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## Effectivity of liquid herbal and supplemented frequency on the body weight percentage of the carcass and abdominal fat of broilers

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## Effectivity of liquid herbal and supplemented frequency on the body weight percentage of the carcass and abdominal fat of broilers

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**Abstract.** The study was conducted to determine the effectiveness of two liquid herbals and interval regulation on the percentage of the carcass and abdominal fat of broilers. The experiment was carried out in a completely randomized factorial pattern design with factor A (combination of herbal ingredients) factor B (when giving herbal ingredients) in 4 replications. Liquid herbals supplemented to broilers consist of 5 herbal ingredients(A1) and consist of 7 herbal ingredients (A2) that supplemented to broilers every day (B1) and every 2 days (B2). Measured Parameters were body weight, the percentage of the carcass and abdominal fat. Analysis of variances showed liquid herbals and interval regulation added in water did not have a significant effect ( $P > 0.05$ ) on the percentage of carcasses and body weight even though the average rate showed a trend of improvement but a significant effect on the percentage of abdominal fat based on LSD test results.

### 1. Introduction

The use of herbs today has been highly developed. Herbs are natural ingredients found in various countries that since ancient times have been used by human ancestors as drugs, cosmetics, cooking ingredients and so on. Food safety for consumers results in restrictions on the use of antibiotics and growth hormones, thus spurring the development of research on antibiotic substitute agents and growth hormones in livestock such as herbs. Scientists from various countries have examined the influence of herbs and their use on livestock. Various herbs have been examined for their content and benefits in livestock through laboratory tests and biological tests. Herbs are phytogetic feed additives that contain natural active ingredients that can improve livestock performance and leave no harmful residues for livestock and humans who consume [1, 2].

Each herb has a different content so that it has different benefits in improving livestock performance, therefore a combination of several herbs in the form of herbal ingredients can produce the expected results in improving livestock performance, production, and quality of livestock [3,4,5,6,7]. Phytogetic compounds such as those found in herbs are alternatives to antibiotic growth promoters. The mode of activation of phytoGENICS to achieve better performance is not entirely clear. Unfortunately, the results of the latest experiments are only available from commercial products that contain a mixture of phytogetic substances. Therefore, a systematic approach is needed to explain the efficacy and mode of action for each type and dose of the active compound [8]. Therefore this study



tried to compare between 2 (two) mixed herbal ingredients with different giving intervals on the weight of the percentage of the carcass and abdominal fat.

## 2. Materials and methods

### 2.1 Experimental animals and design

Total of 48-day old chick (DOC) with 707 strains of unsexed sex. Broilers are maintained until the age of 30 days in a cage that uses the base of the husk. Chickens are randomly selected and put into cages which have been partitioned with bamboo each of them. Each enclosure has a 15-watt incandescent lamp of 1 piece. Provision of rations and drinking water by *ad libitum*. The feed to be given is commercial feed. The combination of A1 herbal ingredients consists of 5 herbal ingredients, namely: ginger, ginger, betel leaf, turmeric, and garlic. The combination of A2 herbal ingredients consists of 7 herbal ingredients, namely: ginger (*Zingiber officinale*), ginger (*Curcuma xanthorrhiza*), betel leaf, turmeric, garlic, galangal, and onion. The drinking water has given is mixed with 2.5 ml / 1 liter of herbal ingredients starting from 1 day DOC (day old chick) to harvest. The parameters observed were the percentage of the carcass and abdominal fat.

The data obtained were analyzed using a Completely Randomized Design (CRD) Factorial 2 X 2 pattern with 4 replications, so that there were 16 units of experiment with 2 factors, namely:

a. Factor A

A1 = a combination of herbal ingredients with the use of 5 types of herbal ingredients.

