

Organoleptic Testing Of Broiler Chicken Meat Quality With The Addition Of Corn Leaf Flour and Seaweed

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Abstract

The addition of corn leaf and seaweed powder will have a positive effect on broiler meat quality in terms of consumer acceptance based on organoleptic testing. This study aims to determine the effect of adding corn leaf flour and seaweed on the quality of broiler chickens. The research design used a completely randomized design (CRD) with 6 treatments and 3 replicates, with the administration of commercial feed (control), corn leaf flour (5-15%), and seaweed flour (5-15%). The variables observed in the study were organoleptic properties (color, aroma, texture) using 30 untrained panelists. The data obtained from the organoleptic test results were analyzed using Analysis of Variation (ANOVA). The results of the ANOVA statistical analysis showed that feeding a mixture of corn leaf flour and seaweed did not have a significant effect ($P < 0.05$). The average organoleptic test results for color were 6.8 (somewhat appealing), aroma 6.9 (somewhat appealing), and texture 7.9 (quite appealing). The conclusion that can be drawn from this study is that adding corn flour and seaweed does not significantly affect the panelists' preference for broiler chicken meat and can reduce the sensory quality or consumer acceptance of broiler chicken.

Keyword: Broiler Chicken, Seaweed, Corn Leaves, Organoleptic Test



INTRODUCTION

Broiler chickens, also commonly known as meat chickens, are a superior breed resulting from crossbreeding between chicken breeds that have high productivity, especially in producing chicken meat. Broiler chickens are the most economically profitable type of livestock compared to other livestock. Broiler chicken maintenance requires attention to important factors, including feed and housing.

Litter pens have the advantage over this litter system in that they are more practical and therefore more efficient. In addition the conditions inside the cage feel warmer due to the properties of rice straw, the husks and wood shavings in retaining heat. In addition to housing, another factor that is equally important in supporting broiler chicken performance is feed. Feed is an important element because it enables broiler chickens to grow and metabolize properly. Increasing the productivity of broiler chicken farms can meet feed requirements while still paying attention to cost efficiency through good feed management in order to generate maximum profits. One innovation that can be used in broiler chicken feed formulation is the use of corn leaf flour and seaweed flour.

Corn is one of the plants that can be useful for livestock because almost all parts of this plant can be used by livestock, especially the leaves, which can be processed into flour. The nutritional content of corn depends heavily on the age of harvest. Corn plants have low protein content. *Eucheuma cottonii* seaweed flour is a marine resource with potential for development as poultry feed. Generally, coastal communities have been utilizing the wealth of seaweed found in Indonesian waters, especially communities Gorontalo Utara which is the largest producer of seaweed, although to date it has not contributed to their economy. Seaweed can also be used as an ingredient in animal feed.

Based on this research, the aim is to conduct research on the organoleptic quality of broiler chickens using corn leaves and seaweed flour, considering that in the Gorontalo region, corn leaves and seaweed have not been used as animal feed.

MATERIALS AND METHODS

This research was conducted at the experimental farm in Molalahu Village, Pulubala District, Gorontalo Regency. This research was conducted over a period of 45 days from January to March 2025.

The equipment used consisted of litter cages measuring 50 cm x 300 cm, with 18 boxes each containing four chickens, feeding and drinking troughs, incandescent lamps, cage cleaners, writing instruments, scales, scalpels, and documentation tools. The materials used in this study



were 72 broiler chickens, vitamins, medicines, disinfectants, seaweed flour, corn leaf flour, and concentrate (BR1).

The design used in this study was a completely randomized design (CRD) with 6 treatments and 3 replicates, The treatments administered were seaweed flour and corn leaf flour. The following are the levels of provision:

P₀ (100% BR1 Commercial Feed)

P₁ (10% corn leaf flour + 90% BR1)

P₂ (10% Seaweed Flour + 90% BR1)

P₃ (5% corn leaf flour + 15% seaweed flour + 80% BR1)

P₄ (10% corn leaf flour + 10% seaweed flour + 80% BR1)

P₅ (15% corn leaf flour + 5% seaweed flour + 80% BR1)

Data Analysis

Data obtained from organoleptic testing results were analyzed using *Analysis of Variant* (ANOVA). If there was a significant effect ($P < 0.05$) on each treatment, it was followed by *Duncan's Multiple Range Test* (DMRT) with a significance level of 5%.

RESULTS AND DISCUSSION

Organoleptic properties are one aspect of meat quality assessment related to consumer acceptance when consumed. The average scores for color, aroma, and texture are shown in Table 1 below.

Table 1. Average Values for Color, Aroma, and Texture.

