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## The Effect of Adding Moringa Leaf Extract (*Moringa Oleifera*) in Drinking Water on Broiler Meat Quality

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### Abstract

This study aims to determine the quality of broiler meat with the addition of Moringa (*Moringa oleifera*) leaf extract. This study was conducted in April 2022 in Gowa Regency, South Sulawesi Province. The research method was arranged based on a completely randomized design (CRD) with a population of 48 broilers placed in 16 cage plots; each plot contained three chickens with four treatments, each consisting of 4 repetitions. Each experimental sample used in this study is P0 = Without Moringa leaf extract (Control), P1 = Drinking water with 3% Moringa leaf extract in 1 liter of water, P2 = Drinking water with 6% Moringa leaf extract in 1 liter of water, P3 = Drinking water with 3% Moringa leaf extract in 1 liter of water. The meat variables observed were carcass percentage, cooking loss percentage, broiler meat texture, broiler meat color and broiler meat odor. The results showed that at P2 with 6% Moringa leaf extract, there was no significant difference in the percentage of carcass and cooking loss. However, P2 gave a substantial difference in the organoleptic test of meat texture 85.87, meat color 80.50 and meat odor 83.10. Based on the data for each parameter tested with various treatments, it can be recommended that the best treatment is P2 (giving 6% Moringa leaf extract).

**Keywords:** Broiler, moringa leaf extract, carcass percentage, cooking loss, color, odor.

### Introduction

Broilers constitute a significant portion of the domestic livestock industry, playing a substantial role in fulfilling the nation's demand for animal products. Broiler meat production in Indonesia has experienced rapid growth. In commercial poultry farms, the rearing of these chickens typically involves the administration of drugs, antibiotics, and vitamins. The continuous use of antibiotics, particularly when administered at suboptimal doses, can lead to the development of antimicrobial resistance (Suharno, 2002).

*Moringa oleifera* is a nutrient-rich plant, boasting a substantial protein content of 22.7%. Its leaves are also abundant in natural antioxidants such as carotenoids, selenium, flavonoids, and phenolics, which have been shown to enhance meat quality. Moreover, Moringa is a rich source of provitamin A and C, particularly carotenoids, which are converted into vitamin A within the body. Due to its robust growth in tropical regions, Moringa is an affordable and widely available plant.

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## Methods

### Material

The study utilized one-day-old broiler chicks (strain grade I) procured from Poultry Shop Anging Mammiri in Gowa. Forty-eight chicks with an average initial weight of 40 grams were used. Commercial feed specifically concentrates on Pb1 and Pb2 produced by PT. Japfa Comfeed Indonesia and Moringa oleifera leaf extract were the primary feed sources. For the extension activities, leaflets were employed as informational materials.

### Method

This study employed a Completely Randomized Design (CRD) with 48 broiler chickens distributed across 16 experimental units. Each unit housed three chickens, with four treatments and four replications. The treatments were categorized into four groups: P0 : Control (no Moringa leaf extract).

P1 : Drinking water supplemented with 3% Moringa leaf extract per liter.

P2 : Drinking water supplemented with 6% Moringa leaf extract per liter.

P3 : Drinking water supplemented with 9% Moringa leaf extract per liter.

### Data Collection Techniques

Data for this study were collected through the tabulation of assessment results.

### Data Analysis

The data collected for this study were analyzed using analysis of variance according to a Completely Randomized Design (CRD), with the aid of SPSS software.

#### a. Research Parameters

1. Carcass percentage
2. Cooking loss percentage
3. Broiler meat texture
4. Broiler meat color
5. Broiler meat odor

## Results

This study investigated the effects of Moringa leaf extract supplementation in drinking water on broiler meat quality over 29 days. Four treatment groups were employed: P0 (control), P1 (3% extract), P2 (6% extract), and P3 (9% extract). The study evaluated several parameters, including carcass percentage, cooking loss, texture, color, and aroma of broiler meat. The results of these parameters are presented in Table 1:

Table 1. Mean Values per Treatment

Treatment	P0	P1	P2	P3
Carcass Percentage	75.24	71.43	71.15	71.82

Cooking Loss Percentage	5.07	4.95	6.66	6.22
Broiler Meat Texture	41.40 <sup>a</sup>	65.32 <sup>b</sup>	85.87 <sup>c</sup>	68.00 <sup>b</sup>
Broiler Meat Color	48.57 <sup>a</sup>	79.25 <sup>b</sup>	80.50 <sup>b</sup>	65.25 <sup>ab</sup>
Broiler Meat Odor	46.47 <sup>a</sup>	75.67 <sup>bc</sup>	83.10 <sup>c</sup>	68.85 <sup>b</sup>

*Source: Primary data after processing, 2022*

**a. Broiler Carcass Percentage**

Based on the research findings, the highest results were observed in treatment P0, yielding a value of 75.24. This value was not significantly different from the other treatments: P3 (71.82), P2 (71.15), and P1 (71.43). These results indicate that the control group (P0) exhibited the highest carcass weight without adding *Moringa oleifera* leaves.

The results demonstrated a decrease in average carcass percentage with the addition of *Moringa* leaf extract to the drinking water. This finding is inconsistent with previous research (Setiyawan et al., 2014), which reported that the supplementation of *Moringa* leaf and garlic extracts at a rate of 50 g/liter of drinking water significantly increased the slaughter weight, carcass weight, and carcass percentage of broilers aged 2-6 weeks. The potential reason for this study's decrease in average carcass percentage could be attributed to a higher percentage of non-carcass components, such as blood, feathers, feet, head, neck, and giblets, which may have weighed more than the carcass itself. Giblets are edible by-products typically consisting of the intestines, liver, heart, and gizzard.

