

Tuna Fish Consumption Model of Pregnant Women (Study in Palopo)

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Abstract:- Pregnant women who consume less fish are a strong factor in the birth of prenatue and low birth weight babies. The purpose of this study was to determine the model of tuna consumption in pregnant women in Palopo City. The sample in this study amounted to 437 pregnant women. Data collection is carried out by distributing questionnaires through Google Form and then performed a data analysis test using multiple linear regression analysis. The results showed that consumer behavior, price, as well as processing and presentation methods had a positive effect on the model of tuna consumption in pregnant women, while the attitude had a negative effect on the model of tuna consumption in pregnant women.

Keyword:- *Comsuption; Tuna Fish; Pregnant Women.*

I. INTRODUCTION

Indonesia is one country has great potential as a producer of world fisheries komoniti. As should make marine and fisheries sector as the mainstay of a very rational choice and appropriate. According to the data, about 12.5 million people make fishing as an activity in economic development there. Of course the support of natural resources and climate help determine the choice of this sector is very potential to be developed. Issue forefront in the development of marine and fisheries sector is a target of increasing fish production was 22.4 million tons in 2014 and 40-50 million tonnes in 2019. This was done to make Indonesia as the largest fish producer in the world with the export target in 2019 amounted to 9.54 billion dollars.

Palopo is one fish producing areas in Indonesia. The city is the main fish supplier in the district / city neighbors, namely Luwu, North Luwu, Luwu Timur, Toraja regency, North Toraja Regency and Enrekang. Location of Palopo directly adjacent to the Gulf of Bone made a great contribution to the economy, one of which is a sub-sector. Aquaculture production is dominated by marine fisheries by the number of 11423.20 tons whereas production 1859.10 tons land fishery.

According to the Central Bureau of Statistics and Information, large pelagic fishery is one fishery commodity that has economic value that is relatively high compared to other fish species. The development of large pelagic primary commodity production nationally indicate the type of tuna in the period of 2018 amounted to 16.146%, 6.83% skipjack, tuna 4.27%, and the type of tunny 5.03%. The data shows that as the principal crops of economic value

production rate over a period of five years is a key indicator of the utilization of the type of large pelagic fish (Tuna, Skipjack, Cob).

Based on the habitat, the fish is classified into two saltwater fish and freshwater fish. Habitat will determine the type of fish meal, which would then affect the nutrient content of fish. Freshwater fish particularly rich in carbohydrates and protein, while sea fish rich in fat, vitamins and minerals. (Khomsan, 2004).

The increase in fish production potential in the region, also is one of them their minapolitan program, by improving the quality and quantity of fish production were included in the main commodity. To assess the potential for the application of food technology and industrial development to tourism needs to be done, given the changes in eating habits (food habits) in Indonesia is largely determined by the potential of the region. Creative effort is needed to carry out diversification of processed fish products so that the rich flavors and varieties of fish as a source of nutrition. Variations of processed fish products will also affect the public interest in the consumption of certain fish which have been less enthused.

As a food source, fish has a very good nutrients like protein as a source of growth, fatty acids omega 3 and 6 that are beneficial to maternal health and fetal brain formation, vitamins, and minerals that are beneficial to both mother and fetus. Fish as a food that contains high protein and contain the essential amino acids needed by the body, in addition to the biological value reached 90%, with little connective tissue, making them easier to digest. The most important thing is the price is much cheaper compared to other protein sources. (Directorate General of Fishing, 2018)

According to the Directorate General of Fishing Indonesia (2018), the fish consumed need to meet certain requirements, such as habitat is not polluted heavy metals (Hg, Pb, and Cu). In addition, the fish should be in a fresh condition. The characteristics of the fish are still fresh: not fishy, the meat was chewy, the tail does not dry and blackened, and his eyes are not red, Avoid fish whose post is being pinned together with other marine animals such as crabs, clams and shrimp, because it would lead to contamination cross. Indonesia has a very wide waters, either sea or land, thus the potential of fishery resources are extremely large. Efforts to increase fish consumption will provide multiple benefits, besides improving intelligence, also more exciting fishing sector.

