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NUTRITION CONTENT IN WINGED BEANS THAT CAN INCREASE BREAST MILK PRODUCTION

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ABSTRACT
Background : The high rate of growth that is not accompanied by an increase in the quality of the population requires and continues to be addressed, namely the family planning program, however, the rate of population growth in Indonesia is still high.
Method : The design used is a descriptive design, which is a design that aims to describe or describe a situation objectively. The population of all implant family planning acceptors. After being calculated, the sample size is 14 respondents
Results : The age characteristics of the respondents are mostly > 30 years, namely 4 respondents (57%), for the work of almost all respondents, namely as housewives, namely 12 respondents (86%), in terms of education, almost all of them are elementary-high school, namely 12 respondents (86%), while based on the number of children born, most of them were aged 2 (86%), then for the length of time using family planning, most of them ranged from 5 years, namely 9 respondents (64%), and for the age of the youngest children, half were aged 2 years and > 2 years as many as 7 respondents and the same between the two (50%)
Conclution : The results of this study are in line with the theory that continuous hypermenorrhea can cause maternal anxiety and if it continues it can cause anemia . Supported Low education is very influential in making decisions

Keywords: Family Planning Implantable Family Planning, Hypermenorrhea, Anemia

1. INTRODUCTION

Data from the World Health Organization (WHO) in 2016 still shows that the average rate of exclusive breastfeeding in the world is only around 38%. In Indonesia, 29.5% of infants who have received exclusive breastfeeding until the age of six months (Indonesian Health Profile, 2017). This is not in accordance with the target of the Strategic Plan of the Ministry of Health for 2015-2019, namely the percentage of infants aged less than 6 months who are exclusively breastfed is 50%.

Data from the Health Office of the City of Kediri found that infants who received exclusive breastfeeding in 2017 were 333 infants (51.3%) and in 2018 there were 340 infants (46.6%). This percentage shows that exclusive breastfeeding coverage has decreased and this figure still not reach the targets of the 2015-2019 Ministry of Health Strategic Plan (Muslimah et al., 2020).

A mother often has problems in exclusive breastfeeding, one of the main obstacles is milk production that is not fluent. Milk production that not fluent will be a factor causing the low coverage of exclusive breastfeeding for newborns (Wulandari and Handayani, 2011). Based on the Indonesian Ministry of Health (1999) in (Sudargo et al., 2018) working mothers are one of the causes of the failure of exclusive breastfeeding because of the limited time for mothers to express breast milk. Work can affect the knowledge and opportunities of mothers to give exclusive breastfeeding. Mothers who work will tend to have more knowledge, but the time to give breast milk is limited. In addition, exclusive breastfeeding is sometimes not carried out properly because it is influenced by lactation management, resulting in a decrease in breast milk production.

One of the common efforts made by the Indonesian people to increase the rate of secretion and production of breast milk is through the use of traditional herbal medicine or called Laktagogue (breast milk fertilizer) (Juliastuti, 2019). Medicinal plants that are allegedly able to facilitate breast milk, one of which is winged bean. From generation to generation, parents in some areas often recommend breastfeeding mothers to consume Winged Beans, either made of fresh vegetables or cooked vegetables, this was conveyed by Prabaningrum, M (2010) in his article.

Winged bean is very easy to find both in grocery stores and traditional markets, so nursing mothers can easily get and consume winged beans at any time. However, until now there is still minimal research related to winged bean in increasing breast milk production. To be able to find out whether winged bean can be classified as a Galactagogue, further research needs to be done. Initial research that can be done is to find out both the nutritional content and the content of chemical compounds (active) contained in winged bean that can increase breast milk production by collecting and analyzing the results of previous studies.

