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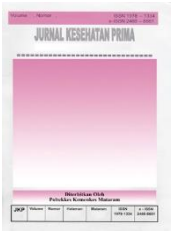

# The Effect Of Koya Reboned Powder Consumption On Protein Levels Of Pregnant Women In Prevention Of Stunting In Babies

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## Abstract

Linear growth retardation in childhood has decreased over the past few decades, but has not had a positive effect. In Indonesia, the change in the prevalence of stunting is around 37%. The nutritional status of pregnant women plays an important role in the incidence of stunting, which will be seen at the age of <5 years in 1000 days of their life. Pregnant women with poor nutrition and significant infection can give birth to a baby with stunting. For this reason, nutritional intake is needed, one of the animal foods that are high in protein is rebon shrimp about 62.4 g / 100 grams of dried shrimp. Protein has an important component so it is necessary for the physical development of children. The purpose of this study was to analyze serum protein levels before and after consuming rebon shrimp based suplementary feeding powder in the intervention group and control group and to analyze differences in serum protein levels for pregnant women before and after consuming suplementary feeding Koya powder made from rebon shrimp between the control and intervention groups. . This type of research is a quantitative study with a quasi-experimental method using the pre post test control group design approach. The number of respondents was 30 people who were divided into 2 groups, namely the intervention group and the control group. The intervention group was given koya powder as much as 100 grams / day for 7 days, assuming the fulfillment of 70 KKal. Data analysis using Data analysis using the Mann-Whitney test, if the data is not normally distributed. If the data are not normally distributed using the free sample t2 test. The conclusion of the analysis results to answer the research hypothesis. The results of the study were significant values P 0.000 <0.05. Conclusion There was a significant difference in serum protein levels of pregnant women before and after consuming suplementary feeding Koya powder made from boiled shrimp between the control and intervention groups.

**Keywords: Koya Rebonded;Pregnant Women;Serum Protein**

## INTRODUCTION

The World Health Organization (WHO) in 2012 supported a 40% reduction in the number of children under 5 who are stunted by 2025, as stunting reduction is one of the six main goals in the global nutrition target. Globally, the prevalence of linear growth retardation in children (stunting) has decreased over the last few decades, however this has not had a positive effect because the rate is still very high. (Bhutta et al., 2020)

In Indonesia, based on the results of Basic Health Research (Riskesdas), the prevalence of stunting in children under five has decreased from 37.21% in 2013 to 30.79% in 2018. The incidence of stunting varies per province from 26% in Riau Islands to 52% in East Nusa Tenggara (Kemenkes RI, 2018). Several factors that have the potential to cause stunting include breastfeeding practices, complementary feeding practices, exposure to infections and related distal determinants such as

education, food systems, health care, and water infrastructure (Beal et al., 2018).

In addition, the nutritional status of the mother plays an important role in the growth failure that will be seen in children aged <5 years which occurs within 1000 days of their life starting in the uterus during pregnancy. Pregnant women with poor nutrition and significant infections can give birth to a baby with stunting (Bhutta et al., 2020).

During pregnancy, pregnant women require increased nutritional intake to prevent micronutrient deficiencies. Intervention with the provision of optimal nutritional intake during pregnancy, especially foods that contain high protein is expected to be able to help meet their needs. Rebon shrimp is included in the type of shrimp that contains high protein around 62.4 g / 100 grams of dried shrimp (Abdullah et al., 2020).

Protein is part of nutrients that have important components so that it is very necessary for the physical development of children. Evidence shows that pregnant women who consume protein below average are 1.6 times more likely to have a short child at 12 months of age than pregnant women who consume above average protein (Ernawati et al., 2013).

Protein functions for tissue growth and maintenance, so that cells can synthesize new proteins, they must have all the essential amino acids. High protein content plays a role in nail growth, hair growth, and is able to increase muscle mass. Toddlers who have less protein intake are 5.54 times more likely to have low nutritional status (Salsa et al., 2016).

One of the efforts to prevent stunting is by intervening in the intake of macro and micro nutrients during pregnancy. Rebon shrimp is one of the animal foods that meet multi micronutrients, because it contains 295 cal calories, 62.4 g protein, 2.3 g fat, 1.8 g carbohydrates, 1209 mg calcium, 1225 mg phosphorus, 6.3 mg substances. iron, vitamin A 210 mg, 0.14 mh vitamin B1, 20.7 g water per 100 gr (Syarif et al., 2017). So it is expected to prevent micronutrient deficiencies associated with adverse outcomes for both mother and baby (Keats et al., 2018).

