

Use of Milk Goat Yogurt Lowering Uric Acid, Cholesterol and Blood Glucose

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Abstract

Health is something that has always been observed by any person for the sake of survival. Healthy lifestyle habits should be a society that is able to be applied in daily life - today. Exercise regularly, consumption of nutritious foods and balanced to support a better life. An unhealthy diet , such as eating foods high in fat , salt , sugar -free and low in carbohydrates complex , vegetables and fruits, the main cause of the increased risk of cardiovascular disease , diabetes mellitus and Hyperuricemia (Sacher , 2004; Kumar et al. 2012). Various types of synthetic drugs used in medicine for example to decrease uric acid , allopurinol denan cause allergic reactions , stomach disorders, bowel , headache , dizziness , fever and blood disorders (Tjay & Rahardja , 2007). Using of drugs that lower koleserol examples drugs of gemfibrozi drug , fenofibrate and bezafibrat of fibrate acid group which is usually used in patients with type III hiperlipoproteinemia and severe hypertriglyceridemia , has side effects gastrointestinal disturbances such as nausea , diarrhea , flatulence , and others. Class of drugs such as cholestyramine and colestipol resins commonly used in patients with hypercholesterolemia, also give side effects such as nausea, vomiting , and constipation, but is reduced after some time of taking the drug. Likewise, the treatment of chronic hyperglycemia USING insulin and oral antidiabetic drugs are relatively more expensive because of its use in the long term and can cause unwanted side effects. Therefore, it is necessary to find an alternative treatment, especially from natural sources that are safer, does not have efek samping and effective for use in the treatment of gout, hiperkolesetolemia and hyperglycemia.

Keywords: Milk Goat, Uric Acid, Cholesterol, Blood Glucose

1. Introduction

Health is something that has always been observed by any person for the sake of survival. Healthy lifestyle habits should be a society that is able to be applied in daily life - today. Exercise regularly, consumption of nutritious foods and balanced to support a better life. An unhealthy diet , such as eating foods high in fat , salt , sugar -free and low in carbohydrates complex , vegetables and fruits, the main cause of the increased risk of cardiovascular disease , diabetes mellitus and Hyperuricemia (Sacher , 2004; Kumar et al. 2012).

Various types of synthetic drugs used in medicine for example to decrease uric acid , allopurinol denan cause allergic reactions , stomach disorders, bowel , headache , dizziness , fever and blood disorders (Tjay & Rahardja , 2007). Using of drugs that lower koleserol examples drugs of gemfibrozi drug , fenofibrate and bezafibrat of fibrate acid group which is usually used in patients with type III hiperlipoproteinemia and severe hypertriglyceridemia , has side effects gastrointestinal disturbances such as nausea , diarrhea , flatulence , and others. Class of drugs such as cholestyramine and colestipol resins commonly used in patients with hypercholesterolemia, also give side effects such as nausea, vomiting , and constipation, but is reduced after some time of taking the drug. Likewise, the treatment of chronic hyperglycemia USING insulin and oral antidiabetic drugs are relatively more expensive because of its use in

the long term and can cause unwanted side effects. Therefore, it is necessary to find an alternative treatment, especially from natural sources that are safer, does not have efek samping and effective for use in the treatment of gout, hiperkolesetrolema and hyperglycemia.

Goat milk has the advantage in the composition of which have natural antiseptic properties that can suppress the development and breeding of bacteria in the body. This is due to Fluorine whose levels reach 10-100 times greater than in cow's milk, alkaline that is safe for the body, protein soft and mild laksatif effect so it does not cause diarrhea to consume, there are fats that are easily digested because it has the texture soft and smooth, smaller than a grain of beef fa. Cow's milk fat droplet 4.55 um (micrometer) and goat's milk only 3,49um. It is easier for the liver to digest thus reduce allergic reactions. The presence of sodium (Na), fluorine (F), calcium (Ca) and phosphorus (P) as the dominant chemical elements and the amount of other nutrients, goat milk is believed to cure some kidney disorders, such as nephrotic syndrome ,infection - kidney infection and gout high (Moeljanto & Wiryanta, 2002) .

