The Pattern of Local Cassava-Based Processed Food Choice in Lampung Province

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Abstract

Local food is a potential commodity in food consumption diversification. Tapioca vermicelli and "siger" rice are two local foods developed in Lampung Province. However, these products have not brought any contribution to the community's food consumption pattern. The objective of this study is to analyze the choice pattern and any factors relating to the choice of tapioca vermicelli and "siger" rice. This research used a quantitative research approach with a survey method. It was conducted in Metro City and Pringsewu Regency with a sample of 110 households. The analysis of Chi-Square descriptive statistics and correlation was used to analyze the data. The results of the research found that tapioca vermicelli is quite popular (widely chosen) by the families living around the agroindustrial area of Metro City. However, "siger" rice is not widely used by people in this location. Tapioca vermicelli is consumed more often with meatballs in a medium frequency and total consumption of 45.33 grams/household/day. "Siger" rice is consumed as a variation with rare consumption, and its average consumption amount is 9.34 grams/household/day. Any variables related to vermicelli tapioca choice are knowledge level on food diversification, education level, age, household income and knowledge level on nutrition. Whereas, any factors related to "siger" rice choice are product identification, knowledge of food diversification and accessibility.

Keywords: food choice patterns, local food, "siger" rice, tapioca vermicelli

INTRODUCTION

Food is a primary need for humans. For this reason, the fulfillment of food becomes a part of human rights. The importance of food for human life makes food development a crucial aspect of each country, especially in developing countries (Boratyńska & Huseynov, 2017; Choudhury & Headey, 2017). Good food security is a manifesttation of successful food development. One of the depictions of the achievement of food security is the condition where country and individual needs of food are fulfilled and sufficient, both from its amount and quality, safety, diversity and nutrition (Law No, 18/2012). From this Law, it can be seen that food sufficiency and diversification are vital in food security. One of the government's programs to actualize food security is Food Diversification Program (Junaedi et al., 2016; Khaeron et al., 2016).

Food diversification strategy is used to minimize dependency on rice consumption. The advantage of food diversification is a variety of food alternatives offered and it is not only focused on rice (Hanani, Asmara, & Nugroho, 2008).

Although many efforts to promote food diversification has been carried out, the expected result has not been achieved. Rice consumption is still high and the targeted food diversity score (Desirable Dietary Pattern/DDP) has not been achieved. The average rice consumption of Indonesia is 233 gram per capita per day or about 85 kg per capita per year (Central Statistics Agency, 2013). That amount is above Japan (45kg per capita per year), Thailand (65kg per capita per year) and Malaysia as well as Vietnam (70kg per capita per year). National desirable dietary pattern/DDP score is 75.4 and it is still lower than the target in 2012 as many as 89.9% (Hardono, 2014).

Law on Food Year 2012, stated that any food diversification effort is based on the potential local resource (Hanafie, 2010; Suter, 2014). The government has started the acceleration effort on food diversification by utilizing local food since 2009, by issuing Presidential Decree (Perpres) Number 22. Local food can be fresh food or processed food. Any local food commodity that has been inspected and tested in industrial-scale namely: corn (Surani, 2013; Suarni & Yasin, 2011), sweet potato product (Marta & Tensiska,

2013) and cassava (Prabawati, Richana & Suismono, 2011), nuts (Haliza, Purwani & Thahir, 2010) and sorghum (Irawan & Sutrisna, 2011). Besides, several kinds of flour (wheat flour, corn and soybeans) can also be used for improving food diversity (Hermayanti, Rahmah & Wijana, 2016).

The commodity of cassava is a potential local food that plays a vital role in food diversification of Lampung Province, considering that Lampung is the leading producer of cassava in Indonesia. The most common form of processed cassava is tiwul. This food is generally known as household processed food. Since 2012, tiwul has been commercially produced (home/small industries) and named as "siger" rice (rice made from "siger" cassava). Besides tiwul, another cassava-based product is tapioca vermicelli in the form of noodles. Cassava-based noodles (tapioca vermicelli) has been widely known in certain regions. Even though tapioca vermicelli and "siger" rice (tiwul) have long been produced in Lampung Province, these dishes consumption is still limited. Tapioca vermicelli has only been known in certain regions with low consumption (Vidyaningrum, Sayekti & Adawiyah, 2016). Similarly, "siger" rice is also consumed more by people with diabetes with the contribution of energy sufficiency of 10.84% (Sayekti, Lestari & Ismono, 2017).