Additional food must meet the requirements in terms of taste, practicality, storage capacity, easy to serve, after being obtained and already known to the public. (Rosa Hadiana Putri , AASP Chandradewi, Reni Sofiyatin, 2019). To meet this standard or requirement, the researcher has tested it first before giving it to the Respondent.

Research related to rebon shrimp on increasing blood protein levels of pregnant women is still limited, but based on a study conducted in 2020, it shows that rebon shrimp can significantly increase hemoglobin levels in pregnant women, this is because the high protein content in rebon shrimp can function. as a means of transporting iron. For this reason, researchers took rebon shrimp because it is high in protein so that it is expected to be able to increase protein levels in the blood. Thus, the researcher adopted this study with the aim of analyzing differences in serum protein levels of pregnant women before and after consuming PMT koya powder made from rebon shrimp.

## METHOD

This type of research is a quantitative study with a quasi-experimental method using the pre post test control group design approach. This study consisted of 2 stages, in the first stage there was an organoleptic test of PMT Koya powder and the second Tahab was a test for differences in serum protein levels in pregnant women.

The research hypothesis testing was included in unpaired numerical comparisons to see the changes in

serum protein serum of pregnant women in the 2nd and 3rd trimesters between the intervention and control groups. The number of respondents was 30 people who were divided into 2 groups, namely the intervention group and the control group with the same number of each group (Swarjana, 2015).

The intervention group was given koya powder as much as 100 grams / day so that the total consumption was 700 grams / week, assuming the fulfillment of 70 KKal. Thus it is expected to be able to meet the adequacy of nutritional substances in pregnant women in the first trimester of 180 while in the second and third trimesters as many as 300.Pregnant women in the first trimester normally experience nausea and vomiting, so to avoid research bias, one of the exclusion criteria is pregnant women. with a history of hyperemesis gravidarum were excluded from the study sample.

Meanwhile, the control group was advised to eat foods such as daily consumption patterns. Independent variable is Rebon Shrimp Koya Powder and the dependent variable is Serum Protein which is categorized into 2 categories, namely low if the serum protein level is (<6.40 g / dl) and Normal if the serum protein level (> 6.40 g / dl) is used. ordinal scale. The research instrument used to measure serum protein was in the form of an observation sheet while the serum protein level test was carried out directly by the health analysis officer at Rs. Sele Be Solu, Sorong City.

Data analysis used the Mann-Whitney test, if the data were not normally distributed. If the data are not normally distributed using the free sample t2 test. This research has received ethical approval from the Health Research Ethics Committee of the Ministry of Health Sorong Polytechnic in 2020, with number DM.03.05 / 6/055/2020 dated April 24, 2020. Because the sample is a vulnerable group, ethically this research has met the 5 criteria refers to the national guidelines for health research ethics and operational guidelines for the health research ethics commission in Indonesia published by the Indonesian Ministry of Health (Mieke.H.Satari, 2011).

## RESULT AND DISCUSSION

**Table 1**

**Characteristics Of Research Subjects In The Intervention Group And The Control Group**

| No | Characteristics | Group | | | |
|---|---|---|---|---|---|
| | | **Intervensi** | | **Kontrol** | |
| | | n | % | n | % |
| 1 | **Age** | | | | |
| | <20 | 1 | 6,6 | 1 | 6,6 |
| | 20-35 | 14 | 93,3 | 13 | 86,6 |
| | >35 | 0 | 0 | 1 | 6,6 |
| | **Total** | **15** | **100** | **15** | **100** |
| 2 | **Religion** | | | | |
| | Islam | 15 | 100 | 11 | 73,3 |
| | Protestan | 0 | 0 | 3 | 20 |
| | Katolik | 0 | 0 | 1 | 6,6 |
| | **Total** | **15** | **100** | **12** | **100** |
| 5 | **Profession** | | | | |
| | IRT | 15 | 100 | 15 | 100 |
| | Non IRT | 0 | 0 | 0 | 0 |
| | **Total** | **15** | **100** | **15** | **100** |
| 6 | **Paritas** | | | | |
| | 1 | 3 | 20 | 5 | 33,3 |
| | 2-5 | 12 | 80 | 10 | 66,6 |
| | >5 | 0 | 0 | 0 | 0 |
| | **Total** | **15** | **100** | **15** | **100** |
| 7 | **Gestational Age (Weeks)** | | | | |
| | 1-13 | 3 | 20 | 1 | 6,6 |
| | 14 – 26 | 4 | 26,6 | 7 | 46,6 |
| | 27 -40 | 8 | 53,3 | 7 | 46,6 |
| **Total** | | **15** | **100** | **15** | **100** |

Based on Table 1, the characteristics of respondents based on the age of the respondents, both the intervention and control groups, were mostly at the age of 20-35 years. In the intervention group as much as 14 (93.3%) and the control group as much as 13 (86.6%). At this age is a safe period for pregnancy and childbirth, because the mother is physically and mentally ready (Zahidatul Rizkah & Trias Mahmudiono, 2017).

