Çınar et al., 2021).

The 'omnivore's' dilemma, that is normally occurred at children, is also associated with food neophobia and refers to their expectation of dangerous or unpleasant taste (Herman et al., 2019; Łoboś & Januszewicz, 2019). Faccio & Guiotto Nai Fovino (Faccio & Fovino, 2019) provided an extensive review on the impact of food neophobia on consumer acceptance, especially to some novel foods, including insect, cultured meat, and genetically modified

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food. The most recent review showed that food neophobia tends to decrease over time across countries as affected by globalization; however, lower dietary quality in general is associated to higher food neophobia (Rabadán & Bernabéu, 2021).

Various methods were developed to measure food neophobia (Damsbo-Svendsen et al., 2017a). The food neophobia trait can be measured by providing a questionnaire, which is called food neophobia scale (FNS), consisting of 10 statements related to the willingness to try novel and ethnic food. Each statement is judged by giving a point of agreement from 7-point Likert scale (Pliner & Hobden, 1992). This FNS method has been applied by some studies. For example, a previous study involving young women at 18-30 years old in Poland reported that ones who live in villages have high level of food neophobia and chose less products that contain neophobic potential ingredients (Guzek et al., 2019).

To our knowledge, studies on how FNS can be applied to measure the reluctant towards ethnic food in Indonesia are scarcely carried out. There was one study on the perception of modernized traditional Indonesian food that used the attitude towards traditional food (ATTF) and FNS questionnaire. They found that consumers are less likely to accept modernization aspects of the food and more likely to choose traditional version as it is in accordance with the traditional value experience that consumers have in mind or by other mean that they feel more familiar with the traditional ones (Fibri & Frøst, 2019). FNS have been applied towards major English-speaking respondents (Damsbo-Svendsen et al., 2017b; Pliner & Hobden, 1992). However, it is not a simple task to apply FNS in other language speaking countries since language differences will impact on the data reliability (de Almeida et al., 2020; Previato & Behrens, 2015).

Translation and validation of the questionnaire are then needed prior to the application of the FNS (Kalfoss, 2019). Hence, this study aims to provide a reliable and valid translation of English version of FNS into Indonesian (*Bahasa Indonesia*) version and to measure the neophobia level on several ethnic foods using the translated version of FNS. A stepwise process of translation technique was performed in order to critically adjust the scale to match the understanding of respondents in different country and culture (Previato & Behrens, 2015).

## Method

### Overview

This research was performed by following Richard Ohrbach et al. (2009) and de Andrade Previato & Behrens (Previato & Behrens, 2015) in conducting the translational and statistical data analysis. Firstly, three university lecturers of English Literature Department were invited to translate and other three lecturers from the same department to back-translate the FNS. A focused discussion panel was then performed after each translation process to obtain a final translation of FNS. Subsequently, the respondents (students of Soegijapranata Catholic University) were purposively recruited to answer the FNS for both English and its Indonesian translation version (Richard Ohrbach et al., 2009). Results were then compared and analyzed. Translated Indonesian FNS was then tested to other respondents to study the ethnic food neophobia.

### Translation and Back-translation of FNS

A total of six English experts from the English Literature Department, Soegijapranata Catholic University were invited to perform translational process of FNS. The expert panel was divided into two groups, namely the first group that carried out direct translation and the second group that carried out back-translation process. The first translated scales were discussed in a focus group discussion to obtain one draft of Indonesian FNS version. An independent back-translation was then performed from the Indonesian version into English

by other three English experts from the same department, who have similar expertise level with the former translators. Focus group discussion was also conducted to evaluate the FNS that had been translated and then paired it with the earliest version of the FNS to get the Indonesian version of the FNS. This back-translation was meant to verify the conformity between both questionnaires, both for language and concept similarity from the first instrument (Richard Ohrbach et al., 2009).

## Validation of the Indonesian Version of FNS

The FNS test was run to 400 undergraduate students of Soegijapranata Catholic University which were selected as respondents, and 381 students of whom successfully completed the test. They had to answer two versions of questionnaire, i.e. the English and Indonesian versions, consecutively. Respondents were randomly separated into two teams, i.e. first one must answer the Indonesian version at first. At the same time, the second one must answer the original English scale. Each of them was then asked to answer the other scale (Indonesian or original English) in a one-week interval from the first to avoid any bias from answering the scale because the content of the translated questionnaire is the same. The English proficiency of the respondents was also recorded and classified based on a cut-off AB grade (3.5 out of 4) on English course they had taken. Among 381 students, 150 respondents were in the group of A and AB grades of English proficiency and the other 231 respondents were in the B to CD grades.