Goat milk is processed fermented yoghurt made has advantages compared with fresh goat's milk, and serves to avoid pain in patients with rheumatoid arthritis. This is because there is fluid in the process of making yoghurt called whey contains sodium (Na) is very high, so the joint stiffness is preventable and curable (Moeljanto & Wiryanta, 2002). Yogurt contains vitamin B1 , vitamin B1 which has the structural formula similar to allopurinol (Setiawan & Suyono , 2012). Allopurinol is a compound that is often used as a drug suppresses the production of uric acid in the body of the patient because these compounds can inhibit the action of xanthine oxidase. Several hypotheses about the decreased levels of cholesterol by Lactobacillus bacteria , namely : 1) the cholesterol that is in kimus eaten by bacteria, so that cholesterol is absorbed by the gastrointestinal tract decreases. 2) cholesterol can be bound to the bacterial cell surface or incorporated into the bacterial cell membrane or in convection becomes coprostanol by cholesterol reductase produced by a strain of Lactobacillus. 3) inhibited the formation of micelles by probiotik.Bakteri Lactobacillus strains can produce ferulic acid (FA), which can inhibit sterol HMGCoA reductase and secrete acid, so that blood cholesterol levels can be decreased (Duchesneau,et al.2014). Yogurt is a probiotic product. Probiotics are living organisms that can provide beneficial effects to health if consumed in sufficient quantities (Muhammadshahi , et al, 2014). This makes researchers are interested to know the effectiveness of goat's milk yoghurt starter against the various levels of uric acid, total cholesterol and blood glucose in male white rats (Rattus norvegicus Wistar strain).

2. Metodologi Research

This research is true experimental using Post Test Control Group Design is research being done to determine the extent of the relationship influences by comparing one or more results of the research object, one or more objects control observed and dukur after treatment (Notoatmodjo, 2005),

Treatment. This study uses a completely randomized design (CRD) with four treatments and six repetitions :

PA = Placebo / water ad- lib

PS = Goat Milk Yogurt Stater Streptococcus with dose (10 ml/day/rat)

PL = Goat Milk Yogurt Stater Lactobacillus with dosage (10 ml/day/rat)

PC = Stater Goat Milk Yogurt Mix (Streptococcus and Lactobacillus) dose (10ml/day/rat).

Animals Materials. Material used is a white male rats (Wistar strain *RattusNovergicus*) , aged between 2-3 months , with the average - average weight of approximately 2,799 grams Koevisien variation ± 9.46 % in a healthy state and has a clear eye . Deuteronomy each treatment 6 times the number of mice as many as 24 male and backup each 2 tail.

- a. Sample inclusion criteria, namely :
 1. Age 2-3 months
 2. Weight is measured using a variation koefisien with the result that more than 10 %
 3. Male white rats, Wistar strain nation
 4. Healthy, characterized by an active movement, and a clear eye.
- b. Sample exclusion criteria, namely :
 1. Rats died when treatment.
 2. Mice that were too aggressive to endanger other mice.