Food consumption is highly associated with decision making in choosing food. Therefore, to improve food consumption, food choice pattern and any factors influencing it must be figured out. This research reviewed household choice/decision making in consuming tapioca vermicelli and "siger" rice. There are a lot of factors determining food choices, such as economic factors and access towards food and behavior factors (Dimitri & Rogus, 2014). A variety of research mentioned that income has an impact on food consumption (Devi & Hartono, 2015). Access to food is related to food availability. Apriani & Baliwati (2011) explained that food availability influences carbohydrate source food consumption. In this case, the behavior factor includes individual or consumer behavior. Consumers' decision-making model consists of three components; those are input, process and output (Schiffman & Kanuk, 2007). The input type is categorized into marketing input and socio-cultural input. This research aims to analyze the choice pattern and any factors relating to tapioca vermicelli and "siger" rice choice in Lampung Province.

METHODS

Research Variable

Tapioca vermicelli and "siger" rice is local cassava-based processed food that its consumption needs to be improved for the sake of realizing food diversification. Food consumption behavior is highly related to food choice. Dimitri & Rogus (2014) stated that food choice is determined by the economic factor, access towards food and behavior factor. In this research, some variables used were income (economic factor), accessibility and identification level (access). Meanwhile, behavior factors were including education level, nutrition knowledge, psychological readiness on food diversification (knowledge, attitude and consumption tendency).

Research Design, Place and Time

The research was conducted using a survey method. The population used were the households around tapioca vermicelli and "siger" rice agroindustry. The research location of the agroindustry of tapioca vermicelli was Metro City, Lampung Province. This location was chosen as Metro City is the center of the tapioca vermicelli industry. Agroindustry of tapioca vermicelli in Metro City is Sinar Harapan, Bintang Obor and Monas Lancar. Margosari Village, North Pagelaran District, Pringsewu Regency was chosen as research location because at that location there was "siger" rice agroindustry that was Kelompok Tani Wanita (Women's farmers Group) Melati. This "siger" rice agroindustry was intentionally chosen by considering that there has not been any research performed relating to the topic in this location. The data collection was conducted in January-May 2017.

Research Samples

The population around tapioca vermicelli agroindustry were Banjarsari and Karangrejo Village, Metro Utara District, and Iringmulyo Village Metro Timur. As many as 1,022 households/heads of family were studied. Besides, in Margosari (Pekon) Village, Pringsewu Regency is as many as 686 households. Sample calculations were based on these following formulation of Sugiarto et al. (2003).

$$n = \frac{N.Z^2.S^2}{N.d^2 + Z^2.S^2}$$

Description:
n   = amount of the samples
N   = population

Z   = trust level (95% = 1.96)
d   = degree of deviation (5% = 0.05)
S   = sample variation (5% = 0.05)

From the calculation of the formula, samples obtained were including 71 households for Metro City and 39 households for Pekon Margosari of Pringsewu Regency. Samples were selected using proportional random sampling for Metro City and simple random sampling for Pringsewu Regency. Analysis unit of this research were household, while the subject of this research were housewives.

Data Type and Research Operational Limitation

The data used were primary and secondary data. Primary data were obtained using an interview method using a questionnaire. It included choice data/decision making/tapioca vermicelli and "siger" rice consumption, psychological readiness against food diversification, knowledge on nutrition, identification level on tapioca vermicelli and "siger" rice, accessibility on tapioca vermicelli and "siger" rice, housewives' age and education level and also households' income. The secondary data were taken from the associated agency and any literature, including the data of the community's food consumption obtained from Food Security Agency and Central Statistics Agency of Lampung Province, Metro City and Pringsewu Regency.

Operational Limitation and Variable Measurement of the Research

The choice of tapioca vermicelli and "siger" rice will be assessed from how households are consuming those foods; 1) consume both foods (score 1) 2) do not consume both foods (score 0). The choice pattern of tapioca vermicelli and "siger" rice is how housewives choose tapioca vermicelli or "siger" rice and use it for everyday consumption. That choice pattern was reflected from the amount, frequency and processed product type of tapioca vermicelli or "siger" rice.

Psychological readiness on food diversification in this research was measured using knowledge, attitude against food diversification and the tendency of consuming carbohydrate source food of non-rice. Seven valid and reliable indicators for the psychological readiness variable on food diversification can be seen in Table 1. Scoring for each indicator was using Likert Scale 1-5.

