

# Yuniza 2019

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## The effect of duration of giving Cinnamononi Extract as a growth promoter feed additive and antimicrobial to broiler's performance on organic breeding

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**Abstract.** Cinnamononi Extract is a growth promoter feed additive and also plays role as antimicrobial that can substitute the use of antibiotic on the ration. This research was conducted to examine the effect of duration of giving the Cinnamononi Extract (EC) to the broiler's performance. This research used 160 broiler chicks on the age of 8 days which was caged on 20 boxes of cage. Each cage contained 8 chicks. There were 5 treatments concerning the duration of giving Cinnamononi Extract: A = no EC given (control), B = EC given every day for 5 weeks, C = EC given every day for the first 2 weeks and the last week, D = EC given every day for 3 weeks, and E = EC given every day for 4 weeks. The treatments were repeated 4 times. The result of this research showed that the treatment has a real impact ( $p < 0.05$ ) to the increasing of weight and ration conversion, but was not really effective to the ration consumption. All EC-giving treatments (treatment B, C, D, and E) can increase the weight gain and decrease the ration conversion ( $p < 0.05$ ). The treatment C (giving EC for the first 2 weeks, stop the giving, and give EC again on the last week) showed bad responses on weight gain and ration conversion ( $p < 0.05$ ) compare to treatment B, D, and E. the conclusion of this research is that the giving duration of Cinnamononi Extract every day for 5 weeks, 4 weeks, and 3 weeks (B, E, and D) gave a better response on weight gain and ration conversion compare to the giving for 2 weeks.

**Keywords** – Cinnamononi extract, feed additive, antimicrobial, organic breeding.

### 1. Introduction

The use of antibiotic on ration causes the chickens exposed by antibiotic continuously, because the ration will be consumed continuously until the chickens are ready to be harvested, so that the antibiotic residue will remain on the carcass produced. This matter will reduce consumers' interest to consume broiler chickens. As the applying of the Government Regulations that ban the giving of antibiotic to ration on the early 2018, it aroused the producers and broiler breeder to find the alternative to substitute antibiotic. This is considered as important because broiler chickens are susceptible to disease, so they cannot be freed from the giving of chemical drugs especially antibiotic, anthelmintic, and anticoccidial (Cocciostat). Furthermore, the high temperature and humidity in Indonesia is a conducive weather for pathogen microbial to reproduce. Therefore, the utilization of natural material that able to have a role as antimicrobial (antibacterial, anti-fungi, antiviral, etc.) is needed to substitute the use of antibiotic on the ration.

Cinnamononi Extract (EC) is an extract from the mixture of cinnamon leaves, noni fruit leaves, and noni fruit (ratio 1:2:2) with water as the solvent. This extract has been tested and it has been proved that this extract can stop the growth of *Escherichia coli* and *Salmonella Sp* bacterial [1], it also can stop the growth of *Ascaridiagalli worm* [2]. Biological test to broiler chickens showed that the right



dose of the EC giving is 250 mg/kg weight [3]. The giving of Cinnamononi Extract with the aforementioned dose can decrease the feed conversion ratio (FCR), meat cholesterol, and abdominal fat content; it also can increase weight gain and broiler carcass weight [3].

Beside the antibacterial ability, Cinnamononi Extract also can push the growth and the production. This happens because the EC contains *proxeronine* which extracted from noni fruit. *Proxeroninase* enzyme will change *proxeronine* into *xeronine* [4]. *Xeronine* is an alkaloid that activates the work of synthesis protein enzymes in the body [5]. So, the giving of EC can be a solution on organic farming system.

That natural herbal plantations regarded safer and have smaller side effect. It happens because the constructive nature of herbal plants, but it also needs to be understood that not all natural things are safer if the utilization is excessive [6]. The side effect of the utilization may appear because of overdose and wrong utilization timing [7]. Continuous giving can also create side effects especially to liver and kidneys. The continuous giving of herbal extract can be avoided by putting duration of giving and stopping. Hence, it is important to examine the perfect duration of giving EC that positively affect the performance and the production, and how long the positive effect will last after the giving was stop. Therefore, we will know the effective duration of giving Cinnamononi Extract to broiler chickens.

## 2. Materials and method

This research use 160 broiler chicks in the age of 8 days from strain Cobb and caged in 20 boxes of cage which make each box will contain 8 chicks. The program that will be used is CRD. There are 5 treatments and 4 repetitions. The treatments are the varying durations of giving the Cinnamononi Extract (EC): A = no EC given (control), B = EC given every day for 5 weeks, C = EC given every day for the first 2 weeks and the last week, D = EC given every day for 3 weeks, and E = EC given every day for 4 weeks. Cinnamononi Extract is given at dose of 250 mg/kg weight per chicks per day through limiter drinking water. Before the giving of EC, the chicks are fasted for 1,5 hours. They will be feed again after all Cinnamononi Extracts are run out. This experiment is stopped after treatment for 5 weeks (42 days old bird). The parameters measured are: ration consumption, weight gain, and ration conversion. The ration is a mixture of refined yellow corn, fish flour, meat bone meal, soybean meal, palm oil, bone meal, and Neobro feed supplement.

Compositi<sup>7</sup> and content of the ration is showed on Table 1. The parameters measured are ration consumption, weight gain, and feed conversion ratio. All obtained data will be analyzed by analysis of variance [8]. For the significant result of the analysis, the Duncan Multiple Range Test analysis will also be conducted [8].