## Food Neophobia Test on Ethnic Food

The validated Indonesian version of FNS was subsequently tested to measure the neophobic level of respondents on specific ethnic foods. The questionnaire was adjusted by changing the term "ethnic food" into the specific name of the dish. To include the familiarity factor of the respondents, two of the least and two of the most familiar ethnic foods were selected by 50 university students by giving a familiarity rank among ten ethnic foods that were provided to respondents. Since there are many ethnic foods in Indonesia, previously, ten ethnic foods were subjectively selected by the researchers based on their popularity in certain regions, namely *coto Makassar, sayur umbut rotan, pempek Palembang, ayam betutu, saksang, papeda, saren, belalang goreng, sate ulat sagu*, and *soto kerbau*. Eventually, the measurement of food neophobia levels of the respondents particularly on the four ethnic foods was performed by other 100 students randomly chosen among students' population.

## Data Analysis

Total scores of each respondent were calculated from the scores obtained in every item. The statement of items number 1, 4, 6, 9, and 10 were reversed because they were negative items (i.e. correspond more to neophilia). The FNS was classified into three categories, the score ≤ 16.4 is classified as food neophilic, 16.5-38.5 as neutral, and ≥ 38.6 is classified as food neophobic (Previato & Behrens, 2015). The Cronbach alpha coefficient was employed to confirm the reliability and consistency of the questionnaire (Shrestha, 2021). Classification of alpha coefficient is considered great if the α is more than 0.8, good if the α is between 0.7 and 0.8, and acceptable if the α is between 0.6 and 0.7. The cut-off points of intraclass correlation coefficient (ICC) were classified as perfect agreement (0.8-1.0), substantial (0.61-0.80), moderate (0.41-0.60), fair (0.21-0.40), discrete agreement (0-0.20), and poor agreement (<0.001). The ICC identifies the consistency of rating a similar value within a group or the reproducibility of FNS score in each items (Miot, 2018). Wilcoxon test was also performed to examine whether each question is perceived similar between both English (original) FNS and Indonesian FNS. Additional screening of English proficiency of respondents was also chosen as a factor that was hypothesized could affect the

understanding of both original and translated questionnaire. All data were analyzed in Excel and SPSS version 20.0.

## Results and Discussion

### The Respondent Profiles

Table 1 shows that 381 respondents of the validation study comprise of 72% female and 28% male, where the ages were between 19 and 20 years old. In regards to English proficiency, 150 respondents have 'A' or 'AB' grade of English proficiency course, where most respondents have 'B' grade.

**Table 1.** The respondent profiles.

| Profile | | Count | Percentage (%) |
|---|---|---|---|
| Total Respondents | | 381 | 100.00 |
| Age (y.o.) | 18 | 24 | 6.30 |
| | 19 | 152 | 39.90 |
| | 20 | 147 | 38.58 |
| | 21 | 49 | 12.86 |
| | >21 | 9 | 2.36 |
| Gender | Female | 276 | 72.44 |
| | Male | 105 | 27.56 |
| English proficiency grade* | A | 77 | 20.21 |
| | AB | 73 | 19.16 |
| | B | 105 | 27.56 |
| | BC | 69 | 18.11 |
| | C | 40 | 10.50 |
| | CD | 17 | 4.46 |

* A = excellent, AB = very good, B = good, BC = satisfactory, C = sufficient, CD = pass.

### Translation of the FNS

The application of FNS questionnaire towards cross-cultural country might lead to an inaccurate result due to different language and local context. This can be hindered by using a series of translational process to improve its validity and reliability (Egolf et al., 2019). This process is not a merely literal translation but the cultural background related to the text must be considered in order to give the most accurate result and minimum bias (Kalfoss, 2019). Following the guidance of World Health Organization (WHO), a basic translational method has been developed, i.e. extracting multiple translation, back and forward translation, discussion, and final conclusion, to provide more accurate and reliable questionnaire (Ricard Ohrbach et al., 2012).

