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Effect of Given Drinking Water with Extract Turmeric (*Curcuma Domestica* Val.), Extract Tamarind (*Tamarindus Indica* L.) and Mixture for Carcass and Offal Internal and External of Broilers 2-6 Weeks

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Abstract

This study aims to determine the effect of giving drinking water with turmeric extract, tamarind extract, and a mixture of turmeric extract and tamarind extract in drinking water for carcass and offal and external offal of broiler using a Completely Randomized Design (CRD) consisting of 4 treatments and 5 replications. The treatments were drinking water without turmeric extract and tamarind extract (A), 2% turmeric extract (B), 2% tamarind extract (C), and a mixture of 1% turmeric extract and 1% tamarind extract (D). The variables observed were slaughter weight, carcass weight, chest percentage, wing percentage, upper thigh percentage, lower thigh percentage, and back percentage, physical carcass, internal and external offal. The results showed that giving 2% turmeric extract (B), 2% tamarind extract (C), and a mixture of 1% turmeric extract and 1% tamarind extract (D) was no significantly increase (P>0.05) weight gain and FCR. but not significantly different (P>0.05) in slaughter weight, carcass weight, chest percentage, wing percentage, upper thigh percentage, lower thigh percentage, and back percentage compared to control treatment (A). But treatment 2%, 2% turmeric, tamarin and 1% mixture turmeric+, tamarin gave no significant effect (P>0.05) to physical carcass, internal and external offal percentage. The results indicated that the effect of used treatment with 2% turmeric extract (B), 2% tamarind extract (C) and a mixture of 1% turmeric extract plus 1% tamarind extract (D) were nonsignificant effect to carcass, a part of carcass, physical carcass, internal and external offal percentage broiler 2-6 week aged.

Keywords

Broiler, Tamarind, Turmeric, Carcass Physical

1. Introduction

Broilers or often referred to as broilers are the result of crosses from chicken breeds that have high meat productivity

[1]. According to statistical data in 2018-2020 consumption of broiler meat has increased every year, nationally the demand for broilers in 2021 was 4,034,794 ton [2]. The use of feed additive is widely used by farmer to maximize and accelerate growth. The most widely uses feed additives are antibiotics as growth promoter or antibiotic growth promoters (AGP). The provision of antibiotics in the livestock industry is also intended as a feed additive to stimulate growth (antibiotic growth promoter/AGP) increase feed efficiency and production [3]. Excessive use of antibiotics in animal rations or feed can be followed by accumulation, so that in 2018 it was prohibited in Indonesia to use them in rations [4]. Phyto biotic are claimed to be the safest additives derived from plants and have similar activity to antibiotics. Tamarind fruit is used in various therapies, making herbal medicine mixed with other ingredients, including its potential as an anticancer [5]. Tamarind mixed with mulberry c. and ginger powder is useful as a health drink, it can increase the immune response of white rats used as experimental animals [5], [6], and [7]. It is also thought to have benefits as an antioxidant. According to [5] that the use of rations containing antioxidants in livestock can reduce the effects of free radicals on the digestive tract so that it can increase ration consumption. Research by [8] Phytochemical substances contained in turmeric rhizome and tamarind fruit are flavonoids, phenols, tannins, terpenoids and vitamin C [8]. While the tamarind plant (*Tamarindus indica L.*) has antibacterial, antifungal, hypoglycemic, hypocholesterolemia, anti-inflammatory, hypolipemic and antioxidant activities [9]. According to [10], it stated that turmeric was a type of rhizome that contains active substances such as curcumin, phenol essential oils, flavonoids, alkaloids, terpenoids and tannins. These secondary metabolites were thought to inhibit the growth of fungi, especially Candida albicans. Curcumin contained in turmeric could cure osteoarthritis in patients by its ability to inhibit the NOS (nitric oxide synthase) enzyme from macrophages [11]. According to [12], broilers reared for 28 days given turmeric at a level of 16 g/1 liter in drinking water and given 3 times were able to improve broiler performance. On the other hand, tamarind plants (*Tamarindus indica* L.) have antibacterial, anti-fungal, hypoglycemic effects, hypocholesterolemia effects, anti-inflammatory, hypolipemic and antioxidant activities [9]. Supplementation is expected to increase feed efficiency, because the nutritional content in it can be directly absorbed by the intestinal wall without requiring a digestive process first. The results of the [12] study that broilers reared for 28 days were given turmeric with a concentration of 16 g/1 liter in drinking water and given 3 times to improve the performance of broilers. Based on the explanation of these facts, further research was carried out to determine the effect of giving turmeric and tamarind extract in drinking water to the percentage of carcass parts and physical carcass of broilers.

2. Materials and methods

2.1. Place of Research

The research took place for 4 weeks (2-6 weeks) at the Udayana University, Faculty of Animal Husbandry Farm on Sesetan street, Gang Markisa No. 5, Denpasar, Bali-Indonesia.

