

# The Effect of Supplemented Clove Leaf Meal on Broiler Productivity

*Khaerani Kiramang*<sup>1,\*</sup>, *Asmuddin Natsir*<sup>2</sup>, *Sri Purwenty*<sup>2</sup>, and *A. Mujnisa*<sup>2†</sup>

<sup>1</sup>Doctoral Student, Hasanuddin University, Makassar, Indonesia

<sup>2</sup>Hasanuddin University, Makassar, Indonesia

**Abstract.** Clove, a plant native to Indonesia, possesses the potential to act as an antibiotic. The presence of essential oils and phytochemicals in clove makes it a promising natural alternative for antibiotics in livestock, especially in poultry feed. The current study aims to investigate the impact of clove leaf powder supplementation as a replacement for growth hormone antibiotics on the productivity of broilers. The study's outcome will provide valuable insights into the potential use of clove powder in poultry feed as an antibiotic substitute. Broilers were divided into five treatment groups with varying levels of clove leaf powder supplementation in their basal ration for 30 days (0%, 2%, 4%, 6%, and 8%). The performance parameters, blood profiles, and internal organ profiles were used to measure productivity. The study employed an experimental approach using the General Linear Model Design with five treatments, repeated three times each. The data was analyzed through Manova, and the Wilks test was used for multiple comparisons to determine the differences in each treatment's productivity. If there were any variations between treatments, the Tukey test was employed to identify the specific treatment that differed. The findings revealed that there were no significant differences in broiler response to the treatment between the measured parameters. Nonetheless, the broiler response remained within the standard range in all treatments. In light of the results, further research is necessary to explore the mechanism of action of clove leaf powder on broilers at various levels.

## 1 Introduction

Broiler farms are generally susceptible to disease attacks caused by bacteria, viruses, fungi, parasites. Therefore, do the addition of feed additives or feed additives given in rations as a solution such as the addition of antibiotics and growth hormones. Antibiotics are additives that function as medicine and disease prevention, as well as growth promoters. Antibiotics can suppress the growth of pathogenic bacteria found in the digestive tract and other microbes that cause various diseases. This can lead to better digestive tract conditions in livestock, thereby improving their performance as well as prevention and treatment of various diseases so as to increase livestock productivity. But the use of drugs, antibiotics,

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\* Co-Corresponding author: [khaerani.kiramang@uin-alauddin.ac.id](mailto:khaerani.kiramang@uin-alauddin.ac.id)

† Corresponding author: [a.mujnisae@yahoo.co.id](mailto:a.mujnisae@yahoo.co.id)

feed additives or growth-promoting hormones that are not in accordance with the recommendations and not according to the set dosage can cause residues in the resulting livestock products [1-2].

Animal products that are affected by antibiotic residues are very dangerous for the community because they can reduce the level of health. This residue will cause allergic reactions which can increase sensitivity reactions, then will cause antibiotic resistance reactions in humans due to consuming low concentrations for a long time [3]. Even in livestock products such as milk, eggs and meat which are affected by residues it will be difficult to process the fermentation because of the resistance reaction in these products.

Indonesia itself has banned the use of AGP which is regulated in Law no. 18/2009 juncto Law No.41/2014 concerning Animal Husbandry and Health. The law states the prohibition of using feed mixed with hormones certain antibiotics and/or feed additives. Through the Minister of Agriculture No. 14/2017 concerning Classification of Veterinary Drugs, since 1 January 2018 the Government has banned the use of AGP in feed. This prohibition was also strengthened by Minister of Agriculture No. 22/2017 concerning Registration and Distribution of Feed, requires a statement not to use AGP in the feed formula produced for producers who will register feed [4].

