

THE EFFECT OF SUPPLEMENTATION FERMENTED KOMBUCHA TEA ON FAT AND CHOLESTEROL LEVELS OF DUCK MEAT

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Abstract

The experiment that concerned the effect of supplementation fermented kombucha tea on fat and cholesterol value of duck meat has been carried out at Tanjungsari, village in Tasikmalaya (West Java). This research used an experimental method with a completely randomized design. There were five kind of treatments (P0 = 0%, P1 = 10%, P3 = 20%, and P4 = 25%) and four replications. The result indicated that supplementation with 25% kombucha decreased significantly fat and cholesterol in duck meat ($p < 0.05$). The conclusion is that the addition of fermented kombucha tea up to 25% can decrease fat and cholesterol levels in the meat the fowl produced.

Key words: Fermented Kombucha Tea, Fat, Cholesterol

INTRODUCTION

Kombucha is a fermented tea that is often drunk for medicinal purposes. There are scientific studies that support the health benefits of Kombucha that show it to be antimicrobial, [1][2] to have hepatoprotective qualities, [3] and to be antioxidative [4][5] among other benefits. Kombucha is available commercially and can be made at home by fermenting tea using a visible, solid mass of yeast and bacteria. Kombucha contains multiple species of yeast and bacteria, as well as the organic acids, active enzymes, amino acids, and polyphenols produced by those microbes.

Many health benefits have been reported by users of Kombucha Tea, benefits are derived at due to its cleansing properties by detoxifying and aiding the liver and kidneys to flush the toxins from the body. The health benefits of this living beverage are varied. Many health benefits that have been reported by others from drinking Kombucha Tea.

Efforts to reduce levels of fat and cholesterol in the duck meat can be done with a drink Kombucha Tea Fermentation (TFK) in duck. Fermented kombucha tea can be consumed as a food supplement that offers the required compounds in stabilizing the body's metabolism. According to [6], yeast ferments contained in kombucha tea is *Candida albicans*, *Sacharomyces*, and *Pichia*

fermentans while the bacterium *Acetobacter xylinum*, *Gluconicum bacteria*, *Acetobacter ketogenum*. The suspension is gluconic acid, gluconic acid, lactic acid, oxalic acid, lactic acid, butyric acid and natural antibiotics material. In addition to producing some organic acids also produce various kinds of vitamins such as vitamin B1, B2, B3, B6, B12, B15, Vitamin C, minerals, folic acid and enzymes [7]. Glucuronic acid is also present in kombucha tea, this acid is a metabolite that is produced by a healthy liver and aids in the detoxification of the body. By drinking kombucha tea daily will help prevent our body tissues from absorbing all the toxins found in our industrial environment that can lead to illness.

Kombucha tea contains most polyphenol, including flavonoids. One of the flavonoids catechin derivatives, these compounds are antioxidants with the power 100 times higher than vitamin C and 25 times vitamin E, which is also a powerful antioxidant. Changes in LDL (Low Density Protein) into a form that LDL oxidized by free radicals can cause damage to artery walls and increases atherosclerosis violence. Prevention mechanisms contained in its ability to inhibit the absorption of cholesterol and inhibits platelet clumping cells thus preventing the blockage of blood vessels. Polyphenol tea is

also a powerful antioxidant that can protect LDL oxidation by free radicals.

According to [8], and [9] that the addition of fermentation products can lower cholesterol levels through the mechanism of inhibit HMG CoA reductase enzyme activity (3-hydroxy 3-methylglutaril CoA reductase) as a producer or through the mechanism of increased cholesterol synthesis bile acids. Increased secretion of bile acids will increase the excretion of cholesterol so that cholesterol levels in the tissue decreased [10]. Reducing cholesterol levels due to the inhibition mechanism of synthesis of HMG CoA played by the components contained in Kombucha tea. As it is known that HMG CoA could form mevalonate acid compound which is a precursor of cholesterol [11].

The Kombucha colonies used in this investigation had a tendency to produce about 3.3% total acid, 0.7% acetic acid, 4.8% glucose, and 0.6% ethanol after a nine-day fermentation. There was no lactic acid produced by these colonies (verified with HPLC; 9). The average pH of the fermented samples tested was 2.5. The pH of the neutralized samples was 7.0. When the fermentation was allowed to continue beyond the desired endpoint, the acidity reached levels as high as 24 g/L (2.4%) acetic acid, with 14 g/L (1.4%) ethanol.

