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**Processed Koya Anchovy “KOIRI” As an Animal Sourced Local Food Business
Innovation in the Southwest Papua Region**

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ABSTRACT

Tackling stunting by improving maternal health, there are local resources that are abundantly available in the Sorong City, Southwest Papua, i.e. Anchovy fish. Additional food “KOIRI” is an additional food for pregnant women made from anchovies, mushroom stock, salt and garlic. The main ingredient in making this fresh anchovies koya which are plentiful and easy to get by the people in West Papua. “KOIRI” has nutritional content that is able to support the mother’s nutritional needs during pregnancy, i.e. 100 grams of koya anchovies contain 665.2 kcal, 4.97 grams of fat, 46.99 grams of protein, 104.88 grams of carbohydrates, 2.77 grams of salt and 2.88 grams of calcium. This is what attracted us to carry out healthcare entrepreneurship innovative research by utilizing the potential of local resources, which provides double benefits, namely health and family economics. The kind of methodology in this paper using experimental method with research design mutu hedonic and liking test design. This paper also pays close attention to measure micronutrients such as calcium, iron, zinc, carbs, and cal. The analysis of the data using organoleptic test and questionnaire. The result of the study in terms of taste, 2 (two) pregnant women who chose bad taste, less good and not fragrant aroma because the mother has a sensitivity to fishy odors in the first trimester pregnancy. The other 8 (eight) pregnant women of 1 trimester and 3 trimester on average chose good taste even very good taste. We also measure the product liking by a liking taste test. In terms of color the average respondent chooses to like it, in terms of fragrant the average respondent chooses to like it, and then in terms of taste the average respondent chooses to like it, and the last indicator is in terms of texture test the average respondent chooses to like it. Potential impact of “KOIRI” are to make the anchovy commodity an important source of nutrition in reducing the incidence of stunting, to develop the potential of local resources that have nutritional and economic value as one of the local wisdom, increase the ability and capability of the community to produce koya anchovy to become a superior commodity.

Keywords: Stunting, Entrepreneurship, Anchovy, Koya, Pregnant Women, Animal Sourced Food (ASF)

INTRODUCTION

Sustainable Development Goals (SDGs) is a strategy to meet the needs of the present and not sacrifice the needs of future generations, in various sectors. In the 2nd goal of the SDGs, namely to eliminate hunger, to end malnutrition, stunting, so as to reduce maternal and child mortality rates, in “ensuring healthy lives and promoting well-being for all

people at all ages” this is explained in the 3rd goal of the SDGs (Department of Economic and Social Affairs, 2023). SDGs (Sustainable Development Goal’s) is a continuation program from MDGs or Millennium Development Goals which involves more developed, developing and less developed countries, intended to create a healthy and prosperous world society for all ages.

According to WHO, in 2019 around 165 million toddlers experienced stunting, (Nya-masege et al., 2021), then, UNICEF (United Nations Childrens Fund) and WHO in 2023 stated that the prevalence of stunting in Indonesia was ranked 27th highest out of 154 countries, and in the Southeast Asia region, Indonesia was ranked 5th (Ke-menko PMK, 2023). If we refer to this data, it shows that the level of health of the Indonesian people is still very low, so it is necessary to fulfill nutrition, nutrition for mothers, babies and children by 2025, it can reduce stunting in toddlers by 40% with the Hari Pertama Kehidupan (HPK) program.

Furthermore, Indonesian Nutrition Case Study (SSGI) in 2022, stunting prevalence is 21,6%. It is known that 6 out of 34 provinces in Indonesia experienced an increase in the prevalence of stunted toddlers compared to 2021, including Papua Province with the highest prevalence of stunted toddlers out of thr 6 provinces at 34,6% with an increase of 5,1%. Then, West Papua Province was in second place which experienced an increase in stunting prevalence of 3,8%, bringing the prevalence to 30,0% (Results of The Indonesian Nutritional Status Survey (SSGI) 2022, 2022). According to WHO, this figure is considered high because the maximum prevalence limit for stunted toddlers is 20% (Fitriahadi et al., 2023), as for the achievement of targets described in the National Medium Term Development Plan (RPJMN), the target for the prevalence of stunting under five is expected to be 14% in 2024 (Ministry of Health of the Republic of Indonesia, 2020), on the other hand, the targets that have been set cannot be achieved, so the government has further targets related to accelerating the reduction in stunting prevalence to 22% by 2025 (Secretariat of the Vice President of the Re-public of Indonesia, 2018).

