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The effect of giving boiled betel leaf (*Piper Betel Lin*) and red guava leaves (*Psidium buajava* L.) on the physical composition of broiler carcass

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Abstract

Broilers are a type of poultry that has high productivity, especially in meat production. However, broilers have a drawback, namely being susceptible to disease. This study aims to evaluate the effect of giving betel leaf and guava leaf decoction water in drinking water on the physical composition of broiler carcasses as an alternative to the use of AGPs. In addition, this study also praised the optimal ratio between betel leaves and guava leaves. The research was conducted for 35 days in Banjar Suda, Nyitdah Village, Kediri District, Tabanan Regency. Using a Complete Randomized Design (RAL) with 4 treatments and 7 replicates. Each replicate consists of 3 broilers. The treatment included P0 (without the addition of betel leaves and guava leaves), P1 (a ratio of 1:1 of 5% body weight to drinking water), P2 (2:1), and P3 (1:2). The variables observed include carcass weight, carcass percentage, and physical composition such as meat, bones, fat, and skin. The results of the study showed that the comparison of 1; 1, 2; 1 and 1; 2 decoction of betel leaf and guava leaf in the percentage of meat was 3.34%, 3.53%, 2.65% lower than P0 respectively but there was no significant difference (P>0.05), in line with the cut weight, percentage of carcass, bones, fat and broiler skin. Thus, the decoction of betel leaves and red guava leaves 5% of the body weight in drinking water has no effect on the physical composition of broiler carcasses, and the administration of 5% of the body weight of betel leaf and guava leaves decoction water in the ratio of 1:1, 2:1, and 1:2 has not been effective in increasing the physical composition of broiler carcasses.

Keywords: AGPs Substitute; Broiler; Betel leaf; Red guava leaf; Physical composition of the carcass

1. Introduction

Broilers are poultry that have high productivity, especially in producing meat. But broiler have a disadvantage, namely being susceptible to diseases that originate from bacteria, viruses, fungi, parasites, the environment and a lack of a nutrient substance [1,2)

Therefore, in broiler feed and drinking water, feed *additives* such as AGP (*Antibiotics Growth Promoters)* are often added, but the use of antibiotics has been banned since 2006.Therefore, to avoid the use of AGP, farmers are encouraged to switch to using antibiotics derived from herbal plants such as betel leaves and red guava leaves.

In betel leaves, phenolic compounds of essential oils are very dominant, which is as much as 1-4.2% [3]. suggests that essential oils stimulate pancreatic sap which contains enzymes amylase, lipase and protease to improve the digestion process of feed ingredients that also affect meat production in chickens. The polyphenol compounds that dominate guava leaves are flavonoids (>1.4%) [4]. Which serves to increase absorption in the intestinal villi.

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2. Material and methods

A total of 84 broiler without gender discrimination (*Unisex*). Using a plot cage with a size of 85 cm x 95 cm, which is filled with 3 broilers and equipped with a feeder and drinking water. The floor of the cage is covered with lime and covered with rice husks. Then the floor is also coated with newspapers and the rations used in this study are commercial rations of PT. Japfa Comfeed Indonesia with codes G 10 (1-20 days old) and G11 (21-35 days old). The provision of rations is carried out on *an ad libitum basis.* The nutrient content in the ration is shown in Table 1.

Table 1 The nutrient content in the ration

Nutritional content	**Ration Type**			
	G10	**SNI Standards 8173-2:2022**	**G 11**	**SNI Standards 8173-3:2022**
Water Content (%)	14.0%	13.0%	14.0%	13.0%
Crude Protein/CP (%)	21.0-23.0%	20.0%	19.0%	19.0%
Crude Fat/LK (%)	5.0%	4.0%	5.0%	4.0%
Crude Fiber/SK (%)	5.0%	5.0%	6.0%	6.0%
Ash %	8.0%	9.0%	8.0%	9.0%
Calcium (Ca)(%)	0.8-1.1%	0.7-1.2%	0.8-1.1%	0.6-1.1%
Fofor (P)(%)	0.5%	0.5%	0.45%	0.45%
Aflatoxin (µg/kg)	50 ppb	50 ppb	pb	pb