Variable	P0	P1	P2	P3	P4	P5	Sig
Color	6,2±1,49	6,3±1,53	6,4±1,35	6,5±1,87	6,6±1,77	6,8±1,97	P>0,05
Aroma	6,1±2,17	6,3±1,68	6,5±1,83	6,9±1,47	6,6±2,19	6,8±2,41	P>0,05
Texture	7,3±1,02	7,4±1,13	7,6±1,16	7,8±0,89	7,9±0,88	7,7±1,09	P>0,05

Note: The treatments showed no significant effect ($P > 0.05$) on the observed variables. P₀ (100% BR1 Commercial Feed), P₁ (10% corn leaf flour + 90% BR1), P₂ (10% Seaweed Flour + 90% BR1), P₃ (5% corn leaf flour + 15% seaweed flour + 80% BR1), P₄ (10% corn leaf flour + 10% seaweed flour + 80% BR1), P₅ (15% corn leaf flour + 5% seaweed flour + 80% BR1).

1. Color of Broiler Chicken Meat

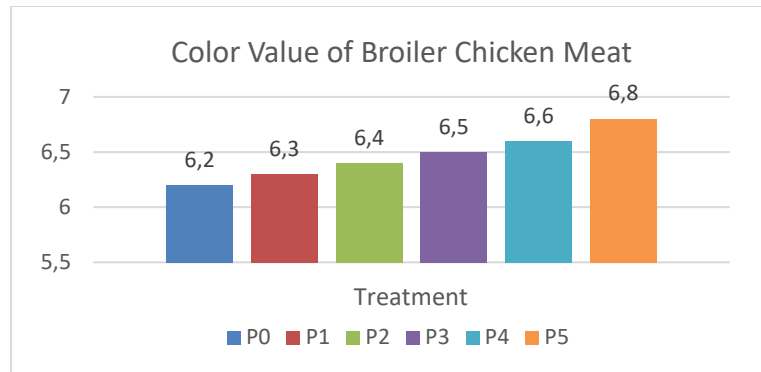


Figure 1. Color Value of Broiler Chicken Meat

The results of the ANOVA statistical analysis of the panelists' assessment of broiler chicken meat color showed no significant differences ($P < 0.05$). The assessment ranged from 6.2 to 6.8. This was because the addition of seaweed flour and corn leaves did not produce a statistically significant difference, however, it can be seen descriptively that treatment with higher additions tends to produce brighter and more attractive colors compared to P0. It may be the case that natural pigments in seaweed and corn leaves, such as carotenoids and chlorophyll pigments, have the potential to affect color, but the concentrations used are not high enough to cause a noticeable difference.

According to research by Muklis et al. (2016), adding fermented seaweed flour to broiler feed does not significantly affect meat color. According to research by Taran et al. (2015), the use of local ingredients as a substitute for corn leaves does not show any significant difference in color. Thus, seaweed and corn leaves as alternative feed can still be considered because they do not reduce the visual quality of broiler chicken meat, especially in terms of color assessment.

Fausiah et al (2019) stated that color testing by panelists is the main attraction before consumers recognize and like other characteristics. The color of poultry meat is influenced by several factors such as age, sex, breed, cage environment, slaughter environment, pre-slaughter and storage conditions, intramuscular fat, meat moisture content, and feed.

2. The aroma of broiler chicken meat

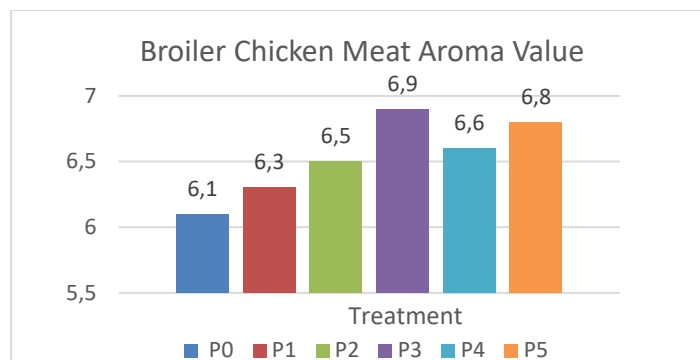


Figure 2. Broiler Chicken Meat Aroma Value

The results of the ANOVA statistical analysis of the aroma assessment of broiler chicken meat show that there is no significant effect between treatments on meat aroma. This is because there is a tendency for the aroma of meat to become more desirable with increased treatment, but the difference is not statistically significant. The tendency for aroma scores to increase is in line with the bioactive content in seaweed, such as phenolic compounds, polysaccharides, and minerals, which play a role in inhibiting fat oxidation, thereby reducing the rancid aroma in broiler chicken meat, meanwhile, corn leaves also contain crude fiber and natural pigments that can affect the metabolite profile in meat. The addition of seaweed flour and corn leaves in broiler feed does not reduce the quality of broiler chicken meat aroma (Megawati., 2020).