Characteristics of Respondents based on religion mostly embraced Islam, in the intervention group as much as 15 (100%) and the control group as much as 11 (73.3%). Religion is one of the factors that can affect the nutritional status of a pregnant woman. Food abstinence or taboo eating, especially eating animal foods such as sea fish, crab and even shellfish will have an impact on the lack of protein intake so that it has an impact on serum protein levels in the blood. Evidence shows there is an effect of the food taboo on the incidence of anemia, although this study did not assess protein levels, it can be concluded that if the mother is anemic it will indirectly affect the protein levels in her blood (Martini & Haryanti, 2015).

Characteristics of respondents based on work, both the intervention and control groups were 100% unemployed. Women who do not work or housewives are a vulnerable group, because they have to do household chores for a full day. In addition, this group tends to have a lower socioeconomic status so that their nutritional needs are not fulfilled properly (Zahidatul Rizkah & Trias Mahmudiono, 2017)

Characteristics of respondents based on parity in both groups were mostly parity of 2-5 children. The nutritional status of children under five is strongly influenced by the number of children, meaning that children from families with a large number of household members are 1.34 times more likely to experience stunting compared to children from families with sufficient household members (Apriasih, 2020). In addition, stunting was more potential to occur in mothers with large numbers of children, 3.25 times greater than those with few children. Limited food consumption. Lack of time to share attention with children is one of the trigger factors (Jihad et al., 2016).

Characteristics of respondents based on gestational age in the two groups were mostly at 27-40 weeks of gestation, in the control group as many as 8 people (53.3%) and in the control group as many as 7 people (46.6%) while the lowest was at 1 to 13 weeks of gestation. in the intervention group as many as 3 people (20%) and the control group as many as 1 person (6.6%). Pregnant mother nutrition is an important factor that is responsible not only for the health of the baby, but also for the long-term growth of the baby (Bang & Lee, 2009).

Nausea and vomiting in pregnancy can affect about 80% of pregnancies, this is caused by several factors including young age, previous delivery, obesity, early menarche, and a history of premenstruals. Symptoms usually appear early in the first trimester, around 5-6 weeks of pregnancy, and peak at 9 weeks of gestation, then subside. Thus, to overcome this bias, pregnant women are sampled even though in the 1st trimester, but with a safe gestational age above 9 weeks so that the intervention given is effective (Chortatos et al., 2018).

**Table 2**

**Blood Biochemical Levels of Pregnant Women (Serum Protein, Serum Albumin And Hemoglobin) Before And After Intervention**

| Kategori | Kelompok Intervensi | | | | Kelompok Kontrol | | | |
|---|---|---|---|---|---|---|---|---|
| | Sebelum | | Setelah | | Sebelum | | Setelah | |
| | n | % | n | % | n | % | n | % |
| Rendah | 13 | 86,6 | 6 | 40 | 4 | 26,6 | 6 | 40 |
| Normal | 2 | 13,3 | 9 | 60 | 11 | 73,3 | 9 | 60 |
| Total | 15 | 100 | 15 | 100 | 15 | 100 | 15 | 100 |

Based on Table 2, it shows that in the intervention group before being given the intervention the most had serum protein levels in the low category as many as 13 (86.6%) respondents while after being given the intervention the most were in the normal category as many as 9 (60). This shows an increase of 7 respondents.