A2 = herbal ingredients with the use of 7 types of herbal ingredients

b. Factor B

B1 = interval of giving herbal ingredients every day

B2 = interval of giving herbal ingredients every 2 days

The treatment used in the study is as follows:

A1B1 = combination of 5 types of herbs with daily administration

A1B2 = a combination of 5 types of herbs with giving every 2 days

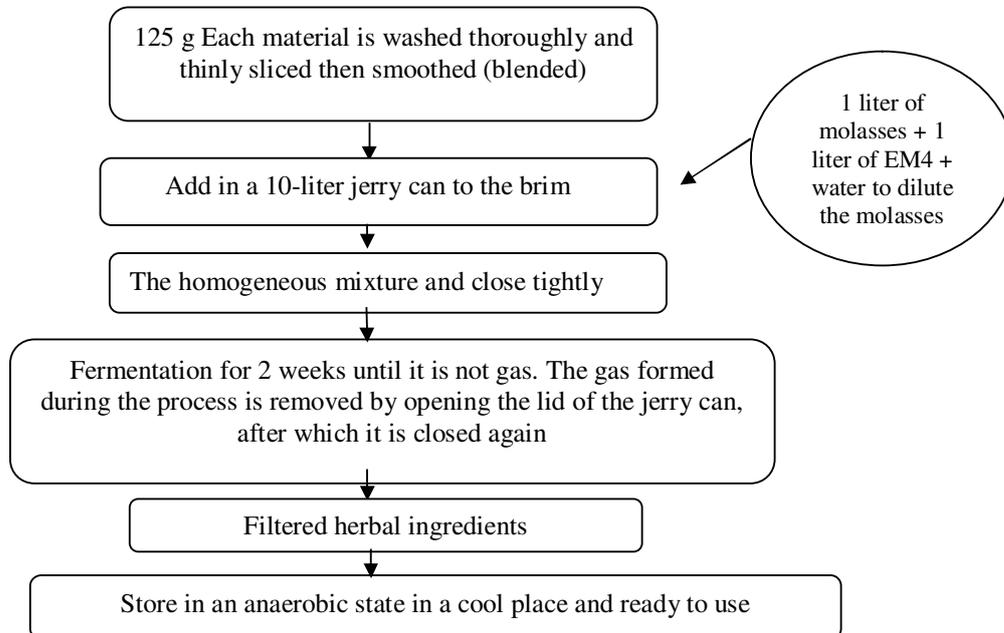
A2B1 = combination of 7 types of herbs with daily administration

A2B2 = a combination of 7 types of herbs with giving every 2 days

### 2.2 Liquid herbal preparation

Making herbal was carry out with mixing 10 liters of water, 125 grams of garlic, 125 grams of betel leaf, 500 ml of EM4, 500 ml of brown sugar, 125 grams of ginger, 125 grams of turmeric, 125 grams of galangal, 125 grams of ginger and 125 grams of red onion. The method of making herbal medicine is preparing the tools and materials to be used, peeling and washing cleanly the ingredients to be used, cutting and slicing the ingredients so that it is easily blended, weighing the ingredients as needed, smoothing the ingredients using a blender, mixing ingredients with molasses and EM4 which has been mixed/activated before, adds 10 liters of water to the ingredients. Then stir it flat, put the ingredients (herbs) into the jerry can, observe the color, aroma, taste and measure pH, close the jerry cans tightly. Then do fermentation for 14 days. Every day the lid of the jerry can need to be opened briefly to release gas.

The procedure for making liquid herbal ingredients is as follows:



Source: Chart of Herbal Making [6]

### 3. Result and discussion

#### 3.1 Result

The results of the 30-day study which included live weight, carcass weight, and abdominal fat in broiler chickens are presented in the table 1.

**Table 1.** Broiler body weight

Interval	Herbs		Average (g)
	A1	A2	
B1	1512.5 ± 93.12	1525 ± 95.74	1525
B2	1475 ± 50.00	1462.5 ± 47.87	1468.75
Average (g)	1475	1493.75	

Description: A1B1 = combination of 5 types of herbs with daily administration  
 A1B2 = a combination of 5 types of herbs with giving every 2 days  
 A2B1 = combination of 7 types of herbs with daily administration  
 A2B2 = a combination of 7 types of herbs with giving every 2 days