Therefore, there is a need for other alternatives that can be implemented to overcome the decline in performance and productivity of livestock due to the ban on the use of antibiotics and growth hormone (AGP). As an alternative, one of the things that can be done is the use of beneficial local ingredients that can produce meat without accumulation of chemicals, is histopathologically safe for livestock and people who consume it, is natural and environmentally friendly and is accepted in the global market and at the same time as an antibiotic so as to improve performance. As the vision of the Directorate of Veterinary Public Health (KESMAVET) through 4 (four) keywords where one of them is the government guarantees that animal food products circulating in the community are Safe, Healthy, Whole and Halal (ASUH) products, and non-food animal products that is safe, has added value and is competitive [5].

The use of local ingredients such as herbs as an alternative to AGP has been studied for its potential and capabilities through many studies by scientists which are then applied to society. One of the plants that has potential as an antibiotic is clove. Cloves are known as native plants of Indonesia and have been used as medicine since ancient times. The content of this essential oil has many benefits. The content of clove essential oil is eugenol, trans-karyofilen, alpha- humulen eugenyl acetate, karyofilen oxide, trimethoxyacetophenone [6]. The eugenol compound has pharmacological activity as an analgesic, anti-inflammatory, antimicrobial, antiseptic, antispasmodic, antiemetic, antioxidant, stimulant, local anesthetic [6-8].

## **2 Materials and Methods**

### **2.1 Making Powder Clove**

Manufacture of Clove Leaf Powder using the Lyophilization method in the Basic Animal Laboratory to 10% - 13% KA, then finely ground.

### **2.2 Biological Test**

Biological testing on livestock to determine the most optimal level of use of clove leaf powder to improve broiler performance. There were 5 (five) treatment levels of using clove leaf powder (dose of 0%; 2%; 4%; 6%, 8) in feed) with 3 (three) repetitions each.

### 2.3 Blood Profile Test

Blood Profile Test as much as 3 ml, after that the blood is accommodated in an EDTA anticoagulant tube and shaken to form the number 8 and then stored in *cool box* which already contains *ice gel*. Next is a blood sample immediately taken to the Clinical Pathology Laboratory of Hasanuddin University for blood tests. Blood examination was carried out using the spectrophotometer method for blood cholesterol, blood triglycerides and blood hematology.

### 2.4 Internal Organ Profile

The internal organ profile is measured by weighing the internal organs and then percentage them to the final live weight. Retrieval of internal organs is done by opening the abdomen and then taking the organs that are measured first.

## 3 Results and Discussion

The effect of clove leaf powder supplementation on livestock productivity covers a wider range of aspects of poultry life. In this study livestock productivity was seen and observed starting from performance, blood profile, internal organ profile and meat quality.

Based on the results of descriptive statistical analysis, where the average value of the treatment indicates a difference between treatments. However, when viewed from the results of inferential statistical analysis, these differences did not show any significant differences between treatments on all livestock productivity parameters starting from performance, blood profile, internal organ profile, and meat quality. As shown from the results of data analysis using the Wilks test with the Tukey average comparison test.

### 3.1 Performance

The performance of broilers supplemented with clove leaf powder in their feed was observed for 30 (thirty) days of research in *Samata Integrated Farming System* on Jalan Bakung, Gowa Regency (Table 1).

**Table 1.** Broiler Performance during Research

| Productivity                  | Treatment      |               |               |               |               |
|-------------------------------|----------------|---------------|---------------|---------------|---------------|
|                               | P0             | P1            | P2            | P3            | P4            |
| Performance                   |                |               |               |               |               |
| • Consumption Ration (gr /kg) | 1173.90±57.48  | 1188.28±24.30 | 1145.33±28.81 | 1145.10±8.03  | 1059.24±94.13 |
| • Increase Heavy Body         | 1441.44±153.51 | 1436.33±8.15  | 1355.78±86.18 | 1295.44±56.26 | 1288.27±25.60 |
| • Heavy Life End              | 1480.33±152.90 | 1476.11±8.34  | 1315.11±86.02 | 1355.89±56.24 | 1337,28±22,23 |
| • Conversion Feed             | 0.82±0.05      | 0.83±0.01     | 0.85±0.04     | 0.92±0.88     | 0.82±0.09     |
| • Consumption Water Drink     | 893.06±10.41   | 878.99±182.85 | 867.48±7.49   | 841.09±37.21  | 779.62±113.86 |
| • Weight fat abdomen (gr)     | 21.84±8.05     | 18.75±4.43    | 17.95±2.67    | 23,23±3,21    | 18.23±2.14    |