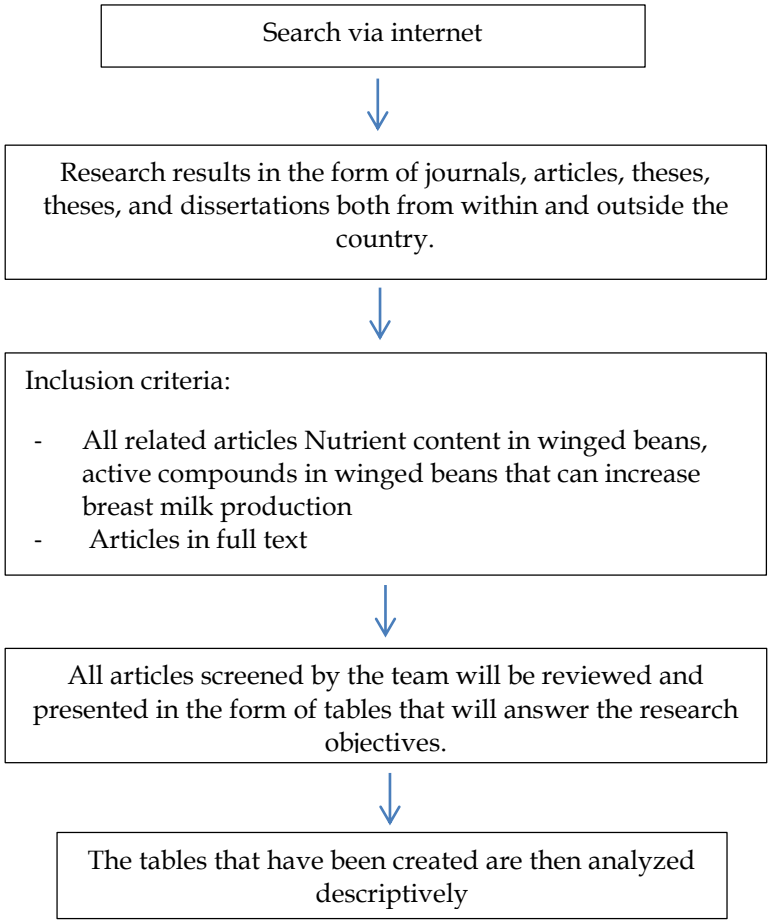
Based on some of the descriptions above, the researchers want to find out more about the nutritional content in winged bean, hormones that can increase breast milk production, and nutrients in winged bean that can increase milk production.

2. METHODS

Literature studies are carried out using the *Traditional review*, the researchers will select scientific papers to reviewed according to the research topic, and are selected based on the

knowledge and experience possessed by the researcher. Data were obtained from various literature sources by searching through the internet in the form of research results in the form of journals, articles, theses, theses, and dissertations both abroad and domestically. The inclusion criteria in this study were all articles related to the nutritional content of winged bean, active ingredients or substances that can increase breast milk production.

The following is the prism of the Literature Study protocol in this study:



3. RESULTS

A. Content of Nutrients/Chemical Compounds in Winged Beans

1) Based on the research of Nurmala *et.al.*,(2018) obtained some information as follows:

Table 1. Contents of chemical compounds in winged bean

No.	Title	Research Objectives	Methods to Determine Compounds in Winged Wings	Research Results-Content of Chemical Compounds in Winged Wings	Remarks
1.	Potency of Winged Winged Fruit Extract (Psophocarpus Tetragonolobus (L.) Dc.) As Antiosteoporos is With Parameters of Increased Alkaline Phosphatase In Female Wistar Rats Induced by Dexamethasone.	To determine the activity of winged bean ethanol extract as antiosteoporos is based on plasma ALP (Alkaline phosphatase) levels in dexamethasone-induced rats.	Phytochemical screening of winged bean: carried out on simplicia and extracts with the aim of ensuring the presence of the target compound in simplicia, and ensuring that the compound is not damaged after being made. in the form of thick extract	Phytochemical screening results on: a. Simplisia winged winged fruit showed the presence of flavonoid compounds, saponins, polyphenols, steroids and terpenoids. b. Thick extract, phytochemical screening results showed the presence of flavonoids, polyphenols, steroids and terpenoids. There are differences in the results of screening between simplicia and extracts, where the results of screening on extracts do not contain saponins.	Simplicia is a natural ingredient that is used for medicine and has not undergone any process changes, and unless otherwise stated it is generally in the form of dried material. Simplicia is divided into 3 groups, namely vegetable simplicia, animal simplicia, and mineral simplicia.

