

NUTRIENT CONTENT ON MORINGA SEEDS BASED ON AGE OF THE FRUIT

Yudianti*) Muh. Hasyim, Najdah
Nutrition Department, Mamuju Health Polytechnic
) E-mail: upm@poltekkes-mks.ac.id

ABSTRACT

Moringa (moringa oleifera are), is a plant that has many the benefit that the womb nutrition especially on the leaves and its fruit. A lot of research that's been done relating to nutrient content in the leaves that are utilized in addressing the problem of good nutrition on toddlers, pregnant women and nursing mothers, even has a lot of company that has patented a leaf of this plant as a commercial product In the form of flour (powder) or in the form of estrak. Moringa , besides leaves, the fruit or moringa seeds has also frequently used. A substance of nutrition in moringa in 100 grams is generally much taller than a source of other food, In addition these plants containing anti oxidant and contains pollutants. Moringa seeds are often used as a purifier of wastewater. The results of the research on nutrition ingredients moringa seeds Had been reported as is conducted by seeing a difference in the level of catfish growth fed with by the addition of soy beans with those fed with the addition of Moringa seed flour, for 8 weeks, It is reported that there is a significant difference (P < 0.05) Group fed with the addition of the seed flour weight of fish higher than the one given the Soy beans (Yuangsoi, at all, 2013). The purpose of this research is to know the nutrient content of kelor based on fruit age. Iron and calcium content is more acquired in young moringa grain flour. The research was conducted at the Health Laboratory of the Indonesian Ministry of Health Makassar. More protein content is obtained from dried Moringa seed flour.

Key words: Nutritional content, Moringa seeds

INTRODUCTION

Moringa (*moringa oleifera*), is a plant that has many benefits because of its nutrient content, especially in the leaves and fruit. *moringa* is a long-lived and flowering plant throughout the year (Palupi et al., 2007). A lot of research that's been done relating to nutrient content in the leaves that are utilized in addressing the problem of good nutrition on toddlers, pregnant women and nursing mothers, even has a lot of company that has patented a leaf of this plant as a commercial product In the form of flour (powder) or in the form of estrak. *Moringa* , besides leaves, the fruit or *moringa* seeds has also frequently used. A substance of nutrition in *moringa* in 100 grams is generally much taller than a source of other food, In addition these plants containing anti oxidant and contains pollutants. This *moringa* has been cultivated in India for thousands of years ago. Indian Ancient Society knows that grains contain vegetable oils and they use them for treatment purposes. Now, Indian society generally utilizes *moringa* as fodder or vegetable feed (Kusnadi, 2015).

Some results of research on content of nutrients *kelor* seeds have been reported as made, By looking at the difference in the growth rate of catfish fed with the addition of a soyabean with those fed with the addition of *kelor* seed flour, for 8 weeks, It was reported

that there was a significant difference (P. < 0.05) of increased catfish weight in both groups, where the group fed with the addition of *moringa* seed flour The weight of fish is higher than that of the soy beans, whereas for blood chemistry and hepatotosomatic index There is no difference (Yuangsoi, at all, 2013). Research to see the chemical characteristics of *moringa* seeds in Egypt. The obtained results show that proteins, lipids, ashes, fibers and the contents of total carbohydrate are in the range of 34.51%-36.5%, 28.62%-30.06%, 4.22%-5.06%, 10.92%-12.16% and 19.00%-20.29%,. As a result, the calorie value is about 450,36-451,32 kcal 100 g-1 for dry *moringa* seeds. When confirmed, dried *moringa* seeds are considered to be a mineral-rich food source. Essential Amino acids (EAAs) and nonessential amino acids (NEAAs) are noted more high than those of a recommended protein. Unsaturated fatty acids (USFA) 77.14%-84.98%, mainly oleic (73.30%-79.58%). Conversely, saturated fatty acids (SFA) reportedly 15.00%-22.83% mainly palmitate and stearic acid (Barakat, 2016). Research to see the difference in nutritional content of *moringa* leaves by dividing *Moringa* leaves in 3 groups of leaves based on the age of the leaf is reported that there are significant provisions and nutrient content on the three columns of the leaf is true experiment, analysis Laboratory, AAS method, Kjeldahl,