The use of seaweed flour and corn leaves as alternative feed does not have a negative impact on the aroma of broiler chicken meat. Aroma is one of the organoleptic parameters that determine consumer acceptance. Several factors affect chicken meat, including the age of the livestock, the type of feed, and the duration and conditions of storage, which can affect the aroma of broiler chicken meat. Each panelist has a different assessment depending on their preferences, due to individual differences in responding to the intensity and quality of a stimulus, depending on the panelist's preferences (Prayoga., 2021).

Its effect on meat aroma, like environmental conditions (litter, ventilation), aroma can develop when meat is cooked, which is an interaction between carbohydrates and amino acids, fats and internal oxidation and thiamine degradation, among these chemical compounds, the fat contained in the meat is what gives chicken its distinctive aroma. This study's organoleptic test could only be conducted on uncooked chicken meat, relying solely on the sense of smell.

3. Broiler Chicken Meat Texture

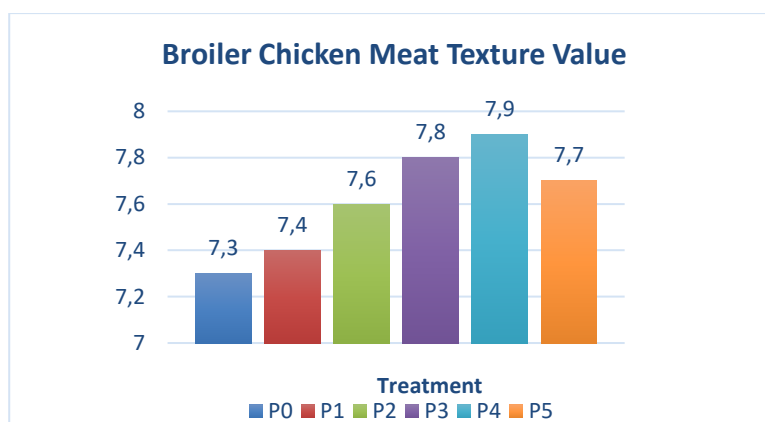


Figure 3. Broiler Chicken Meat Texture Values

The results of the ANOVA statistical analysis of the texture assessment of broiler chicken meat show that there is no significant effect between treatments on meat texture. This is because the feed treatment that can be given has no significant effect on the texture value of broiler chicken meat. This means that adding feed ingredients with natural fiber and bioactive content can affect meat quality, but the panelists' response was more influenced by the balance of protein and intramuscular fat content. The alternative feed provided did not have a significant effect on meat texture because genetic factors and husbandry management also played a major role.

Seaweed has potential bioactive components. Bioactive components in seaweed include phenolic compounds, natural pigments, sulfated polysaccharides, fiber, and halogen compounds. Various types of phenolic compounds, flavonoids, and natural pigments found in seaweed can improve the physiological status of chickens by reducing stress, thereby improving meat quality, including texture ((Rizkaprilisa *et al.*, 2023). The calcium and magnesium mineral content also supports muscle contraction and relaxation, which ultimately contributes to the tenderness of the meat, meanwhile, corn leaves contain about 13–14% crude protein, 4–5% crude fat, 28–30% crude fiber, and about 9% minerals (ash). The protein content in corn leaves plays a role in muscle tissue formation, while the coarse fiber can affect energy metabolism and chicken growth. Corn leaves also have high palatability because they are excellent for feeding livestock varieties of corn that are harvested young. The nutritional content of corn leaves is highly dependent on the age at harvest (Mukhtar *et al.*, 2023). The use of seaweed flour and corn leaves as feed supplements provides a source of nutrients that supports muscle tissue formation and maintains meat quality, with assessment results showing no significant differences.



The texture can be seen from the meat fibers, which are almost the same in each treatment. The chicken breast meat in each treatment had the characteristics of chicken meat, namely fine, long fibers, no yellowish-white fat deposits between the fibers, and smooth, fatty skin. Differences in meat texture are caused by age, activity, sex, and feed. As with aroma, feed has very little effect on meat texture.

CONCLUSION

The results of this study indicate that the addition of seaweed flour and corn leaves to broiler chicken meat does not have a significant effect ($P < 0.05$) on organoleptic tests (color, aroma, texture) with an average score of 6.8 for color (somewhat appealing), 6.9 for aroma (somewhat appealing), and 7.9 for texture (quite appealing) the addition of corn flour and seaweed did not significantly affect the panelists' preference for broiler chicken meat and did not reduce the sensory quality or consumer acceptance of broiler chicken.

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