**Table 2.** The translation of FNS.

| Items of Questionnaire | Statement |
|---|---|
| Item 1 | I am constantly sampling new and different foods |
| Translation | *Saya selalu mencoba makanan yang baru dan berbeda* |
| Back Translation | I always try new and different food |
| Final Conclusion | *Saya selalu mencoba makanan yang baru dan berbeda* |
| Item 2 | I don't trust new foods |
| Translation | *Saya tidak percaya pada makanan baru* |
| Back Translation | I do not trust in new food |
| Final Conclusion | *Saya tidak percaya pada makanan baru* |
| Item 3 | If I don't know what is in a food, I won't try it |
| Translation | *Jika saya tidak tahu bahan suatu jenis makanan, saya tidak mau mencoba makanan tersebut* |
| Back Translation | If I do not know the ingredients of a kind of food, I do not want to try it. |
| Final Conclusion | *Jika saya tidak tahu bahan suatu jenis makanan, saya tidak mau mencoba makanan tersebut* |
| Item 4 | I like foods from different countries |
| Translation | *Saya menyukai makanan dari berbagai negara* |
| Back Translation | I like food from various country |
| Final Conclusion | *Saya menyukai makanan dari berbagai negara* |
| Item 5 | Ethnic food looks too weird to eat |
| Translation | *Makanan daerah lain tampak aneh untuk dimakan* |
| Back Translation | Local food looks strange to eat. |
| Final Conclusion | *Makanan daerah tampak aneh untuk dimakan* |
| Item 6 | At dinner parties, I will try a new food |
| Translation | *Di pesta makan malam, saya mau mencoba makanan baru* |
| Back Translation | At a dinner party, I want to taste new food |
| Final Conclusion | *Di pesta makan malam, saya mau mencoba makanan baru* |
| Item 7 | I am afraid to eat things I have never had before |
| Translation | *Saya takut makan makanan yang belum pernah saya coba sebelumnya* |
| Back Translation | I am scared to eat food that I've never tasted before |
| Final Conclusion | *Saya takut makan makanan yang belum pernah saya coba sebelumnya* |
| Item 8 | I am very particular about the foods I will eat |
| Translation | *Saya sangat pilih-pilih makanan yang akan saya makan* |
| Back Translation | I am very picky about the food I want to eat. |
| Final Conclusion | *Saya sangat pilih-pilih makanan yang akan saya makan* |
| Item 9 | I will eat almost anything |
| Translation | *Saya makan hampir semua jenis makanan* |
| Back Translation | I eat almost any kind of food |
| Final Conclusion | *Saya akan makan hampir semua jenis makanan* |
| Item 10 | I like to try new ethnic restaurant |
| Translation | *Saya suka mencoba restoran etnik yang baru* |
| Back Translation | I like trying a new ethnic restaurant |
| Final Conclusion | *Saya suka mencoba restoran etnik yang baru* |

Table 2 shows the result of the translation, back translation, and final discussion of the FNS. The first translation was able to conclude suitable Indonesian language based on the judgement and assessment of three translators. The translation process of each item was also concluded by an agreement between translators after considering the grammar. Few examples were briefly described as follow: The word 'constantly' (in the statement of item 1) was translated to "*selalu"* rather than "*secara teratur*", since "*selalu*" is closely connected to "constantly" or "always". Moreover, it is more common to use this word rather than "*secara teratur*". The word "ethnic" was translated as "*etnik*" the statement of item 10, but it was translated as "*daerah*" in the statement of item 5, because ethnic restaurant can specifically describe the type of food in the context of region as well as its ethnicity, such as Javanese, Sundanese, and Papuans (Wijaya, 2019). In the final discussion, the word "*kandungan*" was changed to "*bahan*" (item 3). This alteration was made because "*kandungan*" will be perceived to describe nutrient content, such as protein, carbohydrates, and fat. Meanwhile the intended meaning of the statement is more likely to be perceived as the composition of ingredients, which is most closely related to the word of "*bahan*". These examples highlight the importance of considering cultural context and stepwise translation to produce appropriate and accurate translation.