**Tabel 2.**Percentage of carcass of broiler

Interval	Herbs		Average (%)
	A1	A2	
B1	70.28 ± 2.49	71.24 ± 3.43	70.76
B2	72.02 ± 4.17	73.4 ± 5.00	72.71
Average (%)	71.15	72.32	

**Table 3.** Percentage of abdominal fat of broiler

Interval	Herbs		Average (%) (%)
	A1	A2	
B1	1.64 ± 0.42	1.12 ± 0.32	1.38
B2	1.81 ± 0.52	1.43 ± 0.24	1.43
Average (%)	1.72	1.27	

### 3.2 Discussion

#### 3.2.1 Body Weight

*Effect of herbal supplementation.* Variance analysis showed the treatment had no significant effect ( $P > 0.05$ ) on body weight. The average body weight obtained is A1 = 1.475 g / head, A2 = 1.493,75 g / head. From these data, there is a tendency for treatment to be given 7 liquid herbal ingredients (A2) to give a better effect than the treatment of 5 ingredients of liquid herbal ingredients (A1).

This is because the A2 treatment of the number of bioactive substances is higher than A1. The essential oil content contained in each of these herbs can increase appetite and increase the metabolic capacity of the chicken so that it can affect the growth of meat. As Madhupriya et al. [8] suggests that the growth activity of phyto feed additives (herbal) in poultry production is due to their influence in increasing nutrient digestibility, increasing gastrointestinal microbiota, antioxidant properties contributing to reducing oxidative stress, immunomodulation, weight gain, weight gain, feed consumption, conversion feed and carcass characteristics.

*Effect of herbal supplementation.* Giving herbal medicine by adjusting the time interval forgiving does not show a significant effect ( $P > 0.05$ ) on broiler weight. However, broiler body weight tends to be higher with herbal treatment A2 and B1 = 1.525 g daily compared to giving every 2 days. This indicates the administration of liquid herbal ingredients every day shows a higher body weight than the administration every 2 days, because liquid herbal ingredients contain bioactive substances in the form of essential oils and curcumin can improve the performance of the digestive organs of poultry which stimulates the gallbladder, bile secretes bile and stimulates the release of pancreatic geta which is useful for increasing feed absorption such as carbohydrates, oil fats and proteins so that it can increase appetite which can increase carcass weight [6].

*Interaction.* The interaction of administration of herbal concoctions with intervals gave no significant effect ( $P > 0.05$ ). But numerically the weight gain in treatment A2B1 tends to be better in growth compared to treatments of A2B2, A1B1, and A1B2. The A2B1 treatment is given higher amounts of bioactive substances by giving each day more than other treatments so that it can increase appetite and increase the metabolic capacity of chickens which can further affect meat growth. This is in accordance with the opinion of Ichwan [9], that in general weight gain will be influenced by the amount of consumption of food eaten and the nutritional content contained in the feed.

Giving herbal medicine by adjusting the time interval forgiving does not show a significant effect ( $P > 0.05$ ) on broiler weight. However, broiler body weight tends to be higher with herbal treatment A2 and B1 = 1.525 g daily compared to giving every 2 days. This indicates the administration of liquid herbal ingredients every day shows a higher body weight than the administration every 2 days, because liquid herbal ingredients contain bioactive substances in the form of essential oils and curcumin can improve the performance of the digestive organs of poultry which stimulates the gallbladder, bile secretes bile and stimulates the release of pancreatic geta which is useful for increasing feed absorption such as carbohydrates, oil fats and proteins so that it can increase appetite which can increase carcass weight [6].

### 3.2.2 Percentage of carcass

*Effect of herbal supplementation.* The results of the analysis showed that the administration of liquid herbal concoctions had no significant effect ( $P > 0.05$ ) on the percentage of the carcass. Numerically the administration of 7 types of herbal ingredients ( $A2 = 72.32\%$ ) tends to be better in increasing the percentage of carcass weight compared to the administration of 5 types of herbs ( $A1 = 71.15\%$ ).

Essential oils contained in herbal ingredients can improve the work of the digestive organs of poultry to stimulate the gallbladder, remove bile and stimulate the release of pancreatic sap, which is useful for increasing feed consumption such as carbohydrates, oil fats, and proteins so as to increase appetite which can increase weight carcass [10].