Source: Secondary data that has been processed, 2019

Ration consumption is the amount of feed that enters the animal's body. The amount of consumption is obtained by calculating the difference between feeding and remaining feed

at a certain time. The amount of feed consumption in this study was 1173.90 gr for P0; 1188 gr for P1; 1145.33 gr for P2; 1145.10 gr for P3 and 1059 gr for P4. It appears that there is a decrease in feed consumption with increasing concentration of clove powder in the ration. The decrease occurred due to the spicy taste of cloves and the bitter and astringent taste due to the content of tannins and saponins. Nevertheless, the consumption of the research ration was still within the normal range as Blakely's and Bade (1992) [9], that consumption of livestock rations is between 15.9 – 100 gr / oak / day.

Body weight gain during the study was 1441.44 gr for P0; 1436.33 for P1; 1355.78 gr for P2; 1295.44 gr for P3 and 1288.27 gr for P4. Body weight gain is the result of the growth achieved during the study. According to Soeharsono (1976) [10], body weight gain is an easier benchmark to give a clear picture of growth. As with the consumption of the weight gain ration, it was also seen that there was a decrease along with the increase in the consumption of the ration. The low body weight gain during the study can also be caused by the high ambient temperature during rearing. The average ambient temperature during the study was 31oC, this temperature was too high for the maintenance of broiler chickens. This is in accordance with the opinion of Abidin (2002) that a comfortable temperature for broiler chickens ranges from 20-26°C [11].

The final live weight achieved after the chickens were reared for 30 days was 1480.33 gr for P0; 1476.11 gr for P1; 1315.11 gr for P2; 1355.89 gr for P3 and 1337.28 gr for P4. The addition of clove leaf powder level in the ration appears to be in line with the decrease in final live weight. The results of this study are in line with Blakely's and Bade (1992), that a month-old chicken has reached a weight of about 1000 grams [9].

Ration conversion is calculated as a result of a comparison between live weight achieved by the amount of ration consumption. Ration conversion has a meaning and economic value that determines for interest business Because is the ratio between the ration consumed and the resulting body weight gain. The smaller the number of conversions generated means the more Good. Conversion rations need pay close attention This has to do with production costs because an increase in the amount of ration conversion means that the production cost for each body weight unit will increase. The ration conversion rate obtained was 0.82 for P0; 0.83 for P1; 0.85 for P2; 0.92 for P3 and 0.82 for P4. There was a tendency to increase with ration conversion with increasing clove powder concentration in the ration. According to Ichwan (2003), factors that influence ration conversion to be efficient are ration energy, temperature, cage ventilation, feed quality (including feed digestibility) and disease [12]. The ration conversion value obtained in this study was less than 1. These data indicate that the ration given was very efficient in providing broiler meat production. However, the conversion of the ration obtained was within the limits of less than 2 with reference to the conversion value of the Blakely ration and Bade (1992) [9].

Consumption of drinking water during the study was 893.06 ml for P0; 878.99 ml for P1; 867.48 ml for P2; 841.09 ml for P3 and 779.62 for P4. The decrease in drinking water consumption was also seen by the increase in the level of clove powder in the rations. Based on the Ministry of Research, Technology and Higher Education (2000) drinking water consumption of approximately 1226 ml per head in the first 4 weeks is quite far from the results of the study [13]. Even though the difference is quite far, the results of consumption of the final live weight ration and weight gain are normal.