## Validation of the English and Indonesian FNS

Validity and reliability assessment were needed to obtain both reproducible and accurate measurement (Budiastuti & Bandur, 2018). Several studies on FNS application have applied the assessment after the result of translation process was obtained (Damsbo-Svendsen et al., 2017a; Previato & Behrens, 2015). The reliability assessment shows that the ICC of the Indonesian FNS is 0.846 (Table 3), indicating that the questionnaire is reliable. A previous translational study on Brazilian Portuguese version of FNS reported that the ICC of translated questionnaire was 0.903, which shows good reliability of the final Brazilian-Portuguese version of the FNS (Previato & Behrens, 2015). Indonesian version was able to produce an acceptable score of the alpha coefficient at 0.783. These results therefore suggest that the translated questionnaire is reliable and reproducible to be used by Indonesian respondents.

Result of the Wilcoxon test shows that three items have significant differences (i.e. items 6, 7, and 8 have *p* value of 0.008, 0.003, and 0.004, respectively). The significant difference indicates that both questionnaires were perceived differently by the respondents. This could be not only due to differences in English proficiency among respondents, but also specific context matters. Different eating lifestyle among respondents, who are were university students, could become a factor that affect different perception in those items. The term "dinner *parties*" (item 6) can be differently perceived with the translated "*pesta makan malam",* or dinner parties, since this might not be a day to day of student's eating lifestyle.

A comparison of FNS between data taken from overall 381 respondents versus 150 respondents having only A and AB English course grades shows that the overall respondents have lower alpha coefficient and ICC, i.e., 0.846 and 0.783 compared to 0.859 and 0.806, respectively. Interestingly, a significant difference of Wilcoxon *p* value based on the respondents' English proficiency occurred only at item 8 ($p = 0.006$). Accordingly, de Andrade Previato & Behrens (Previato & Behrens, 2015) reported that FNS on item 8 shows a significant difference at 95% confidence interval, implying that this item 8 is perceived differently by the respondents. Previous studies also reported that item 8 could be perceived more on dietary restriction and health aspect rather than neophobia itself, and thus it was considered less suitable in the food neophobia assessment (Previato & Behrens, 2015; Ritchey et al., 2003).

**Table 3.** Validity scores of the english and the indonesian fns (*n*=381 respondents).

| Pair | Language Version | Mean ± SD | Wilcoxon Test P | | ICC |
|---|---|---|---|---|---|
| | | | Overall | A-AB (*n* = 150) | |
| 1* | English | 3.40±1.35 | 0.567 | 0.372 | 0.44 |
| | Indonesian | 3.35±1.48 | | | |
| 2 | English | 3.24±1.31 | 0.924 | 0.977 | 0.582 |
| | Indonesian | 3.22±1.29 | | | |
| 3 | English | 4.09±1.60 | 0.736 | 0.278 | 0.423 |
| | Indonesian | 4.11±1.63 | | | |
| 4* | English | 2.84±1.35 | 0.286 | 0.594 | 0.573 |
| | Indonesian | 2.91±1.39 | | | |
| 5 | English | 3.67±1.47 | 0.313 | 0.249 | 0.387 |
| | Indonesian | 3.61±1.38 | | | |
| 6* | English | 2.63±1.26 | 0.008** | 0.189 | 0.652 |
| | Indonesian | 2.45±1.20 | | | |
| 7 | English | 3.74±1.48 | 0.003** | 0.285 | 0.614 |
| | Indonesian | 3.53±1.47 | | | |
| 8 | English | 4.38±1.38 | 0.004** | 0.006** | 0.301 |
| | Indonesian | 4.06±1.74 | | | |
| 9* | English | 3.48±1.50 | 0.067 | 0.797 | 0.684 |
| | Indonesian | 3.64±1.57 | | | |
| 10* | English | 3.14±1.35 | 0.271 | 0.619 | 0.608 |
| | Indonesian | 3.20±1.37 | | | |
| ICC of total summed questionnaire | | | | 0.846 | |
| Cronbach Alpha Coefficient | | | | 0.783 | |

* Reversed items
** Significantly different by 95% confidence interval
A-AB English grades

## Application of Indonesian FNS on Ethnic Food Study

In order to examine food neophobia towards ethnic foods in Indonesia, the Indonesian version of FNS was then applied to several ethnic foods that are produced in major Islands in Indonesia (Sumatra, Jawa, Bali, Papua, Kalimantan, and Sulawesi). By employing a case study approach, ten ethnic foods were subjectively selected, by the researchers, among many ethnic foods (Figure 1) and screened into four according to its familiarity (Figure 2).

