

# The Effect Of Giving Extracted Moringa Oleifera Leaves Plus Royal Jelly Supplement On Infant Weight And Length Of New Born Of Anemia Pregnant Woman In Takalar District

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## **Abstract**

*Moringa leaves plus royal jelly contain many nutrients and nutritional supplements that are needed by pregnant women.*

*Purpose: to determine the effect of giving Moringa leaf extract capsules plus royal jelly to pregnant women on body weight and body length of newborns in anemia pregnant women in Takalar district.*

*The research method used was True Experimental with the type of intervention randomized double blind, controlled post test. The subjects in the study were 63 samples of anemia pregnant women with a gestation age of 20-32 weeks which were divided into 3 groups, namely the Moringa leaf extract plus royal jelly group with 21 samples, 21 samples of Moringa leaf extract, and 21 samples of Fe tablet. Supplements are given once a day for 60 days. Data analysis using one way ANOVA test.*

*Results: The increase in infant weight and body length for newborns after the intervention was the highest in the Moringa leaf extract plus royal jelly group compared to the Moringa leaf extract and Fe tablet groups.*

*Conclusion: Moringa leaf extract capsules plus royal jelly are more effective in increasing baby weight and newborn body length in anemic pregnant women.*

*Keywords: Moringa Leaf Extract, Royal jelly, weight of newborns, body length of newborns, pregnant women with anemia.*

## **1. INTRODUCTION**

Pregnancy is something special that is felt by a woman as a prospective mother. Changes that occur during pregnancy are physical, social and mental changes, so from the mother as a prospective woman, she must prepare herself to welcome her baby. The mother must also be

in good health, because a healthy mother will give birth to a healthy baby, especially if the mother does not live alone but lives together with the fetus in her womb.<sup>1</sup> Anemia, namely hemoglobin levels <11 g%. In pregnant women, anemia often occurs caused by iron deficiency anemia. Iron deficiency anemia in pregnant women can have a big impact on pregnancy, such as bleeding, maternal mortality, prematurity, perinatal mortality and low birth weight.<sup>2</sup>

Based on data from the World Health Organization (WHO) 2013, the prevalence of pregnant women with iron deficiency ranges from 35-75%. In developing countries the prevalence of anemia among pregnant women varies from 52% to 90%. The prevalence of anemia in developed countries is around 23%, while in developing countries it is around 53%. Anemia in pregnant women contributes to maternal mortality by 20%. The prevalence of anemia in the world reaches 38%, the highest prevalence is in Africa at 55.8% and in Asia at 41.6% and the lowest prevalence is in the European continent reaching 18.7% and in North America at 6.1%.<sup>3,4</sup>

In Indonesia, the prevalence of anemia in pregnant women continues to increase from year to year, where in 2007 it was 24.5%, in 2013 it had increased to 37.1%, in 2018 it reached 48.9%. The prevalence of anemia is almost the same among pregnant women who occur in urban areas (36.4%) and in rural areas (37.8%), according to age, pregnant women aged 25-34 are around 33.7%, at the age of 35-44 it occurs around 33.6%, at the age of 45-54 occurs around 24%, which means that nearly half of pregnant women are at high risk of experiencing pregnancy complications.<sup>5</sup> Meanwhile, from data from South Sulawesi Province, the incidence rate of anemia in pregnant women in 2007 was 48.7% and based on data from the South Sulawesi Provincial Health Office, 23,839 pregnant women whose hemoglobin levels were checked in 2015 experienced anemia with hemoglobin levels 8-11 mg / dl there were 23,478 people (98.49%) and pregnant women with hemoglobin levels <8 mg / dl there were 361 people (1.15%). Meanwhile, data in Takalar Regency in 2017 the number of pregnant women with anemia was 142 pregnant women and continued to increase by 524 pregnant women in 2018. From the data obtained, anemia in pregnant women is a category of severe problems.<sup>5,6</sup>

Public health problem and a priority concern today is nutrition.<sup>7</sup> The cause of nutrition problems is poverty, lack of food availability and public knowledge about nutrition.<sup>8</sup> While the most important period for consuming good nutrition for women is before and during pregnancy. Because, the mother's nutritional needs play an important role in the development and growth of the fetus in the womb and can cause low birth weight which is at high risk of stunting.<sup>9</sup>