2) Based on BOSTID (1981) in an article written by Krisnawati, A. (2010), the following information was obtained:
   a) Chemical composition of winged winged plant parts (in g/100 g fresh weight)

Table 2. Chemical composition of winged winged plant parts (in g/100 g fresh weight)

No.	Types of Nutrition	Flowers	Leaves	Young	Pods Young	Seeds Old Seeds	Bulbs
1	Water[1]	84.2-87.5	64.2-85.0	76.0-93.0	35.8-88.1	8.7-24.6	54 ,9-65.2
2	Energy (mJ)[2]	0.17 (x)	0.20 (x)	0.19 (x)	0.10-1.71	1.61-1.89	0.63 (x)
3	Protein	2.8-5.6	5.0-7.6	1.9-4.3	4.6-10.7	29.8-39.0	3.0-15.0
4	Fat	0.5- 0.9	0.5-2.5	0.1-3.4	0.7-10.4	15.0-20.4	0.4-1.1
5	Carbohydrates	3.0-8.4	3.0 -8.5	1.1-7.9	5.6-42.1	23.9-42.0	27.2-30.5
6	Fiber	-	3.0-4.2	0.9-3.1	1 0.0-2.5	3.7-16.1	0.9-1.7

[1]In g/100 g wet weight.
[2]mJ = megaJuoles. 4.184 mJ = 1000 kilocalories.
(x) = average.

b) Mineral content of winged winged plant parts (in g/100 g fresh weight)

Table 3. Mineral content of winged winged plant parts (in g/100 g fresh weight)

No.	Minerals	Leaf	Pods	Seed	Bulbs
1	Potassium	80-436	205-381	1,110-1,800	550
2	Phosphorus	52-98	26-69	200-610	30-64
3	Sulfur	-	-	380	21
4	Calcium	113-260	53-330	80-370	25- 40
5	Magnesium	54	58	110-255	23
6	Sodium	2.5-18	3-3.4	14-64	33
7	Iron	2-6.2	0.2-2.3	2-18	0.5-3
8	Manganese	1 ,5	2.2	4-25	10
9	Zinc	1.4	0.2	3.1-5	1.3
10	Copper	0.5	0.6	1.3	1.3

c) Vitamin content in winged bean

Table 4. Content vitamins in winged bean

No.	Vitamins	Leaves	Young pods	Seeds
1	Vitamin A (IU)	5,240-20,800[1]	300-900	-
2	Thiamine (mg/100 g)	3,6[1]	0.06-0.24	0.08-1.7
3	Riboflavin (mg /100 g)	2.6[1]	0.08-0.12	0.2-0.5
4	Pyridoxine (mg/100 g)	1[1]	2	0.1-0.25
5	Niacin (mg/100 g)	15[1]	0.5-1.2	3.1-4.6
6	Folic Acid (mg/100 g)	67[1]	-	25.6-63.5
7	Ascorbic Acid (mg/100 g)	14.5-128	20-37	Slightly
8	Tocopherol (mg/100 g)	3.5[1]	0.5	22.8

[1]Values are based on dry weight, while the rest are graded on wet weight

3) Based on the research of Adegboyega, TT, *et.al* (2012), the following is the composition of nutrient and antinutrients.

Table 5. The composition of nutrient and antinutrients

No	Types of Nutrients/Chemical Compounds	Seeds		Pods
		Through Processing	**Without**	
	Nutrient Processing:			
1	Water (%)	6.72±0.09	4.74±0.10	4.74±0.10
2	Ash (%)	4.79±0.02	4.78±0.04	4.78 ±0.04
3	Fat (%)	17.65±0.36	17.76±0.29	17.76±0.29
4	Protein (%)	36.83±0.14	29.88±0.22	29.88±0.22
5	Fiber (%)	13.82±0.00	5.49±0.0	5.49±0.0
6	Carbohydrates (%)	20.21±0.29	37.34±0.15	37.34±0.15
	Antinutrients (Chemical Compounds):			
1	Tannins (%)	1.79±0.40	1.76±0.24	
2	Phytates (mg/100gr)	5.05± 0.09	8.65±0.14	

