

Consumers' Preference and Future Consideration Toward Organic Instant Noodles: Evidence from Indonesia

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Abstract

The consumption of instant noodles in Indonesia is the second highest globally. However, people are now more aware of sustainable lifestyles and the health risks of consuming food additives, so some opt for more organic choices, including instant noodles. Research on customers' preferences in this area remains lacking, so the current study aims to fill the gap. This study also analyses the relationship between the choices and consumers' future considerations. Discrete Choice Experiment (DCE) method was used to reveal the perception of sustainable attributes in organic instant noodles. The future considerations were measured using the Future Consequences Consideration (FCC) scale. As many as 592 respondents participated in the study, selected using the convenience sampling method. Data were analyzed using conditional logit via package support.CEs on R software. The findings show that Indonesian consumers' preferences are primarily based on the extrinsic attributes: organic labels and packaging materials, but they also consider the health claims. They will likely prefer instant noodles with organic characteristics for future considerations. The results of this study have implications for instant noodle product development. Young consumers take up a large portion of the market, and they are now more aware of sustainability and health. The current study can inform the product development and the approach to the targeted market. To the best of the authors' knowledge, this is the first study on consumer perception on sustainability attributes in organic instant noodles.

Keywords

Consumer preference, future consideration, discrete choice experiment, organic instant noodle.

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Introduction

Currently, food safety attracts special attention globally, especially on the consumers' side. In recent years, many consumers have been willing to purchase food products that are guaranteed to be safe to consume (Chen et al., 2020). Consumers also notice how products are made, the ingredients, and the safety (Güney and Giraldo, 2019; McFadden and Huffman, 2017; Meas et al., 2015). Therefore, they avoid food containing chemical substances, such as pesticides and antibiotics (Siderer et al., 2005). Consumers are also aware of the carbon footprint of the products they consume. They believe that they should safeguard the environment by purchasing environmentally friendly products (Chiu et al., 2019). Therefore, more and more

consumers now opt for organic food products. For instance, between 2000 and 2015, the global organic market increased more than quadrupled (Willer et al., 2018), and currently, the sales have reached USD 90 billion. In Asia, China became the top organic foods producer with more than two million hectares of land and a market share of €5.9 billion in 2016 (Lin et al., 2020). Meanwhile, Indonesia has also contributed to the global organic foods supply. The country is at the top fifth agriculture producers in Asia (Najib et al., 2021; Toiba et al., 2020).

With the rising consumption of organic foods globally, producers innovate based on the trends and changing preferences. There have been substantial studies that investigate the consumers' willingness

to pay for various organic food products, such as organic eggs (Güney and Giraldo, 2019), organic pork (Wang et al., 2018), organic vegetables (Bhattarai, 2019), and organic rice (Jitrawang and Krairit, 2019). However, producers also need to pay attention to consumers' desire to increase consumer interest in organic foods. For instance, modern lifestyles are likely to prioritise time efficiency to reduce time spent preparing and cooking. In this case, consumers likely prefer instant foods (Nagy, 2018). In Indonesia, instant noodles are popular, which can be seen from the number of consumptions that reached 12.52 billion servings—the second after China (World Instant Noodle Association, 2020). The first recorded consumption of instant noodles was dated back to 1972. They are chosen for convenience, low cost, and taste, although they contain monosodium glutamate (MSG) and other chemical additives that could be bad for health (Blossom et al., 2021). Organic instant noodles, therefore, are considered a good alternative.

To date, there have been several studies investigating consumers' preference for the attributes in instant noodles (Akachukwu, 2018; Cha and Wang, 2020; Pangaribuan et al. 2020; Torres et al. 2019). For instance, Cha and Wang (2020) claimed that the essential attributes are affordability, quality, brand, and design; and that these attributes affect consumers satisfaction. Akachukwu (2018) investigated the consumption choice in Nigeria and found that the choice of instant noodles was mainly influenced by taste and availability, consumer's age and family choice. Torres et al. (2019) also summarised that food labelling is an essential attribute to increase the consumers purchasing decision—they purchase when the label shows the nutritional content. Pangaribuan et al. (2020) examined the factors associated with the purchase intention of organic instant noodles in Indonesia. Using the theory of planned behaviour, they indicated that consumers attitudes, subjective norms, and perceived behavioural control significantly influence purchase intention.