Table 1 lists seven indicators that includes: knowledge on food diversification and local food (knowledge dimension), indicators of local food role in manifesting food diversification, the importance of consuming local food and the importance of socialization on staple food diversification (attitude dimension) and indicator of

Table 1. Result of validity and reliability test in psychological readiness in encountering food diversification

Indicator	Validity test		Reliability test	
	Value	Result	Value	Result
Knowledge of food diversification	0.768	Valid		
Knowledge of local food	0.641	Valid		
Role of local food in food diversification	0.593	Valid		
The importance of consuming local food	0.583	Valid	0.731	Reliable
The importance of local food socialization	0.489	Valid		
Local food consumption act	0.613	Valid		
Local food for the entire family	0.454	Valid		

Source: Primary data analysis (2018).

Table 2. Result of validity and reliability test on consumers' accessibility towards tapioca vermicelli and "siger" rice

Indicator	Validity test		Reliability test	
	Value	Result	Value	Result
Business scale	0.293	Valid		
The amount of shop	0.351	Valid		
Street condition	0.567	Valid		
Transportation	0.546	Valid	0.680	Reliable
Street width	0.235	Valid		
Street quality	0.556	Valid		
Layout	0.213	Valid		

Source: Primary data analysis (2018)

local food consumption and local food choice (dimension of tendency to consume non-rice local food).

Housewives' knowledge of nutrition was measured from 25 questions on nutrition and healthy food, score 1 for a true answer and 0 for a false answer. The score of knowledge about nutrition was then categorized into three (3): low, medium and high. The identification level of tapioca vermicelli and "siger" rice can be seen from respondents' ability to answer any question on tapioca vermicelli and "siger" rice. The assessment of respondent ability to answer any questions on tapioca vermicelli was ranging from 1-4, while on "siger" rice was ranging from 1-3 (less understand-understand). Accessibility on tapioca vermicelli and "siger" rice was assessed from several indicators related to accessibility on tapioca vermicelli and "siger" rice. Each indicator was scored with Likert Scale (5 scale).

Data Analysis

Data analysis was conducted descriptively and statistically using *Chi-Square*. *Chi-Square* was used to analyze any factors related to tapioca vermicelli and "siger" rice choice. The chi-Square method was used as it is needed to see the relationship independent variables and dependent variables. The variable measurement scale was nominal and ordinal. The hypothesis proposed was household income, housewives' education levels, housewives' age, psychological readiness on food diversification, knowledge level on nutrition, identification level on local processed food, knowledge level on food diversification and accessibility on local processed food related to decision making (choosing/consuming and are not choosing/consuming) on local processed food.

RESULTS AND DISCUSSION

Households' Socio-Economic Conditions

The respondents of this research were housewives as the main controller of the household food consumption. Most housewives who become respondents in Metro City (94.37%) were in productive age, the rest were old, while all respondents in Pringsewu Regency were in productive age.

Most respondents were housewives. In other words, they did not go to work to get a salary (have other occupations). Respondents who were unoccupied in Metro City were 60.56%, while in Pringsewu Regency was 48.72%. Most households' income in Metro City was between IDR 650,000.00 up to IDR 2,000,000.00 per month (54.93%). In Pringsewu Regency, the income of most households is under one million rupiahs per month (64%).

The education levels of most housewives in Metro City were in the group of Junior High School (SMP), which was 46.48%. While in Pringsewu Regency, the education levels of most housewives were Elementary School (SD), which was around 48.72%. The condition showed that in both research regions, the education level of the housewives was low, up to Senior High School (SMA). Each was 46.48% (Metro City) and 89.74% (Pringsewu Regency).

Choice/Consumption Pattern of Tapioca Vermicelli and "Siger" Rice

Many households around the agro-industry of tapioca vermicelli in Metro City consume tapioca vermicelli (48.10%). Most tapioca vermicelli consumption was with meatball processed products (as a complement). Table 3 presents the consumption frequency of tapioca vermicelli based on the processed product type.

The frequency score for tapioca vermicelli in meatball was the highest of three other processed products. In this case, tapioca vermicelli consumption in meatball was the substitution of noodles, which means that it can reduce the consumption of wheat flour-based noodles. The average amount of tapioca vermicelli consumption in the household around agro-industry was 20.75 grams/household/day. This was lower than the research result of Vidyaningrum et al. (2016) that was 45.33 grams/household/day. The difference occurred as the research objects were also different. Vidyaningrum et al. (2016) inspected housewives who bought tapioca vermicelli in the market, while this research inspected housewives in general.