**b. Cooking Loss Percentage**

Based on the research findings, treatment P2 yielded the lowest mean value of 4.95. This value was not significantly different from the other treatments: P0 (5.07), P2 (6.66), and P3 (6.22). These results indicate that applying 3% *Moringa* leaf extract in treatment P1 resulted in the lowest cooking loss.

This finding is consistent with the opinion of Soeparno (2005), who stated that the cooking loss of meat generally ranges from 1.5% to 54.5%. However, meat with lower cooking loss tends to have better quality due to minimal loss of nutritional value.

**c. Broiler Meat Texture**

The research findings indicate that treatment P2 yielded the highest result of 85.87, surpassing the other treatments: P0 = 41.40, P1 = 65.32, and P3 = 68.00. These results suggest that applying 6% *Moringa* leaf extract in treatment P2 resulted in a more resilient texture than the control group.

An increase in age does not necessarily correlate with increased muscle texture roughness, especially in muscles with smaller fibers (Soeparno, 2005). The organoleptic

evaluation revealed that the administration of Moringa leaf extract in broiler drinking water led to changes in texture, as assessed by a panel of evaluators. The texture of broiler meat remained favorable under treatment P2 (6% Moringa leaf extract), which received the highest score compared to other treatments.

#### **d. Boiler Meat Color**

Based on the research findings, treatment P2 exhibited a value of 80.50, while the means for P0, P1, and P3 were 48.57, 79.25, and 65.25, respectively. However, the analysis of variance revealed significant differences in meat color quality. These results indicate that the administration of 6% Moringa leaf extract in treatment P2 resulted in a higher score, significantly different from the control group without Moringa leaf extract supplementation. Moringa leaves also produce  $\beta$ -carotene, a pigment contributing to brighter meat color. Consequently, increasing the level of fermented feed leads to a more intense meat color. Lawrie (2003) stated that oxymyoglobin is a crucial pigment in fresh meat, primarily on the surface, and it represents the desired meat color for consumers. The organoleptic evaluation demonstrated that the administration of Moringa leaf extract did not negatively impact color, with treatment P2 (6% Moringa leaf extract) maintaining a favorable meat brightness and achieving the highest score compared to other treatments.

#### **e. Boiler Meat Odor**

Based on the research findings, treatment P2 exhibited the highest score of 83.10, significantly differing from the other treatments: P0 (46.47), P1 (75.67), and P3 (68.85). These results indicate that the administration of 6% Moringa leaf extract resulted in a relatively favorable scent, characterized by the absence of an unpleasant odor, compared to the control group, which did not receive Moringa leaf extract. A panel of evaluators determined This favorable scent profile based on established scent criteria for broiler meat.

The scent develops during the cooking process, resulting from interactions between carbohydrates and amino acids, thermal oxidation and thiamine degradation (Soeparno, 2005; Northcutt, 2009). Panelists generally prefer foods with distinct scents that do not deviate from the norm. The characteristic scent often arises from the influence of ammonia in the meat (Mulia et al., 2014). In this study, organoleptic evaluation was conducted on raw chicken meat, solely relying on the sense of smell.

### **Conclusion**

Based on the results of the research and the implementation of the extension, it can be concluded that: Adding Moringa oleifera leaf extract to drinking water did not significantly affect broilers' carcass percentage or cooking loss when administered at concentrations of 3%, 6%, or 9%. However, treatment P2, with a 6% concentration, did significantly influence organoleptic properties, resulting in improved meat texture (85.87), color (80.50), and aroma (83.10). Based on the analysis of all parameters across different treatments, it is recommended that treatment P2 (6% Moringa leaf extract per liter of water) be adopted

### **Suggestion**

Further research or investigation is necessary to examine the effects of Moringa leaf extract supplementation's effects on broiler meat quality in drinking water.

## References

- Lawrie, R.A. 2003. Ilmu daging. Edisi Ke-5. Diterjemahkan oleh parakkasi, A., dan Y. Amwila. Universitas Indonesia Press, Jakarta.
- Mulia, D.S., Y. Nartanti, H. Maryanto, & C. Purbomartono. 2014. Fermentasi tepung bulu ayam dengan *Bacillus Licheniformis* B2560 untuk meningkatkan kualitas bahan baku pakan ikan. *Proceeding Biology Education Conference: Biology, Science, Environmental, and Learning* 11(1):234-240.
- Northcutt, J.K. 2009. Factors Affecting Poultry Meat Quality. The University of Georgia Cooperative Extension Service-College of Agricultural and Environmental Sciences Department of Poultry Science (Bulletin 1157). Pub. : 12/01/2009 <http://en.engormix.com>
- Setiyawan, D., Bidura, I G. N. G., Putra Wibawa. 2014. Pengaruh Pemberian Ekstrak Daun Kelor (*Moringa Oleifera*) Dan Bawang Putih (*Allium Sativum*) Melalui Air Minum Terhadap Berat Karkas Broiler Umur 2-6 Minggu. *Peternakan Tropika* Vol. 2 No. 2 Th. 2014: 252-261
- Soeparno. (2005). Ilmu dan Teknologi Daging. Cetakan ke-4. Gadjah Mada University Press, Yogyakarta.
- Suharno, B. 2002. Beternak Itik Secara Intensif. Cetakan Kesebelas. PT. Penebar Swadaya. Jakarta