Although research on product development has been extensive, research on consumers' perception of the organic instant noodle attributes is limited. Therefore, this study investigates consumers' perception of instant noodles' organic labelling, eco-friendly labelling, and nutrition claims. Furthermore, this study also examines the relationship between future preference, measured by the Future Consequences Consideration (FCC) scale, and preference

on organic instant noodles, as well as the consumers' willingness to pay for organic instant noodles.

Theoretical background

Neoclassical economic theory states that rational consumers lean to products with maximum utilities despite budget constraints. They choose a product because of its attributes (Lancaster, 1966), most likely with the highest utility (Manski, 2001). With this premise, researchers can reveal consumers' product preferences because: (1) each choice can be described as a utility-scale index; (2) consumers will choose an alternative with the highest utility index (Lancaster, 1966). Börsch-Supan (2012) denotes the number of n consumers, each of which chooses one among i discrete alternatives. Each alternative is associated with a utility index (U_{in}) that provides an advantage or disadvantage for consumers. Then the utility index is assumed to consist of a deterministic component (V_{in}) and an error component (ε_{in}) as shown in the following equation:

$$V_{in} = U_{in} + \varepsilon_{in} \quad (1)$$

The Discrete Choice Experiment (DCE) approach is a stated preference method with a clear and robust basis (McFadden's Random Utility Theory and Lanchasterian Consumer Theory). Compared to other stated preferences such as Contingent Valuation, DCE has a better external validity (Noor et al., 2022). Respondents are placed in a buying situation with trade-off options like real-life purchasing activities. This method has been widely used to investigate consumer preferences for organic food products (Chakrabarti et al., 2019; Chen, et al., 2019; Li et al., 2019; Wang et al., 2019).

The organicity of food products is a credence attribute only known for certain by sellers or producers. In various DCE studies, organic claims are often presented in labels (Dominici et al., 2019; Risius and Hamm, 2017; Wongprawmas and Canavari, 2017). While organic products hold an essential value for the environment, consumers consider health benefits more. Since Go Organic movement in Indonesia started, organic products have become increasingly consumer-oriented (David and Ardiansyah, 2017).

Instant noodles, a popular source of calories in Indonesia (Dewi, 2016), contain MSG, which is harmful to health if consumed continuously over a long period (Charles et al., 2018; Huh et al., 2017; Tan et al., 2019). In addition, the plastic waste generated from the packaging

has also become an issue (Aday and Yener, 2014; J. Wang et al., 2018). One measure to reduce this plastic waste is to incentivise the use of biodegradable materials (Kakadellis et al., 2021; Mancini et al., 2017; Loo et al., 2019). To date, the organic quality in instant noodles is only about the raw materials of noodles and not so much about the plastic packaging. Considering this, researchers have attempted to develop instant noodles with both quality ingredients and sustainable packaging.

Materials and methods

Samples and surveys

The sample research is determined by convenience sampling because the actual population, instant noodle consumers in Indonesia, is unknown. Screening questions related to the consumption of instant noodles were firstly asked to select the suitable respondents. The data collection was carried out in May-August 2021. Questionnaires were prepared using a google form and distributed online through WhatsApp groups and social media. A total of 592 respondents (from 878 respondents) passed the screening questions and completed all the questions.

Four sections in the questionnaire must be completed by respondents: screening, demographic questions, FCC and DCE. The screening questions revealed whether or not they had purchased instant noodles before and the frequency. The exclusion was if they never consumed instant noodles. After filling in the questionnaire about demographics, they filled in six FCC questions adopted from De Marchi, Caputo, Nayga Jr, and Banterle (2016). This was to look at consumer psychological factors related to future preferences. After that, the respondents received a cheap talk script about the terms used in DCE before filling in the DCE questionnaire.

Experimental design

The initial stage in DCE is the determination of attributes and levels. Based on the literature review (Al-Azawi et al., 2020; Farrand et al., 2017; Li et al., 2021; Marciniak-Lukasiak et al., 2019; Montandon and Colli, 2016; Naspetti et al., 2019), the attributes are organic labels, tastes, packaging materials, food additives, health claims, and prices. Organic labels and packaging materials are sustainable attributes that affect the environment, whereas MSG content and health claims are health attributes. Price is a monetary attribute, and taste is a common attribute for food products. Each attribute consists of three levels,

as detailed in Table 1.