Research variable

1. Variabel independent
The independent variable in this research was the goat's milk yoghurt by using starters *Lactobacillus* , *Streptococcus* , and the mixture (*Lactobacillus* and *Streptococcus*) 10ml/day/head.
2. Variabel dependent
The dependent variable in this study is the level of uric acid and blood glucose cholesterol total white male rats(*Rattus novergicus* Wistar strain).
3. Instrumen Research
 - a. Maintenance tool mice : mice Cages,cage cover of woven wire, a bottle of water .
 - b. Other equipment : Smit injection of 3 ml and 1 ml , scales to measure the body weight of rats, Spectrophotometer wave 546 nm , Pipette drops , micropipette, Gloves, microhematocrit, centrifuges, Test Tube, Vaccutainer, sonde, cotton.
 - c. Surgical tool rat: surgical scissors, tweezers, place the blood (preparation bottle), Gloves, network hook, needles, surgical board, paper table.
4. Consumption of Goat Milk Yogurt
Consumption of goat's milk yoghurt 10 ml/day/mice were divided into three feedings for 30 days through the sonde tool made of injection devices (syringes) size Pipette 3ml modified with rubber with a diameter of 4 mm and a length of 7 cm.
5. Processes anesthesia
The process of anesthesia in rats using chloroform as many as 5 ml (can be used for 10 rats) by using cotton that has been given chloroform was added to the glass chamber for 5 minutes , then put on chamber mice and then closed. Wait until 20-25 seconds until the rat did not move again.
6. Processes Surgery
Surgery rats by means of bodies stretched flat rat on board and then on the foot is given a pin so that the mice did not change position when surgery . Then split vertically mice that bottom up on the base of the neck. The base of the neck to do division horizontally so that the skin of mice can be expanded . Having pierced with a pin for easy identification in blood collection . Blood is drawn through the aorta to the heart of the capillary tube of 1-2 ml using a 3 ml syringe . After taking the blood through the aorta

of the heart, and then inserted into vaccutainer. Label on each - each blood on vaccutainer.

7. Analysis of Data

The data obtained in this study to analyze the data using one-way ANOVA test to test the hypothesis of similarity between the average value of each group and if there is a difference followed by Least Significant Difference test.

3. Results And Discussion

3.1 Levels of Uric Acid Research

The observation of 30 days after administration of the goat milk yogurt uric acid levels and presented in Table 1

Table 1. Average uric acid levels in the observation day to 30 male rats (*Rattus norvegicus* Wistar strain)

Treatment	Average Levels of Uric Acid (mg/dl)
Placebo / water	3,75a
Group of goat's milk yoghurt with <i>Lactobacillus bulgaricus</i> starter	2,50bc
Group of goat's milk yoghurt with <i>Streptococcus thermophilus</i> starter	2,40c
Group of goat milk yoghurt with <i>Lactobacillus bulgaricus</i> starter mix dengan <i>Streptococcus thermophilus</i>	2,65b

Note: Different letters in one column indicate significant differences

Uric acid levels given placebo group was given yogurt goat milk is 3.75 mg/dl. Highest compared to the group of uric kadar`asam goat's milk yoghurt with *starterLactobacillus bulgaricus* with the average - average uric acid levels in rats 2.5 mg/dl , with *starterStreptococcus thermophilus* has a value - average of 2.4 mg/dl and a mixed starter (*Lactobacillus bulgaricus* and *Streptococcus thermophilus*) obtained value - average of 2.65 mg/dl. Lowest levels of uric acid in the treatment of streptococcus thermophilus starter has a value - average of 2.4 mg / dl , but the result is the same as the treatment of *Lactobacillus bulgaricus* starter with the average - average uric acid levels in rats 2.5 mg / dl. The results of this study shows that the goat milk yogurt can lower blood uric acid levels . This is explained by Setiawan & Suyono (2012) ; Anandagiri , et al (2014) on goat milk yogurt has vitamin B1 which possess similar chemical strutur allopurinol to inhibit xanthine oxidase work such compounds will compete with xanthine and hypoxanthine, so the amount of uric acid is the end product xanti conversion can be suppressed.

3.2 Blood Glucose Research

The observation of the effectiveness of various goat's milk yogurt starter and placebo on blood glucose levels in male rats can be seen in Table 2.

