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SAGO CATERPILLARS: ALTERNATIVE LOCAL FOOD SOURCES OF NUTRITION POST PANDEMI FAMILY

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Abstract

The existence of sago caterpillars as an alternative source of animal protein brings its own color in food diversity because it is unique and potentially available in sago growing areas. Sago caterpillar is included in the class of food ingredients that are easily damaged, so it is necessary to carry out an innovative processing, one of which is by using a vacuum dryer to maintain its shelf life and aesthetics so that it is easily accepted. This study aims to introduce sago caterpillars in the community as an alternative source of animal protein. This research is a qualitative research with a descriptive approach, while the data collection technique is carried out by exploring journals, books and other information relevant to the study. The results of chemical laboratory analysis of sago caterpillars studied from Wolasi sub-district, South Konawe Regency showed that the average moisture content of fresh sago caterpillars was 57.92%, total energy was 265.67 kcal, protein was 8.52%, fat was 20.07% and carbohydrates were were 12.74 %. While the average moisture content of dry sago worms was 4.31%, total energy was 374.80 kcal, protein was 16.66%, total fat was <0.02% and carbohydrates were 77.04%. In conclusion, in terms of nutritional content, the sago caterpillar has the potential to be an alternative source of animal protein.

Keywords: Sago Caterpillar, Local Food, Source of Nutrients, Post-Pandemic.

INTRODUCTION

In the era of and after the Covid-19 pandemic, people are faced with various life problems , one of which is the problem of food supply. Farmers and fishermen experience disruptions in the food supply chain, which ironically has an impact on food commodity prices which have decreased due to falling demand (Directorate of Scientific Publications and Strategic Information, 2020) . The reduced activities of people who do a lot of activities at home, have an impact on the economic sector, namely culinary, where their business is not running so that the demand for food commodities actually drops drastically (Fahrika & Roy, 2020).

The impact of Covid-19 is not only from the disease, but also the policies taken, there are PSBB and so on, this affects economic activity, agriculture is also

affected. The decline in food commodities occurred because of the PSBB which caused food distribution to be hampered and even many commodities were damaged so that prices fell. The spread of layoffs also triggered a decline in people's purchasing power. This decline in economic growth cannot be separated from the process of handling the spread of the Corona virus which has had an impact on all aspects of life and the economy (Sihaloho, 2020) . According to (Fahrika & Roy, 2020) the Covid-19 pandemic also had an impact on macroeconomic developments in Indonesia and the policy responses adopted . This is also due to the high number of cases of morbidity and mortality, further triggering economic and public health problems as well as triggering stress that makes the body easily sick. Stress triggers a decrease in body resistance.

Adequacy of nutrition and food is one of the most important factors in developing the quality of human resources during a pandemic. Indonesia is still facing serious nutritional problems that have an impact on the quality of human resources (HR), one of the problems of malnutrition which is still high is stunting and wasting in children under five. And during the pandemic it is estimated that there will be an increase in cases of malnutrition in toddlers.

Stunting, according to the World Health Organization (WHO) is a developmental disorder in children caused by poor nutrition, repeated infections, and inadequate psychosocial stimulation. If a child has a height (TB) < -2 standard deviations (SD.) the child's growth median set by WHO According to the Ministry of Health's Basic Health Research (Riskesdas) data (2019), the national stunting rate has decreased from 37.2% in 2013 to 30.8% in 2018. Meanwhile, according to the 2019 Indonesian Toddler Nutrition Status Survey (SSGBI), this figure has decreased to 27.7%. The reduction in the stunting rate has been declared a national priority program (Ministry of Women's Empowerment and Child Protection of the Republic of Indonesia, 2020).

Currently, the government is constantly moving to organize the implementation tools for accelerating stunting prevention and formulating the National Strategy (Stranas) for the Acceleration of Stunting Prevention for 2018-2024. And through the 2020-2024 Medium Term Development Plan (RPJMN), the government has set a target for the national stunting rate so that it can fall to 14%. However, over the last 20 years, the handling of the problem of stunting has been very slow. Globally, the percentage of children experiencing stunted growth has decreased by 0.6% per year since 1990. WHO has proposed a global target of reducing stunting in children under the age of five by 40% by 2025, but it is predicted that this target can only be achieved by 15- 36 countries (Coordinating Ministry for Human Development and Culture, 2018) . Given these nutritional problems, it is necessary to think of an alternative in meeting nutritional needs through cheap, easy to obtain and nutritious local food so that it can support the reduction of malnutrition rates in Indonesia.

The rapid development of the human population and the expansion in middle-class society for quality protein sources, such as beef, poultry, eggs, it is predicted that in the future we will no longer be able to meet their availability. For this reason, new thinking is needed in providing food sources of animal protein from other food ingredients such as insects. Insects have an excellent conversion rate from feed to meat. There is no way we can sustain conventional livestock

production environmentally if we are to meet the needs of a growing human population.

Eastern Indonesia is the largest sago producing region in ASIA (Putra, 2014) . Sago is a local food source of carbohydrates and waste from harvesting sago trees produces sago caterpillars as a source of protein (Nirmala et al, 2017). Research on sago caterpillars originating from Papua has been carried out by (Köhler, 2020) where the nutritional value of protein is quite high, approaching that of meat, poultry and egg protein of 10.39/100 grams and a digestibility value of 92%. In addition, there are also other nutrients such as high zinc and magnesium and safe levels of heavy metals. Research on sago caterpillars on healthy toddler subjects in Sulawesi showed an increase in body weight and height after the intervention of 20 g of sago caterpillars which were diversified in complementary foods for breast milk (ASI) (Nirmala et al., 2017) . Intervention of sago worms in this study used a dose of 0.36 g/100 g body weight/day based on lysine needs during the growth period and a dose of 1.36 g/100 g body weight/day based on intervention research on sago caterpillars as a complementary food to breast milk to increase height. healthy children's bodies (Lestari et al., 2021a) . Wistar rats aged 4 weeks were used in this study because they are the same age as children 2-3 years old in humans (Andersen & Winter, 2019) . Research on sago caterpillars as an alternative source of protein has also been carried out with the aim of repairing tissue damage caused by oxidative stress.