Attribute	Levels
Organic Label	No info*; Organic Indonesia; USDA
Packaging Material	Plastic*; Oxodegradable; Biodegradable
Taste	Onion*; Soto; Curry
Food additive	No info*; Contain MSG; MSG free
Health Claim	No info*; Low Carbon; Low Fat
Price (IDR)	5,000; 10,000; 15,000

Note: * = Reference level; IDR 1= € 0.0000614 (Exchange rate on November 28, 2022)

Source: Authors

Table 1: Attribute and Levels of DCE.

The complete factorial design of the attributes and levels above is 729 combinations of product choices (36). These are too many for respondents to choose from, so the number had to be reduced (Jin et al., 2017). To do so, this study applied the rotation design technique: orthogonal array run using the support.CEs package in the R software (Aizaki et al., 2014; Jin et al., 2017). The final design resulted in 18 combinations that are grouped into two blocks (nine sets per block). Each combination consists of two alternatives and a 'none of the above' option to ensure the external validity. An example of one of the choice sets can be seen in Figure 1.

Set 4/9 - If there were only these 2 organic instant noodles, which one would you purchase? *

A



IDR 5.000

B



IDR 10.000

☐ Choose A
☐ Choose B
☐ None of These!

Source: Authors

Figure 1: One example of choice set.

Data analysis

First, descriptive statistical analysis was performed on the demographic and FCC data, whereas conditional logit was used to analyse the DCE data. The study was carried out using the survival package in the R software. If ASC is an alternative

specific constant that denotes the likelihood of not choosing, β is the effect of product attributes, ε_{ij} is an unobservable error component, then the choice of respondent i in alternative to j is as follows:

$$V_{ij} = ASC + \beta_{org_{OI}} + \beta_{org_{USDA}} + \beta_{taste_{soto}} + \beta_{taste_{curry}} + \beta_{pack_{oxo}} + \beta_{pack_{bio}} + \beta_{msg_{contain}} + \beta_{msg_{free}} + \beta_{health_{fat}} + \beta_{health_{carbon}} + \varepsilon_{ij} \quad (2)$$

Marginal willingness to pay (mWTP) indicates the amount of money consumers spend on organic instant noodle products with specific attributes. An example is how much money consumers are ready to spend on upgrading feature A to feature B. The word 'marginal' refers to the fact that WTP is relative depending on the reference level. If V_j is the coefficient value of the j level and V_p is the price coefficient value, then mWTP is an absolute comparison of V_j and V_p (Aizaki et al., 2014).

Result and discussion

The respondents' profiles can be seen in Table 2. The most of respondents (62.7%) was women. In terms of age group, most consumers were between 17 and 23 years old (48.1%). Most of them had a bachelor degree (49.3%). The majority's occupation was student (46.8%). As many as 63.2% of respondents were single, and 62.3% did not have children, while 53.5% had 3-4 people in their household. Most respondents had incomes of IDR 1-3 million (€ 61.54 - € 184.62) per month (33.1%) or IDR 7-10 million (€ 430.80 - € 615.75) per month (21.8%). The majority spent between IDR 500 thousand (€ 30.77) and IDR 1 million (€ 61.54) per month (37%). These values are in line with previous study by Toiba et al. (2022).

The results of the FCC measurement are shown in Table 3. In general, respondents showed a high future preference. They think that their current choices will have implications for future

Variable		Freq	%
Gender	Male	221	37.3
	Female	371	62.7
Age	17 - 23 years	285	48.1
	24 - 29 years	93	15.7
	30 - 35 years	42	7.1
	36 - 40 years	37	6.3
	41 - 45 years	37	6.3
	46 - 50 years	55	9.3
	51 - 60 years	43	7.3
Education	Elementary school	1	.2
	Junior High	2	.3
	Senior High	165	27.9
	Diploma	14	2.4
	Bachelor	292	49.3
	Master	89	15.0
	Doctor	29	4.9
Occupation	Student	277	46.8
	Housewife	30	5.1
	Private employee	127	21.5
	Government employee	99	16.7
	Entrepreneur	59	10.0
Marital status	Not married	374	63.2
	Has been married (widow/widower)	11	1.9
	Married	207	35.0

Note: IDR 1 equals to € 0.0000614 (Exchange rate on November 28, 2022)

Source: Authors

Table 2: Respondents' profiles. (To be continued).