Table 2. Average RAL - Average blood glucose levels in mg/dl

Treatment	Average Levels of blood glucose (mg/dl)
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Placebo / water	148,66 ^a
Group of goat's milk yoghurt with <i>Lactobacillus bulgaricus</i> starter	134,50 ^{bc}
Group of goat's milk yoghurt with <i>Streptococcus thermophilus</i> starter	135,33 ^c
Group of goat milk yoghurt with <i>Lactobacillus bulgaricus</i> starter mix dengan <i>Streptococcus thermophilus</i>	130,16 ^b

Note: Different letters in one column indicate significant differences

LSD test results shown that the treatment group goat milk yogurt starter, especially with a mixture of *Lactobacillus bulgaricus* and *streptococcus thermophilus* proven most effective at lower blood glucose levels. Starter mixture of *Lactobacillus bulgaricus* and *Streptococcus thermophilus* little has activities that are more effective than starter not mix, due to the combination of the two starter will form a mutually beneficial relationship mutualism or symbiosis. *Streptococcus thermophilus* produces formic acid which can stimulate the growth of *Lactobacillus bulgaricus*. Furthermore, *Lactobacillus bulgaricus* produces amino acids glycine and histidine needed for the growth of *Streptococcus thermophilus* (Yunita, D., Rohaya S, N., & Maulina Husna, 2011). Glucose levels highest real control group compared to the group treated yogurt. This is because yogurt contains Lactic Acid Bacteria (LAB), which can increase insulin sensitivity, especially in the IRS (Insuline Receptor Substrate) by reducing the formation of fat in the body of mice that is more effective at and insulin secretion in a glucose transfer to cell to be optimized. The results of this study reinforced by research conducted by (Naydenovi.K., et al., 2012) which states that the yogurt is a functional food that is able to work as an antidiabetic and antioxidant. According Sulistyoningrum (2010) resistance or reduced insulin secretion in the blood caused by the accumulation of fat, high cholesterol levels and hypertension.

3.3 Cholesterol Blood Research

White rat blood cholesterol levels by various stater yoghurt goat milk can be seen in Table 3.

Table 3. Average - Average levels of total cholesterol (mg/dl)

Treatment	Average Levels of cholesterol (mg/dl)
Placebo / water	62,83 ^a
Group of goat's milk yoghurt with <i>Lactobacillus bulgaricus</i> starter	52,17 ^b
Group of goat's milk yoghurt with <i>Streptococcus thermophilus</i> starter	51,00 ^{bc}
Group of goat milk yoghurt with <i>Lactobacillus bulgaricus</i> starter mix dengan <i>Streptococcus thermophilus</i>	54,16 ^b

Note: Different letters in one column indicate significant differences

LSD test results showed that the placebo group (water) treatment significantly different stater *Lactobacillus*, *Streptococcus* significantly different, and the mixture (*Lactobacillus* and *Streptococcus*). While the *Lactobacillus* group-*Streptococcus*, mix - *Lactobacillus*, and

mixtures - Streptococcus was not significantly different can lower total cholesterol levels in male rats. Total cholesterol levels placebo treatment (water) had the highest blood cholesterol levels compared to the other treatment groups, namely Lactobacillus, Streptococcus and mixture (Lactobacillus and Streptococcus). This is because of LAB (Lactic Acid Bacteria) in the treatment group were able to survive in the gut and help the fermentation process and the process dekonjugasi empedu. Proses salt helps reduce plasma cholesterol levels by cutting through the mechanism of conjugation Bile Salt Deconjugation. Not only mechanism Bile Salt Deconjugation, but the cell bodies of the bacteria asam laktat able to bind cholesterol in the digestive tract, so cholesterol can not be absorbed by the intestinal lumen and out along with feces (Kumar, et al., 2012). Another factor is the amount of vitamin E in goat milk fat is able to function as antioxidants and able to control contents cholesterol in the blood (Sodik & Abidin, 2008).

4. Conclusion

Based on the results and discussion of this study , it can be concluded as follows :

1. Yoghurt goat milk is effective in lowering the levels of uric acid, glucose and blood cholesterol h in male white rats (*Rattus norvegicus Wistar* strain)
2. Yogurt mixed starter of goat milk with *Lactobacillus bulgaricus* with *Streptococcus thermophilus* more effective than a single starter yogurt.

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