

IDENTIFICATION OF FE CONTENT IN CILOK KELOR LEAF AS AN EFFORT TO INCREASE THE HEMOGLOBIN OF ADOLESCENT WOMEN

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ABSTRAK IDENTIFIKASI KANDUNGAN FE PADA CILOK DAUN KELOR SEBAGAI UPAYA MENINGKATKAN HEMOGLOBIN REMAJA PUTERI

Latar belakang: Anemia merupakan masalah gizi yang paling umum dialami oleh seluruh dunia, termasuk Indonesia. Angka kejadian anemia pada remaja putri semakin meningkat dari tahun 2013 yaitu sebanyak 37,1% menjadi 48,9% pada tahun 2018. Remaja perempuan lebih berisiko mengalami anemia karena keadaan stress, terlambat makan, dan kehilangan sejumlah besar zat besi selama menstruasi. Daun kelor merupakan salah satu tanaman yang dipercaya dapat meningkatkan hemoglobin. Pemanfaatan sumber daya lokal seperti daun kelor dengan melakukan substitusi tepung daun kelor dalam pembuatan cilok dapat meningkatkan nilai gizi cilok, sehingga cilok yang dihasilkan dapat di klaim sebagai cilok sumber zat besi.

Tujuan: Penelitian ini bertujuan untuk mengidentifikasi kandungan Fe pada cilok daun kelor sebagai upaya meningkatkan hemoglobin remaja putri.

Metode: Metode dalam penelitian ini yaitu melakukan uji laboratorium pada cilok daun kelor dengan cara meneteskan 3 tetes kalium tiosianida atau ammonium tiosianat 2 N ke dalam 5 tetes larutan sampel, jika terbentuk warna merah darah didapatkan hasil reaksi positif.

Hasil: Hasil penelitian didapatkan cilok daun kelor mengandung Fe yang ditandai dengan hasil uji laboratorium terbentuknya larutan berwarna merah darah pada sampel cilok daun kelor. Simpulan: Penggunaan tanaman lokal seperti daun kelor dengan inovasi dalam bentuk cilok dapat digunakan sebagai alternatif untuk meningkatkan HB.

Saran: Peneliti selanjutnya disarankan dapat melakukan penelitian tentang pengaruh pemberian cilok daun kelor pada remaja putri untuk mengatasi masalah anemia pada remaja.

Kata Kunci: Anemia, Cilok Daun Kelor, Hemoglobin

ABSTRACT

Background: Anemia is the most common nutritional problem experienced by the whole world, including Indonesia. The incidence of anemia in young women has increased from 2013 which was 37.1% to 48.9% in 2018. Adolescent girls are more at risk of developing anemia due to stress, eating late, and losing large amounts of iron during menstruation. *Moringa oleifera* is one of the plants that are believed to increase hemoglobin. Utilization of local resources such as *Moringa oleifera* and increasing the nutritional value of cilok, substitute *Moringa oleifera* flour in the manufacture of cilok so that the resulting cilok can be claimed as a source of iron.

Purpose : To know identify the Fe content in *Moringa oleifera* cilok as an effort to increase the hemoglobin of adolescent girls.

Method: The method in this study is to carry out laboratory tests on cilok *Moringa oleifera* by dripping 3 drops of potassium thiocyanide or ammonium thiocyanate 2 N into 5 drops of sample solution, if blood red color is formed ,a positive reaction results.

Results: The results showed that *Moringa oleifera* cilok contained Fe which was indicated by the results of laboratory tests for the formation of a blood-red solution in the *Moringa oleifera* cilok sample.

Conclusion: The use of local plants such as *Moringa oleifera* with innovation in the form of cilok can be used as an alternative to increase HB.

Suggestion: Further researchers are advised to conduct research on the effect of giving cilok *Moringa* leaves to adolescent girls to overcome the problem of anemia.

Keywords: Anemia, Cilok Moringo Oleifera, Hemoglobin

INTRODUCTION

Anemia is the most common nutritional problem experienced throughout the world, especially in developing countries including Indonesia (WHO, 2016). Every age group has the potential to experience anemia, including adolescents, where

WHO defines adolescents as children aged 10-19 years (Glader, 2013; Soekarjo, 2006). Anemia often occurs in adolescent girls due to stress, menstruation, or late eating (WHO, 2008). The incidence of anemia in young women in developing countries is around 53.7% (Raspati, 2010; Ministry of Health R1, 2018).