B. Hormones that affect breast milk production

Based on research by Augustine, RA, *et.al* (2017), some information wa obtained as follows:

Table 6. Hormones that affect breast milk production

No	Research title Research	Objectives Research	Methods	Results and Conclusions
1	Prolactin regulation of oxytocin neurone activity in pregnancy	Determines the effect of Intracerebroventricular (ICV) prolactin on oxytocin neurons in virgin rats, pregnant rats and lactating rats	The research was conducted using several laboratory research methods, namely: 1. In vivo electrophysiology	1. During breastfeeding, prolactin increases the synthesis of milk and oxytocin,

and lactation	given urethane anesthesia	2. Intracerebroventricular cannulation for immunohistochemistry and Western blotting experiments 3. Dual-label immunohistochemistry for oxytocin and phosphorylated signal transducer and activator of transcription 5 (pSTAT5) 4. Western blotting for phosphorylated extracellular regulated kinase (pERK) and	which stimulates milk production. 2. In virgin rats, prolactin inhibits the activity of oxytocin-secreting neurons. 3. Researchers found that prolactin inhibits neuronal activityis lost during lactation and some oxytocin neurons are stimulated by prolactin in lactating rats
		phosphorylated Akt (pAkt)	4. Oxytocin neuronal activity on altered prolactin regulation is not associated with changes in the activation of intracellular signaling pathways known to pair with prolactin receptors. 5. The activity of oxytocin neurons in the downregulation of prolactin in lactation allows coordinated activation of both populations of oxytocin neurons for successful lactation.

C. The content of nutrients/chemical compounds in Katuk Leaf that can increase the hormone production of Oxytocin and Prolactin

1) Based on the research of Susanti, NMP*et.al.*,(2014), the following are chemical compounds from the phytochemical screening results of katuk leaf extract *(Sauropus androgynus (L.) Merr.)*

Table 7. Results of phytochemical screening of katuk leaf extract *(Sauropus androgynus (L.) Merr.)*

No.	Phytochemical Test	Conclusions
1	Alkaloids	**+**
2	Steroids	**-**
3	**Triterpenoids**	**+**
4	**Saponins**	**+**
5	**Tannins** and **Polyphenols**	**+**
6	**Glycosides**	**+**
7	**Flavonoids**	**+**

2) Based on research by Yuliani and Marwati (1997) in Santoso, U. (2018), the following is the nutritional content of katuk leaves

Table 8. Nutrient content of Katuk Leaf

No.	Types of Nutrition	Katuk Leaf Flour	Fresh Katuk Leaves
1	Water	12%	75.28%
2	Ash	8.91%	2.42%
3	Fat	26.32%	9.06%
4	Protein	23.13%	8.32%
5	Carbohydrate	29, 64%	4.92%
6	(mg/100 g)	374.42 mg/100gr	165.05 mg/100 g
7	Energy (cal)	447.96 cal	134.10 cal

3) Based on research by Miharti, SI, et al (2018), the following is the Effect of Katuk Leaf Ethanol Extract on Prolactin Hormone Levels in Breastfeeding White Rats

Table 9. Effect of Katuk Leaf Ethanol Extract on Prolactin Hormone Levels in Breastfeeding White Rats

Rats	Research Objectives Research	Methods	Results Analysis
1	To analyze the effect of the ethanol extract of the leaves of Sauropus androgynus (L) Merr on the hormone prolactin in white rats.	This type of experimental research with Post Test Only Control Group design. The number of samples was 24 lactating rats which were divided into 4 groups, namely the control group and 3 treatment groups P1, P2 and P3 which were given 24 mg, 48 mg and 72 mg of katuk leaf ethanol extract, respectively. Penelitian dilakukan di Labor Farmasi dan Biomedik Universitas Andalas	There is a difference in the levels of the hormone prolactin between control group (13.679±2.061ng/L) value ($p<0.05$) with group P3 (17.509±2.515 ng/L) and group P1(13,816±1.665 ng/L) with group P3 (17.509±2.515 ng/L) L) at a dose of 24 mg and 72 mg