Based on the data above, it shows that stunting has a negative impact on the growth of the new generation, not just a

matter of appearance, according to Martoell, a pro-fessor of International Nutrition of Emory University, but stunting is the gateway to various developmental problems and he added that the more children who experi-ence stunting, the bigger the problem becomes. It is possible that the brain, kidneys, and other organ systems are affected (Schmidt, 2014). According to (Nyamasege et al., 2021) that stunting can hinder optimal growth and development and prevent maximum brain development, causing poor cognitive abilities, obstacles to the development of children aged 6-23 months, poor performance at school, and reduced development potential of a nation (Syahrudin et al., 2022).

Stunting can be prevented with healthy living behaviour, according to Dror and Allen in 2011 in (Headey et al., 2018) essential amino acids are required for mTORC1 acti-vation. Because essential amino acids cannot be synthesized from scratch in the human body; they must be obtained through diet; the best sources are animal source food (meat, poultry, fish, and eggs). In various micronutrients linked to growth and cognitive development (iron, B12, choline, zinc), and micronutrients such as calcium are needed to stimulate insulin secretion such as growth factor I (IGF-I), a hormone that stimulates bone and tissue growth, thereby increasing children's linear growth.

For this reason, it is absolutely necessary to fulfill the nutrition of pregnant women through Providing Additional Food (PMT), in order to prevent stunting (Riskasda, 2018). The Provision of Additional Food (PMT), has a significant correlation with the incidence of stunting in toddlers aged 7 to 24 months with p-value=0,000 (<0,05) (Wanimbo, 2020) and the results of the case control study : maternal factors have a direct influence on the occurrence of stunting by 30,3%, and child factors are influ-enced by the mother, having an influence of 56,7% (P<0,001), so that maternal and child factors are

moderate predictive variabels for the occurrence of stunting (Santo-sa et al., 2022)

For this reason, the role of health workers, especially midwives who collaborate with nutritionists and health workers, is to provide socialization and promotion of PMT, by utilizing local resources that can meet nutritional needs. Pregnant women are a priority target group for the National Acceleration Strategy to Prevent Stunting (Secretariat of the Vice President of the Republic of Indonesia, 2018b), people are expected to follow healthy food consumption patterns for pregnant women (Gultom & Patriawati, 2022). Providing local PMT to pregnant women with KEK will experience improved nutritional status (Chandra & Dewi, 2023), one of which is anchovies as a local re-source found in the Sorong region, Southwest Papua Province. Anchovies contain protein and calcium which are important micronutrients in growth and development (*Stolephorus Sp.*). The large micronutrients content in anchovies (*Stolephorus spp.*), such as protein, omega-3 fatty acids, vitamin D, minerals, iron, zinc and calcium, are very beneficial for pregnant women because : protein is important for the growth and development of the fetus, then omega-3 fatty acids support the development of the fetus brain and nervous system, iron prevents anemia which can increase the risk of premature birth, and calcium and vitamin D (Maryeni, 2022) this micronutrients are important for the formation of fetal bones and teeth.

Based on the description above, it shows that to improve the health of pregnant women in order to reduce stunting rates, there are local resources that are abundantly available in the Sorong area, namely anchovies. Apart from providing health bene-fits, the management of anchovies in various products, such as anchovy koya can increase family income and economy. Anchovy koya is an additional food product for pregnant

women, koya itself is a savory power that is used as a food supplement, according to Hendayani and Marwanti in 2011 at (Wardhana, 2019). This is what attracted us to carry out innovative research by utilizing the potential of local re-sources, which provides double benefits, namely health and family economics.

SOLUTION

Uganda and Bangladesh with the respective orders of stunting in these countries being 10%, 9% and 16%. Animal food sources, including meat, fish, milk and eggs provide high quality protein, containing essential micrpnutrients, simultaneously with other bio-active (such as lysozyme and lactoferrin and growth factors (such as insulin 1) have been documented. On the other hand, the results of this study add that foods that do not contain ASF (i.e. plant foods) can contribute many of the micro and macronutrients needed for optimal growth. However, ASF provides a greater density of some micronutrients per 1.000 calories of food.