2.2. Diets and Drinking Water

In this study, two different rations were used, in the starter phase a commercial ration of CP 511 was used and in the finisher phase a commercial ration of CP 512 was used. The drinking water used in this study was obtained given ad libitum.

The turmeric that will be used is large turmeric or what is often referred to as “turmeric rhizome” then 1 kilogram of turmeric/tamarind is cut into small pieces then added 1 liter of water and then mashed. A mixture of turmeric extract and tamarind extract requires 500 grams of turmeric and 500 grams of crushed tamarind then added with 1 liter of water.

2.3. Research Design

The research design used was a completely randomized design (CRD), with 4 treatments and 5 replications and 5 chickens were added to each replication.

The treatment given in this study, among others:

a) Drinking water without turmeric extract and tamarind extract.
b) Drinking water given 2 cc/100 cc turmeric extract.
c) Drinking water given 2 cc/100 cc tamarind extract.
d) Drinking water mixed with 1 cc/100 cc turmeric extract and 1 cc/100 cc tamarind extract.

2.4. Broiler Chicken

Chicken randomization was carried out to select 100 broilers from 200 broilers aged 2 weeks with an average broiler weight of 457.41 ± 22.87 g (Standard Deviation ± 5%). Carcass and relative carcass part weights to determine at the end of the experimental periode, 5 birds from each treatment were selected, fasted overnight and sacrificed for carcass anal-

ysis. All carcass traits and relative part carcass weights were expressed as a percentage of the live weights [13].

2.5. Variables

The variables observed were: slaughter weight, carcass weight, percentage (carcass, chest, wings, thighs, and back). Physic carcass and internal or external offal percentage.

2.6. Statistical analysis

The data obtained were analyzed by means of variance, if the treatments differed significantly at 5% ($P<0.05$), followed by Duncan's double-distance test [14].

3. Results and discussion

The results of the study on the slaughter weight, carcass and apart of carcass of broilers treated with drinking water without a extract of turmeric and tamarind extract (A), drinking water with 2% turmeric extract (B), drinking water with 2% tamarind extract (C), and drinking water mixed with 1% turmeric extract and 1% tamarind extract (D) can be seen in

Table 1. Carcass and part of carcass broilers (2-6 weeks) given turmeric extract, tamarind extract, and a mixture of turmeric extract and tamarind extract

Variabel	Treatment [1)]				SEM[2)]
	A	B	C	D	
Slaughter weight (g/head)	2648.88[a]	2632.30[a]	2668.62[a]	2672.60[a]	28.74
Carcass weight (g/head)	1879.80[a]	1871.60[a]	1900.00[a]	1911.71[a]	60.98
A Part of Carcass					
Chest Percentage (%)	41.44[a]	39.59[a]	41.70[a]	40.92[a]	0.96
Wing percentage (%)	9.83[a]	10.83[a]	9.88[a]	9.75[a]	0.36
Thigh percentage (%)	28.94[a]	29.94[a]	29.38[a]	29.70[a]	1.11
Back percentage (%)	19.79[a]	19.64[a]	19.04[a]	19.63[a]	0.62

Note : 1. Treatment of drinking water; A: Drinking water without turmeric extract and tamarind extract; B: Drinking water with 2% (2 cc/100 cc) turmeric extract.; C: Drinking water with 2% (2 cc/100 cc) tamarind extract; D: Drinking water with a mixture of 1% (1 cc/100 cc) turmeric extract + 1% (1 cc/100 cc) tamarind extract; 2. SEM: Standard Error of the Treatment Means; 3. Values with different letters in the same row are significantly different ($P<0.05$).

The results showed that the broilers given treatment A, B, C and D had no significant effect to carcass and part of carcass broilers (2-6 weeks). This result because broiler gave turmeric extract, tamarind extract and a mixture of turmeric extract and tamarind extract treatment gave protection against pathogen microorganism, especially in the intestines, can be inhibited so that the feed consumed can be digested, and absorbed maximally which causes the FCR value of broilers to be lower than that of broilers gives drinking water without turmeric and tamarind extract (A). According to [8] argues that turmeric extract, tamarind extract and a mixture of turmeric extract and tamarind extract have a low number of coliforms and E. coli bacteria. The content of flavonoids in the tamarind has a good antibacterial against the growth of E. coli so that the higher the concentration given, the diameter of the inhibition will increase [15], [16] and [17]. According to [18] work with duck stated that the decrease in FCR value was influenced by the increased digestibility of ration nutrients due to the presence of microbial bio supplements from termite inoculants which were able to increase ration nutrients and nutrient metabolism. Impact on the increase in final body weight and weight gain of broilers. Treatment D had a high slaughter weight of 2,762.60 g/head which was statistically nonsignificant different ($P>0.05$), this was because the content of curcuminoids and flavonoids in turmeric and tamarind was able to absorb the nutrients in the ration so that it could be used to increase cutting weight. According to [19], [20] which states that this increase in slaughter weight is due to increased ration consumption which is followed by an increase in food substances consumed and needed to support the production process. The highest percentage of broiler breasts was in the 2% tamarind extract treatment (C treatment), which was 41.70%. The percentage of wings in the study showed that the 2% turmeric extract (treatment B) had the highest percentages of 10.83% and 29.94% and the percentage but no significant effect ($P>0.05$) of broiler backs (%) in the control treatment was 19.79% is presented in Figure 1.

