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OVERCOMING STUNTING WITH A HEALTHY PAPUA KITCHEN IN SENTANI, JAYAPURA DISTRICT

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ABSTRACT
Stunting is a condition in which toddlers experience growth failure due to impaired nutrient absorption. The impact of stunting is brain disorders, intelligence, metabolic disorders in the body, heart, diabetes, stroke and disability in old age. So it will affect the quality of human resources, productivity, and national competitiveness in Indonesia. Objective to overcome stunting by utilizing Papua's natural resources such as sago and Sentani Lake snakehead fish which will be processed into cookies, as well as monitoring the growth and development of toddlers. Experiment with completely randomized design and Quasy Experiment approach one Group Pretest and Posttest with a sample 14 toddlers with accidental sampling. this study was divided into 4 stages; manufacturing cookies, organoleptic test and content analysis cookies after which experimental test. There is an effect of giving sago cookies and snakehead fish on changes in toddler weight, with a significance value of 0.000 (<0.05) and giving cookies with height measurement obtained a significance value of 0.189 (>0.05). There is an effect of giving sago cookies and snakehead fish on weight gain and there is no effect of giving sago cookies and snakehead fish on changes in height.

Keywords: development, growth, nutrition, stunting ,toddlers

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INTRODUCTION

Stunting is a linear growth disorder indicated by a Z score of TB/U of less than minus 2 SD, which is categorized as low nutritional status, and is characterized by short body posture caused by chronic malnutrition. Stunting can also increase the risk of illness, death, impaired brain development, motor skills and decreased productivity of toddlers in the future (Apriningtyas & Kristini, 2019). The impact of stunting can occur in the short term or long term. The short term is impaired brain development, impaired intelligence, impaired physical growth, and impaired body metabolism. While the long-term impact is decreased cognitive ability and learning achievement, decreased immunity so that it is easy to get sick and a high risk of diabetes, obesity, heart and blood vessel disease, cancer, stroke and disability in old age. This will affect the quality of human resources, productivity, and national competitiveness in Indonesia (Pratiwi et al., 2021).

The World Health Organization is targeting a 40% reduction in stunting by 2025. Globally, there were 149.2 million children under five who suffered from stunting in 2020. This number will increase due to obstacles in accessing food and limited knowledge in meeting toddler nutrition needs (Who, 2020). Basic Health Research Data 2018 shows the prevalence of stunting in toddlers in Indonesia is 30.8% and then decreased by 3.1% in 2019 to 27.7% (Who & Bank, 2021). Jayapura Regency is one of the regencies in Papua, according to the Jayapura Regency Bappeda, stunting cases in Jayapura Regency in 2023 were 16.42%, this figure is still above the national target in 2024, which is below 14%. Therefore, stunting is still a serious problem and must be addressed so that the stunting rate can decrease. One of the

targets in the Sustainable Development Goals (SDGs) as the 2nd sustainable development goal is to overcome hunger and all forms of malnutrition by 2030 and achieve food security. In order to achieve this target, the government has made stunting one of the priority programs. The implementation of the Healthy Indonesia Program with a Family Approach, one of which is by Providing Additional Food (PAF) for toddlers (Safrina & Putri, 2022).

Additional food can be given in the form of cookies. Because cookies can last a long time, are easy to carry, do not take long to make and have various shapes so that toddlers are interested and as many as 13.40% of the Indonesian population consumes more than one cookie a day (Erniyanti et al., 2019). During the growth period, toddlers really need protein and carbohydrates. One of the best and easily digested carbohydrates is sago. Sago is a plant that is easily obtained in the Papua region, especially in Jayapura Regency. Sago can be processed into various foods that are popular with the community and have high nutritional value (Payu et al., 2023). Sago flour can be used as a food ingredient such as bread, cookies, noodles, crackers and pastries. Sago flour is indeed rich in carbohydrates but does not contain enough protein. The protein content around Jayapura Regency is Lake Sentani snakehead fish. Sentani snakehead fish (Oxyeleotris Heterodon) is one of the most important sources of animal protein, the protein content of snakehead fish is 25.2 grams per 100 grams of fish weight, the content of snakehead fish has the advantage of having albumin reaching 8.2%. Albumin is a type of globular protein that is most abundant in blood plasma. Therefore, protein from snakehead fish is very much needed during the growth period and weight gain in malnourished toddlers (Handayani et al., 2022). Snakehead fish can also be processed into flour as an ingredient in making cookies. (Suryani et al., 2022). The aim of this research is to overcome stunting by utilizing Papua's natural resources such as sago and Sentani Lake snakehead fish which will be processed into cookies, as well as monitoring the growth and development of toddlers.

