In Vitro Studies: Potential Of Natural Source Herbal As Anti Cholesterol Agent

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Abstract. Globalization era, must human life with practices. Human consumption Fast food that rich of fat availability everywhere daily. The change of lifestyle include eating habit. Fruit, vegetable and sport activity very limited in human life style the now era. This is caused obstruction blood vessel by fat very high, that cause stroke and heart coronary, the vitality of disease. This study aims to evaluate potential of Indonesian as a rich country of any fruit, leaf, (herbal) and fat emulsion activity of herbal. Perhaps can be a problem solving human now. May be so can formulated broiler chicken nutrition to produce meat healthy. The methods was in vitro, cholesterol content test with MU/INST/4 (GC) method at Centre of Agro Based Industry, Bogor. Material used are formulation of stroke care, heart care and green coconut water as control. The result of this study herbal have potentials as an anti-cholesterol agent. Average cholesterol content from heart care formula 23.2 mg/100 gram, stroke care formula 86.9 mg/100 gram and control green coconut water 130.7 mg/100 gram.

1. Introduction
Indonesia is the rich country with herbal plant such as fruit, leaves, stems, roots, rhizomes and tubers. Herbal plant are very beneficial for human health and beauty also animal health and production.

First step research was analysis the content nutrition of Persimmon fruit such as proximate analysis, mineral content, vitamin content and microbiology content [1]. Second step was biological research by giving formula to beef cattle traditionally maintained. The result this experiment indicated that Persimmon fruit and other herbal formula can reduced the number of worm eggs [2]. The third experiment was identification of microbial content at Persimmon fruit. This result indicated that Persimmon fruit auto fermentation content of \( \text{Bacillus sp} \) that have potential as an antibiotic, antifungal and anthelmintic [3]. The fourth step was in vitro studies potential formula Persimmon fruit with other herbal as lipid emulsion [4] and as an anti-cholesterol agent [5].

This experiment design to know the potential of herbal composition on heart care \(^R\) and stroke care \(^R\) with control green coconut water.

2. Material and Methods

2.1. Material
Material used in experiment are human plasma liquid that contain 200 mg/dl cholesterol, stroke care formulation, heart care formulation and green coconut water.
2.1.1. Preparation sample for human plasma liquid. 5 g of egg yolk dissolved in 100 ml of isotonic solution, and for control 5 g of egg yolk dissolved in green coconut water.

2.1.2. Preparation sample of Stroke Care formulation. Persimmon fruit (Dyospiros kaki) 50%, celery (Apium graveolens) 20%, dutch teak (Guazuma umnifolia) 20%, roselle (Hibiscus sabdarifa) 10%.

2.1.3. Preparation sample of Heart Care formulation. Bitter plant (Andropogus panniculata) 35%, betel plant (Piper bettle) 25%, ginger rhizome (Zingiber officinale) 25%, nutmeg (Myristica fragrans) 15%.