Sensory factors are factors that greatly influence feed consumption. Because of the smell and taste it produces, consumption of medicinal plants can stimulate the central nervous system, in turn stimulate the salivary glands and secretion of digestive juices from the stomach, liver, pancreas and small intestine which are useful in controlling the appropriate pH for the effective work of digestive enzymes. Herbs will increase the amount of saliva and stomach acid production so that it will have a positive effect on the digestion of food substances. By increasing the production of saliva, it will increase the production of ptyalin

enzymes in the mouth which will increase the digestion of starch. At the same time there is an increase in the activity of digestive enzymes due to an increase in the production of digestive juices so that there is a regulation of microbial activity in the digestive tract. Each digestive enzyme requires an optimum pH to support its effectiveness. For example pepsin (an enzyme for digesting protein) requires a relatively low pH (2-3). An acidic environment is a favorable condition for beneficial microorganisms and will negatively affect pathogenic microorganisms [14].

The crude fiber content is also thought to affect consumption. High crude fiber is known to reduce the availability of energy and other nutrients and affect the speed of flow of food materials in the digestive tract [15]. Undigested crude fiber is thought to carry some food substances out with the feces, so that the availability of food substances such as protein, vitamins and others including energy will decrease.

According to Manafe et al. (2017) that normal abdominal fat weight ranges from 1.54% - 2.42% [16]. Abdominal fat weight in this study was 21.84 gr ; 18.75 ; 17.95; 23.33 and 18.23 gr respectively for P0, P1, P2, P3 and P4. When percentaged, abdominal fat is included in that category, namely 1.47%; 1.27%; 1.32%; 1.55% and 1.54% for P0, P1, P2, P3 and P4. Abdominal fat weight appears to fluctuate and is still within the normal range.

There are several factors that can affect the weight of abdominal fat. According to Chan et al. (1996), the content of tannins and saponins tends to decrease fat digestion due to the process of saponification by saponins and protection of feed against degradation by tannins [17]. The content of crude fiber in clove leaf powder according to the proximate analysis results is also quite high, namely 25%. Nonetheless, the percentage of crude fiber ration total study ranged from 5% (Table 2).

**Table 2.** Results of Proximate Analysis of Clove Leaves used during the study

| Nutritional Content | Composition (%) |
|---------------------|-----------------|
| Water content       | 13,27           |
| Crude protein       | 24.56           |
| Crude Fat           | 10.41           |
| Coarse Fiber        | 25.96           |
| BETN                | 34.04           |
| Ash                 | 5.03            |

Source: Results of Analysis of Animal Feed Chemistry Laboratory at Hasanuddin University, 2019.

### 3.2 Blood Profile

The blood profile provides an overview of the health status of the poultry body (Table 3). Adequacy of intake of nutrients obtained Poultry will provide optimal body defense. Blood sampling was carried out through the *pectoralis vein* which is on the wing. 3 ml of blood was taken and then put into the taboo *EDTA*. Blood profile measurement was carried out by spectrophotometric method.

The body's cholesterol content comes from exogenous and endogenous materials. Exogenous cholesterol is cholesterol material synthesized from feed ingredients that come from outside the body, while endogenous cholesterol is cholesterol that comes from the body which is synthesized in several tissues, especially in the liver [18]. The existence of exogenous cholesterol levels affects the performance level of the liver and intestines in synthesizing endogenous cholesterol. Cholesterol synthesis in the liver and intestines will increase when cholesterol levels from feed are low, whereas cholesterol synthesis will decrease if cholesterol levels from feed are high [19].