In meeting the needs of the fetus in the womb, pregnant women need nutrients to prevent pregnancy complications such as low birth weight. Undernourished pregnant women can cause low birth weight babies and have an impact on the nutritional status of the baby because birth weight is a determinant of the child's survival and development. Maintenance of children's health is carried out from the fetus (in the womb), birth and until the age of 12 years.<sup>10</sup>

Based on WHO and UNICEF data in 2013, there were 22 million babies born in the world where 16% of them were with low birth weight. In developing countries the percentage

of low birth weight is estimated to be 16.5%, twice as high as 7% in developed countries and is more common in countries with low socioeconomic conditions. Indonesia is one of the countries that is in the third place for low birth weight cases at 11.1% after India with 27.6% and South Africa with 13.2%. Even for ASEAN countries, Indonesia ranks second with cases of low birth weight after the Philippines 21.2%. From data from the South Sulawesi Health Office in 2015, the percentage of infant cases with low birth weight in South Sulawesi was 4,697 cases (3.23%) with the number of live births of 149,986 and the number of live births weighed 120,293. In 2016, South Sulawesi Province was ranked the seventh highest prevalence of low birth weight, namely 12%. Meanwhile, in Takalar, the prevalence of LBW in 2013 increased by 11% with the number of KH 5560 compared to 2012, namely 9% with the number of KH 5481.<sup>4,5,6</sup>

From the results of research conducted by Wijaya (2013) states that there is a relationship between pregnant women who are anemia and the incidence of LBW. The results obtained using statistical tests that have been carried out show  $p = 0.026$ .<sup>11</sup>

In Indonesia, one of the causes of the high incidence of LBW is the lack of public trust that considers food to have a very important role in determining the nutritional status of pregnant women and fetal growth. The belief that occurs in the food taboo culture community is based on the associative relationship between foodstuffs based on their shape and nature so that they have bad consequences.<sup>12</sup>

Seeing the problem of pregnancy with LBW, one of the interventions that can be done is by giving Moringa capsules. Moringa Oleifera Leaves supplement is a local plant that has been a multipurpose, nutrient dense and medicinal plant for centuries. Moringa leaves contain various kinds of nutrients and a source of phytochemicals. Moringa contains more and more various natural compounds than other plants. According to research results (Hamzah and Yusuf, 2019), Moringa leaves contain high Fe and can be used as an alternative to treat anemia in pregnant women naturally.<sup>13</sup>

The content of moringa compounds has been researched and reported by (Ibok et al, 2008) which states that Moringa leaves contain 28.29 mg of iron in 100 grams. Another study conducted by Zakaria 2013 said that the nutritional content of 100 grams of Moringa leaf extract protein 27.10 grams, vitamin A 16.30, vitamin E 113, vitamin C 17.30 iron 28.2 and zinc 5.20.<sup>14</sup>

Leone's 2016 study showed that with laboratory tests, the nutritional composition of Moringa leaf extract was 25.25% protein, 91.72 mg iron, and 33,991.51 ug of vitamin A, 1125.71 mg of vitamin C and 3.34 mg of vitamin E. every 100 grams of ingredients. Moringa leaves contain 773 mg of vitamin C for every 100 grams of dry matter. Moringa leaf extract supplements are also considered to be more efficient in preventing anemia and can maintain normal Hb levels (prevent anemia). From the results of research (Suzana et al, 2017), the protein content of moringa extract was 27.33%, the average iron content was 14.67 mg / 100gr, vitamin C 759.05 mg / 100gr. In this study, the content of Moringa leaves such as iron, vitamin A, vitamin C, vitamin K, vitamin B6, thiamine, riboflavin, flavonoids, and protein play a role in the formation of erythrocytes which can increase hemoglobin levels in the blood.<sup>15</sup>