and Spectrophotometer, Protein, Zn and P. Highest on the leaves with drying blancing, wither and drying; Fe Ca, the highest on the old leaves blancing, wither and drying. Based on leaf age there are significant differences of Fe Ca, Zn, protein, and posfor; By drying methods, significant difference are Fe, and Zn, whereas Ca, P and protein are not significant; Based on the age of the leaf and a significantly different drying method is Fe. Protein Fe, Zn, P insignificant (Salim, DKK, 2016). Moringa seeds, as well as Moringa leaves, as described or reported in the results of previous studies, is a source of excellent nutrients, because besides being reviewed from quantity, also quality. West Sulawesi people utilize the seeds or fruit of moringa not maximum, old moringa seeds utilized as an alternative source of family income, dried moringa seeds are sold to be used as a coagulant in water purification, other than that It is the most widely utilized is the fruit that is still young, while the old or dry, if used only a small community of people in West Sulawesi. This research aims to know the nutrient content of kelor based on fruit age.

RESEARCH METHODS

This research is a development-related experimental research, with a type of pure experimental Research (true experiment) by testing nutrient content in 3 groups of Moringa seed samples in the laboratory. Samples (Moringa fruit) were taken from moringa trees in West Sulawesi. Processing samples (drying and flour making in Mamuju Ministry of Health Polytechnic, analysis of nutrient composition in the Indonesian Ministry of Health Health Laboratory Makassar. The time of study was conducted in July until August 2017.

Moringa leaf flour is made at Mamuju Ministry of Health Polytechnic, With the

following steps: Take Moringa fruit, separate moringa fruit in three parts, namely (1) The young part, (2) The old part, (3) dry parts. Young fruit, old and dried fruits are taken from the same tree because the of elements nutrients in the soil where the moringa grows affect the content of nutrients that exist in the fruit. Open the fruit pods, remove all the seeds on the pods, place them on the dryer container, sundry under the sun, do up to dry beans (easily crushed when crushed). Each piece of moringa seed is dried apart in a dryer container made of wood as a wall and gauze from plastic as a base and cover. Dried fruit is pounded manually using the petri dish, sifted using a sieve from a plastic gauze. Before doing further examination, the material is kept in a sealed container made of dark colored plastic. Laboratory analysis results are processed and analyzed to determine whether or not the differences of each sample group are present. Analysis of protein content using Keyldhal method. Analysis of Fe, Ca, and Zn with titration method or absorption of wavelength with spectrophotometer, Posfor analysis with AAS, all samples (3 groups) analyzed in the same way.

The data that has been collected is then processed with SPSS and analysed univariate to describe variable spreads and data presented with tables.

RESULTS

The test results analyzed the nutritional content of the three types of fruit, namely young, old, and dry (the seeds were taken) and made flour after being dried with sunlight and then tested at the Makassar Health Laboratory can be seen from each type of seed with 3 repetitions and the results of an analysis of the average nutrient content (young seeds, old seeds, and dry seeds).

Table 1. Seeds of moringa flour (young seed) analysis results of young moringa seed flour laboratory after drying

Moringa seed flour	iron (Fe) µg/g	calcium (Ca) µg/g	Protein %	Moisture content %
Young Seeds (1)	14,53	2709,08	25,13	14,39
Young Seeds (2)	15,57	3742,43	25,38	14,59
Young Seeds (3)	181.68	3586,17	25,94	14,46

The above results show 3 times the repetition of a different nutrient content analysis each time analysis, nutrient content of iron and protein in the result of a 3-higher

repetition test results of 181.68 µg/g Fe and 25, 94% protein and calcium in The second examination of the nutritional content is higher 3742, 43 µg/g Ca.

Table 2. Moringa seed flour B (old seed) analysis results of old Moringa seed flour laboratory after drying

Moringa seed flour	iron (Fe) µg/g	calcium (Ca) µg/g	Protein %	Moisture content %
Old seed (1)	28,74	2850,16	30,38	8,75
Old seed (2)	26,64	3517,75	31,5	8,72
Old seed (3)	13,33	2713,67	30,62	8,90

Iron on the analysis results of the first examination laboratory higher nutrient content of 28, 74 µg/g Fe and for calcium and higher

protein nutrients in the second examination is 3517, 75 µg/g Ca and 31.5 proteins

Table 3. Moringa seed flour C (dried beans) Analysis results of young kelor seed flour Laboratory after drying

Moringa seed flour	iron (Fe) µg/g	calcium (Ca) µg/g	Protein %	Moisture contain %
Dry seeds (1)	89,86	1920,99	32,86	7,15
Dry seeds (2)	26,64	1168,02	33,5	7,29
Dry seeds (3)	70,21	1820,63	30,75	7,06
The Average	62,2	1636,5	32,4	7,2

