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Effect of amino acids intake of rubber seeds processing as alternative comestible length for infants born against

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Abstract. Sumatra and Kalimantan are the region with the area and the highest rubber production in Indonesia, including Lampung province that is also abundant production of rubber seed every year. Rubber seed contains a protein that is high enough. With the high crude protein, it can be used to make rubber seed chips and snacks potential to be used as a source of protein for pregnant ibi amino acids to help meet the mother during pregnancy. Sufficient amino acid intake during pregnancy associated with a body length of birth. This research was observational analytic with cross sectional design. Sampling method used in this study is consecutive sampling. The study was conducted in East Lampung in 2016. The subjects were all pregnant women including rubber farmers in East Lampung region and met the inclusion criteria of the study. The samples obtained were 124 pregnant women and their babies. Data were analysed descriptively. The results obtained indicate that rubber seed chips can help meet amino acid intake during pregnancy and affects the baby's body length at birth. From the sample of the research note that 89.5% of the infants had a body length of > 48 cm (normal) and 10.5% of infants had a body length of <48 cm (short). The nutritional intake of pregnant women is very important to prevent children born with a body length is not normal. The results obtained indicate that rubber seed chips can help meet amino acid intake during pregnancy and affects the baby's body length at birth. From the sample of the research note that 89.5% of the infants had a body length of > 48 cm (normal) and 10.5% of infants had a body length of <48 cm (short). The nutritional intake of pregnant women is very important to prevent children born with a body length is not normal. The results obtained indicate that rubber seed chips can help meet amino acid intake during pregnancy and affects the baby's body length at birth. From the sample of the research note that 89.5% of the infants had a body length of > 48 cm (normal) and 10.5% of infants had a body length of <48 cm (short). The nutritional intake of pregnant women is very important to prevent children born with a body length is not normal.

1. Introduction

Indonesia is the country's second largest natural rubber producer after Thailand, with an area of rubber plantation in the world [1]. Most of the rubber produced from the rubber of the people which covers a total area of 81% of existing dar. Rubber plantation nearly spread all over Indonesia, including Lampung Province. Based on data from the Plantation Office of Lampung Province [2], the land area of rubber in the province of Lampung is 158.999 ha which includes 15 East Lampung district that currently has the potential rubber cultivation increasingly passionate. Rubber is growing every year, both in terms of acreage and production (tonnes). The average production from 2007 to 2014 as many



as 46 798 tonnes. The rubber plant is one kind of plant MPTS (Multi Purpose Tree Species) which produces non timber forest products such as gum [3]. Rubber seeds contain nutrients especially proteins that could potentially be used as a raw material of food. Rubber seed as a food ingredient has not been fully utilized by the community, but each plant capable of producing seeds rubber around 0.8 to 1.2 tonnes / ha / year (for plants with over 4 years of age). The abundance of rubber seed in the East Lampung Regency is one of the capital to improve the creative food industry in the District. Rubber seed as a food ingredient has not been fully utilized by the community, but each plant capable of producing seeds rubber around 0.8 to 1.2 tonnes / ha / year (for plants with over 4 years of age). The abundance of rubber seed in the East Lampung Regency is one of the capital to improve the creative food industry in the District. Rubber seed as a food ingredient has not been fully utilized by the community, but each plant capable of producing seeds rubber around 0.8 to 1.2 tonnes / ha / year (for plants with over 4 years of age). The abundance of rubber seed in the East Lampung Regency is one of the capital to improve the creative food industry in the District.

Constraints are less optimal utilization of rubber seeds as an alternative comestible due to the content of HCN. However, HCN reduction techniques related research has been done before and proven to reduce the HCN content until the limit is safe to consume all circles from children, adolescents, adults and pregnant women. Boiling rubber seeds for 15 minutes and soak them in water for 24 hours (the soaking water replacement every 6 hours) has been shown to reduce levels of cyanide (HCN) in the rubber seeds. Rubber seeds that have been safely consumed can be used as raw material for rubber seed chips. Rubber seed has a proportion of parts that can be consumed around 57%. In addition, rubber seed contains nutrients, especially protein. Rubber seed nutrient composition consisting of 27% protein, 32.3% fat, carbohydrates 15.9%, water 9.1% and 3.96% [4]. With the crude protein content is high, then the rubber seed chips containing amino acids and also high potential to be used as a source of protein snacks [4]. Processed rubber seeds can be used to meet the daily protein requirement for pregnant women in addition to meat, fish, eggs, milk and various derivatives in terms of support programs Protein Adequacy Score (AKP). Quality of food proteins is determined by the composition and quantity of essential amino acids [5]. This amino acid plays a role in meeting the nutritional needs of pregnant women. The adequacy of nutrition of pregnant women affect the nutritional status of children in the womb which will further define the development of children, especially during growth (golden age) [6].