*Effect of the delivery interval.* The results of the analysis show that the herbal interval time interval did not have a significant effect ( $P > 0.05$ ) on the percentage of the carcass. However, numerically, herbal medicine every 2 days ( $B2 = 72.71\%$ ) tends to be better in increasing the percentage of carcass weight compared to ( $B1 = 70.76\%$ ). The percentage of carcass weight of each treatment included normal between 70% and 73%.

Giving herbal ingredients every day causes the amount of administration of bioactive substances is higher so that it can affect the performance of the digestive organs is not optimal because of the excess bioactive substances contained in herbs rather than giving every 2 days, for example, essential oils that have herbal ingredients can increase appetite and increase ability chicken metabolism so that it can affect meat growth.

The results of [11], showed that the administration of 7 types of herbal concoctions with once every 2 days in liquid form was better in increasing the percentage of carcass compared to daily administration. The results of his research are on giving 7 types of herbal ingredients with 2 days getting the percentage of the carcass (70.98%) higher than the provision of 7 types of herbal ingredients by giving each day (69.25%). This is in accordance with the opinion of [6] that the distance between the administration of liquid herbal ingredients can affect metabolic processes in the body of livestock.

*Interaction.* Based on the analysis of the variety of interactions between herbal medicine with intervals, the administration showed no significant effect ( $P > 0.05$ ), but numerically the highest percentage of carcass weight was 7 liquid herbal ingredients with the administration of 2 days ( $A2B2 = 73.4\%$ ) tending to be better growth rather than the treatment of 7 liquid herbal concoctions with administration every day ( $A2B1 = 71.24\%$ ), 5 types of liquid herbal concoctions with daily administration ( $A1B1 = 70.28\%$ ) and 5 types of herbal concoctions with administration every 2 days ( $A1B2 = 72.02\%$ ).

Most spices or herbs given to poultry stimulate the function of pancreatic enzymes (lipase, amylase, and protease); some also increase gastric mucosa digestive enzyme activity. In addition to its effects on bile synthesis and enzyme activity, extracts from herbs and spices accelerate digestion and shorten the time of food or food through the digestive tract [12] so as to increase consumption which ultimately increases the percentage of carcass broiler.

### 3.2.3 Percentage of abdominal fat

*Effect of herbal supplementation..* The results of the variance analysis showed that the administration of liquid herbal ingredients had a significant effect ( $P > 0.05$ ) on the percentage of abdominal fat broilers, especially in the intervals and interactions of the herbs based on the results of LSD's follow-up test. Therefore treatment A2 with a mixture of 7 types of herbs significantly decreases abdominal fat compared to A1 treatment with a mixture of 5 types of herbs only.

This is because the bioactive substance content in A2 treatment is more numerous and varied than treatment A1. Especially in the content of essential oils and curcumin contained in herbal ingredients

can stimulate the release of pancreatic sap where pancreatic sap secretes the enzyme lipase which can break down glycerol fatty acids so that the formed fat is reduced [13]. While the flavonoids in red onions and garlic can reduce blood fat levels [14].

*Effect of the delivery interval.* Based on the results of the analysis of variance and the LSD test the percentage of abdominal fat had a significant effect ( $P > 0.05$ ) on the distance between the administration of herbal ingredients. The percentage of abdominal fat at the interval of administration of herbs in this study was normal, which ranged from 1.38% -1.43%. This is not in accordance with the opinion of [15] that the weight of abdominal fat usually ranges from 2-2.5% of the carcass weight, it can even reach 5-6%. Caused by the content of essential oils and curcumin contained in herbal ingredients can stimulate the release of pancreatic sap where pancreatic sap secretes the enzyme lipase which can break down glycerol fatty acids so that the formed fat decreases. Interaction.