The World Health Organization (WHO) recommends the intake of at least two servings of fish per week (WHO, 2003). Nevertheless, the data suggest that the level of fish consumption Indonesia still tend to be low compared to other countries. Indonesian fish consumption in 2013 amounted to 35.14 kg / cap / yr. It already shows an increase when compared with previous years is 33.89 kg / cap / yr (2012), 32.25 kg / cap / yr (2011), and 30.48 kg / cap / yr (2010) (www.statistikkp.go.id). Brich *et al.* (2012) say that the level of fish consumption is still low when compared with FAO recommendations. Indonesian fish consumption is also low compared to countries of Europe and Asia. Korean state fish consumption was 54 kg / cap / yr, Netherlands 52 kg / cap / yr, Spain 41 kg / cap / yr, and the French 35 kg / cap / yr. Council food security (2013) also mentioned that the consumption of fish Indonesia (5 g / cap / day) is still far compared to other Asian countries such as Malaysia (50 g / cap / day), Japan (24 g / cap / day), Vietnam (22 g / cap / day), Korea (9 g / cap / day), and Myanmar (43 g / cap / day).

Eating fish during pregnancy, brings a variety of health benefits. The reason is because fish contains a variety of vitamins, minerals, and nutrients that are good for the health of pregnant women and fetuses in the womb. Eating fish during pregnancy is good for health because fish contains protein, omega 3, vitamin B12, vitamin D, iron, iodine, and selenium. However, pregnant women should still be careful when eating fish. If carelessly eating fish, the mother's health and fetal hami could be threatened. (Marianti, 2020)

Tuna is one type of fish recommended for pregnant women. In one serving of tuna or equal to 6 tablespoons, contain omega-3 fatty acids up to as much as 300 mg. Benefits tuna beromega 3 can be felt even before we were born. Omega 3 is an essential fatty acid that the body needs in order to function correctly. Omega-3 fatty acids in tuna fish have anti-inflammatory effects. It can lower blood pressure and triglyceride levels, reduce blood clots and irregular heart rate, and lower risk of stroke and heart failure. (Prime, 2020)

Kusuma *et.al* (2017) explains that the low fish consumption be a strong risk factor for the incidence of premature delivery and low birth weight (LBW). Consumers in many pregnant women are still unable to consume fish during pregnancy because due to the condition of pregnancy that sometimes does not stambil because of food cravings and blood pressure factor. Several factors are thought to influence the Tuna Fish Consumption in Pregnancy namely: Attitude, Social Pressure, Price, and Processing and Presentation.

II. LITERATURE REVIEW

A. Consumer Behavior

Consumer behavior is the study of individual, group, or organization and processes used by the consumer to choose, make sure, spent a product, service, experience, or ideas to satisfy needs and their impact on the process undertaken consumers and communities who had become the target company. (Hawkins & Mothersbaugh, 2010). According to Peter & Olson (2013), consumer behavior involves the thoughts and feelings they experience and what they are doing in the communication process. It includes everything in the environment that affects thoughts, feelings, and actions (Peter & Olson, 2013).

Broadly speaking, consumer behavior can be divided into two factors: internal and external factors. Internal factors include the perception, learning, memory, motivation, personality, emotions, and attitudes. External factors include the culture, subcultures, demographic, social status, reference groups, families, and marketing activities. Both groups of factors can influence each other in the purchase decision process (Hawkins & Mothersbaugh, 2010). Consumer behavior is dynamic because of thoughts, feelings, and actions of individual consumers, consumer target groups and the wider community changes constantly.

B. Fish Consumption

Consumption of fish means all types of social activities carried out so that it can be used to characterize and identify them, other than (in addition to) what allows them to do for a living (Damsar, 2002).

The level of fish consumption in Indonesia has increased each year. Fish consumption reached 38.14 kg per capita in 2014. Then, the number increased to 40.9 kg per capita in 2015. Then, consumption increased again to 43.88 kg in 2016 and 47.12 kg per capita in 2017. In 2018 fish consumption in the country reached 50.69 kg per capita. While the target in 2019 amounted to 54 kg per capita. (Aldin, 2019)

Community Palopo is apparently very fond of eating fish. 2018 ago, the level of fish consumption in Palopo reach 58 kg per capita per year. This figure is on top of the South Sulawesi Provincial Government's target of 54 kg per capita and the national target of 44 kg per capita. As for 2019, fish consumption reached 60.03 kg per capita figure, which would exceed the national target of 54 kg per capita. (Indriani, 2019)

C. Factors Affecting Fish Consumption

➤ The days Pregnancy Fish Consumption

When pregnant, the effort to eat healthy foods so that optimal fetal development continues. Doctors also suggest eating a variety of vegetables, fruits, meat, and fish. Although some pregnant women are still reluctant to eat fish during pregnancy, despite the incredible benefits. This is caused by worry there is mercury in fish, especially sea.