Iron on and calcium dried moringa seeds after being analyzed higher at the first examination of 89.86 µg/g Fe and 1920.99

µg/g of calcium and higher protein in the second examination 33.5% protein

Table 4. Moringa seed flour (young seed, old seed, and dried beans) Results of nutrient analysis on Kelor seed flour

Moringa seed flour	iron (Fe) µg/g	calcium (Ca) µg/g	Protein %	Moisture contain %
Young seed (avarage)	70,6	3345,9	25,5	14,5
Old seed (avarage)	22,9	3027,2	30,8	8,8
Dry seeds (avarage)	62,2	1636,5	34,2	7,2

The results of the analysis of the three fruit beans (young seeds, old seeds, and dried seeds) nutrient content in iron seeds are 70.6

µg/g and calcium is 3345 µg/g higher compared to other seeds. While the protein is growing age the fruit is higher nutrient content

can be seen in the table above or where the protein content as much as 34.2%.

DISCUSSION

The results of laboratory tests showed that out of 2 laboratory examinations on young moringa seed flour, old kelor seeds and dried kelor seeds showed that the highest average iron content derived from dried moringa seed flour. While the low is derived from young moringa seed flour. Many benefits of Moringa make this plant need to be managed properly because of the nutrient content of high enough in the leaves, stems or seeds. In Africa and Asia Leaf Moringa is recommended as a supplement that is rich in nutrients for nursing mothers and children at the time of growth. (Syarifah A, Tezar R, Muflihani Y, 2015). Moringa seeds are enriched with vitamins, minerals and amino acids. In addition, Moringa seeds include vitamin A, C and E, as well as minerals such as calcium, protein and potassium, in this case it is the macronutrient needed by the body. (Saputra, 2017). Iron (Fe) is an essential microelement for the body, this substance is especially necessary in hematopoiesis (blood formation) is in the synthesis of haemoglobin (Hb), mothers who in his pregnancy have suffered from iron deficiency Can not provide a spare iron to his baby in sufficient quantities for the first few months.

Although the baby gets milk from her mother, deficiency Fe as a result of the lack of consuming food sources of Fe in a relatively long time can cause various health disorders such as anemia, decreased body endurance which consequently easy Disease, especially infectious diseases.

The results of laboratory tests showed that out of 3 laboratory examinations on young moringa seed flour, old moringa seeds and dried moringa seeds showed that the highest calcium content was derived from young moringa seed flour while The low is derived from dried moringa seed flour. Dietary intake containing high calcium is important given to the child early because in addition to bone formation and nutrition also prevents osteoporosis in old age (Afrianti, Aaron, 2011). The mineral content that forms dentine and enamel is the same mineral that makes up the bones, but the crystals in the teeth are more dense and the water content is lower. Calcium

during the period of tooth formation can cause vulnerability to tooth decay. (A. R. P. Walker (1995).

The results of laboratory tests showed that out of 3 laboratory examinations on young moringa seed flour, old moringa seeds and dried moringa seeds showed that the highest Protein content was derived from dried moringa seed flour while The low is derived from young moringa seed flour. This is in line with the composition of nutrients in moringa leaves where dry leaves contain more protein levels than with fresh leaves. This difference can happen because there is a difference in the mineral absorption of older plants with younger plants that the younger plants are more concentrated for the growth of raising the stem and more Strengthen the pseudobulbs while the older plants concentrate on the absorption of minerals where with the large rooting system can absorb minerals and more organic substances are needed by the plant body in the process Metabolism (Ismail, 2006). This is in line with the composition of nutrients in moringa leaves where dry leaves contain more protein levels than with fresh leaves. Existing theory shows that for protein content between Moringa fruit and moringa seed is protein in moringa seeds where there is protein as much as 12.36 G/100 g of ingredients whereas in moringa seeds there are proteins as much as 32.19 g/ 100 g of materials. (Tsakniset et al., 1998). As for moringa leaf flour, there is a protein content of 27.1 g/100 g flour. (Lowell Fuglie, 1999), by comparing the third percentage of the material, the most protein comes from moringa seeds. Therefore to ensure the availability of such materials then one of the efforts that can be done is by processing in the form of flour so that the shelf life can be utilized as an additional material in food products with Objectives to increase nutritional value.

Protein plays a very important role in the process of growth and human survival, because its function in addition to as a source of energy, proteins also play an important role in some metabolic processes of the body. (Almatsier, 2003).

THE CONCLUSION

Iron and calcium content is more widely obtained on young moringa seed flour. More

Protein content is obtained on dried moringa seed flour.

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