METHOD

This research is an experimental and quasy experimental research with a one group pretest and posttest approach. This research is divided into four stages, namely material preparation, manufacture, organoleptic test and nutritional content analysis of sago flour cookies and cork fish. Determination of cookie ingredients was modified from previous research to get the best results. The materials needed in this study are sentani cork fish (Oxyeleotris Heterodon), sago, granulated sugar, chicken eggs, sweetened condensed milk and margarine. Making cookies starts with making sago flour and cork fish flour then proceeds to making cookies. Organoleptic test or liking test is to see the response or not to the properties of the material tested with five hedonic scales for color, aroma, taste and overall acceptability. The test of sago cookies and sentani cork fish was tested at the Jayapura BPOM Laboratory. Then a toddler's fall was examined before being given treatment after which treatment was carried out by giving sentani cork fish sago cookies to stunted toddlers for 1 month which was given twice a day at 09.00 WIT and 15.00 WIT to see the impact of the treatment given. This study will produce sago and sentani cork fish cookies as well as the effectiveness of these cookies on stunted toddlers.

RESULT

Sago flour and snakehead fish cookies are one of the alternative additional foods for toddlers. Before being given to toddlers, sago flour and snakehead fish cookies products must be tested first, namely the organoleptic test at the BPOM of Jayapura City to determine the level of preference and content.

Table 1.
Organoleptic Test (n= 25)

Organoleptic Test	f	%
Cookies Flavor		
Do not like	0	0
Kinda dislike	1	4
Kinda Like	1	4
Like	11	44
Really like	12	48
Total	25	100
Cookies Color		
Do not like	0	0
Kinda dislike	1	4
Kinda Like	7	28
Like	12	48
Really like	5	2
Total	25	100
Aroma Cookies		
Do not like	0	0
Kinda dislike	2	8
Kinda Like	15	60
Like	6	24
Really like	2	8
Total	25	100

From the results of this organoleptic test, it shows that out of 25 panelists, based on the taste scale, the majority of panelists chose the category of really liking as many as 12 people (48%) and no panelists disliked the cookies product. Based on the color scale, the majority of panelists chose the category of liking as many as 12 panelists (48%) and no panelists disliked the color of the product. Based on the aroma scale, the majority of panelists chose the category of slightly liking as many as 15 people (60%) and no panelists disliked the aroma of cookies. Cookies are brown in color with chocolate aroma, sago content and snakehead fish. The aroma of chocolate in cookies will attract interest for those who consume them.

Table 2.
Organoleptic Test Results (n= 25)

Evaluation	Flavor	Color	Aroma
Mean	4,36	3,84	3,32
Mode	5	4	3
Minimum	2	2	2
Maximum	5	5	5

Of the 25 panelists who underwent the argonoleptic test, the average value for taste was 4.36, the color category was 3.84 and the aroma category was 3.32.

Table 3.
BPOM Test Results

Types of BPOM Lab Tests	Result
PK Protein	9,31 %
PK Fat	26,83 %
PK contamination Cd	0,12mg/kg
PK contamination Pb	0,08 mg/kg
PK carbohydrate	23,39%
PK Water	3,2 %
PK Ash	1,3%

Conclusion: Meets the requirements for PK Air and PK Abu

Table 4.
Respondent Characteristics (n=15)

Characteristics of Toddlers		f	%
Age (months)			
	1-12	5	33.3
	13-24	4	26,7
	25-36	6	40
	37-48	0	0
	49-60	0	0
Gender			
	Male	9	60
	Female	6	40

From the table 4, based on the characteristics of the respondents, based on age, the majority of toddlers are aged 25-36 months, amounting to 6 toddlers, based on gender, the majority of toddlers are male, amounting to 9 toddlers.

Table 5.
Normality Test

Data	Evaluation	Statistic	Sig.	Result description
Weight	*Pretest*	0,943	0,417	normally distributed
	Posttest	0,908	0,127	normally distributed
Height	*Pretest*	0,913	0,150	normally distributed
	Posttest	0,908	0,150	normally distributed

**Uji Shapiro-Wilk*

Based on the table 5 describing the normality test on the Toddler's Weight data pretest and posttest of Sago Cookies administration, the sig value is > 0.05, meaning that the data is normally distributed.