High seafood consumption during pregnancy is associated with a favorable neurological development of children and vice versa mothers who ate seafood lower than their neurological development to less than optimal. The advantage of eating fish during pregnancy, but on the one hand contribute to the total consumption of fish protein consumption is still low. Contributions consumption of fish protein in pregnant women only 13.7% of the total consumption of protein. (Circumstance *et.al*, 2007)

➤ Attitude

Attitude is defined as an overall evaluation done by someone on a concept (Peter & Olson, 2013). Attitude is divided into three components, namely the belief (cognitive), feeling (affective), and propensity to respond (behavioral). Namely cognitive beliefs about an object. Affective a feeling or emotional reaction to an object. Behavioral is a person's tendency to respond in certain ways to an object or activity.

The attitude of consuming fish is defined as a comprehensive evaluation of a person to fish, how to fish belief, she felt when eating fish, as well as the propensity to respond to the fish and processed fish. Confidence in the fish is trust someone to fish and processed fish. Confidence is divided into two, namely the belief sensory and non-sensory beliefs. Sensory beliefs include beliefs that can be perceived by the senses like a fish has a fishy smell, tastes good, fish has scales, and have a soft texture of meat. Non-sensory beliefs include the location of the purchase of fish, packaging, as well as the belief that fish can meet the nutritional needs of the body.

Feeling when eating fish is a favorite expression shown by a person against such fish like fish are packed neatly, and better enjoy using fish meal than not. The tendency of the response is something that is usually done when eating fish eating fish such as the notion that it's a hassle, really do not like fish, appreciate food made from fish, as well as the habit of consuming fish because it has a place to stay that is close to the coastal areas. (Pratisti, 2015)

Research on the consumption of fruit carried by Qing *et al.*, (2012) mentions that the attitude of consumers in buying the fruit is based on sensory and non-sensory attributes of the fruit. Sensory attributes include consumer perceptions about the appearance, texture, and taste of the fruit (Peneau *et al.*, 2006). The taste is one of the most important sensory quality in explaining the attitude (Aikman *et al.*, 2006). Olsen (2004) also adds that the smell affects the attitude to consume fish. Non-sensory attributes associated with the location of fruit purchase, brand, and the time required from the arrangement is finalized in the consumption of fruit (Peneau *et al.*, 2006; Qing *et al.*, 2012). Olsen (2001); JIFSAN (2002) adds that one of the reasons a person consumes fish is their sense of responsibility to eat healthy food,

Thorsdottir *et al.* (2012) assessed the attitude of confidence factor of sensory and health involvement. Someone who is familiar with the smell and taste of the fish will tend to have high levels of fish consumption is higher than someone who is not familiar with the taste and smell of fish. Confidence Sensory is a strong predictor for assessing the level of fish consumption. The involvement of health is a predictor of the weak against the consumption of fish.

Ketidaksesuaian taste, smell, and feeling that eating fish was troublesome for the low level of fish consumption (Brunsø *et al.*, 2009). Brich *et al.*, (2012) stated that the Australian respondents preferred the fish meat that has been packaged. It is considered to be more convenient and saves time. Another advantage of marine fish products that have been packaged is the inclusion of the date on the packaging, so as to enable the respondent to determine the level of freshness of the fish. The meat is packaged normally equipped with cooking methods. It is easier for consumers to eat fish.

Brunsø *et al.*, (2009) examined the consumption of fish in the segments lovers of processed fish and not a lover of fish processed in Belgium and Spain, found that lovers of fish processed able to determine the freshness of fish from the smell and the shape of the fish meat, while segments that are not a lover of fish processed can not do it. The ability to choose fresh fish is also one factor that can increase the purchase of fish.