4) Based on the research of Soka, S., Wiludjaja, J., and Marcella (2011), the following is the expression of Oxytocin and Prolactin Genes in BALB/C mice that were supplemented with Katuk Matur leaf extract:

Table 10. Expression of Oxytocin and Prolactin Genes in BALB/C mice that were supplemented with Katuk Matur leaf extract

No.	Research Purpose	Methods	Analysis Result	Conclusion
1	Analyzing the increased expression of Oxytocin and Prolactin Genes in BALB/C mice that were supplemented with Katuk Matur leaf extract.	24 BALB/c mice during lactation were divided into 3 groups. During the lactation period, mice were treated with several doses for 12 days. Groups 1 and 2 were given extracts of	The expression of the oxytocin gene in lactating mice that were given supplementation with 173.6 mg/kg and 868 mg/kg BW of katuk matur leaf extract increased significantly to 22.02 Fold and 46.39-Fold. Each was compared with the control group ($p < 0.05$, ANOVA). The level of	The increase in gene expression in both treatments could be attributed to the papaverin content in katuk matur leaves which relaxes smooth muscles and dilates blood vessels. This also causes the circulation of the hormone oxytocin more smoothly
		173.6 mg/kg and 868 mg/kg body weight of mice. Group 3 is the control group (not given katuk matur leaf extract)	prolactin gene expression in the group of mice given katuk matur leaf extract increased significantly 14.65-fold compared to the control group, as well as group 2 given katuk matur leaf extract 868 mg/kg increased significantly when compared to the control group ($p < 0.05$, ANOVA).	through the bloodstream.

4. DISCUSSION

A. Nutrient content in Winged Bean

Based on Table 5.1, it can be seen that the chemical compounds in the winged winged wing that have not undergone any process changes consist of flavonoids, saponins, polyphenols, steroids, terpenoids (Nurmala, *et.al.*, 2018), Tannins, and Phytates (Adegboyega,TT,*et.al.*,2019). While the content of chemical compounds in the viscous extract as a result of phytochemical screening of winged bean consists of flavonoids, polyphenols, steroids and terpenoids. Not only the content of chemical compounds in the winged bean, but based on Table 5.2 the winged bean also contains other nutrients, including energy, protein, fat, carbohydrates, and fiber. In addition, winged bean is also

rich in mineral and vitamin content, it is listed in Table 5.3 and Table 5.4 that winged bean contains minerals consisting of potassium, phosphorus, sulfur, calcium, magnesium, sodium, iron, manganese, zinc, and copper and contains vitamins that consists of vitamin A, thiamine, riboflavin, pyridoxine, niacin, folic acid, ascorbic acid, tocopherol (BOSTID, 1981).

Based on the exposure of the data above, we can know that in one food ingredient, winged bean, it contains several kinds of nutrients that can meet balanced nutritional needs. In some circles of society usually use winged bean as a food ingredient that can launch breast milk, but this has not been supported by further research to uncover the truth.

Galactagogues that are widely known by the public include katuk leaves, papaya leaves, kukukan leaves, and there are still several other food ingredients (Sudaryanto, 2017). Katuk leaves have long been known that the nutritional content / active compounds in katuk leaves can increase breast milk production, there have been many studies that reveal the various benefits of katuk leaves, even since a few years ago katuk leaves have been produced in capsule form and have been circulated extensively.

When viewed from the nutritional content and chemical compounds present in katuk, which have been described in tables 5.7 and table 5.8, they have similarities to the nutritional content and chemical compounds found in winged bean. Based on Table 5.7, it can be seen that of the 7 chemical compounds found in Katuk leaves, namely Alkaloids, Triterpenoids, Saponins, Tannins, Polyphenols, Glycosides, and Flavonoids, 5 of them are found in Winged Beans, namely Triterpenoids, Saponins, Tannins, Polyphenols, Glycosides, and Flavonoids. Meanwhile, if seen from Table 5.8, almost all of the nutritional content in Katuk leaves is also found in Winged Beans.