The demographic profile of 100 respondents is presented in Table 4. Since the respondents were Soegijapranata Catholic University students, most of them were coming from Central Java. A small proportion from West Java and other regions. They were all living in Semarang city, Central Java for their study.

Table 5 shows that respondents tend to avoid unfamiliar foods (*sayur umbut rotan* and *sate ulat sagu*) when compared to the more familiar ones, i.e. *pempek Palembang* and *ayam betutu*. Interestingly, the more familiar ones are not necessarily related to the neophilic score but to the neutral. In general, familiarity indeed impacts on the FNS score; i.e. respondents who are more familiar with the food will be less to be food neophobic (de Oliveira Torres et al., 2020).

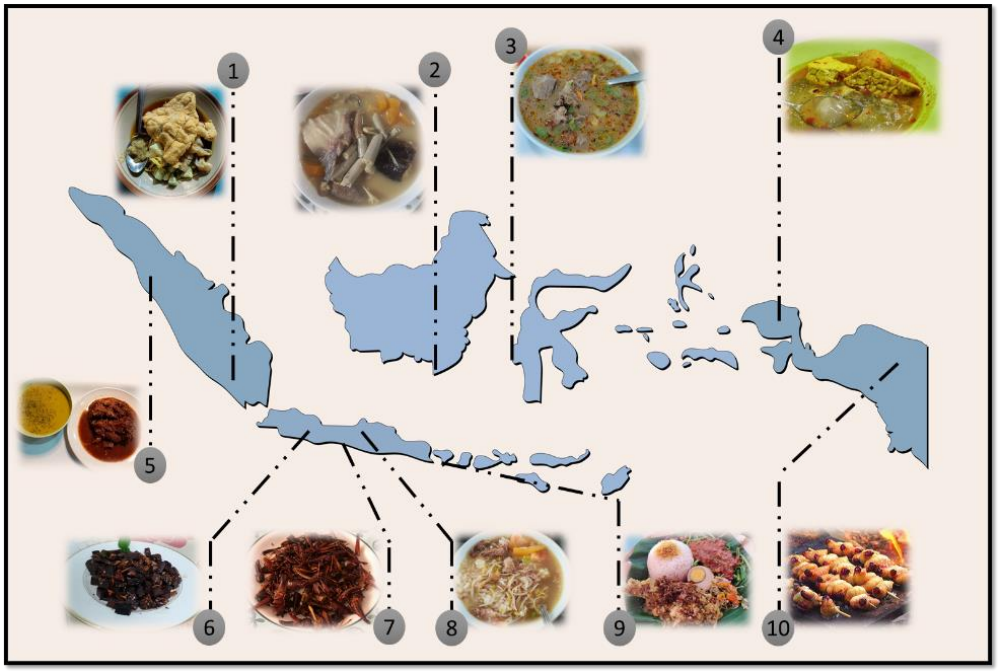


**Figure 1.** The Indonesian ethnic foods selected as a case study (1) *Pempek Palembang*; (2) *Umbut Rotan*; (3), *Coto Makassar*; (4), *Papeda*; (5) *Saksang*; (6) *Saren*; (7) *Belalang Goreng*; (8) *Soto Kerbau*; (9) *Ayam Betutu*; (10) *Sate Ulat sagu*. (1,3-9: Private sources, 2: kindly provided by Mr. Menteng Gohong; 10: was taken from Instagram under permission from @yoboi.faa).


**Figure 2.** A & B: the least familiar ethnic foods (*umbut rotan* and *sate ulat sagu*, respectively), C & D: the most familiar ethnic foods (*pempek palembang* and *ayam betutu*, respectively) (source: private source, A: kindly provided by Mr. Menteng Gohong; B: taken from Instagram under permission and support from @yoboi.faa).