Variable		Freq	%
Number of children	Zero	369	62.3
	One child	61	10.3
	Two children	96	16.2
	3 children	44	7.4
	4 children	21	3.5
	More than 4 children	1	.2
Number of family members	1-2 people	42	7.1
	3-4 people	317	53.5
	5-6 people people	207	35.0
	7-8 people	26	4.4
Income (IDR)	< 1 million	93	15.7
	1 - 3 million	196	33.1
	3 - 5 million	101	17.1
	5 - 7 million	72	12.2
	7 - 10 million	129	21.8
	> 10 million	1	.2
Expenses (IDR)	< 500 thousand	73	12.3
	500 thousand - 1 million	219	37.0
	1,5 - 2 million	150	25.3
	2,5 - 3 million	75	12.7
	3,5 - 4 million	35	5.9
	> 4 million	40	6.8

Note: IDR 1 equals to € 0.0000614 (Exchange rate on November 28, 2022)

Source: Authors

Table 2: Respondents' profiles. (Continuation).

Items	Mean	Med	SE
Future consideration and daily behaviour influence	5.91	6.00	0.04
Achieving not immediate outcomes	5.26	5.00	0.05
Sacrificing immediate wellbeing for future outcomes	5.69	6.00	0.05
Avoiding negative outcomes seriously	5.47	5.00	0.05
Performing necessary to distant consequences behaviour	5.74	6.00	0.05
Future-based decision making	5.92	6.00	0.04
Future consequences behaviour	5.73	6.00	0.05

Note: 1 = strongly disagree; 7 = strongly agree

Source: Authors

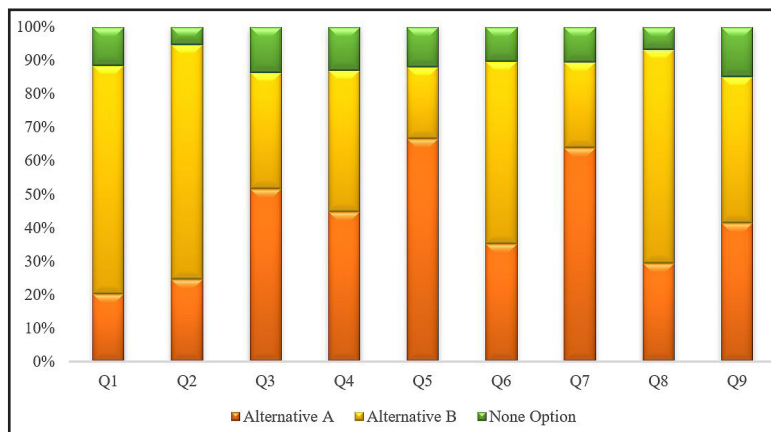
Table 3: Descriptive statistic of Future Consequences Consideration (FCC).

preferences. They are also willing to delay gratification for a more long-term benefit. In other words, their decision making is primarily based on future benefits and consequences rather than any immediate satisfaction.

Figure 2 Shows the proportion of consumers who did not choose each alternative given in the choice set by selecting the 'none of the above' option. In DCE, this option is stated as Alternative Specific Constant (ASC), which is always present in every choice set. The proportion of opting-out in each

choice set is at 14.8%, which means that more than 80% of consumers selected their option, either alternative A or B.

The conditional logit estimation results (Table 4) show that consumers prefer organic instant noodles more than the non-organic alternatives. The probability of selecting instant noodles with Indonesian Organic and USDA certificates is 2.2 times compared to the non-organic instant noodles. Furthermore, the coefficient value of oxo-degradable and biodegradable packaging



Source: Authors

Figure 2: Opt-Out rate of DCE scenarios.

Level	Main Effect			FCC Interaction		
	β	Exp(β)	SE	β	Exp(β)	SE
ASC	-0.08	0.90	0.10	0.20	1.02	0.10
Organik Indonesia	0.80***	2.21	0.07	0.10***	1.00	0.01
USDA	0.80***	2.21	0.05	0.10***	1.01	0.01
Soto Flavour	-0.04	1.03	0.06	-0.02	1.00	0.01
Kare Flavour	-0.10*	0.91	0.06	-0.04**	1.01	0.01
Oxodegradable packaging	0.80***	2.05	0.06	0.10***	1.00	0.01
Biodegradable packaging	1.00***	3.02	0.06	0.20***	1.03	0.01
Contain MSG	0.20**	1.02	0.06	0.02**	1.00	0.01
Without MSG	0.72***	2.00	0.06	0.10***	1.00	0.01
Low Carbohydrate	0.70***	2.03	0.06	0.10***	1.02	0.01
Low Fat	0.70***	2.00	0.05	0.10***	1.01	0.01
Price	0.00***	1.02	0.00	0.00***	1.00	0.00