From 39 households around "siger" rice agro-industry, there were 5 households (12.82%) consuming "siger" rice. But the "siger" rice they consumed was not produced by the local industry and the type of processed products was different from the product of agro-industry. The processed product of "siger" rice were in the form of tiwul and oyek. Tiwul and oyek were rarely consumed as a variation. The average consumption amount of "siger" rice was 9.34 grams/households/day.

Table 3. Consumption frequency of tapioca vermicelli processed product by households

Processed Food Type	Consumption frequency							Total Score
	a	b	c	d	e	f	Total	
A (stir-fry vermicelli)	0	0	0	1	4	66	71	14
B (complement of meatball)	0	3	2	12	21	33	71	246
C (complement of soto)	0	1	0	1	10	59	71	45
D (complement of soup)	0	0	0	0	1	70	71	1

The description of consumption frequency:

a : very often, if > 1 x /day (every meal), score 50

b : often, if > 1x/day, 1 x in a day, 4-6x/week, score 25

c : often enough, 3 x in a week, score 15

d : enough (< 3x/week or 2x/week), score 10

e : seldom (1x/week), score 1

f : never, score 0

The Identification of Tapioca Vermicelli and "Siger" Rice as well as Its Nutrition Knowledge

The identification stage of tapioca vermicelli was considered from respondents' ability to answer the questions about tapioca vermicelli. The correct answer on the definition of tapioca vermicelli is a food ingredient with a thin form like noodles and made from ingredients other than wheat flour and the respondents can mention the basic ingredients of tapioca vermicelli. The correct answer was scored 4 and answered by 69 respondents (97.2%). That result showed that most respondents understood the definition of tapioca vermicelli.

Households around the agro-industry of "siger" rice in Pringsewu Regency had a little knowledge about "siger" rice. The highest score for "siger" rice identification in Pringsewu was 3, and the correct definition of "siger" rice was food ingredients with the form like rice made from cassava or gaplek, 41.03% of respondents mentioned the right answers, while 58.97% of answers did not know with score 1.

Knowledge on nutrition

The score of housewives' knowledge on nutrition in Metro City ranged from 7 up to 23, while in Pringsewu Regency ranged from 0 up to 26. The score obtained was then classified into three classes, those were low (< 11.34 for Metro and < 8.66 for Pringsewu), medium (11.34 – 14.88 for Metro and 8.66 – 18.72 for Pringsewu) and high (> 14.88 for Metro and > 18.72 for Pringsewu). From the classification, it was known that housewives' knowledge levels on nutrition, both in Pringsewu and in Metro City, mostly were in the low category. Both in Metro City and Pringsewu Regency, housewives' knowledge on nutrition was included in the low category. It is

expected that this condition is related to housewives' low formal education in both regions.

Psychological Readiness against Food Diversification

A community's psychological readiness against food diversification is a concept proposed by Hidayah (2011). In this research, the community's psychological readiness against food diversification was measured by knowledge, attitude towards food diversification and the tendency of consuming non-rice carbohydrate source food. Housewives' knowledge on food diversification was obtained from how much their knowledge of food diversification was known according to their choice on the alternative answers given. The alternative answers were scored 1 (not understand) up to 5 (completely understand).

Most respondents in Metro City and Pringsewu Regency did not understand food diversification. Knowledge distribution on food diversification in Metro City and Pringsewu Regency can be seen in Figure 1. From Figure 1, it can be seen that only a small number of housewives cannot answer the definition of food diversification, those are 18% of housewives in Pringsewu. Most housewives answered that they know about food diversification, but they do not have a good understanding of it. In the understanding levels category, most housewives (55% in Metro and 54% in Pringsewu) did not understand about the term of food diversification. They only knew that fooddiversification was one of the government's programs and they did not know the objective of this program.