Consuming Moringa leaves is the same as consuming other green leafy vegetables such as spinach, kale, cassava leaves, lettuce and katuk, therefore, there is no inaccurate dosage or overdose as with non-organic chemicals or synthetics, just like nothing. dose or overdose when consuming green vegetables. Royal jelly is a product of the bee's cephalic gland secretion which serves as the most important part of the diet of honey bee larvae. For the first 2-3 days royal jelly can only feed young larvae for the ripening process whereas in adult bees it is a long-term food only, another reason for surviving longer than adult bees is due to royal jelly. One of the drugs that are widely used for traditional medicine and in modern medicine. Royal jelly consists of water (50% -60%), protein (18%), carbohydrates (15%), lipids (3% -6%). Based on modern spectrometry, about 185 organic compounds have been detected in royal jelly. Royalactin is the type of protein that is highest in royal jelly. In addition, royal jelly contains bioactive compounds including 10-hydroxy-2 decenoic (HAD), which has benefits as an immunomodulator, protein, adenosine monophosphate (AMP), adenosine, aceticolin, polyphenols and hormones such as testosterone, progesterone, prolactin, and estradiol as components. bio active in royal jelly.<sup>16</sup>

Moringa plant has been used successfully to treat malnutrition in children and pregnant women. Pregnant women showed higher milk production when consuming Moringa leaves added to their diet and in children showed significant weight gain. Consumption of Moringa leaves is an alternative to tackle malnutrition cases in Indonesia.<sup>17</sup> From the many studies that have been done above, the provision of Moringa extract plus royal jelly supplementation has never been done before, so this study aims to determine the effect of giving Moringa leaf extract plus royal jelly supplementation on baby weight and body length of newborns in anemic pregnant women in Takalar District.

## 2. METHODS

This research was conducted at PuskesmasKecamatanPolongbangkeng Utara (PuskesmasPolut, Ko'mara and Towata) Talakar Regency from July to October. The research subjects were anemia pregnant women with a sample size of 63 anemia mothers who had signed the consent form to become respondents. The sampling technique used simple random sampling according to the inclusion criteria including pregnant women with anemia at 20 - 32 weeks of gestation, hemoglobin levels (<11gr / dl), single fetuses, not taking multivitamins and minerals other than fe during the study. The research design used True Experimental with a randomized double blind pretest-posttest controlled double blind design. Data analysis in this study used the one way ANOVA test.

## RESEARCH PROCEDURE

The research group was divided into 3, namely the group receiving Moringa leaf extract capsules, the group receiving Moringa leaf extract capsules plus Royal Jelly and the group receiving iron (Fe) tablets, after which explained to respondents how to take the supplements the researchers would give, namely by give 1 capsule / day with a dose of 1x500mg taken in the morning for 60 days. After the intervention, the newborn weighed using a pig scale with a capacity of 20 kg and measured the length of the newborn's body after the intervention using an infantometer.

### 3. RESULTS

Table 1 Frequency Distribution of Respondent Characteristics

Respondent Characteristics	Moringa Oleifera Leaves Extract plus RoyalJelly		Moringa Oleifera Leaves Extract		Tablet Fe		Total		P-Value
	n	%	n	%	n	%	N	%	
<b>Age</b>									
Low risk	16	33.3	16	33.3	16	33.3	48	100	1.000 <sup>a</sup>
High risk	5	33.3	5	33.3	5	33.3	15	100	
<b>Gestational Age</b>									0,659
24	1	50.0	1	50.0	0	0.0	2	100	
25	3	21.4	4	28.6	7	50.0	14	100	
26	6	46.2	4	30.8	3	23.1	13	100	
27	6	30.0	7	35.0	7	35.0	20	100	
28	5	35.7	5	35.7	4	28.6	14	100	
<b>Education</b>									0,518 <sup>a</sup>
Low	6	28.6	7	33.3	8	38.1	21	100	
High	15	35.7	14	33.3	13	31,0	42	100	
<b>Occupation</b>									0.474 <sup>b</sup>
Unemployment	15	30,0	17	34.0	18	36,0	50	100	
Employment	6	46,2	4	30.8	3	23,1	13	100	
<b>Income</b>									0.158 <sup>b</sup>
Low < UMK	17	30.4	19	33.9	20	35.7	56	100	
High ≥ UMK	4	57.1	2	28.6	1	14.3	7	100	
<b>Parity</b>									0.759 <sup>a</sup>
Primigravida	11	33.3	10	30.3	12	36.4	33	100	
Multigravida	10	33.3	11	36.7	9	30,0	30	100	

*Chi-square<sup>a</sup>, Mann-Whitney test<sup>b</sup>*

Based on the data in table 1 shows that most of the ages of anemia pregnant women with low risk, namely 20-35 years of age in the control intervention group, in the gestational age group 27 had the most gestational age. As for the number of parity and pregnant women, most of them were primigravida. In the education group, most mothers had higher education or equivalent to a diploma / bachelor's degree, although most of the mothers did not work and most mothers had an income of <Rp. 3.1000.000.