Anchovies contain very high levels of calcium because only anchovies can be eaten down to the bones, so they have the highest calcium mineral content of all type of fish. Then it was also explained that 100 gr of fresh anchovies contain 500 mg of calcium (Kamalah, 2022). These micronutrients include vitamin A, vitamin B-12, ribovlafine, calcium, iron and zinc. Apart from that "KOIRI" has nutritional content that can support the mother's nutritional needs during pregnancy, 100 grams of koya anchovies contain 665.2 kcal, 4.97 grams of fat, 46.99 grams of protein, 104.88 grams of carbohydrates, 2.77 grams of salt and 2.88 grams of calcium.

Fungsional

The benefits of Anchovy Koya are to meet the nutritional needs of pregnant women through local resources (koya anchovies), where anchovies themselves are plentiful and easily available to the

community. Pregnant women like koya puri fish because it has fragrant aroma and a delicious taste even very delicious taste. Apart from health perspective, people can process local food (koya puri fish) to increase the economic value of typical Papuan souvenirs.

Unique Selling Points (USPs)

Identify the values that make it different from other products, including:

a. Innovation

In this case what we have is of good quality and has a uniqueness that other local businesses (koya puri fish) don't have. This is the latest innovation from a West Papuan culture-based business.

b. Cost-effectiveness

Calcium requirements can be met with pharmacological supplements namely kalk supplements that containing 500 mg or 0.5 grams of calcium at a price of IDR. 30.000/bottle. Koya puri fish containing 280 grams/jar contains 1.400 mg or 1.4 grams of calcium and is priced at IDR. 25.000.

Based on the description above, koya puri fish is more cost-effective than calcium supplements because the costs incurred to get calcium are cheaper with local product (koya puri fish) than calc supplements (calcium).

c. Customer experience

Not only does it prioritize production value, but anchovy koya has been tested on 3 pregnant women in the first trimester, 1 in the second trimester and 7 in the third trimester so that a total of 10 pregnant women took part in the taste test at Public Health Center, Tanjung Cassowary, data study used questionnaire parameters with 4 indicators with results obtained as follows by the chart below:

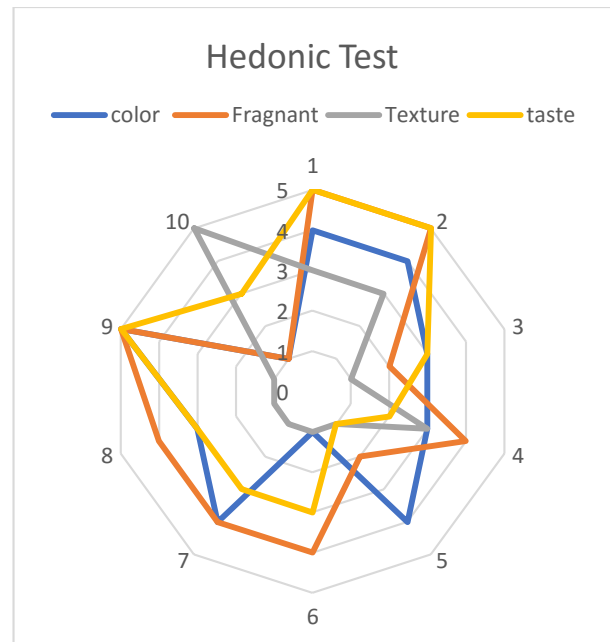


Figure 1. Hedonic Test of Koya Anchovies "KOIRI"

In terms of color, 2 people stated that the product was not dark, 3 people said it was quite dark, 4 people said it was dark, and 1 person said it was very dark. On the aroma indicator, 1 person stated that the product had no aroma, 2 people said it was no fragrant, 4 people said it was fragrant, and 3 people said it was very fragrant. In terms of texture, 6 people stated that the product has a texture that was not thick, 3 people said it was quite thick, and 1 person said it was very thick. In terms of taste, 1 person stated that the product has a bad taste, 1 person stated that it was less tasty, 5 people stated that it was tasty, and 3 people stated that it was very tasty.

In terms of taste, 2 (two) pregnant women who chose bad taste, less good and not fragrant aroma because the mother has a sensitivity to fishy odors in the first trimester pregnancy. The other 8 (eight) pregnant women of 1 trimester and 3 trimester on average chose good taste even very good taste.