B. Hormones that Affect Breast Milk Production

Based on Table 5.6, it can be seen that there are 2 hormones that affect breast milk production, the two hormones synergize in producing breast milk, namely Prolactin and Oxytocin. The study showed that in virgin mice, prolactin inhibited the activity of neurons that secrete oxytocin. Researchers found that inhibition by prolactin was lost during lactation.

The results of another study showed that Tauriska (2014) explained that there was a relationship between baby sucking and breast milk production. It was found that 16 respondents who sucked babies were right, almost entirely (94%) had sufficient milk production. The sucking movement of the child can influence the stimulus to the nipple. The nipple contains many sensory nerve endings. When stimulated, impulses arise to the hypothalamus and then to the anterior pituitary gland (front) so that this gland produces the hormone prolactin. Nipple stimulation is not only transmitted to the anterior pituitary gland but also to the posterior (back) pituitary gland, which produces the hormone oxytocin.

Physiologically the body has prepared for breastfeeding after a mother gives birth. However, breast milk production varies greatly for each mother, this is due to several factors including inappropriate breastfeeding techniques, unbalanced nutritional intake, lack of knowledge of mothers, family economy, psychological

mothers who are less confident when giving breast milk to their babies and lack of understanding of proper lactation management (Apriza, 2017).

Breast milk production can be increased by using a galactagogue which functions to stimulate the hormones prolactin and oxytocin to produce breast milk so that its secretion increases. The mechanism of action of galactagogues in stimulating lactation and then helping to increase the rate of secretion is by directly stimulating protoplasmic activity in the secretory cells of the mammary glands and secretory nerve endings in the glands of the milk which can result in increased milk secretion, or stimulating the hormone prolactin which is a lactogenic hormone against mammary glands to be precise in the alveolar epithelial cells (Goodman and Gilman, 1970).

The increase in the hormone oxytocin is influenced by the presence of polyphenols. Polyphenols are one of the active compounds in plants that are allegedly able to increase breast milk production. The presence of these polyphenols will make breast milk flow more profusely. Excessive milk production can be seen with the milk that drips and will radiate profusely when the baby sucks (Wahyuni, 2013).

C. Active Compounds in Winged Bean that can Increase Breast Milk Production

Based on Table 5.9 it can be seen that giving ethanol extract of katuk leaves can increase prolactin hormone levels, this is in line with the research of Soka, S., Wiludjaja, J., and Marcella (2011) which is described in Table 5.10, namely an increase in oxytocin and prolactin gene expression after being given supplementation with katuk matur leaf extract.

Katuk leaves in addition to having nutritional content, contain 7 active compounds and affect the body's physiological functions and if they work together, they will be efficacious as a booster of breast milk production. Katuk leaves can increase breast milk production because it is suspected that the hormonal effects of the chemical content of sterols contained in it are estrogenic (Marini, 2010).

The similarity of active compounds between the winged winged and Katuk leaves allows the winged bean to have the same effect as the Katuk leaf, which is to increase breast milk production or is known as a lactagogue. The active compounds include Triterpenoids, Saponins, Tannins, Polyphenols, Glycosides, and Flavonoids, although further studies are still needed to prove this.

5. CONCLUSION

Winged bean has a complete nutritional content of energy, protein, fat, carbohydrates, and fiber, minerals (potassium, phosphorus, sulfur, calcium, magnesium, sodium, iron, manganese, zinc, and copper), and vitamins consisting of vitamin A, thiamine, riboflavin, pyridoxine, niacin, folic acid, ascorbic acid, tocopherol. In addition, winged bean also contains active compounds, namely flavonoids, saponins, polyphenols, steroids, terpenoids. Hormones that can increase milk production are prolactin and oxytocin hormones. The active compounds in winged bean which are allegedly able to increase breast milk production are flavonoids, saponins, polyphenols, steroids, terpenoids. Because the active compound is owned by Katuk leaves which have been shown to increase breast milk production.

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