The attitude towards food diversification was used to measure psychological readiness, including respondents' roles and opinions on local food and the importance of promotion and socialization on food diversification. Most respondents were included in the criteria of less understanding of local food roles. Respondents in Metro City
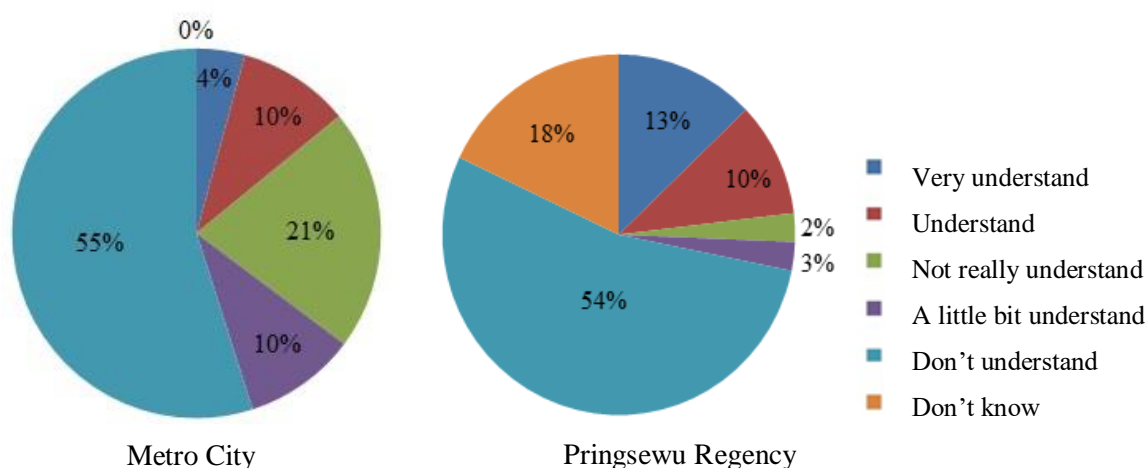
Figure 1. Distribution of Knowledge on Food Diversification in Metro City and Pringsewu Regency
Description:
1. Completely understand: Respondents answer that food diversification is a food quality improvement program through consuming a variety of food
2. Understand: Respondents answer that food diversification is a program to decrease rice consumption
3. Less understand: Respondents answer that food diversification is a program to make use of any local food available in the region
4. Slightly understand: Respondents answer that food diversification is a government program to improve the community's nutrition
5. Not at all understand: Respondents answer that food diversification is one of the government programs, respondents do not know the objective of this program
6. Do not know: Respondents cannot answer the question

and Pringsewu Regency (84.51% and 66.67%), stated that local food consumption could eliminate respondents in Metro City stated that they did not really understand the importance of consuming local food (households were able to begin consuming local food if it is available) that was around 60.56%. Most respondents stated that they really understand (households must start to consume local food), that is around 33.33%. Most respondents in Metro City (54.93%) and Pringsewu Regency (46.15%) considered that promotion/socialization on food diversification was important.

The measurement of consumers' attitude on food diversification consisted of three questions; those were local food roles in food diversification, the importance of consuming local food and the importance or the unimportance of promotion/socialization on food diversification. The answer to the question was scored 1-5, where 5 was given for the a correct answer and 1 for an incorrect answer. So, the total score of the three questions was ranging from 3 to 15. The result of research showed that the score for attitude against food diversification in Metro ranged from 6 to 12, while in Pringsewu ranged from 6 to 15. After being classified into three categories, those are

low (6-9), medium (9-12) and high (>12), then it is suggested that housewives' attitude against food diversification in Metro and Pringsewu was in medium category, each was 59.15% (Metro) and 46.15% (Pringsewu).

Communities' readiness to encounter food diversification was also considered from consumer's tendency on food diversification. In both regions of the research, the community has been used to consume local food and would improve it. Most people in the community of Pringsewu Regency had that kind of tendency. The community of both regions will improve its local food consumption if the food is easy to find. It showed that food availability is an essential factor in food consumption.

From the three aspects assessed in psychological readiness on the food diversification, the score obtained ranged from 13 to 29. Afterwards, classification was performed to obtain the distribution, as seen in Table 4. From Table 4, it can be seen that in Metro City and Pringsewu Regency, housewives' psychological readiness levels on food diversification was in the medium category. For Pringsewu Regency, high classification is higher than Metro City.

Table 4. Housewives' distribution based on psychological readiness classification on food diversification

| Classification | Category | Metro City | | Pringsewu Regency | |
		Amount (person)	Percentage (%)	Amount (person)	Percentage (%)
13-18	Low	26	36.62	9	23.08
19-24	Medium	37	52.11	22	56.41
>24	High	8	11.27	8	20.51
Amount		**71**	**100.00**	**39**	**100.00**

(Source: Primary Data Analysis, 2017)