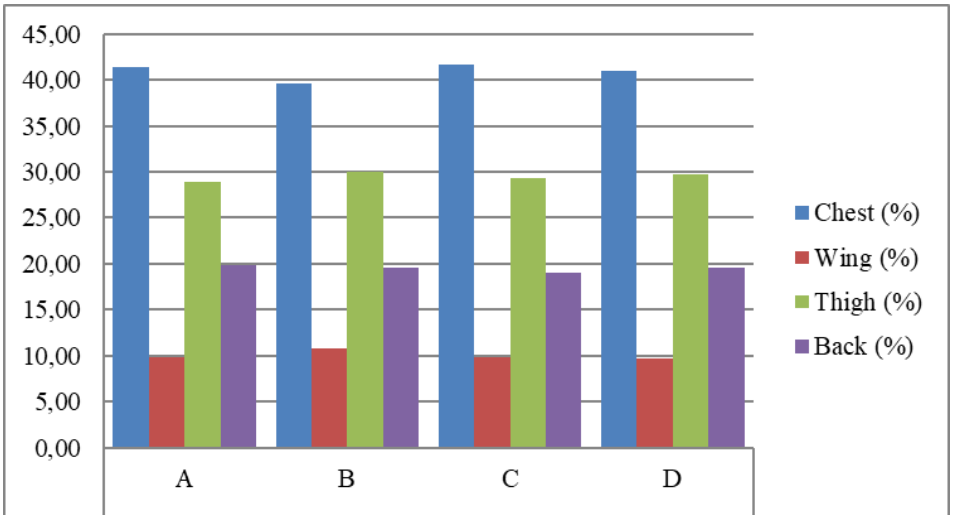

Figure 1. The effect of treatment to part of carcass.

The treatment A, B, C and D turmeric extract, tamarind extract, and a mixture of turmeric extract and tamarind extract B, C, D gave no significant effect (P>0.05) for carcass percentage, a part of physical carcass, internal or external offal (Table 2) .

Table 2. The effect broilers (2-6 weeks) given turmeric extract, tamarind extract, and a mixture of turmeric extract and tamarind extract for carcass, physical carcass, internal or external offal percentage

Variabel	Treatment [1)]				SEM[2)]
	A	B	C	D	
Carcass percentage (%)	70.99[a]	71.08[a]	71.20[a]	71.53[a]	2.10
Meat (%)	53.49[a]	53.44[a]	53.54[a]	53.87[a]	0.04
Skin + Fat (%)	15.38[a]	15.16[a]	14.74 [a]	14.18 [a]	0.01
Bone (%)	31.30[a]	31.40[a]	31.72[a]	31.95[a]	0.02
Internal Offal (%)	13.36[a]	12.89[a]	12.83[a]	13.67[a]	0.02
External Offal (%)	15.65[a]	16.03[a]	15.97[a]	30.00[a]	0.10

Note: 1. Treatment of drinking water; A: Drinking water without turmeric extract and tamarind extract; B: Drinking water with 2% (2 cc/100 cc) turmeric extract; C: Drinking water with 2% (2 cc/100 cc) tamarind extract; D: Drinking water with a mixture of 1% (1 cc/100 cc) turmeric extract + 1% (1 cc/100 cc) tamarind extract; 2. SEM: Standard Error of the Treatment Means; 3. Values with different superscript in the same row are significantly different (P<0.05).

The reduction in carcass yield and physical carcass percentage it relates to percentage of internal and external offal non-significant effect (P>0.05) (Table 2). According to [21], the percentage of broiler carcasses ranged from 65%-75% of live weight. According to [22] that the percentage of carcass is influenced by several factors including; breed of livestock, feed consumed, age of livestock, sex of livestock. According to [12] broilers reared for 28 days given turmeric at a level of 16 g/1 liter in drinking water and given 3 times were able to improve broiler performance. On the other hand, tamarind plants (*Tamarindus indica* L.) have antibacterial, anti-fungal, hypoglycemic effects, hypocholesterolemia effects, anti- inflammatory, hypolipemic and antioxidant activities [19]. Bioactive compound in the herbs were beneficial in reducing the growth and population of pathogenic bacteria in the gut potentially improve the growth performance broiler chickens [23] and [24].

4. Conclusion

The effect of used treatment with 2% turmeric extract (B), 2% tamarind extract (C) and a mixture of 1% turmeric extract plus 1% tamarind extract (D) were nonsignificant effect to carcass, a part of carcass, physical carcass, internal and external offal percentage broiler 2-6 week aged.

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