**Table 4.** The respondent profile on FNS study applied to ethnic food.

| Profile | | Count | Percentage (%) |
|---|---|---|---|
| Total Respondents | | 100 | 100.00 |
| Age | 18 | 6 | 6.00 |
| | 19 | 32 | 32.00 |
| | 20 | 24 | 24.00 |
| | 21 | 11 | 11.00 |
| | >21 | 4 | 4.00 |
| Gender | Female | 50 | 50.00 |
| | Male | 50 | 50.00 |
| Region of Origin | West Java | 15 | 15.00 |
| | Central Java | 82 | 82.00 |
| | Sulawesi | 1 | 1.00 |
| | Yogyakarta | 1 | 1.00 |
| | Nusa Tenggara Barat | 1 | 1.00 |

**Table 5.** Food neophobia classification of the ethnic foods.

| Categories | *Pempek* | *Ayam Betutu* | *Ulat Sagu* | *Umbut Rotan* |
|---|---|---|---|---|
| Neophilic | 1 | 2 | 0 | 0 |
| Neophobic | 14 | 20 | 85 | 70 |
| Neutral | 86 | 79 | 16 | 31 |

*Pempek Palembang* is originated from South Sumatra, specifically it is well known as the food of Palembang city. It is a fish cake dish shaped into different forms and with different proportion of fish, tapioca flour, and egg filling. *Pempek* dough is firstly steamed before fried and served with a typical dark sweet-sour sauce, called *cuko*, which is made from brown sugar, chilli pepper, garlic, vinegar and salt (Supriadi et al., 2020). *Ayam betutu* is a Balinese style braised chicken dish, based on its Hindu Balinese ethnicity as a food offering. It is cooked with many spices that is called *"jangkep"* or complete (Purna, 2019). *Pempek Palembang* and *ayam betutu* are two examples of ethnic foods that have been widely available across Indonesia, making them easier to be accepted by the respondents, as their flavor and taste profile are much likely expected.

However, the ethnic foods *sayur umbut rotan* and *sate ulat sagu* are not as popular and widely available as the former two dishes. These make the expectation of unknown taste and can trigger the presence of danger in their taste and flavor expectancy, especially when the study was done by students located in Central Java region. *Sayur umbut rotan* is an ethnic food originated from Borneo Island, especially among the *Dayak* ethnicity. It is a vegetable taken from the young rattan shoot (Gusniati et al., 2017). *Sate ulat sagu* is originated from Papua. It is a skewed larva of red beetle (*Rhynchophorus ferrugineus*), which is then barbecued. It is rich in protein and becomes one of animal protein source among Papua citizens (Mukaromah & Ethica, 2018; Nuban et al., 2020). The respondents who are originated from the regions that produce *sayur umbut rotan* or *sate ulat sagu* might not be neophobic as they will feel familiar.

The results indicate that the level of neophobia towards a specific ethnic food depends on the familiarity of the respondents have, which is most likely related to their ethnicity and region, as well as on the avoidance attitude related to taste and other sensory attributes. The demographic data gives a picture of respondent distribution involved in the study of focused FNS (Table 4). Therefore, the finding could not describe the wider scope situation, e.g., in relation with different age, social condition, and other parameters.

A previous study in Switzerland showed that people with increasing age, particularly in male, have higher food neophobia levels, and people with higher income and educational background have lower food neophobia. Moreover, people living in urbanized area and French-speaking region in Switzerland have less neophobia trait in comparison of German-speaking region (Siegrist et al., 2013). Another food neophobia study among German adolescent reported that overall food neophobia decreases in girls in accordance with the increase age. Meanwhile, for male during childhood and adulthood show higher food neophobia level, but there are no differences between male and female during adolescents. The authors expected educational background, social background, sex, age, and urbanization could correlate with food neophobia (Verbeke & López, 2005). Predieri et al. (2020) reported that Italian respondents at 46 – 60 years old had the highest score of food neophobia scale (28.9) than ones at 31 – 45 (score 26.4) 18 – 30 years old (score 26.3).

Our current study predicted that university students might have broad knowledge of ethnic foods that might reduce their neophobic behavior of unfamiliar foods. Costa et al. (2020) reported that consumers with higher level of education have higher scores of food neophobia scale than the lower level ones. However, demographic factors towards food neophobia need more confirmation analysis, particularly in Indonesia, and with broader range of respondents are needed. A more comprehensive study could also be performed by an open-wide survey for bigger numbers of respondents to share their idea of food neophobia by different ethnicity. To our knowledge, studies on ethnic food neophobia are much less performed than on other types of food.