**Table 3.** Broiler Blood Profile Research Results

| Productivity<br>Parameter (%) | Treatment    |             |              |             |              |
|-------------------------------|--------------|-------------|--------------|-------------|--------------|
|                               | P0           | P1          | P2           | P3          | P4           |
| · Cholesterol (mg/dL)         | 117,33±19,39 | 124,33±5,50 | 121,67±12,05 | 122±14      | 118,33±10,23 |
| · Trigliserida (mg/dL)        | 49,67±35,81  | 37±9,16     | 30,67±1,52   | 43±16,37    | 34,67±6,42   |
| · Eritrosit (106/mL)          | 1,83±0,62    | 2,04±0,58   | 1,78±0,37    | 1,77±0,59   | 2,05±0,14    |
| · Leukosit (103/mL)           | 83,67±39,30  | 84,72±34,08 | 74,25±24,67  | 75,40±38,03 | 94,78±11,75  |
| · Haemoglobin (g/dL)          | 6,1±2,10     | 6,63±1,89   | 5,97±1,25    | 6,63±1,50   | 6,73±0,32    |
| · Haematokrit (%)             | 22,9±7,63    | 24,97±7,021 | 21,93±4,21   | 21,83±6,37  | 25,63±1,06   |

Source: Secondary Research Data that has been processed, 2019

Cholesterol levels of clove powder supplementation treatment P0, P1, P2, P3, and P4 were 117.33 mg / dL ; 124.33 mg /dL;121.67mgdL; 122 mg / dL and 118.33 mg / dL are below the normal range according to Mangisah's statement (2003) which explains that normal chicken blood cholesterol levels range from 125-200 mg / dL, although not too far [20].

Essential oils are known to play a positive role in the activity of digestive enzymes and the metabolism of nitrogen, amino acids and glucose. Usta et al. in 2002 investigated the effect of cinamonum and clove on FOF1ATPase in mouse mitochondria [21]. Both were found to stimulate ATP, reduce mitochondrial membrane potential and inhibit NADH oxidase6. The addition of clove leaf powder level seems to help to increase cholesterol levels to normal levels but at the P4 level of 8% clove leaf powder has decreased again. As it is known that high concentrations of eugenol cause necrosis which will not be painful due to the action of local anesthetics [22].

Blood triglyceride levels describe the fat content in the animal's body. Increased digestibility of feed will increase energy requirements in the body to help process nutrient metabolism. Tornheim and Ruderman (2011) state that energy needs in the body can be met by utilizing triglycerides in fat tissue [23]. When the need for energy in the body increases, to meet this requirement the body will synthesize triglycerides (in the form of fatty acids) which are stored in fat tissue, where the fatty acids will be re-esterified to provide fuel for all cells in the body that need energy. Triglyceride levels in chicken blood were 49.67 mg / dL; 37 mg / dL; 30.67 mg dl; 43 mg / dL and 34.67 mg / dL are still within the limits of normal levels, namely <150mg/dl [24].

Normal total erythrocytes in chickens range from 2.5 to 3.5 x 10<sup>6</sup> / µl with an average of 3.0 x 10<sup>6</sup> / µl [25]. Even though it can be seen in the results of measuring erythrocytes that are slightly below normal, namely in the range of 2.05 - 1.77 x 10<sup>6</sup> µL. The results of the measurement of the erythrocytes were in line with the hemoglobin level, which was slightly below normal, 6.73-5.97 gr /dl. Normal hemoglobin levels in chickens range from 7.0 gr /dl-13.0 gr /dl with an average of 9.0 gr /dl, hemoglobin levels are directly proportional to the number of red blood cells, the higher the red blood cell level, the higher also hemoglobin levels [26]. Factors that affect hemoglobin levels are species, age, number of erythrocytes and sex [27].

The hematocrit values obtained in this study were 22.9%; 24.97%; 21.93%; 21.83% and 25.63%. As for normal hematocrit values in chickens ranging from 22.0% -35% with an average of 30.0%. The hematocrit value of clove leaf powder supplementation research was normal. Hematocrit values can describe healthy blood conditions. Swenson (1984) stated that a high ambient temperature can increase the hematocrit value, whereas a low ambient temperature will decrease the hematocrit level [28]. The hemacocrit results are not consistent with the number of erythrocytes and hemoglobin levels. Soeharsono et al. (2001) stated that the number of blood cells did not always affect the hematocrit value [29].