Whereas in the control group before the intervention was carried out the most were in the normal category as many as 11 (73.3%) respondents

| Group | | Sig | Ket |
|---|---|---|---|
| *Test of normality* | Intervensi | 0.000 | Data Not Normally Distributed |
| | Control | 0.000 | Data Not Normally Distributed |

and after the intervention the most were in the low category as many as 9 (60%). This shows a decrease in serum protein levels in 2 respondents

**Table 3**

**Mean Serum Protein Level Measurement Results Before and After the Intervention**

| Group | Pre | Post |
|---|---|---|
| Intervensi | 5.867±0.5948 | 6.493±8388 |
| Control | 7.113±1.1904 | 6.427±9677 |

Table 3 above shows that the mean results of changes in the blood biochemical content of pregnant women in the control group are smaller than the intervention group. After that, the univariate test will be carried out with *Uji Paired Samples Test.*

**Table 4**

**Univariate Test Results Using Paired Samples Test and Wilcoxon**

| | Data | Sig | Information |
|---|---|---|---|
| *Paired Sample Test Dan Wilcoxon* | Serum protein before and after in the intervention group | 0.003 | There are significant differences |
| | Serum protein before and after in the intervention group | 0.003 | There are significant differences |

The results of the Paired Samples Test and Wilcoxon test in table 4 above, for the whole sample experienced a significant difference. To prove the difference in the effectiveness of PMT koya powder on changes in blood serum protein levels of pregnant women, a bivariate test was performed using uji *Independent Samples Test*.

**Table 5**

**Bivariate Normality Test Results Using Kolmogorov Smirnov Z**

From Table 5 above, it is found that the data are not normally distributed. After that, the homogeneity test was carried out with the Levene test to see whether the data variance was homogeneous or not. The results of the homogeneity test of the data variance were not homogeneous. The data is not normally distributed and is not homogeneous so that the Independent Sample Test cannot be done. The homogeneity and normality test results meet the requirements of the Mann Whitnney test. The results of the Levene test and Mann Whitnney test are as follows:

| *Levene's test* | Sig | Information |
|---|---|---|
| Comparison of control and intervention | 0.057 | Homogeneous data variance |

**Table 6**

**Results of Comparative Change Test Using Mann Whitney**

| *Mann Whitnney* | Sig | Ket |
|---|---|---|
| Comparison of changes betwee Control and Intervention Grou | 0.000 | There are significant differences |

From Table 5, it is found that the data variance is not homogeneous, which means that all conditions are met. After that, the Mann Whitnney test was carried out with the results in Table 6, it was found that there was a significant difference between the control group and the intervention group with a P value of 0.000 <0.05. The conclusion of the null hypothesis is rejected, thus "There is an effect of consumption of PMT Koya powder made from rebon shrimp (Mysis Relicta) on changes in serum protein in pregnant women.

WHO has recommended 60 mg of iron daily during pregnancy, but a randomized controlled trial in Bangladesh suggests that iron should be supplemented

with a multiplemicronutrient intake which will have an impact on the child's length at birth, first, third, and sixth month. (Haider et al., 2013).

Rebon shrimp koya powder is thought to be able to meet 70 KKal, with a composition of 41 mg of Calcium (Ca), 265 mg of protein, 21.4 mg of Fe, 0.06 mg of Vitamin B1 and 21.6 grams of water. This means that in addition to the protein content of rebon shrimp, it will be able to have an impact on other body systems. Protein functions as a means of transporting iron, while its calcium (Ca) content is directly related to the genetic system to determine a person's height. Lack of calcium intake can cause low blood calcium levels and can interfere with the body's growth process. Phosphorus (Pi) and Magnesium (Mg) are the main minerals in fetal bone mineralization. Low levels of calcium in maternal serum can cause low serum Ca levels in the fetus (Prendergast & Humphrey, 2014).

Fetal hardening of the bones begins at the sixth week of pregnancy. For this reason, at this time pregnant women must have a good nutritional status, if the supply of nutrients is insufficient it will interfere with fetal growth (Fitriani et al., 2020). The most common nutritional deficiencies can cause linear growth failure (Prendergast & Humphrey, 2014).

The trigger factor for stunting is micronutrient deficiency, in addition to inadequate breastfeeding and recurrent infections during pregnancy. ASI merupakan asupan utama nutrisi pada bayi karena bermanfaat bagi kesehatan dan kesejahteraan bayi. Karena ASI dapat mengurangi risiko infeksi, alergi, dan berdampak positif bagi tumbuh kembang (Jannah, 2020). Endocrine and metabolic signaling, is a complex interaction of maternal nutritional status. Fulfillment of micronutrients during pregnancy as a balanced energy reserve and protein for the mother can reduce the incidence of stunting by 9% and 31% (Prendergast & Humphrey, 2014).

## CONCLUSION

Research related to rebon shrimp is very good, especially in the field of obstetrics. Recommendations for further research can be carried out laboratory tests related to the content of rebon shrimp before use.

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