The biggest cause of anemia is a lack of iron intake (Froessler, 2018). Adolescent girls are more at risk for anemia because they lose large amounts of iron during menstruation (Stevens, 2013). Adolescent girls who experience anemia are more at risk of morbidity and mortality during the reproductive period (Teji, 2016).

Iron intake can be obtained by eating foods sourced from animal protein such as liver, fish and meat, but not all people can eat these foods so they must be given blood-added tablets (Kemenkes RI, 2018). The government's effort to reduce the rate of anemia in adolescent girls is by giving blood-added tablets through UKS/M in educational institutions as much as one tablet/week throughout the year. The coverage of consumption of blood-added tablets in the Province of NTB has a coverage of 38.22 % . According to the research results of Riskesdas Adolescents in 2017, knowledge on how to overcome anemia includes taking pills to increase blood as much as 57.0%, taking iron tablets 14.0%, increasing consumption of meat, fish and liver 19.8%, increasing consumption of rich vegetables for iron 31.8%, others 2.8% and don't know 8.8% (Ministry of Health RI, 2017).

Moringa leaves contain very high amounts of vitamin A, vitamin C, vitamin B, potassium, iron and protein which are easily digested and assimilated by the human body. Moringa leaves are vegetables that have long been used to overcome the problem of malnutrition in children, adolescents, and pregnant women. In addition, the content of micronutrients such as iron can be used as an alternative supplement for young women to prevent anemia. Kelo leaves are effective in increasing hemoglobin levels in women with anemia (Madukwe, 2013). The iron content is higher in Moringa leaves that have been processed into powder (flour) than in fresh Moringa leaves (Sindhu, 2013). The results of Arini's study showed that the hemoglobin level in young women changed between before being given

Moringa leaf flour the HB level was 10.88 mg/dl, and after being given Moringa leaf flour the HB level was 12.27 mg/dl. This shows that there is a significant effect of giving Moringa leaf flour on HB levels (Arini, 2018). The results of non-clinical tests showed that administration of moringa leaf extract at a dose of 400 mg/kgBW had an effect on increasing hemoglobin levels in wistar strain rats. The rats were previously induced by aluminum chloride for 21 days which resulted in a mild anemic condition with a hemoglobin level of 10.80 g /dL (Dadi, 2020). The results of clinical trials showed that giving Moringa leaf extract at a dose of 2x1 with a content of 1000 mg in adolescent girls was able to increase Hb levels after 2 months of intervention (Anwar, 2020).

Another study also showed that giving 2x2 doses of Moringa leaf flour capsules containing 500 mg of flour per capsule, in the morning and evening, for 12 weeks, was able to increase the Hb levels of adolescent girls (Arini, 2018). Changes in Hb levels in the control group were 14 people (58.3%) with an increase in Hb levels of 0.3-3.5 g/dl who were not given Moringa leaf flour, while in the intervention group the changes in Hb levels were 22 people (91.7%).) with an increase in Hb levels of 1.5-2.2 g/dl after being given Moringa leaf flour. The increase in Hb levels is due to the content of Moringa leaves which are rich in iron and vitamin C, where vitamin C helps absorption (Gopalakrishnan, 2016; Nua, 2021).

Cilok is one of the favorite snacks among teenagers. Bonita 's research results show that teenagers are more fond of *fast food* , one of which is cilok. 17.4 % of teenagers consume cilok >2x a week. Utilization of local resources such as Moringa leaves by substitution of Moringa leaf flour in the manufacture of cilok can increase the nutritional value of cilok, so that the resulting cilok can be claimed as a source of iron cilok (Bonita, 2017). The purpose of this study was to identify the Fe content in Moringa leaf cilok as an effort to increase the HB of adolescent girls.

Based on the things above, researchers are interested in conducting a study entitled "Identification of Fe content in Moringa leaf cilok as an effort to increase the HB of adolescent girls"

RESEARCH METHODOLOGY

The method in this research is to test the Fe content at the Pharmacy Laboratory of the University of Muhammadiyah Mataram. The following materials and research procedures were carried out:

Ingredients

The ingredients for making Moringa leaf cilok consist of 4 grams of Moringa leaf flour, 50 grams

of wheat flour, 50 grams of tapioca flour, 2 grams of salt, 2 grams of mushroom broth, and 70 ml of water.