Broiler leukocyte levels in this study from P0 to P4 were 83.67; 84.72; 74.25; 75.4 and 94.78 x 10<sup>3</sup> /□L. The normal leukocyte count in broiler chickens is in the range of 12 – 30 ×

103/ml [30]. Based on the results of this study, the number of leukocytes in the blood of broiler chickens indicated a healthy condition so that the chickens did not make efforts to fight pathogenic bacteria or viruses that entered the body. Livestock infected with bacteria will cause the chicken's health to decline with a marked increase in white blood cells [31]. Apart from being caused by a bacterial infection, an increase in the number of leukocytes can be caused by environmental stress which in turn affects physiological processes to become abnormal and affects the hormonal balance in the body of the chicken. broiler chickens according to Amrullah (2004), but the chickens in this study did not experience this [32]. An increase in the number of leukocytes can be caused by environmental stress which increases production corticosteroids and glucocorticoids which adversely affect chicken health and reduce the body's defense system [33].

White blood cells or leukocytes are blood cells that can form the immune system because they play a role in fighting various infectious diseases and foreign bodies [34]. The main function of leukocytes in general is immune system, but there are different mechanisms in each leukocyte fraction. Monocytes in carrying out the function of the immune system act as macrophage engulfs and destroys cells, microorganisms and foreign bodies that are pathogenic. Eosinophils carry out the function of the immune system by way of lysis as a chemical function, namely enzymatically. Heterophiles function as the first line of defense against bacterial infection, when there is no infection the heterophils are not affected. The percentage of heterophiles will increase when there is a bacterial infection in the body. Lymphocytes play a role in responding to antigens (foreign objects) by forming antibodies and developing immunity [35].

Each individual livestock sometimes has a difference in the number of leukocytes, which generally these differences are caused by several factors including physiological activity, age, nutrition, stress and others, the number of leukocytes that deviate from normal conditions is related to the health condition of the livestock [36].

### 3.3 Internal organ profile

The profile picture of the internal organs can provide information about the metabolic mechanism in the animal's body (Table 4). Measurement of internal organs is done by removing the contents of the internal organs of the chicken that has been cut. The internal organs are cleaned and then weighed individually. The internal organs observed were liver, pancreas, heart, intestines and gizzard. Then converted to a percentage of the final live weight.

**Table 4.** Profile of Broiler Internal Organs from Research Results

| Productivity<br>Parameter (%) | Treatment |           |           |           |           |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|
|                               | P0        | P1        | P2        | P3        | P4        |
| ● Heart                       | 1.61±0.06 | 1.43±0.04 | 1.36±0.19 | 1.38±0.10 | 1.35±0    |
| ● Pancreas                    | 0.17±0.01 | 0.18±0.02 | 0.19±0.75 | 0.19±0    | 0.2±0.02  |
| ● Heart                       | 0.31±0.02 | 0.32±0.02 | 0.29±0.01 | 0.31±0.04 | 0.36±0.08 |
| ● Intestines                  | 1.98±0.14 | 2.06±0.16 | 2.16±0.37 | 1.91±0.02 | 2.08±0.72 |
| ● gizzards                    | 1.15±0.08 | 1.22±0.28 | 1.58±0.13 | 1.43±0.05 | 1.22±0.07 |

Source: Secondary Research Data that has been processed, 2019

The process of food metabolism in the body of poultry will affect the work activities of the gizzard, liver and heart. Poultry will increase their metabolic ability to digest crude fiber thereby increasing the size of the gizzard, liver and heart.

The liver is a vital organ that acts as a filter for food substances that have been absorbed before entering the blood circulation and tissues. Resnawati (2010), showed that the percentage of liver weight ranged from 1.71 – 1.85 percent at all levels of use of sage seed oil. Liver weight in this study was 1.35-1.61 [37]. Liver weight appeared to decrease with increasing concentration of clove leaf powder. Even so, the results of inferential statistical tests from the General Linear Model show no differences between treatments.