Information: 1.Broiler animal feed brochure PT. Japfa Comfeed Indonesia; 2. Nutrient standards according to SNI (2006)

This research was conducted for 35 days. The design used in this study was a completely randomized design (CRD), which consisted of 4 treatments and 7 replicates, each replicate using 3 broilers. The four treatments are: P0 (Drinking water without added betel leaf and red guava leaf), P1 (Drinking water added a mixture of betel leaf decoction and red guava leaf with a ratio of one to one of 5% body weight), P2 (Drinking water added a mixture of betel leaf decoction and red guava leaf with a ratio of two to one of 5% body weight), P3 (Drinking water added a mixture of betel leaf decoction and red guava leaf with a ratio of one to two of 5% body weight).

2.1. Cutting Procedure

Slaughtering is done when the chickens are 35 days old. Before slaughtering, the chickens were fed for 12 hours so that there was no food left in the cache and intestines so as not to affect the weight of the chicken, but drinking water was still given. Slaughter is done on the jugular vein and carotid artery so that the blood in the chicken can be removed. The chicken that has been slaughtered is then put for a few minutes into cold water then into hot water which serves to kill bacteria and facilitate the process of plucking feathers. After the feathers are clean, the offal is removed. Offal removal is done by making an incision in the abdominal area, then the abdominal contents or offal are pulled out by hand. The next stage is to find the carcass weight by cutting the head, neck and legs.

2.2. Observed Variables

The variables observed in this study are physical composition, including: Carcass weight, carcass percentage, meat percentage, bone percentage, fat and skin percentage. Each of these variables was calculated based on the method developed by Waskito [5].

2.3. Data Analysis

The data from this study were analyzed using Analysis of Variance (ANOVA). If there were significant differences between treatments ($P<0.05$), the analysis was followed by Duncan's Multiple Range Test [6].

3. Result and Discussion

The data from the study of carcass weight, carcass percentage, meat, bone, and fat of broilers given water with the addition of betel leaf decoction and red guava leaves as much as 5% of body weight with the ratio of betel leaves and guava leaves as much as 1:1 (P1), 1:2 (P2), 2:1 (P3) are shown in table 2.

The average carcass weight of P0 broilers was 1704.29 g/head (Table 2) while P1, P2, P3 increased by 3.9%, 4.9%, 6.5% respectively, but statistically the four treatments showed no significant effect (P>0.05). This is because the level and dose of the mixture of betel leaf decoction and red guava leaf given is not high enough to have a significant effect on carcass weight. Supported by the feed used in this study is a commercial ration with good and balanced nutritional content (Table 1), resulting in consumption and body weight gain that is not significantly different [7] if body weight is not significantly different then carcass weight is also not different.

Table 2 Carcass weight, carcass percentage, meat, bones and broiler fat given drinking water with the addition of a mixture of betel leaf decoction and guava leaves

Variable	**Treatment1)**				**SEM2)**
	P0	**P1**	**P2**	**P3**	
Carcass Weight (g/tail)	1704.29a3)	1745.71a	1741.43a	1790.00a	39.60
Carcass Percentage (%/head)	76.25a	75.81a	75.61a	76.07a	1.12
Meat Percentage (%/head)	52.29a	50.54a	50.44a	50.90a	0.61
Bone Percentage (%/head)	15.91a	17.66a	17.33a	17.32a	0.87
Percentage of Fat and Skin (%/head)	8.05a	7.61a	7.83a	7.60a	0.38