Table 6.
The Effect of Sago Cookies and Snakehead Fish on Increasing Toddlers' Weight and Height

Result	n	%	*Pre Test* Mean±SD	*Post Test* Mean±SD	Average Difference Mean±SD	*P-Value*
Effect of Cookies on Body Weight	15	100	7,46 ±0.68	8,52 ± 0,94	1,05 ± 0,26223	0.000
Cookies for Height	15	100	77,13 ± 6,52	77,15±6,55	0,02±0,03	0,189

* *Paired Samples T-test*

Based on table 6, the assessment of toddlers' weight before and after being given snakehead fish sago cookies obtained a significance value of <0.05 (0.000), meaning that there is an effect of snakehead fish sago cookies on changes in toddlers' weight as a prevention of stunting in the Sentani Health Center Working Area, Jayapura Regency, Papua. There was a difference in the pretest and posttest values, namely 7.46-8.52 with a difference in increase of 1.05. The assessment of toddler TB before and after being given sago cookies obtained a significance value of > 0.05 (0.189), meaning that there was no effect of giving snakehead fish sago cookies on changes in toddler height as a prevention of stunting in the Sentani Health Center Working Area, Jayapura Regency, Papua. The difference in pretest and posttest values was 77.13-77.15 with a difference in increase of 0.02.

DISCUSSION

The study was conducted on 15 stunted toddlers in the Sentani Health Center work area. Providing additional food to toddlers in the form of cookies with carbohydrate and protein nutritional content obtained from sago flour and snakehead fish is one of the efforts to prevent stunting in toddlers, cookies are additional food that is liked by all ages. Making cookies with sago flour and snakehead fish flour substitution can increase nutritional intake in toddlers. These cookies can be used as an alternative additional food or snacks (finger food) for stunted toddlers (Safira & Kusumaningati, 2024). Making cookies usually uses wheat as an

ingredient. However, wheat has a relatively expensive price, therefore making cookies requires modification of the ingredients used by utilizing local food ingredients (Nadimin et al, 2019). Local food ingredients that can be processed into flour include sago (Dara et al., 2023). Sago can be used as a food product with a carbohydrate content of 84.7% which is the main ingredient in the Papuan community pattern. In addition, sago can also be used as a basic ingredient for making cookies (Parinussa & Matulessy, 2024). Before the cookies were given, organoleptic and BPOM tests were carried out, after being declared to meet the requirements, they were then given to stunted toddlers who had previously been weighed and their height measured. The provision was carried out for one month, every day the toddlers were given cookies 2 times. After the cookies were given, Height and Weight measurements were taken. The results of weighing and weight measurements can be seen in table 4.5, which shows the effect of giving sago flour and snakehead fish cookies on changes in weight gain p 0.000.

Various studies related to the provision of additional food in the form of biscuits or cookies to toddlers have often been carried out, including a significant increase in the weight of PAUD children after intervention with gaguk rainbow fish cookies, namely 0.928 kg for 27 days. Providing gaguk rainbow fish cookies as additional food or snacks contains energy and protein which are good for the growth of early childhood. Additional food or snacks play an important role in providing additional contributions to meet nutritional adequacy, especially energy and protein (Erdiana et al., 2021) . Snakehead fish is a freshwater fish that contains quite a lot of protein, so it is often used as a raw material for food (Nurhamzah et al., 2024). Previous studies have revealed that snakehead fish is the best source of animal protein, namely 20.0 g/100g compared to beef, poultry, and other types of fish which are below 18.8 g/100g. The high protein content in snakehead fish is also described by the high albumin compound (Phan et al., 2021). For that reason, consuming snakehead fish will certainly increase the amount of albumin in stunted children (21.4%) which is lower than the albumin in children with normal nutritional status. In addition, snakehead fish can also be processed into various types of processed foods such as snack bars, biscuits, shredded meat, and cookies (Pangestu et al., 2024). Main function The main function of protein is to form new tissue and repair damaged tissue. Protein is needed for growth and development during growth and to maintain body tissue. Children who lack protein have a 17.5 times greater risk of stunting compared to toddlers who have sufficient protein intake (Kundarwati et al., 2022). For the assessment of height, the results showed that there was no effect of giving sago cookies and snakehead fish on changes in height p 0.189. This is in line with research (Salsabilah et al., 2016). conducted in the Kapasa Health Center area of Makassar City, with the results of providing additional food ineffective on changes in height and length with a p value of 0.502. Because stunting occurs not only because of diet but also due to various factors. Rohmah's research, 2020 said that there is a relationship between parental height and the incidence of stunting with a p value of 0.309.

CONCLUSION

The conclusion is that there is an effect of giving sago cookies and snakehead fish on weight gain and there is no effect of giving sago cookies and snakehead fish on changes in height.

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