Formulation of the problem is how does the influence of amino acid intake from rubber seed treatment as an alternative to body length comestible baby is born?. The purpose of this research is to determines the effect of amino acid intake from rubber seed treatment as an alternative to long comestible birth weight. This research can be used for:

1. As the information to the public and the government about the effect of amino acid intake from rubber seed treatment as an alternative to long comestible birth weight.
2. Can be input to the government or the parties concerned in order to increase the creative food industries in East Lampung regency.

2. Method

2.1. *The design, location and research subjects*

This research was observational analytic with cross sectional design. Sampling method used in the study is consecutive sampling. The study was conducted in East Lampung in 2016. The subjects were all pregnant women including rubber farmers in East Lampung region and met the inclusion criteria of the study. The samples obtained were 124 pregnant women and their babies. The subject has the following inclusion criteria.

1. Pregnant women who are physically healthy and clinical
2. Not having a birth defect
3. Residing in East Lampung
4. Eating chips during pregnancy rubber seeds
5. Parents babies willing to participate in the study by signing the informed consent

Subjects who met the inclusion criteria measurements of the baby's length at birth by looking at the data in the book MCH (Maternal and Child Health Handbook).

2.2. Collecting, processing and data analysis

The data collected were body mass index (BMI), protein level and baby's body length. Body length measurements carried out by trained personnel using berketelitian-board length of 0.1 cm. Analysis of the data used is descriptive analysis and presented in tabular form. While the rubber seed chips consumption data collected by food recall 1 x 24 hours per month during the study and were taken on average consumption. How rubber seed processing into chips [7]:

1. Literature review. Information on reduction techniques cyanide (HCN) contained in the rubber seed and the details of the content of the nutritional value obtained from the literature. The information is used as a reference in the processing of rubber seeds to make it safe for consumption.
2. Selection and extraction of rubber seeds. Sorting is done to get a rubber seed deserves to be further processed as raw material comestible. High-quality rubber seed memantulnya marked with rubber seeds when dropped. Rubber seed extraction is done with the aim of separating the hard seed coat with meat seeds. The extraction process using a hammer or stone tools.
3. HCN reduction process. HCN reduction process is based on past studies as well as information obtained from our library. Boiling rubber seeds for 15 minutes followed by immersion in water for 24 hours and the replacement of the soaking water every 6 hours is used as a method of HCN reduction in this study.
4. Processing of rubber seeds as an alternative comestible. Rubber seed that has passed the HCN reduction process, to be further processed as an alternative comestible grains rubber chips.

3. Results

Table 1. Body Mass Index (BMI) pre pregnancy and third trimester

Classification of BMI	Pre		Third Trimester	
	Amount	(%)	Amount	(%)
<i>Underweight</i>	20	16,1	17	13,7
<i>Normal range</i>	68	54,9	76	61,3
<i>Overweight at risk</i>	17	13,7	12	9,7
<i>Obese</i>	19	15,3	19	15,3
Total	124	100	124	100

BMI of pregnant women in pre-pregnancy and third trimester are generally included in normal BMI.

Table 2. Protein levels at the beginning of second trimester and third trimester

Protein Levels	Beginning of Second Trimester		Third Trimester	
	Amount	%	Amount	%
≥ 6,4 mg/dl	109	87,9	115	92,7
< 6,4 mg/dl	15	12,1	9	7,3
	124	100	124	100

The protein levels at the beginning of the second trimester of pregnancy was 12.1% which lacked protein and decreased to 7.3% in the third trimester.

Table 3. Body length measurement results baby is born

Long Firm	Amount	Percentage (%)
> 48 cm (normal)	111	89.5
<48 cm (short)	13	10.5
Total	124	100

At birth body length measurements of babies born to mothers who regularly eat chips of rubber seed with an average of 300 grams / per month. The results showed 89.5% of infants born with normal body length > 48 cm and 10.5% of infants born with a body length \leq 48 cm.

