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Organoleptic Qualities of Quail Meat with a Combination of Additional Feed Black Cumin Flour and Noni Leaf Meal

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ABSTRACT: The research was conducted with the aim of knowing the organoleptic quality of quail meat which was given a combination of additional feed in the form of black cumin flour (Nigella Sativa) and noni leaf meal (Morinda citrifolia L). This research was conducted in Panaikang Village, Pattallasang District, Gowa Regency. The research design used a completely randomized design (CRD) consisting of 4 treatments, 4 replications with each replication consisting of 6 quails. The feeding treatment was P0: basal feed (control), P1 = basal feed + 1% black cumin meal + 3% noni leaf meal, P2 = basal feed + 2% black cumin meal + 2% noni leaf meal, P3 = basal feed + 3% black cumin flour + 1% noni leaf flour. The maintenance phase was carried out on quail strain autumn aged 45 days as many as 96 tails, 6 for each experimental unit for ± 4 weeks of treatment plus 3 days of environmental adaptation period. Food and drink are provided ad libitum, and no vaccination program is carried out. Sampling for carcass production was carried out at ± 10 weeks of age as many as 2 individuals per experimental unit so that a total of 32 samples of laying quail were then processed into carcasses. The organoleptic test of meat was carried out by cooking meat samples without salt or spices. The panelists used were somewhat trained (semi-trained) panelists of 10 people to give a score to each sample. Organoleptic test results data were analyzed by ANOVA test for significantly different followed by LSD test. The results showed that giving a combination of additional feed in the form of black cumin flour (Nigella Sativa) and noni leaf meal (Morinda citrifolia L) showed a significant effect ($P < 0.05$) between treatments on quail meat texture, while no significant effect ($P > 0.05$) on other organoleptic tests including color, flavor, tenderness, juiceness, and level of preference. In general it can be concluded that there is a real difference in texture of quail meat between treatments P0, P1 and P2, P3. While there was no significant difference between the treatments for other organoleptic tests.

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INTRODUCTION

Quail meat contains nutrients that are not inferior to other poultry meat. Therefore, quail meat can be an alternative consumption of animal protein that can meet the nutritional needs of the human body. However, the nutritional completeness of quail meat is certainly influenced by the quality of the quail meat which is of course also liked by the public. One of the parameters to see the quality of quail meat is to observe how the organoleptic (sensory) quality of quail meat includes color, texture, flavor, tenderness, taste, and juiceness. The quality of meat is influenced by the amount of nutrients contained in the feed ingredients so that the food produced tastes good, has high nutritional value and is safe for consumption (Manafe & Ressie, 2021).

The organoleptic quality of quail meat can be influenced by several factors. The main factor that influences it is feed. The feed consumed by quail will affect its growth and development. Therefore, quail feed should contain the nutrients needed to support basic life needs, productivity and health. Additional feed in the form of black cumin flour and noni leaf flour is believed to be able to support the health of the quail body from disease attacks mainly in digestion so that it will maximize the absorption of feed nutrients for basic needs and quail productivity such as meat production.

Black cumin and noni leaves have active substances that are useful as feed supplements for livestock. Black cumin has properties as anti-inflammatory, anti-inflammatory, anti-bacterial and many others. Giving black cumin in the form of flour can increase live weight and performance of the digestive organs of broilers (Salam et al, 2013). Noni fruit juice contains proxeronine which works to provide xeronin. Xeronin functions to repair damaged cells and works at the molecular level which is expected to improve carcass weight percentage (Sjabana & Bahalwan, 2002 quoted by Fenita et al., 2011).

The use of additional feed in the form of a combination of black cumin flour and noni leaf flour will certainly affect the sensory (organoleptic) quality of quail meat. Sensory quality/meat quality characteristics are parameters of meat quality consisting of flavor, color, taste, texture, tenderness, and panelists' overall acceptability/favorability of meat tested subjectively by panelists (Sundari et al., 2013). Assessment of sensory (organoleptic) quality of quail meat can be done through organoleptic testing. Based on this, it is necessary to study the organoleptic quality of quail meat with the aim of knowing the organoleptic quality of quail meat given a combination of additional feed in the form of black cumin flour and noni leaf flour.

RESEARCH METHODS

Research Tools and Materials

Table 1. Tools used during the study

No.	Tool	Specification	Quantity	Unit
1.	Scale	Digital scale with accuracy of 0.1 gr with power adapter	1	pcs
2	Treatment feed mixing container	Airtight plastic jar with a capacity of 10 L	4	pcs
3	Sendok pakan	Plastic shovel	4	pcs
4	Knife	Kohana Black Ceramic Che'f Knife	1	pcs
5	Jumbo stainless basin container	Komodo Stainless Steel Basin 50cm Large Stainless Steel Basin 50 Cm	2	pcs

Table 2. Materials used during the study

No.	Materials	Quantity	Unit
1	Pullet laying quail 45 days old	96	ekor
2	Basal feed	100	kg
3	Black Cumin Flour	1	kg
4	Noni Leaf Flour	2	kg
5	Clean water	500	l
6	Ram wire / enclosure insulation	10	m