Table.2 The effect of after administration of Moringa leaf extract capsules plus royal jelly, Moringa leaf extract capsules and Fe tablets on body weight of newborns in the working area of the Puskesmas Polongbengkeng Utara subdistrict, takalar district.

Group	n	Mean	P Value
MoringaOleiferaLeavesExtractplus RoyalJelly	21	3519,0	0,000
MoringaOleiferaLeavesExtract	21	2980,1	
Tablet Fe	21	2780,1	

*One Way Anova*

Based on the data in table 2 From the test results using one way ANOVA to determine the effect after administration of Moringa leaf extract capsules plus royal jelly, Moringa leaf extract capsules and Fe tablets on body weight of newborns and the mean value of Moringa leaf extract plus royal jelly group was 3519.0 , the Moringa leaf extract group 2980.1 and the Fe 2780.1 tablet group with a value of Pvalue = 0.000 (<0.05), showed that there was a significant difference between the Moringa leaf extract plus royal jelly, Moringa leaf extract capsule and Fe tablet against newborn weight.

Table 3 Analysis of Intermediate Post-Hoc Capsule Group Moringa leaf extract plus royal jelly capsules, Moringa leaf extract capsules and Fe tablets on the body of a newborn in the working area of the Puskesmas, Polongbengkeng Utara sub-district, takalar district

Group	Difference in mean	CI95%	P Value
MoringaOleiferaLeavesExtractplus RoyalJelly vs MoringaOleiferaLeavesExtract	538,0	349,1-726,2	0,000
MoringaOleiferaLeavesExtractplus RoyalJelly vsTablet Fe	738,0	549,1-926,2	0,000
MoringaOleiferaLeavesExtract vs Tablet Fe	200,0	-11,8-388,1	0,034

*Post-hoc Bonferroni*

Based on the data in table 3 From the results of the Post Hoc test, it was found that the Moringa leaf extract plus royal jelly group with the Moringa leaf extract group had a mean selection of 538.0 with a value of Pvalue = 0.000 so that the mean difference between the two groups showed significant results. The Moringa leaf extract plus royal jelly group

with the Fe tablet group had a mean selection of 738.0 with a value of Pvalue = 0.000 so that the mean difference between the two groups showed significant results, while the Moringa leaf extract group and the Fe tablet group had a mean selection of 200.0 with a value of Pvalue = 0.034 so that the mean difference between the two groups shows a significant result.

Table.4 The effect of after administration of Moringa leaf extract capsules plus royal jelly, Moringa leaf extract capsules and Fe tablets on body length of newborns in the working area of the PuskesmasPolongbangkeng Utara subdistrict, takalar district.

Group	n	Mean	P Value
MoringaOleiferaLeavesExtractplus RoyalJelly	21	47,5	0,000
MoringaOleiferaLeavesExtract	21	45,5	
Tablet Fe	21	44,8	

*One Way Anova.*

Based on the data in table 4 From the test results using one way ANOVA to determine the effect after giving Moringa leaf extract capsules plus royal jelly, Moringa leaf extract capsules and Fe tablets on the body length of newborns and the mean value of the Moringa leaf extract plus royal jelly group was 47.5, the extract group. Moringa leaves 45.5 and Fe tablet group 44.8 with a value of Pvalue = 0.000 (<0.05), indicating that there was a significant difference between the Moringa leaf extract plus royal jelly, Moringa leaf extract capsules and Fe tablets on the baby's body length. Newborn.

Table 5 Post-Hoc Analysis Between Groups of Moringa leaf extract plus royal jelly capsules, Moringa leaf extract capsules and Fe tablets on body length of newborns in the working area of the PuskesmasKecamatanPolongbangkeng Utara, Takalar Regency.