RESEARCH METHODS

This research is a qualitative research with a descriptive approach . Qualitative research method is a research method that focuses on in-depth observation. Therefore, the use of qualitative methods in research can produce a more comprehensive study of a phenomenon. Qualitative research that pays attention to humanism or the human individual and human behavior is the answer to the awareness that all consequences of human actions are affected by the internal aspects of the individual. These internal aspects include beliefs, political views, and the social background of the individual concerned (Ardianto, 2019) . According to Ansori (2019) the descriptive method is carried out by describing facts which are then followed by analysis, not only deciphering, but by providing sufficient understanding and explanation. While the data collection is done by exploring journals, books and other information relevant to the study. The data sources used as material are the results of research data and books, journals, articles, and similar things obtained through Google Scholar. Activities in qualitative data analysis in this study were carried out by relying on interactive models (Miles, 1984) which is done through data reduction, data display, and conclusion drawing/verification.

RESULT AND DISCUSSION

Malnutrition is a form of malnutrition as a result of a lack of availability of nutrients needed by body tissues. Signs of malnutrition include slow growth which is characterized by excess body fat loss in both children and adults.

Lack of nutrients, especially energy and protein nutrients, is a direct factor in malnutrition. Insufficient protein intake can inhibit the growth rate of children who need large amounts of protein compared to other age groups. Protein will become

an essential nutrient that has a role in a child's growth, processes in the body and reduces the body's resistance to disease (Nuban et al., 2020).

Most people in Papua besides taking sago starch, the rest of the sago plant stems are used to cultivate sago caterpillars. Sago caterpillars by the people of Papua and Maluku are generally consumed as a complement to sago porridge. Utilizing the remnants of sago trees whose starch has been taken plays a significant role in reducing the waste produced. Communities generally use and take sago caterpillars from the remaining processed products directly in the forest (Purnamasari, 2009).

Sago caterpillar is the larvae of the coconut red beetle. Sago caterpillars are the food consumed by the majority of the people of Papua. According to the belief of the Komoro people (one of the tribes in Timika, Papua) that sago caterpillars have a high protein content. The sago caterpillar contains 13.8% and a high number of amino acids, while the use of the sago caterpillar is still limited.

The nutritional content of sago caterpillars has almost the same quality as standard protein (casein), which means that sago caterpillars can be used to support the growth and maintenance of body tissues. Sago caterpillar contains 16 amino acids, 8 of which are essential amino acids, namely Isoleucine, Lysine, Methionone, Phenylalanine, Threonine, Valine, and Tryptophan (Setyaningsih, 2018). Sago caterpillar flour can be used as an alternative source of protein to repair tissue damage caused by oxidant stress (Lestari et al., 2021).

Imago stage 3-6 months. Eggs are laid by female beetles in stem wounds or oryctes movement marks. The number of eggs can reach 500 eggs. Length 2.5mm, width 1mm. the eggs hatch after 3 days. Larval period 2.5-6 months (depending on temperature in humidity). After growing up, the larvae will stop eating, then look for a cool, damp protected place to prepare to form pupae. When it will form a pupa, the larva has a length of 3-4 cm and a sheet of 1.5 cm. Two weeks live in the cocoon and change shape to become adults for 3 weeks and still live in the cocoon. The last phase is red-brown and the body parts have shown the body of an adult beetle.

Harvesting sago caterpillars naturally will usually only be done once for each log of sago waste. This is because when harvesting sago caterpillars, the growing media (sago logs) are damaged using an ax or machete. Sago caterpillars will usually be on the inside or cracks of rotting tree trunks. The shape of the sago caterpillar varies, some are very small to the largest the size of an adult's thumb.

For the benefits of the nutritional content of the sago caterpillar itself, every 100 grams of raw sago caterpillar to be cooked contains about 9.34% protein. This sago caterpillar can also be used as an alternative side dish that is free of cholesterol, very good for our bodies because it contains high protein and is free of cholesterol (Hastuty, 2016).

The results of the chemical laboratory analysis of sago caterpillars studied from Wolasi sub-district, Konawe Selatan Regency showed that the average water content of fresh sago caterpillars was 57.92%, total energy 265.67 kcal, protein 8.52%, total fat 20.07% and carbohydrates 12 ,74%. Meanwhile, the mean water content of dry sago caterpillar was 4.31%, total energy was 374.80 kcal, protein was 16.66%, total fat was <0.02% and carbohydrates was 77.04%.

In line with the results of the analysis of the protein content of sangu caterpillars using the Kjshal method in research g, that with thorny stems was

22.8652% without spikes, the protein was 10.06988%. The protein content of sago caterpillars carried out in Halmehera maluku utasa was 4.0575% (Matondang et al., 2022).

CONCLUSION

Based on the research conducted, it was found that the sago caterpillars studied from Wolasi sub-district, South Konawe Regency showed that the average water content of fresh sago caterpillars was 57.92%, total energy 265.67 kcal, protein 8.52%, total fat 20.07% and carbohydrates. 12.74%. Meanwhile, the mean water content of dry sago caterpillar was 4.31%, total energy was 374.80 kcal, protein was 16.66%, total fat was <0.02% and carbohydrates was 77.04%. So it can be concluded that this sago caterpillar has the potential to be used as an alternative source of animal protein.

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