➤ Social pressure

Indonesian dictionary defines social pressure as the force used for a person to do certain things. Coercion exercised may come from parents, friends, and media. Social pressure is said to be successful when a person is able to behave in accordance with the desired demands. In childhood (2-11 years) the greatest social pressure comes from parents. Children learn to adjust to a social environment that is family first. Thorsdottir *et al.*, (2012) mentions that the social pressure is strong enough factors influencing consumption of fish at young consumers. Parents have the power to influence the choice of eating his children until the early 20s. This is possible when children live with their parents.

The next social pressure comes from peers. Peer is a friend to the age level or the same level of maturity. The age of adolescents (13-21 years), children begin to socialize into the wider environment. The main requirement in adolescence is the need to have friends so that people can share the same interests with other individuals. Peers influence adolescent personality patterns in two ways. First, adolescent self-concept is a reflection of presumption of her friends. Second, individuals are under pressure to develop personality traits that are recognized by the group (Hurlock, 1988).

Social pressure Another important enough media. The high exposure to a variety of advertising through mass media and social media has influenced the behavior of private consumption. Marketing communications made by the company through advertising delivered on mass media and social media has effectively generate interest or consumer purchasing behavior (Kotler & Keller, 2012).

Today young people spend 5-6 hours / day to use a combination of various media such as television, radio, internet, magazines, and more. Media exposure has affected consumer behavior in young consumers. The survey, conducted in adolescents and young adults (15-24 years) in Europe showed that the highest information obtained from TV / radio (29%), magazines (27%), newspapers (27%), professionals (26%), food packaging (22%) and friends (22%). Studies in the US show $\frac{3}{4}$ young consumers choose the media as a source of information regarding healthy nutrition. Surveys in Germany also showed that in adolescents aged 14 years and older, newspapers and magazines are also the highest position (56%). Freisling *et al.*, (2009) also reported that adolescents exposed to advertising of fruit and vegetables have a probability of 47% -59% higher to consume fruits and vegetables that are advertised.

Sumarwan *et al.*, (2012) investigated the influence of advertising in the purchase of snack products in children found that the more often children see on television advertising snacks, the more often the children buy snacks advertised product.

Research Olsen (2004); Verbeke & Vackier (2005) found that social pressures or expectations of family and friends influence adolescents food preferences. Altintzoglou *et al.*, (2010) added that after seeing an ad on fish, respondents are interested to see and begin to think to buy. However, respondents obstacles the lack of information provided about the location of seafood purchases in supermarkets.

➤ Price

Kotler and Keller (2012) mention that the price is the amount of money charged for a product or service. The number of consumers that are exchanged for benefits held by using products and services. Research Qing *et al.*, (2012) in China found that the purchase price does not affect the level of the fruit. Nevertheless, the findings Oktari (2008) in Indonesia explained that the fish according to non-fishing family group of underprivileged including expensive consumer goods. The condition shows that price is an important factor. This is supported by research on fruit purchases at Carrefour, Medan found that price is one of the dominant factors in the purchase of fruit.

Selection as a determinant of the purchase price is also supported by Trondsen *et al.*, (2003) which says that one of the barriers to eating fish is the perception of a relatively high price. In line with previous findings, Brich *et al.*, (2012) found that when entering the supermarket, $\frac{2}{3}$

Australian respondents who were not originally planning to buy fish would be willing to buy fish when they're on sale.

➤ Processing and Presentation

Ways of presenting and processing is the process of preparing fish from fish species selection, purchase, storage, preparation / compounding, and fish processing into food to be served, as well as ensure preparations are made from fish to avoid contamination (Purawidjaja, 1995).

Consumption of fish may require additional skills to process and present the fish that is suitable for young consumers. Brich *et al.*, (2012); Thorsdottir *et al.*, (2012) states that one can increase the consumption of seafood is a way of processing and presentation. Altintzoglou *et al.*, (2010) say that the lack of knowledge about how to cook the fish into one of the bottlenecks in consuming the fish. Tolerance time required to prepare the fish until ready to be served very dependent on the respondent and the situation (Altintzoglou *et al.*, 2010).