Information: P0: Drinking water without added betel leaves and guava leaves; P1: 5% mixture of betel leaf and guava leaf decoction water from body weight as much as 1:1; P2: 5% mixture of betel leaf and guava leaf decoction water from body weight as much as 1:2; P3: 5% mixture of betel leaf and guava leaf decoction water from body weight as much as 2:1; *Standard Error of the Treatment Means*; Values with different letters in the same row indicate significantly different (P < 0.05)

The percentage of broiler carcasses in the P0 treatment was 76.25% (Table 2) while in the P1 treatment; P2 and P3 were 0.57%, 0.83%, 0.23% lower than the P0 treatment, but statistically the four treatments showed no real effect (P>0.05). In this study, the absence of a noticeable difference in the percentage of carcasses can be caused by several factors. One possibility is that the boiling process used in the extraction of active compounds has the potential to cause a reduction in the content of several components, such as flavonoids, tannins, and saponins, which have a role in improving the metabolism and health of livestock, so that it does not have a significant effect on feed consumption and the efficiency of nutrient utilization and the formation of carcass tissue. This is in line with research Bili et al. [8] which shows that the addition of herbal herbs in drinking water does not have a significant effect on the percentage of broiler chicken carcasses.

The percentage of broiler meat in the administration of betel leaf and guava leaf decoction water in the P0 treatment was 57.22% (table 2) while in the P1 treatment; P2 and P3 were 0.02%, 0.07%, 0.10% lower than the P0 treatment, respectively, but statistically the four treatments showed no real effect (P> 0.05)This study showed that broilers who were given a decoction of betel leaf water and guava leaves 5% of body weight did not have a significant difference (P>0.05) with the percentage of broiler meat. The absence of a noticeable difference in the results of this study can be attributed to several possibilities. One of them is that the dose of betel leaf and guava leaf decoction given may still be at a level that is not optimal enough to have a real effect on protein metabolism and broiler muscle tissue synthesis, so that it does not have an impact on the increase in feed consumption. In line with research Suryanah et al. [9] that there are several variables that affect the percentage of broiler meat, including ration consumption during the maintenance period and handling methods when separating meat from bones.

The percentage of bone in the P0 treatment had the lowest bone percentage, which was 29.83% (Table 2). while the P1, P2 and P3 treatments had a bone percentage of 0.07%, 0.23%, 0.33% heavier respectively than the P0 treatment, but statistically the four treatments showed no real effect (P> 0.05). This is due to the concentration of active compounds in the stew which may experience a reduction in content during the boiling process. On the other hand, the use of the same ration in each treatment is also a major factor contributing to uniform results. Suryanah et al. [9] As the broiler gains weight, the percentage of bones tends to decrease proportionally, increasing the proportion of boneless meat.

The percentage of broiler fat and skin in the administration of betel leaf and guava leaves in broiler produced a percentage of fat and skin ranging from 12.91% to 12.95%. The P0 treatment had the highest percentage of fat and skin at 12.95% (Table 2) while the P1, P2 and P3 treatments had a lower percentage of fat and skin at 0.08%, 0.23%, 0.31% than P0. however, statistically the four treatments showed no real effect (P> 0.05). The absence of a noticeable difference in fat and skin percentage is most likely due to several factors. First, the consumption of rations is relatively the same in all treatments. Second, the rations used have the same composition, so there are no major changes in the protein and energy balance that can have an impact on the composition of the broiler body. Syzka et al. [10] states that the distribution and accumulation of fat in broilers is greatly influenced by feed consumption patterns. The effectiveness of betel leaf and guava leaf decoction in influencing broiler body composition was limited by the level of administration that could not provide a significant influence. A dose of 5% of body weight is not strong enough to have a noticeable effect on fat metabolism.

4. Conclusion

Based on the results of the study, it can be concluded that the administration of betel leaf and guava leaf decoction water as much as 5% of the weekly body weight with a ratio of 1:1, 2:1, and 1:2 has not shown effectiveness in increasing the physical composition of broiler chicken carcasses.

Compliance with ethical standards

Disclosure of conflict of interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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