The liver plays a role in bile secretion, fat, protein, carbohydrate metabolism, iron and vitamins, detoxification, red blood formation, and vitamin storage [38]. Factors that affect liver weight are body weight, species, sex, age, and pathogenic bacteria [39]. Crawley et al. (1980) stated that liver weight increases with increasing age, but the percentage is constant to body weight [40].

Heart weight in this study was 0.29-0.38%. This result is not much different from Sulistyani's research (2018), which is 0.37-0.56% [41]. According to Akoso (1998), the heart is a muscular organ which is divided into four chambers, namely two chambers (left ventricle and right ventricle) and two atria (left atrium and right atrium) [42]. This organ allows efficient circulation of blood into the lungs for the exchange of O<sub>2</sub> and CO<sub>2</sub> in supporting the body's metabolic processes.

Ressang (1984), which states that heart size depends on sex, age, body weight, and animal activity [38]. Based on the results of observations during the study, the activity of the chickens in each treatment was relatively the same, the sexes were unsex, the body weights were relatively the same, and the age of the broilers was also the same, so this had an impact on heart weight for each treatment in the study which was also relatively the same.

The metabolic process begins when the feed enters the body of the bird. This metabolic process will affect work activity, gizzard, liver, and heart. Poultry will increase their metabolic ability to digest crude fiber thereby increasing the size of the gizzard, liver and heart. Akoso (1998), states that the size of the gizzard or gizzard is influenced by its activity [42]. The percentage of gizzards in this study was 1.15-1.58%. The normal weight of the gizzard as a result of research reported by Kismono (1986), is around 1.89 - 2.34 percent [43]. Results Consumption of the same ration resulted in no difference between treatments based on the results of the inferential statistical test. In accordance with the opinion of Akoso (1998) above, during the study, the activity of chickens was relatively the same, as disclosed in the discussion of the heart above, so the final results of gizzard weights were also relatively the same [42].

Bowel weight in this study showed no effect due to herbal variations ( $P > 0.05$ ). The intestinal weight of this study ranged from 1.91 – 2.16% of the live weight of the chickens. The results were not significantly different because the food consumed by each treatment was relatively the same. The results of this study are in line with research conducted by Resnawati (2010) between 1.62 - 1.82% [37].

The pancreas has an important role in digestion because it secretes pancreatic juice which functions in the process of digesting food substances. In accordance with the opinion of North (1984) said that the pancreas will produce the enzymes amylase, trypsin, and lipase respectively digesting carbohydrates, proteins, and fats contained in the ration which is secreted into the duodenum [44]. Normal pancreas weight [45] is around 0.25% -0.40% of live weight or 2.5-4.0 g, not much different from the results of research on clove leaf powder supplementation with a pancreas weight of 0.17-0.2%, as well as research results [46] with a pancreas weight of 0.22-0.45%.

Based on the results of inferential statistical analysis of productivity where all data is processed with Manova, the result is that all treatments have no significant effect on all parameters measured. Therefore, based on the results of the discussion, the application of clove leaf powder in feed can be given to broiler chickens.

## 4 Conclusions

Supplementation clove to broiler chickens no show exists difference between treatment. The response given by livestock in normal range so leaf clove This can used as alternative antibiotics potential to poultry.

### 4.1 Suggestion

Seeing the results obtained, further research is needed at different levels of clove leaf powder to find out more about the mechanism of action of clove leaf powder on broilers.

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### Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### Author contribution statement

Khaerani Kiramang: Conceptualization, Methodology, Writing- Original draft preparation. Asmuddin Natsir: Data curation, Writing- Reviewing and Editing. Sri Purwanty: Visualization, Investigation, Writing- Reviewing and Editing. A. Mujnisa: Validation, Writing- Reviewing and Editing.

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