Accessibility and Food Choice

Accessibility on tapioca vermicelli and "siger" rice is assessed from several indicators, such as the effort to get tapioca vermicelli/"siger" rice, the amount of store/stall, road width, road condition, road quality and tapioca vermicelli/"siger" rice layout in the store. Each indicator was scored with Likert Scale (5 scale). The measurement result of household accessibility level on tapioca vermicelli and "siger" rice in Metro City and Pringsewu Regency through the interview process is seen from mode value based on given answer score. After that, mode score obtained will be appeared and classified into five classes, those are "very easy", "easy", "moderate", "difficult" and "extremely difficult". After performing analysis process, the result obtained for consumers' accessibility in getting tapioca vermicelli in Metro City was in the category of easy. Meanwhile, "siger" rice accessibility in Pringsewu was in the category of extremely difficult. Consumers' accessibility on tapioca vermicelli in Metro was in the category of easy, mode value obtained was 4, those were for effort scale, store amount and road quality indicators. That condition showed that tapioca vermicelli can be accessed with small effort as good road quality and there are a lot of store selling tapioca vermicelli. The different condition was found for "siger" rice accessibility, from the result of the research mode 1 was obtained for store amount, road conditions and transportation indicators. Consumers in Pringsewu found difficulties in accessing "siger" rice since there was only a few of stores selling "siger" rice, bad road conditions and they have to use public transportation to buy "siger" rice.

Housewives' choice on processed food (tapioca vermicelli and "siger" rice) was a decision taken by housewives in consuming tapioca vermicelli and "siger" rice in the last one week when the interview was performed. Many housewives of Metro City consumed tapioca vermicelli, those were 48 households (67.61%). In Pringsewu Regency, only 6 people chose "siger" rice (15.38%). The fact showed that the consumers in Metro, which a region around tapioca vermicelli agro-industry, were consuming tapioca vermicelli. The different condition was found in some regions near "siger" rice agro-industry where only several households consumed "siger" rice. This was expected as a result of the consumers' difficult accessibility against "siger" rice, since only a few stores selling "siger" rice and also poor road condition and transportation.

Any Factors Related to the Choice of Local Processed Food

Some variables related to the choice of local processed food (tapioca vermicelli and "siger" rice) were including household income, housewives' education level, housewives' age, housewives' psychological readiness levels, knowledge level on nutrition, product identification level, knowledge level on food diversification and accessibility (Table 5).

Based on the analysis, some variables related to tapioca vermicelli choice in Metro City were obtained, those were: knowledge levels on food diversification, education levels, age, household income, psychological readiness and knowledge levels on nutrition. Any variables related to "siger" rice choice in Pringsewu Regency are identification level, knowledge levels on food diversification.

Knowledge on food diversification has a positive relationship with tapioca vermicelli and "siger" rice choice. It showed that the higher the knowledge on food diversification, the bigger possibility of choosing locally processed food. Knowledge is one of the aspects that determine the act of selecting food (Dimitri & Rogus, 2014).

Product identification levels have positive relationship with "siger" rice choice but do not have a real relationship with tapioca vermicelli choice. It is because all housewives in Metro City have already known about tapioca vermicelli. "Siger" rice is on the opposite of this condition.

Table 5. Any factors related to decision making of tapioca vermicelli consumption

| Variable | Tapioca vermicelli (Metro) | | "siger" rice (Pringsewu) | |
| | Pearson Chi-Square | | Pearson Chi-Square | |
	Value	Asymp. Sig. (2-sided)	Value	Asymp. Sig. (2-sided)
Income (X1)	2.420^{++}	0.120	1.046	0.307
Housewives' education levels (X2)	5.140^{**}	0.023	1.004	0.316
Housewives' Age (X3)	2.839^{*}	0.092	0.341	0.559
Psychologically Readiness (X4)	2.341^{++}	0.126	1.492	0.222
Knowledge levels on nutrition (x5)	1.953^{+}	0.162	0.385	0.535
Identification levels (X6)	0.291	0.589	6.407^{**}	0.011
Knowledge levels on food diversification (X7)	10.528^{***}	0.001	4.820^{**}	0.028
Accessibility (X8)	1.372	0.241	1.820^{+}	0.177

Description

***	Trust level of 99%	*	Trust level of 90%	+	Trust level of 80%
**	Trust level of 95%	++	Trust level of 85%		

Regarding this finding, then the information on the products is highly needed to deliver to the consumers as this will determine consumers' willingness to buy certain products (Sari & Setiaboedhi, 2017).