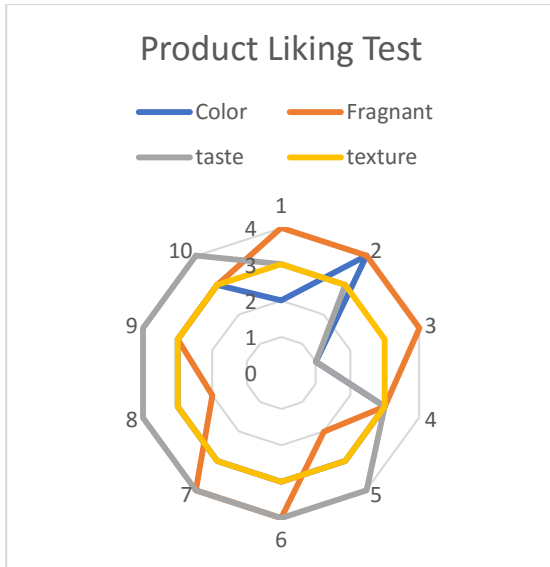


Figure 2. Product liking test of Koya Anchovies “KOIRI”

The descriptive analysis of product liking by a liking taste test. In terms of color the average respondent choose to like it, In terms of fragrant the average respondent choose to like it, and then In terms of taste the average respondent choose to like it, and the last indicator is in term texture test the average respondent choose to liking.

d. Niche Target Audience

Based on preliminary research conducted by the research team, stunting is a major problem in Indonesia and West Papua ranks second after Papua, in Sorong City itself stunting toddlers in 2023 reached 508 toddlers experiencing stunting. On the other hand, Papuan people really like to eat anchovies because they are easy to get and cheap, processed which is often cooked is fried anchovies. This local-based food is very attractive to the people of Western Papua, with a large number of people who have not been able to process so that the fish can last long. This opens us opportunities for researchers to develop animal-based local resources (koya anchovy) in increasing the dual value of health and economy.

e. Eco-Friendly

Koya anchovy is an environmentally friendly product that does not use substances harmful to the environment, does not spread poison in the sea to get

anchovies. And the most important thing is that the packaging (jar) of koya anchovy can be used sustainably in household products.

f. Brand reputation

Koya anchovy is very environmentally friendly, the products used do not use substances harmful to the environment, do not spread poison in the sea to get anchovies. And the most important thing is that the packaging (jar) of koya anchovy can be used sustainably in household products.

g. Scalability

If anchovies koya experience an increase in consumers, the team will be overwhelmed thus, requiring more staff to produce them, and the more production increases, the more the team will anticipate the quality

h. Integration

The local preparation of Anchovy koya does not conflict with the world of health and the contrary, Anchovy koya is very supportive of the needs of mothers during pregnancy and the development of toddlers.

i. Support and service

Anchovies koya provides nutritional value information correctly and the benefits obtained for customers can be enjoyed in health value.

MARKET ANALYSIS

Target Audience

- Parents
- Toddlers
- Pregnant mothers
- Pharmacy
- Souvenir shop

Market size

Bottom up analysis:

Couples of childbearing age : 5.264

Target pregnant women : 800

Target under-fives : 3.760

For our store, we did an analysis calculation of number of stores x production per/week

Pharmacy : 60 x 245 = 14.700

Souvenir shop : 5 x 245 = 1.220

Thus, 25.744 cup market size

Potential competitors

The results of research conducted by (Kamalah, 2022) on anchovies processed into local innovation products “anchovy cookies” to fulfill calcium for mothers during pregnancy, in serving 100 grams of anchovy cookies contains 0.095 grams of calcium. On the other hand, local preparations (koya anchovy) serving 100 grams contains 2.88 grams of calcium which can be consumed 5 times with a dose of 2 tablespoon per one meal. The development of anchovy cookies is also not too broad so that koya anchovy can compete with anchovy cookies.

Handle scability

Adding more staff to produce without reducing the quality of koya anchovies

METHODOLOGY

The kind of methodology in this paper using experimental method with research design mutu hedonic and liking test design. This paper also pay close attention to measure micronutrients such as calsium, iron, zinc, carbs, and ccal. The analisys of the data using by organoleptic test and questionnaire.

POTENTIAL IMPACT IN THE HEALTHCARE SECTOR

The objectives in this local business (koya puri fish) include:

- a. To measure the level of knowledge and literacy of the community about the nutritional content of anchovies for the health of pregnant women and children;
- b. To develop community creativity and innovation, in utilizing anchovy processing with a wider market;
- c. To make the anchove commodity an important source of nutrition in reducing the incidence of stunting

Benefits in this local business (koya puri fish) include:

- a. To develop the potential of local resources that have nutritional and economic value as one of the local wisdom.

- b. Adding research data and knowledge about koya anchovy in foodresearch and development.
- c. Increase the ability and capability of the community to produce koya anchovy to become a superior commodity.

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