4. Discussion

In the rubber seed processing chips, do boiling water for 15 minutes, and replacement of water every 6 hours for 24 hours. This time is shorter when compared with Widayati [8] and this ensures that the content of amino acids in the rubber seed still available. In order to get the maximum processing, rubber seed must go through perfect processing to eliminate the anti-nutritional substances in it (HCN / Acid Cyanide). Widayati [8] do boiling for 45 minutes and test of hemagglutinin activity against rubber seed analyzed indicate negative values. The processing of rubber seeds will improve the digestibility of the protein, from 85.95% in the seeds of 102.46% of raw rubber into the rubber seeds that have been soaked and boiled. The percentage of amino acids decreased, while the percentage of the proteins varied according to a decrease in protein content. Amino acids in the seeds of the rubber is methionine, cysteine and lysine. Score each seed raw rubber is 32.0 (methionine + cysteine) and 45.6 (lysine). While on the rubber seeds that have been soaked and boiled amounted to 36.9 (methionine + lysine) and 40.4 (lysine).

BMI was calculated in pregnant women to determine the nutritional status of pregnant women related to nutritional intake during pregnancy. From the data obtained shows that pregnant women generally are on a normal BMI. The number of normal BMI of pregnant women increased from 54.9% to 61.3% in the third trimester. The number of pregnant women with protein levels \geq 6.4 mg / dl also increased in the third trimester from 87.9% to 92.7%. The next step is to measure the length of the baby's birth where during pregnancy the mother has additional protein intake through rubber seed chips (Table 3).

In this study the results obtained indicate that rubber seed chips consumption habits affect the baby's body length. Babies are born with a body length of normal (> 48 cm) more than babies with a body length is not normal / short (\leq 48 cm). Emawati, et al [6] states that babies are born with a short body length of 6 times risky short stays at 12 months compared to normal birth, while pregnant women with protein intake is less than 58% RDA is 1.6 times greater risk of having a child stunting at the age of 12 months than women with \geq 58% RDA of protein intake. Babies born to normal (body length \geq 48 cm) have a higher survival rate compared with children who were born with a body length is not normal (<48 cm). The length of the body is born with the risk of occurrence of stunting.

Based on research Septiani [9], the rate of maternal nutrient consumption is still low. Only 39% of pregnant women who meet their protein requirements. Amino acid intake of protein obtained from rubber seed chips to help meet the needs of an amino acid in pregnant women. Pregnant women need protein in sufficient quantity and complete amino acid content because during pregnancy increased protein requirements for growth and development of the fetus [10]. The impact of protein intake deficiency is a growth disorder in the fetus, such as intrauterine retardation, birth defects, low birth weight and miscarriage [11]. Nutrition during pregnancy is one of the important factors that influence the development of the embryo and fetus and health status of pregnant women. Pregnancy is a continuous phase, so that deficiency in a period would give a different impact on the outcome of pregnancy. Quality of babies born very dependent on the state of maternal nutrition before and during pregnancy.

Short birth length of the body can lead to stunting. Short stature (stunting) became one of the nutritional problems in developing countries, including Indonesia. Riskesdas data in 2010 showed that 35.6% children in Indonesia are having problems stunting. That is, more than a third of our toddler has a height lower than the standard height toddler age. Stunting be an indicator of chronic malnutrition which describes the history of child malnutrition in the long term and does not rule out the possibility in the womb or have had recurrent infectious diseases after birth. Children who experience severe stunted not only on shorter physical stature, but also on cognitive function. Children who suffer from malnutrition, including short,

Grantham-McGregor [12] states that a failure of linear growth stunting due to malnutrition and infections both before and after birth. Semba [13] also stated that stunting in children early age is associated with cognitive, motor, and a low socio-emotional development and increase mortality. Short children cannot reach full growth potential and will become stunted adolescents and adults. The consequences of stunting will continue in adulthood, with reduced work productivity. In women, there is increased risk of death in childbirth and adverse birth outcomes around the world where about one-third of preschool children is stunted. Therefore, to prevent stunting in early childhood, especially at birth,

5. Conclusion

Rubber seed chips help meet amino acid intake during pregnancy and affect the baby's body length at birth.

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