Socio-cultural changes, including an increase in the number of women in the workforce, changes in household composition including smaller households, and the more limited time for cooking led to a high demand for more convenient foods. Research in Denmark, Norway, and Iceland revealed that consumers want to consume more marine fish but is limited to the time and effort it takes to cook. Young consumers tend to want fish that are practical and ready to be cooked (Brich *et al.*, 2012)

D. Research Hypothesis

Based on the literature review that has been mentioned above, it was determined the hypothesis in this study as follows:

H₁: Attitude positive effect on future pregnancies fish consumption

H₂: Social Pressure positive effect on future pregnancies fish consumption

H₃: Prices positive effect on future pregnancies fish consumption

H₄: Processing and Presentation positive effect on future pregnancies fish consumption

III. DATA ANALYSIS METHOD

A. Respondents and Data Collection

Data obtained through an online questionnaire distributed to pregnant mothers in Palopo City and surrounding areas. Respondents Data obtained from data on pregnant women who had a pregnancy check at the Hospital ST. Madyang, Nasirah Midwife Maternity Clinic, AT-Medika Hospital, General Hospital Sawerigading Palopo many as 437 people. Of these, who filled out a questionnaire online just as much as 309 respondents. This is because katerbatasan information and the ability to operate a mobile phone android and ios. The questionnaire contained 20 statements and four open-ended questions. The statement was assessed by a likert scale, points 1 to "Strongly Disagree" and 5 points to "Strongly Agree".

B. Data analysis

The data have been tabulated and then held validity and reliability to ensure that the questionnaire used in this study is valid or invalid. After passing the test validity and reliability, hereinafter normality test to ensure that the data collected is taken from the normal distribution or normal population. Furthermore, the multiple linear regression tests to determine the effect of each variable and to test the hypothesis. The model will be tested in this study are:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$$

IV. RESULTS AND DISCUSSION

A. Test of Data Analysis

Test Validity test is done by calculating the correlation between the score or the questions with a score

construct or variable. This can be done by comparing the significance test with the count r_{table} . This test is whether there is a questionnaire which can reveal data that exist on the research variables appropriately. The results of testing the validity of the questionnaire in this study are all otherwise valid, because the value of the 20 items of the statement r_{hitung} greater than the r_{table} . As well as to test reliability, more than 0.60 Cronbach alpha ($\alpha > 0.60$), so it can be concluded that all variables are reliable and the questionnaire can be used as a data collection tool.

Normality test is done in this study to ensure that the data collected is taken from the normal distribution or normal population. Here are the results of data normality test:

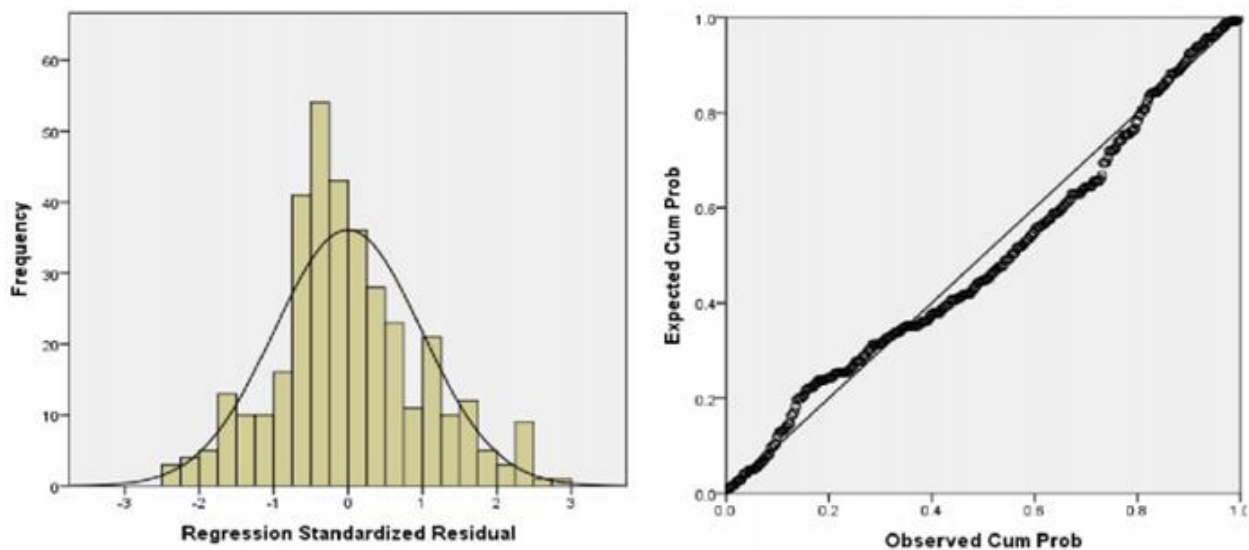


Fig 1:- Normality Test Results

Test this hypothesis using multiple regression analysis. Summary multiple regression results are presented in table below:

$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$			
	coefficient	t-statistic	Sig.
constants	8.66	2:56	0:00
The days Pregnancy Fish Consumption (Y)	0:23	1:12	0:01
Attitude (X1)	0:39	0:21	0:00
Social pressure (X2)	-0.17	2.77	0:18
Price (X3)	0:26	1:32	0:03
Processing and Presentation (X4)	0:18	1:33	0:00
N = 437			
$R^2 = 0684$			
Adj. $R^2 = 0613$			
F-Statistic = 4.94			

Table 1:- Summary of Multiple Regression Test Results

Based on the above test results, it can be explained that the attitude variable (X1), Price (X3), Processing and Presentation (X4) positive effect on Fish Consumption The days of Pregnancy (Y). While the Social Pressure (X2) negatively affect pregnancy days the Fish Consumption (Y). Value Adj. R² of 0613% indicates that the variable attitudes, social pressures, pricing, as well as the processing and presentation of future fish consumption can affect pregnancy in Palopo amounted to 61.30%. While the remaining 38.70% influenced by other factors outside of the factors examined in this study. Whereby it is possible the addition of other variables in subsequent studies.

B. Statistical Hypothesis Test

- The results of hypothesis testing 1 shows that the attitude factor positive effect on fish consumption during pregnancy. The results are consistent with research conducted by Thorsdottir *et al.*, (2012) assessed the attitude of confidence factor of sensory and health involvement. Someone who is familiar with the smell and taste of the fish will tend to have high levels of fish consumption is higher than someone who is not familiar with the taste and smell of fish. Confidence Sensory is a strong predictor for assessing the level of fish consumption. The involvement of health is a predictor of the weak against the consumption of fish.
- The results of hypothesis testing 2 show that social stress factors negatively affect fish consumption during pregnancy. The results of this study are not supported by research Olsen (2004); Verbeke & Vackier (2005) found that social pressures or expectations of family and friends influence adolescents food preferences. As well Altintzoglou *et al.*, (2010) added that after seeing an ad on fish, respondents are interested to see and begin to think to buy. However, respondents obstacles the lack of information provided about the location of seafood purchases in supermarkets.
- The results of hypothesis testing 3 showed that the price factor positive effect on fish consumption during pregnancy. Selection as a determinant of the purchase price is also supported by Trondsen *et al.*, (2003) which says that one of the barriers to eating fish is the perception of a relatively high price. In line with previous findings, Brich *et al.*, (2012) found that when entering the supermarket, 2/3 Australian respondents who were not originally planning to buy fish would be willing to buy fish when they're on sale.
- The results of hypothesis testing 4 showed that the factors of processing and presenting positive effect on fish consumption during pregnancy. The results of this study are supported by research conducted by Thorsdottir *et al.*, (2012) which states that one can increase the consumption of seafood is a way of processing and presentation.

V. CONCLUSIONS

A. Conclusion

Based on the above results it can be concluded that:

- The results of hypothesis testing 1 shows that the attitude factor positive effect on fish consumption during pregnancy. So the first hypothesis is accepted.
- Hypothesis test results show that social stress factors negatively affect fish consumption during pregnancy. So that the second hypothesis is rejected.
- Hypothesis test results showed that the price factor positive effect on fish consumption during pregnancy. So the first hypothesis is accepted.
- Hypothesis test results showed that the factors of processing and presenting positive effect on fish consumption during pregnancy. So the first hypothesis is accepted.

B. Suggestion

Based on the above results, the researchers suggest further research would be able to add other variables that are considered may affect future fish consumption in pregnancy. In addition, further research is expected to be able to use other research methods so that the expected results of this study lebih nice and more complex. Tentunta by increasing the area of population.

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