Note: *** = $p < 0.001$; ** = $p < 0.01$; * = $p < 0.05$

Source: Authors

Tabel 4: Conditional logit estimation of main effect and FCC interaction.

materials shows a significant positive number, which means that consumers are more inclined to select environmentally friendly packaging. The probability that consumers choose biodegradable packaging is the highest, which is three times more likely than plastic packaging. In terms of ingredients, consumers show a significant preference for noodle products without MSG. The probability of choosing instant noodles without MSG is two times higher than those without MSG content information. Meanwhile, low-carbohydrate and low-fat claims have a significant influence on consumer preferences. Consumers prefer instant noodles with the claims to those without any claims. The price coefficient calculated linearly showed a negative coefficient value, which means that consumers tend to choose low prices.

The conditional logit estimation on the interaction model with the FCC shows similar patterns. In general, consumers with future preferences (high FCC) are one-time more likely to choose organic instant noodles with sustainable packaging and health claims and without MSG. The interaction between consumer and time preferences can be seen in Table 4. Consumers with future preferences have a higher chance to choose organic over non-organic instant noodles.

In aggregate, consumers are willing to pay higher prices for organic instant noodles, both with Indonesian organic certification for (€ 1.14) and USDA (€ 1.13). Biodegradable packaging materials received the highest rating, indicated by consumer mWTP for € 1.64, while

oxo-degradable packaging materials scored mWTP for € 1.13 compared to plastic packaging. Consumers are willing to pay more for instant noodles with MSG-free claims (€ 1.02). Regarding health claims, consumers are willing to pay more for low-carbohydrate (€ 0.93) and low-fat claims (€ 1.03).

Using DCE, this study reveals that consumers have specific preferences and are willing to pay more for organic instant noodles. Public awareness about a healthy lifestyle plays a role in increasing the consumption of organic foods (Asif et al., 2018). The utility values of the Indonesian organic certification and USDA are not much different, which means that whether a product is locally or internationally certified does not affect the choice of Indonesian consumers. In line with several studies (Li et al., 2019; Nesselhauf et al., 2019), these findings indicate that Indonesian consumers rely more on a third party (certification provider) upon in ensuring the quality of organic instant noodles.

Biodegradable packaging materials are the most preferred packaging materials for organic instant noodle consumers. This preference is related to consumer awareness of sustainability, where food packaging materials from plastic have become pollution on earth (Kakadellis et al., 2021). This packaging material also received the highest mWTP value among other level attributes. In line with Lago et al. (2020), this study shows that young Indonesian consumers are willing to pay higher for the sustainability features in organic instant noodle packaging.

Health claims have a significant impact on consumer preferences. Information about the MSG content in organic instant noodles determines consumers' purchasing due to their health concerns (Sikander et al., 2017). This perception significantly influences the health attributes (MSG-free, low fat and low carbohydrate).

The first implication of this research is on the product development. Consumers show the highest preference for biodegradable packaging

materials, which means that the development of organic instant noodles should concern about both the ingredients and the packaging materials. In other words, the product development must be both customers- and environment-oriented. Lastly, certification is essential because consumers still lean to a third party in ensuring the quality of food products.

Conclusion

This study aims to analyse consumer preferences for sustainability and health attributes on organic instant noodles and their influence on future considerations. This study involves 592 respondents to participate in an online survey. A discrete choice experiment model is used to determine consumer preferences, and the data were analysed using conditional logit via package support.CEs on R software.

The analysis results show that consumer preference for organic instant noodles is higher than traditional instant noodles. Organic labels and packaging materials, extrinsic attributes score high among the consumers, similar to the health attributes. Psychological factors about future preferences as measured using the Future Consequences Consideration (FCC) scale show a similar pattern to the current tendencies. The direction of organic instant noodle product development is to consider consumers' needs and the environmental impacts.

This study implies that consumers have a high preference for sustainability attributes, such as biodegradable packaging of noodle products. This fact provides evidence that sustainability branding positively influences the assessment of a product. If companies can communicate this issue well to consumers, the market expansion is promising. Practically, product advantages for environmental sustainability might be a marketing strategy's main focus. Through marketing initiatives, consumers might be persuaded that by purchasing organic instant noodle products, they not only receive healthier food but also have contributed to a better environment.

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