Another study reported that picky eaters are those with higher neophobia behavior, particularly their sensitivity in food flavor odor, texture, and taste shown by its high degree of FNS (Kauer et al., 2015). Ones with extreme picky eating behavior might come to problem in eating a diverse and nutritional foods that leads to eating disorder. Previous studies have associated food neophobia with more consumption of unhealthy foods and low consumption of vegetables, fish, and fruit that lead to poorer overall dietary intake (Elkins & Zickgraf, 2018; Helland et al., 2017). Particularly in children, food neophobia can be considered crucial as their reluctance behaviour will often lead to malnutrition due to poor fruit and vegetable consumption (Kähkönen et al., 2018; Kutbi, 2020). The typical taste and texture of vegetables are negatively perceived by the food neophobia consumers (Appleton et al., 2019). One study in pre-school children from southern Poland reported that the level of food neophobia in children was not correlated with their socio-economic status. Neophobic children's diets were poorer in vegetables compared with children with low levels of neophobia, which resulted in deficiency in realisation of the norm for vitamin C (Kozioł-Kozakowska et al., 2018). Accordingly, a study reported that in the Finnish and Estonian adult populations, a higher level of food neophobia was associated with lower dietary quality, adverse concentrations of health-related biomarkers, and a higher incidence of chronic diseases (Sarin et al., 2019).

Initial exposure of product knowledge may contribute to the reduction of food neophobia traits. Knowing that the food is also consumed by others with the taste that they consider "at least OK" could influence to not be afraid in trying something new (Herman et al., 2019). Especially in the childhood period, several methods of reducing food neophobia trait could be applied. When a food neophobic child is not immediately treated, this trait could still persist to further age development into adulthood. Hence, early education and dietary practices from parents could be crucial in reducing this trait (Øverby et al., 2020). A previous study reported that a web-based intervention trial to educate children, kindergarten personnel, and parents about sensory and healthy dietary intake could reduce the level of food neophobia of children and improves children's cognitive development (Blomkvist et al., 2018). Parental guidance and breast-feeding period might also impact the degree of food neophobia as their child grows. It was found that longer exposure of breast-feeding duration of a newborn baby could enhance their acceptance of food and thereby promote in decreasing food neophobia (Elkins & Zickgraf, 2018; Kutbi, 2020). Frequent

exposure to the wide variety of food choices since beginning and techniques to include unfamiliar food or ingredients (i.e. vegetables in children) into familiar food could also become solutions in order to tackle food neophobia (Blomkvist et al., 2018). Interestingly, the intensity of exercise could lead to food neophobia as the less frequent exercising could lead to a lower intake of variety of food but more on the high sugar food (Guzek et al., 2018).

## Conclusion

A translational process of FNS from English to Indonesian language has been undertaken in this study and confers very good agreement and good reliability at 0.846 and 0.783 of the ICC and alpha coefficient, respectively. The translated FNS was successfully applied to classify several ethnic food neophobia among specific respondents. Application of the Indonesian version of FNS could be beneficial in determining food neophobia traits among Indonesian citizens and thus could identify their reluctance of new, novel, and especially ethnic foods.

Demographic factor can be an unresolved key that might answer food neophobia among Indonesian citizens. Therefore, various demographic factors can be involved with a broader range of ethnic food used by open-source survey. Vast application of Indonesian FNS and its scale conversion into childhood FNS can also be undertaken to further grasp the influence of the willingness to try ethnic foods among Indonesian respondents towards their custom dietary intake.

### List of Abbreviations

FNS : Food Neophobia Scale
ATTF : Attitude Towards Traditional Food
CFNS : Child Food Neophobia Scale
FTNS : Food Technology Neophobia Scale

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### Author Contributions

PYN, YKSU, IH discuss the idea and prepare the conceptual and technical design of experiment, data analysis, and drafting the manuscript. YKSU conducted the survey and data analysis. YKSU, IH, and PYN write the final manuscript. The authors read and approved the final manuscript.

### Availability of the Data

The authors confirm that the data supporting the findings of this study are available within the article.

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