*Interaction.* The results of the variance analysis showed that the interaction of the administration of liquid herbal ingredients with the giving interval had no significant effect ( $P > 0.05$ ) on the percentage of abdominal fat broilers. Statistically the administration of herbal ingredients with 7 ingredients at intervals given every 2 days (A2B2) tends to be good compared to giving 7 types of herbal ingredients at intervals every day (A1B2), giving 5 herbal ingredients at daily intervals (A1B1) and 5 herbal ingredients at intervals every 2 days (A2B1).

This is because the treatment has the same bioactive substances although different compositions, bioactive substances namely curcumin and essential oils that can stimulate the release of pancreatic sap where the pancreatic sap secretes lipase enzyme which can break down glycerol fatty acids so that the formed fat decreases. Although numerically there are differences, statistically the administration of seven liquid herbal ingredients and given every other day tends to be better in increasing carcass percentage and reducing broiler abdominal fat because in each herb the herbal ingredients have the same bioactive substance but have different amounts of the composition [11].

#### 4. Conclusions

The feeding of liquid herbal ingredients in broilers did not have a significant effect on body weight and the percentage of the carcass and abdominal fat weight. However, numerically there is a tendency to increase body weight with more types of herbs with more intensive intervals, increase the percentage of the carcass by giving 7 types of herbs with intentionally once in 2 days and a decrease in abdominal fat with the treatment of 7 types of herbs with each given intensity day.

#### References

- [1] Klis, Der JV and Vinyeta E 2016 *Int. Anim. Health J.* **3** (4)
- [2] Widiastutik and Retno 2017 *Greetings Known for PhytoGenics* (<http://novindo.co.id/2017/09/26/Greetings-Known-for-PhytoGenics/>. PT.Novindo Agritech Utama)
- [3] Umatiya RV, Srivastava AK, Pawar M M, Chauhan HD and Jain AK 2018 *J. Pharmacog. and Phytochemist.* **7**(3)1136-1140
- [4] Omar JA, Hejazi A and Badran R 2016 *Open J. Anim. Sci.* **6** 68-74
- [5] Gerzilov V, Nikolov A, Petrov P, Bozakova N, Penchevand G, and Bochukov A 2015 *J. Central Europ. Agric.* **16** (2) p10-27DOI:10.5513/JCEA01/16.2.1580
- [6] Agustina L 2006 Use of Herbal Remedies as a Feed Additive to Improve Broiler Performance *Proceedings of the National Workshop on Technological Innovation in Supporting Competitive Poultry Businesses* (Bogor: Publisher of Animal Husbandry Research and Development Center) p 47-52
- [7] Hayani E 2006 *National Technical Meeting of Agricultural Functional Workers* p 309-312
- [8] Madhupriya V, Shamsudeen P, Raj Manohar G, Senthilkumar S, Soundarapandiyani V and Moorthy M 2018 *Int. J. Sci., Environ. and Tech.* **7**(3) 815 – 822
- [9] Ichwan WM 2003 *Making Broiler Chicken Feed* (Jakarta: Agromedia Pustaka)

- [10] Saenab, A B Bakrie, T Ramadhan and Nasrullah 2006 *Bulletin of Animal Husbandry and Fishery* **10** (2)133-143
- [11] Apritar RR 2012 *Optimization of the Use of Combinations and Intervals of Giving Herbs Against the Percentage of Carcass and Abdominal Fat in Broilers*. Repository (Makassar: University of Hasanuddin)
- [12] Suganya T, S Senthilkumar, K Deepa, J Muralidharan, G Gomathi and S Gobiraju 2016 Herbal feed additives in poultry *International Journal of Science, Environment and Technology* **5**(3) 1137 – 1145
- [13] Afriastini J J 2011 *Planted cutchery (Kaempferia galanga L.)* (Jakarta: Penebar Swadaya)
- [14] Nisa, CA and Rosita L 2010 *Effect of Red Onion Ethanol Extract (Allium cepa L) to Total Cholesterol Content of Rat (Rattus norvegicus)* Mutiara Medika **10** (1) 07-15
- [15] Waskito, W. M. 1983. Effect of Various Environmental Factors on Gala Growing Broiler Chickens. Dissertation. (Bandung: University of Padjajaran)