Supplementation kombucha tea on 0,5% level of the total drinking water, have a lower tendency on abdominal fatty broiler meat

[13], also [14], that the total cholesterol and LDL decrease on supplementation 12,5 and 25% levels of the total drinking water, while adding kombucha tea 25% levels of the total drinking water, can increase the HDL in the blood serum.

MATERIAL AND METHOD

The research used 20 duck, with average body weight 1800 gram and coefficient variable 8,59%, age 1,5 years The duck kept in the cage, as much as 5 flock, and each unit consist 1 duck.

The ration consist 16% protein and metabolist energy 2900 kcal/kg

The formula rations were :

- R0 Control diets
- R1 Diets contain 10% of kombucha
- R2 Diets contain 15% of kombucha
- R3 Diets contain 20% of kombucha
- R4 Diets contain 25% of kombucha

Sample preparation: Kombucha was prepared by adding 100 g/L (10%) weight/volume sucrose and tea leaves of desired dry weight to boiling water. Normal drinkable tea of 4.4 g/L (0.44%) weight of dry tea per volume of boiled water, and increased levels of 8.7 g/L, 17 g/L, 35 g/L, and 70 g/L were prepared in duplicate. The fermentation time averaged twelve days at 25° C.

RESULTS AND DISCUSSIONS

Table 1. Effect on the level of fat and cholesterol duck meat

Variables	P0	P1	P2	P3	P4
Fatty Duck Meat (%)	12,17 ^a	11,92 ^a	11,85 ^a	10,89 ^{ab}	9,54 ^b
Cholesterol Duck Meat (mg/g)	71,486 ^a	70,580 ^a	70,192 ^a	69,237 ^{ab}	65,238 ^b

Note: The same letter on the same line show no significant difference (P<0.05)

1. Effect Treatment on Fatty Duck Meat

Based on Table 1, the percentage of the average fatty levels of ducks meat per treatment decreased with increasing doses of kombucha tea. Adding 25% kombucha tea of the total drinking water consumption could be reduced the fatty. level, while 10 until 20% dose showed not significantly difference from control (no treatment). This is possible because of the low presentation of kombucha tea were given, the active substance in

kombucha tea can not optimally react in reducing the fatty level of duck meat. The effect of kombucha tea on the level of fatty duck meat with 25% dosage of drinking water consumption, may be due to non-starch polysaccharide component which is the fraction of water-soluble fiber[12]. The kombucha fermented product is largely a soluble fiber fraction (non-insured polysaccharides) which include arabinose, mannose, galactose, and amino acid number.

Fraction of fiber is expected to participate in fat excretion from the body so that the fat deposit in the body decreased.

The mechanism of fat decrease content in duck meat using feed additives that coarse grained is inhibit the absorption of fat, including cholesterol in digestive system is inhibited because it would be bound to the soluble fiber fraction components derived from the kombucha tea.

2. Effect Treatment on Cholesterol Duck Meat

Based on Table 1, cholesterol levels decreased because of the active substances activity that contained in kombucha tea. The addition of fermentation products could decrease the cholesterol levels of carcass through the mechanism of inhibition of an enzyme activities that involved in cholesterol biosynthesis (3-hydroxy 3 metilglutaril CoA reductase) or through the mechanism of increased bile acid synthesis. Increased excretion of cholesterol bile acids that decrease cholesterol levels in the tissue [10]. [7] states that the content of niacin in kombucha tea can reduce the excess of cholesterol in the blood. Vitamin B3 (niacin) has been used since the 1950's to reduce high LDL, cholesterol and triglycerides (fats) in blood and more effective in increasing HDL.

CONCLUSIONS

1. Providing kombucha tea fermented at dose 25% in drinking water can reduced the fat and cholesterol duck meat, with an average rate 9.54% low-fat and cholesterol 65.238 mg/100g duck meat.

2. 25% fermented kombucha tea in ducks drinking water is the most optimum level to reduced the fat and cholesterol levels of duck meat.

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