**Table 1.** Composition and nutrient content of the ration.

Ration Composition	Research Ration	
	Age 0 – 3 weeks	Age 3 – 6 weeks
Yellow Corn (%)	59	62,5
Soy meal (%)	20	18
Fish meal (%)	5	6
Meat bone meal (%)	12	7
Palm oil (%)	2,5	4
Neobro (%)	0,5	0,5
Bone meal (%)	1	2
Total (%)	100	100

ME* (kkal/kg)	3027,5	3004,04
Protein* (%)	23,10	20,30
Fat* (%)	6,14	7,08
Rough fiber* (%)	3,74	3,58
Ca* (%)	1,11	1,22
P* (%)	0,50	0,57
Lysin* (%)	1,10	1,13
Metionin* (%)	0,45	0,39

Note: \*Calculation result.

### 3. Result and discussion

Responses observed are ration consumption and cumulative weight gain from the age of 8 days to 42 days, it followed by feed conversion ratio calculation. This data showed on Table 2 which is average of four repetitions for each treatment.

**Table 2.** Average ration consumption, weight gain (pbb), and feed conversion ratio during research.

Treatments	Ration Consumption <sup>ns</sup>	Body Weight Gain	Feed Conversion Ratio
	----- (gram/bird/day) -----		
A = without EC	118,26	57,36 <sup>b</sup>	2.11 <sup>a</sup>
B = EC duration during research (5 weeks)	117,08	62,36 <sup>a</sup>	1.94 <sup>b</sup>
C = EC duration the first 2 weeks and the last 1 week	115,62	59,82 <sup>ab</sup>	1.93 <sup>b</sup>
D = EC duration 3 weeks	118,46	62,12 <sup>a</sup>	1.96 <sup>b</sup>
E = EC duration 4 weeks	114,81	61,97 <sup>a</sup>	1.89 <sup>b</sup>

Note: ns = non significant

Different superscript on the same column shows significant differences ( $p < 0.05$ ).

Analysis of variance result on data obtained shows that the giving of Cinnamononi Extract and the duration of giving are not significant effect ( $p > 0,05$ ) to the ration consumption, but give a significant effect ( $p < 0,05$ ) to the weight gain and feed conversion ratio. Further analysis (DMRT) on the weight gain variable shows that Treatment A (where the chicks were not given any EC) result the weight gain significantly lower ( $p < 0,05$ ) compare to the other birds that given EC (B, D, and E), except treatment C. The result of DMRT on feed conversion ratio variable also shows that the birds which was not get any Cinnamononi Extract (treatment A) resulted lower weight gain ( $p < 0,05$ ) compare to treatment B, C, D, and E.

This result shows that the giving of Cinnamononi Extract could accelerate growth without affecting the ration consumption. In consequence, the feed conversion ratio became better. It happened because there is *proxeronine* substance gained from noni fruit. *Proxeroninase* enzyme will change *proxeronine* into *xeronine* [4]. *Xeronine* is an alkaloid that activates the work of synthesis protein enzymes in the body [5]. Therefore, by giving Cinnamononi Extract through drinking water, it can make ration giving more efficient.

A (without EC) and also difference, but not much, compare to treatment B, D, E. This result shows that the stoppage of giving EC on the early period of grower (3<sup>rd</sup> week from the treatment) for 2 weeks can affect the growth.

**Table 3.** Average body weight gain every treatment week.

Treatments	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>
	Week <sup>ns</sup>	Week <sup>ns</sup>	Week	Week	Week <sup>ns</sup>
----- (gram/bird/day) -----					
A = without EC	39,49	66,08	59,29 <sup>b</sup>	59,38 <sup>b</sup>	53,49
B = EC duration during research	38,96	66,70	66,40 <sup>a</sup>	72,78 <sup>a</sup>	61,97
C = EC duration first 2 weeks and the last week	36,69	64,11	67,17 <sup>a</sup>	63,60 <sup>b</sup>	67,49
D = EC duration 3 weeks	39,35	63,13	67,54 <sup>a</sup>	79,64 <sup>a</sup>	62,35
E = EC duration 4 weeks	36,71	68,09	69,01 <sup>a</sup>	72,75 <sup>a</sup>	64,51

eterangan: ns = non significant

Different superscript font in the same column shows real differences ( $p < 0.05$ ).

To do further study on this matter, so the analysis of variance was done every treatment week on the weight gain data (Table 3). From Table 3, it shows that the effect of the stoppage of giving EC (treatment C) can only be seen on the 4<sup>th</sup> week from the treatment. On the 4<sup>th</sup> week from the treatment, it can be seen that birds that given treatment C (duration of giving EC for 2 weeks) have a body weight gain which difference non significantly ( $p > 0.05$ ), compare to the broiler with no EC give (treatment A); but it is a significantly difference compare to treatment B, D, and E. It indicates that after stop giving the EC after 2 weeks (treatment C) on the early grower period, the growth rate decreased. However, after the giving of EC for 1 week before harvested, the body weight gain was improved and able to be equal to the result of treatment B, D, and E.

DMRT result also shows that body weight gain and feed conversion ratio on the broiler that get treatment D and E differ non significantly ( $p > 0.05$ ) compare to the chicken that get treatment B. It shows that giving EC every day for 3 weeks (treatment D) and 4 weeks (treatment E) result the same performance compare to treatment B which gave the EC every day for 5 weeks during the research. Therefore, the most efficient duration to give EC is for 3 weeks (treatment D).

Based on those data, it can be concluded that the giving of Cinnamononi Extract can improve broiler chicken's performance, which increase body weight gain and decrease feed conversion ratio. The most efficient duration of giving EC is 3 weeks (treatment D).

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