Education level is positively related to tapioca vermicelli choice. The higher the education, the bigger the chance of choosing tapioca vermicelli. Education is one of the social factors that defining food consumption. This is in accordance with the result of the research of Vidyaningrum et al. (2016); Hamad & Schmitz (2019); and Widodo, Kamardiani & Rahayu (2016).

Tapioca vermicelli choice is also positively and significantly related to housewives' age. It means that the older the age, the bigger chance for them to choose tapioca vermicelli. The older housewives' age, the better their knowledge (familiarization) on tapioca vermicelli. It is because tapioca vermicelli was a product that has been long sold in Metro City.

Psychological readiness against food diversification is related to tapioca vermicelli choice, but not to "siger" rice. The higher psychological readiness, the bigger opportunity of choosing tapioca vermicelli. The different condition was found in households around "siger" rice agro-industry. It is expected to happen since the availability of "siger" rice is low, as "siger" rice industry does not sell their products in this area, but directly to their customers who lived outside the regions. Therefore, even though consumers are psychologically ready to implement food diversification, they cannot choose "siger" rice. The accessibility factor plays a significant role in "siger" rice consumption. It is supported by the research of Pavithra (2018).

Income is closely related to tapioca vermicelli selection. The higher income, the higher possibility of choosing tapioca vermicelli. This is in line with the research of Devi & Hartono (2015) and Vidyaningrum et al. (2016), which stated that income is one of the factors influencing food choice and demand. Income does not necessarily relate to "siger" rice consumption. It is because most of the households around "siger" rice agro-industry are consuming their self-made "siger" rice.

CONCLUSIONS

Tapioca vermicelli is widely chosen by any households around agro-industry in Metro City. Whereas, any household around "siger" rice agro-industry does not prefer it. Most tapioca vermicelli is consumed with meatball, with medium frequency and the consumption amount was 45.33 gram/household/day. "Siger" rice is rarely consumed as variation and the amount of average consumption was 9.34 grams/household. Some variables related to tapioca vermicelli choice are knowledge level on food diversification, education level, age, household income, psychological readiness and knowledge on nutrition. Meanwhile, some variables related to "siger" rice choice are product identification level, knowledge of food diversification and accessibility.

References

Apriani, S., & Baliwati, Y. F. (2011). Faktor-faktor yang berpengaruh terhadap konsumsi pangan sumber karbohidrat di perdesaan dan perkotaan. *Jurnal Gizi Dan Pangan*, *6*(3), 200–207.

https://doi.org/10.25182/jgp.2011.6.3.200-207

Badan Pusat Statistik. (2013). *Konsumsi Kalori dan Protein Penduduk Indonesia dan Provinsi*. Jakarta.

Boratyńska, K., & Huseynov, R. T. (2017). An innovative approach to food security policy in developing countries. *Journal of Innovation & Knowledge*, *2*(1), 39–44. https://doi.org/10.1016/j.jik.2016.01.007

Choudhury, S., & Headey, D. (2017). What drives diversification of national food supplies? A cross-country analysis. *Global Food Security*, *15*, 85–93. https://doi.org/10.1016/j.gfs.2017.05.005

Devi, S. R. M., & Hartono, G. (2015). Faktor-faktor yang mempengaruhi keputusan konsumen dalam membeli sayuran organik. *Agric*, *27*(1), 60–67. https://doi.org/10.24246/agric.2015.v27.i1.p60-67

Dimitri, C., & Rogus, S. (2014). Food choices, food security, and food policy. *Journal of International Affairs*, *67*(2), 19–31.

Haliza, W., Purwani, E. Y., & Thahir, R. (2010). Pemanfaatan kacang-kacangan lokal mendukung diversifikasi pangan. *Pengembangan Inovasi Pertanian*, *3*(3), 238–245.

Hamad, H., & Schmitz, M. (2019). The impact of demographic variables and consumer shopping orientations on the purchasing preference for different product categories in the context of online grocery shopping. *Journal of Marketing and Consumer Research*, *52*, 21–32. https://doi.org/10.7176/JMCR/52-05

Hanafie, R. (2010). Peran pangan pokok lokal tradisional dalam diversifikasi konsumsi pangan. *Jurnal Sosial Ekonomi Pertanian (J-SEP)*, *4*(2), 1–7.

Hanani, N., Asmara, R., & Nugroho, Y. (2008). Analisis diversifikasi konsumsi pangan dalam memantapkan ketahanan pangan mayarakat pedesaan. *AGRISE*, *8*(1), 46–54.