2.2. Methods

2.2.1. Invitro Methods

2.2.1.1. Control

2.2.1.1.1. Take 5 g of egg yolk and dissolved in 500 ml of green coconut water, mixed.

2.2.1.1.2. Take 5 g of egg yolk and dissolved in 1000 ml of green coconut water, mixed

2.2.1.1.3. Take 5 g of egg yolk and dissolved in 1500 ml of green coconut water, mixed

2.2.1.2. Heart care R

2.2.1.2.1. Take 1 g heart care R for 5 g of egg yolks, dissolved in 100 ml of isotonic water

2.2.1.2.2. Take 2 g heart care R for 5 g of egg yolks, dissolved in 100 ml of isotonic water

2.2.1.2.3. Take 3 g heart care R for 5 g of egg yolks, dissolved in 100 ml of isotonic water

2.2.1.3. Stroke care R

2.2.1.3.1. Take 1 g stroke care R for 5 g of egg yolks, dissolved in 100 ml of isotonic water

2.2.1.3.2. Take 2 g stroke care R for 5 g of egg yolks, dissolved in 100 ml of isotonic water

2.2.1.3.3. Take 3 g stroke care R for 5 g of egg yolks, dissolved in 100 ml of isotonic water

2.2.2. Cholesterol content. [6]

2.2.2.1. Prepare GC according to sample standard

2.2.2.2. Inject the solvent 2 µl into the Colom

2.2.2.3. Solvent peak will be visible

2.2.2.4. Inject the sample 5 µl into the Colom

2.2.2.5. Read cholesterol levels in the sample

2.2.3. Statistic calculation: This experiment used average of dupplo laboratory test.

3. Result and discussion

Cholesterol is a metabolite containing sterol fat found in cell membranes and circulated in blood plasma. The normal human cholesterol content 200 mg/dl. Way of life, food consumption high fat, fried, fast food, overweight, minimalized sport, genetic can cause high blood cholesterol and atherosclerosis. Atherosclerosis in brain can cause stroke and in heart can cause heart coronary disease. Cholesterol can decrease with herbal consumption. Indonesia rich with many kind of herbal plant. Empirical case show that “jamu” can make human healthy and smart. “Jamu: is natural cultural heritage. Complex mechanism on jamu to make our health and beauty hereditary.
The development of herbal medicine from boiled with water, powder, simplifier, extraction and Nano technology. We mixed many herbal plant and processes to decrease blood cholesterol such as heart care and stroke care.

Composition herbal used in this experiment:

![Figure 1. Heart care composition](image1)

![Figure 2. Stroke care composition](image2)

Herbal plant used in this experiment:

| Heart Care      | Stroke Care     |
|-----------------|-----------------|
| ![Andropogus panniculata](image3) | ![Diospiros kaky](image4) |
| ![Piper betle](image5) | ![Apium grafeolens](image6) |
| ![Zingiber officinale](image7) | ![Guazuma ulmifolia](image8) |
| ![Myristica fragrans](image9) | ![Hibiscus sabdarifa](image10) |

![Figure 3. Herbal Plant](image11)
Persimmon fruit \((Diospiros kaky)\) content polyphenol can reduce cholesterol, prevent heart coroner disease, prevent hardening of the arteries, maintain blood pressure, maintenance of the blood vessel flexibility, stability of blood pressure the key of heart healthy [10]. Flavonoid in Sledri \((Apium grafeolens)\) can blood circulation well and reduce blood pressure [11]. Jati belanda \((Guazuma ulmifolia)\) content alkaloid, substances and resin also flavonoid. These compound can inhibits fat and cholesterol absorption [12].

Cholesterol content in this experiment see in table 1.

Table 1. Cholesterol content in vitro study in human plasma liquid

| Dose (mg/dl) | Cholesterol content (mg/100 g) |
|--------------|-------------------------------|
|              | Heart Care | Stroke Care | Control Green coconut water |
| 20           | 8.81       | 102         | 214                      |
| 40           | 8.79       | 64.5        | 114                      |
| 60           | 52.0       | 94.2        | 64.2                     |
| Average      | 23.2       | 86.9        | 130.7                    |

The control this experiment used green coconut water, because from empirical study green coconut water also can eliminate vascular obstruction. Normal plasma human cholesterol content was 200 mg/dl and in this control with dose 20 mg/dl was 214 mg/100 g. Increasing the dose can decrease cholesterol content and the average 130.7 mg/100 g.

![Figure 4. Cholesterol content in different herbal formulation](image)

The average cholesterol heart care 23.2 mg/100 g and stroke care 86.9 mg/100 g. This indicated that heart care more efficient to decrease cholesterol content in the plasma blood human by study in vitro

4. Conclusion

The result of this study herbal combination have potentials as an anti-cholesterol agent. Average cholesterol content from heart care formula 23.2 mg/100 gram, stroke care formula 86.9 mg/100 gram and control green coconut water 130.7 mg/100 gram

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