Group	Difference in mean	CI95%	P Value
MoringaOleiferaLeavesExtractplus RoyalJelly vs MoringaOleiferaLeavesExtract	2,0	1,0-2,9	0,000
MoringaOleiferaLeavesExtractplus RoyalJelly vsTablet Fe	2,7	1,7-3,6	0,000
MoringaOleiferaLeavesExtract vs Tablet Fe	0,7	0,02-1,4	0,039

*Post-hoc Tamhane*

Based on the data in table 5 From the results of the Post Hoc test, it was found that the Moringa leaf extract plus royal jelly group with the Moringa leaf extract group with a

mean selection of 2.0 with a value of Pvalue = 0.000 so that the mean difference between the two groups showed significant results. The Moringa leaf extract plus royal jelly group with the Fe tablet group had a mean selection of 2.7 with a value of Pvalue = 0.000 so that the mean difference between the two groups showed significant results, while the Moringa leaf extract group and the Fe tablet group had an average selection of 0.7 with a value of Pvalue = 0.039, so the mean difference between the two groups shows a significant result.

#### 4. DISCUSSION

Effect after administration of Moringa leaf extract capsules plus royal jelly, Fe tablets and Moringa leaf extract capsules on baby weight and body length of newborns

From the research results, it was found that Moringa leaf extract capsules plus royal jelly are very good for consumption in pregnant women for fetal growth and development. Because from the results obtained, the average group of Moringa leaf extract plus royal jelly capsules had a higher average compared to the Moringa leaf extract and Fe tablet group and the results were significant. This shows that the Moringa leaf extract capsules plus royal jelly are more complete and can meet the nutritional needs for fetal development so that it is appropriate to give pregnant women to affect body weight and body length of the newborn.

This is in line with the research of Tended kk (2011) which states that Moringa leaves are an effort that can be done to overcome malnutrition because they contain complete protein and have a big role in the immune system of pregnant women so that they can prevent the occurrence of weight and length of newborns. abnormal. Likewise with Suryanti's research (2017) where the greater effect of giving Moringa capsules on infant weight and newborn body length, giving Moringa capsules has an effectiveness in preventing body weight and abnormal body length.<sup>18,19</sup>

Difference in mean weight of babies and length of newborns after being given Moringa leaf extract capsules plus royal jelly, Fe tablets and Moringa leaf extract capsules

Based on the results of this study, there were differences in the mean body weight and body length of newborns after being given Moringa leaf extract capsules plus royal jelly, Fe and Moringa leaf extract capsules where the statistical results showed that there was a significant difference in infant weight and body length for newborns, so that This indicates a difference in infant weight and body length of newborns in the group given Moringa leaf extract capsules plus royal jelly, the group given Fe and the group given Moringa leaf extract capsules. This proves that giving moringa plus royal jelly capsules to pregnant women can increase baby weight and normal newborn body length. This is because Moringa leaf extract capsules plus royal jelly contain many benefits for pregnant women to consume.

This is in line with research conducted by Suryanti (2017) which shows that there is a difference in the mean given by Moringa capsules and Fe tablets where the Pvalue value is 0.004, where the group given Moringa leaf extract capsules has a higher body weight with an average of 3268.5 compared to the average group given Fe 3189.25. Thus the research conducted by Supyati (2015) where the mean value in the Moringa leaf extract group was 3.06 and the Fe group the average value was 3.01. This indicates that Moringa leaf extract can affect the body length of newborns.<sup>19,20</sup>

Good nutritional intake during pregnancy is important because by consuming lots of macronutrients and micronutrients that provide benefits to meet additional nutritional needs during pregnancy. Maternal nutritional status is influenced by the amount of energy or calorie intake, protein, iron, carbohydrates, vitamin A, asthma, folate, calcium, iodine and other nutrients. Worldwide, pregnant women and children under 5 years of age are at the highest risk of micronutrient deficiencies. Deficiencies in iron, iodine, folate, vitamin A, and zinc are the most widespread micronutrient deficiencies and are common contributors to poor growth, intellectual impairment, perinatal complications, and increased risk of morbidity and mortality.<sup>21</sup>

## 5. CONCLUSIONS

There was an increase after the supplementation of Moringa leaf extract capsules plus royal jelly, Moringa leaf extract and Fe tablets. However, the highest average increase was in the group of Moringa leaf extract plus royal jelly capsules. Thus, Moringa leaf extract supplements plus royal jelly can be used as an alternative to treat anemia and increase baby weight and body length for newborns in Takalar district.

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