Hardono, G. S. (2014). Strategi pengembangan diversifikasi pangan lokal. *Analisis Kebijakan Pertanian*, *12*(1), 1–17. https://doi.org/10.21082/akp.v12n1.2014.1-17

Hermayanti, M. E., Rahmah, N. L., & Wijana, S. (2016). Formulasi biskuit sebagai produk alternatif pangan darurat. *Industria: Jurnal Teknologi Dan Manajemen Agroindustri*, *5*(2), 107–113.

Hidayah, N. (2011). Kesiapan psikologis masyarakat pedesaan dan perkotaan menghadapi diversifikasi pangan pokok. *Humanitas: Indonesian Psychological Journal*, *8*(1), 88–104.

Irawan, B., & Sutrisna, N. (2011). Prospek pengembangan sorgum di Jawa Barat mendukung diversifikasi pangan. *Forum Penelitian Agro Ekonomi*, *29*(2), 99–113. https://doi.org/10.21082/fae.v29n2.2011.99-113

Junaedi, M., Daryanto, H. K. S., Sinaga, B. M., & Hartoyo, S. (2016). Technical efficiency and the technology gap in wetland rice farming in Indonesia: a metafrontier analysis. *International Journal of Food and Agricultural Economics*, *4*(2), 39–50.

Khaeron, E. H., Yuyun, Y. A. S., Sudarjat, & Sendjaja, T. P. (2016). Assessment of sustainable food diversification development model in West Java, Indonesia. *International Journal of Humanities and Social Science*, *6*(11), 175–181.

Marta, H., & Tensiska. (2013). Pembuatan berbagai produk ubi jalar dalam upaya diversifikasi pangan dan peningkatan gizi masyarakat di Desa Sekarwangi dan Desa Cilangkap Kecamatan Buahdua Kabupaten Sumedang. *Dharmakarya : Jurnal Aplikasi Ipteks Untuk Masyarakat*, *2*(2), 85–92.

Pavithra, S. (2018). Factors influencing on the mothers' brand choice in baby milk formula: A study in Vavuniya District, Sri Lanka. *Journal of Marketing and Consumer Research*, *44*, 74–80.

Prabawati, S., Richana, N., & Suismono. (2011). Inovasi pengolahan singkong meningkatkan pendapatan dan diversifikasi pangan. *Sinar Tani*, 1–5.

Sari, H., & Setiaboedhi, A. P. (2017). Faktor-faktor yang memengaruhi minat beli pangan organik melalui situs online. *Jurnal Manajemen Dan Agribisnis*, *14*(1), 54–64. https://doi.org/10.17358/jma.14.1.54

Sayekti, W. D., Lestari, D. A. H., & Ismono, H. (2017). Kontribusi beras "siger" dalam pola konsumsi pangan rumah tangga konsumen beras "siger" di Provinsi Lampung. In *Seminar Nasional Perhimpunan Ekonomi Pertanian*. Pontianak: Perhimpunan Ekonomi Pertanian Indonesia.

Schiffman, L., & Kanuk, L. L. (2007). *Perilaku Konsumen*. Jakarta: Indeks.

Suarni. (2013). Pengembangan pangan tradisional berbasis jagung mendukung diversifikasi pangan. *IPTEK Tanaman Pangan*, *8*(1), 39–47.

Suarni, & Yasin, M. (2011). Jagung sebagai sumber pangan fungsional. *IPTEK Tanaman Pangan*, *6*(1), 41–56.

Sugiarto, Siagian, D., Sumaryanto, L. T., & Oetomo, D. S. (2003). *Teknik Sampling*. Jakarta: Gramedia Pustaka Utama.

Suter, I. K. (2014). Pangan tradisional: Potensi dan prospek pengembangannya. *Media Ilmiah Teknologi Pangan (Scientific Journal of Food Technology)*, *1*(1), 96–109.

Vidyaningrum, A., Sayekti, W. D., & Adawiyah, R. (2016). Preferensi dan permintaan konsumen rumah tangga terhadap bihun tapioka di Kecamatan Purbolinggo Kabupaten Lampung Timur. *Jurnal Ilmu Ilmu Agribisnis: Journal of Agribusiness Science*, *4*(2), 200–208.

Widodo, Kamardiani, D. R., & Rahayu, L. (2016). Minat konsumen terhadap beras organik di Daerah Istimewa Yogyakarta dan Jawa Tengah. *Agraris : Journal of Agribusiness and Rural Development Research*, *2*(2), 134–142. https://doi.org/10.18196/agr.2234