Research procedure

1. Five drops of the sample solution are put into a test tube
2. Drop on the sample 3 drops of potassium thiocyanide/ Ammonium thiocyanate 2 N
3. Observe the color change in the test tube

4. Wait ± 5 minutes to read the results
5. Positive reaction when blood red color is formed

RESEARCH RESULT

The results of the study on the identification of Fe content in Moringa leaf cilok as an effort to increase the HB of adolescent girls can be seen in the following table:

Table 1
Testing Fe Content in Moringa

Materials	Metals	Reactors	Observations	Results
Cilok	Fe	KSCN (Potassium thiocyanide)	Formation of a blood red solution	+
Moringa powder	Fe	KSCN (Potassium thiocyanide)	Formation of a red solution	+

DISCUSSION

(*Moringa oleifera*) is one of the local plants that has long been known as a plant that has multipurpose functions, is nutrient dense, and has medicinal properties. Moringa leaves contain natural compounds that are more numerous and varied than other types of plants, such as vitamin A, vitamin B, vitamin C, calcium,

potassium, iron and protein. Aminah's research results explain that the iron content in Moringa leaves in the form of flour is 25 times higher than spinach (Aminah, 2015). Research by Asriyapati also showed that the Fe content in dried Moringa leaves that were already in the form of flour was higher at 28.2 mg compared to fresh Moringa leaves, which was 7 mg (Asriyapati, 2020). Moringa leaves have benefits as a nutritional supplement, increase energy, increase body resistance, and can overcome complaints of mineral deficiencies such as lack of iron in cases of anemia (Sylvie, 2013).

Consuming Moringa leaf extract can increase Hb levels in the blood (Mustapa, 2020; Kusumawardan, 2019). Moringa leaf extract is suitable for young women, especially those suffering from anemia (Aminah, 2015). Yulianti's research shows that giving Moringa leaf extract is proven to increase hemoglobin levels in adolescent girls, where there is an increase of 1.5 -2.0 gr/dl (Yulianti, 2016). Based on the results of the pharmaceutical laboratory at the University of Muhammadiyah Mataram, it was found that cilok Moringa leaves contain Fe which is marked by the solution turning blood red.

Various studies also state that *Moringa Oleifera* leaves have a variety of nutritional content that is easily digested by the human body. Some of them are iron, protein, Vitamin A, Vitamin C, potassium, calcium, and antioxidants. Moringa

leaves contain higher iron than other vegetables, which is 26 mg/100 g. This is supported by research conducted by Gopalakrishnan and Rockwood which explains that the content of iron (Fe) in dried Moringa leaves or Moringa leaf flour is equivalent to 25 times higher than spinach 7.16.

Moringa leaves have considerable nutritional potential, various macro and micro nutrients, as well as their active ingredients as antioxidants. In addition, it contains essential nutrients such as 28.2 mg Fe, 2003.0 mg calcium, and 16.3 mg Vitamin A. Other nutrients include protein, C, Vitamin D, Vitamin E, Vitamin K, and Vitamin B (thiamine, riboflavin), niacin, pantothenic acid, biotin, Vitamin B6, Vitamin B12, and folate). The content of Vitamin C in Moringa leaf extract also facilitates the absorption of iron (Rockwood, 2013). Moringa is also used as a main ingredient in hundreds of medicines, both for prevention and treatment (Matic, 2018).

Moringa leaves can be used by people with anemia with low and relatively high doses. The significant increase in the number of red blood cells (erythrocytes) and white blood cells (leukocytes) with Moringa leaf treatment shows that Moringa leaves are suitable as a dietary supplement and medicine for people with anemia (Samuel, 2015).

CONCLUSION

The use of local plants such as Moringa leaves with innovation in the form of cilok can be used as an alternative to increase HB. Based on the results of the study, cilok Moringa leaves contain Fe content so that it can be used as an effort to increase HB in adolescent girls.

SUGGESTION

Further researchers are advised to conduct research on the effect of giving cilok Moringa leaves

to young women to overcome the problem of anemia in adolescents.

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