Research Design

This study was designed using a completely randomized design (CRD), namely 4 treatments with 4 replications. The arrangement of the treatment is as follows: P0 = Basal Feed P1 = Basal Feed + 1% Black Cumin Flour + 3% Noni Leaf Powder P2 = Basal Feed + 2% Black Cumin Flour + 2% Noni Leaf Powder P3 = Basal Feed + 3% Black Cumin Flour + 1% Noni Leaf Powder

Research Procedure

The study used 96 quails of the autumn strain aged 45 days, 6 for each experimental unit. Maintenance was carried out for 4 weeks of treatment plus 3 days of environmental adaptation. Rations and drinking water were provided ad libitum. Cages and drinking bowls are cleaned every morning. The research sample was taken at the age of approximately 30 days. A total of 2 pullet quails were taken randomly from 16 experimental units so that a total sample of 32 broiler chickens were slaughtered and processed into carcasses. The resulting carcass is then subjected to organoleptic testing to see the physical quality of the broiler meat including observation of color, texture, flavor, tenderness, impression of juice/wetness (juiceness) and level of preference with scores/numbers ranging from a scale of 1 – 5 as shown in Table 3.

Table 3. Scale for Testing the Organoleptic Properties of Quail Meat

Test Parameters	Scale				
	1	2	3	4	5
Color	Dark red	Bright red	Pink	Pale white	White
Texture	Not smooth	Less subtle	Quite smooth	Soft	Very smooth
Flavor	Very fishy	Fishy	Quite fishy	A little fishy	Not fishy
Tenderness	Not tender	Less tender	Quite tender	Soft	Very tender
Effect of juice/wetness (Juiceness)	No juiceness	Little juiceness	Enough juiceness	Juiceness	Very juiceness
Levels of delight	Disliked	Little liked	Quite preferred	Liked	Very liked

The organoleptic test of meat was carried out by cooking meat samples without salt or spices. Boil the meat for 60 minutes at 80ºC. The length, width and height of each piece of meat are 1 x 1 x 1 cm. The panelists used in this test were semi-trained (10) semi-trained panelists according to the method of Sundari et al. (2013). All panelists are tasked with giving a score to each sample presented in the form provided. Data on organoleptic test results were analyzed using non-parametric statistics Kruskal Wallis and ANOVA for significantly different ones followed by the LSD test using the SPSS computer program version 16 for Windows.

RESULTS AND DISCUSSION

The results of the organoleptic quality test of quail meat including color, texture, flavor, tenderness, impression of juice/wetness (juiceness), and level of preference are shown in table 4.

Table 4. Results of organoleptic quality test of quail meat

Treatment mean	Parameter					
	Color	Texture	Flavor	Tenderness	Juiceness	Levels of Delight
P0	3.86±0.11 a	3.23±0,16 b	3.41±0,34 a	3.27±0,32 a	2.77±0,16 a	2.59±0.11a
P1	3.97±0.12 a	3.18±0,13 b	3.25±0,42 a	3.01±0,07 a	2.64±0,20 a	2.48±0,31a
P2	3.87±0.28 a	2.83±0,10 a	3.17±0,09 a	3.06±0,22 a	2.64±0,29 a	2.61±0,29a
P3	3.70±0.09 a	2.86±0,33 a	3.22±0,17 a	2.97±0,17 a	2.97±0,22 a	2.69±0.14 a

Description : P0 = Basal Feed; P1 = Basal feed + 1% black cumin flour + 3% noni leaf meal; P2 = Basal feed + 2% black cumin flour + 2% noni leaf meal; P3 = Basal Feed + 3% Black Cumin Flour + 1% Noni Leaf Meal. Different superscripts in the same column show differences real ($P<0.05$).

Organoleptic Quality Test is a number of parameters of a product that can be assessed by organoleptic test and used as a reference in selecting a product. Meat organoleptic test assessment was carried out using hedonic test methods such as color, texture, flavor, tenderness, taste and juceness. The hedonic test was carried out by the panelists to assess the level of quality parameters for the meat samples (Usman 2022). Organoleptic test on quail meat treated with P0 = Basal Feed, P1 = Basal Feed + 1% Black Cumin Flour + 3% Noni Leaf Powder, P2 = Basal Feed + 2% Black Cumin Flour + 2% Noni Leaf Powder, P3 = Feed Basal + 3% Black Cumin Flour + 1% Noni Leaf Powder.

Effect of Treatment on Color

The results showed that the feed treatment had no significant effect on the color test results. Treatments between P0, P1, P2, and P3 were not significantly different. The color of the meat between treatments, which was not significantly different in this study, was probably due to the average consumption of feed which was almost the same, and quail, including poultry, had looser and less meat fiber, while for treatments P2 and P3, the difference was significantly due to the level of digestibility of feed ingredients in quail. higher than treatment P0 and P1. Yamantino Taran et al. (2015) stated that the high and low brightness of meat color is

caused by protein and water bonds and the meat fiber is not too dense so that light can spread and make the color of the meat look brighter. Novan Sodika (2009) added Black Cumin (Nigella sativa L.) supplementation in rations without affecting the consumption of dry matter and organic matter, but affecting the digestibility of dry matter and organic matter digestibility.

Effect of Treatment on Texture

The results of the variance analysis showed that there was a significantly different effect (P<0.05) between the texture of meat in P0.P1 treatment with P2.P3, while P0 with P1 treatment was not different, as well as P2 and P3 treatment was not different.

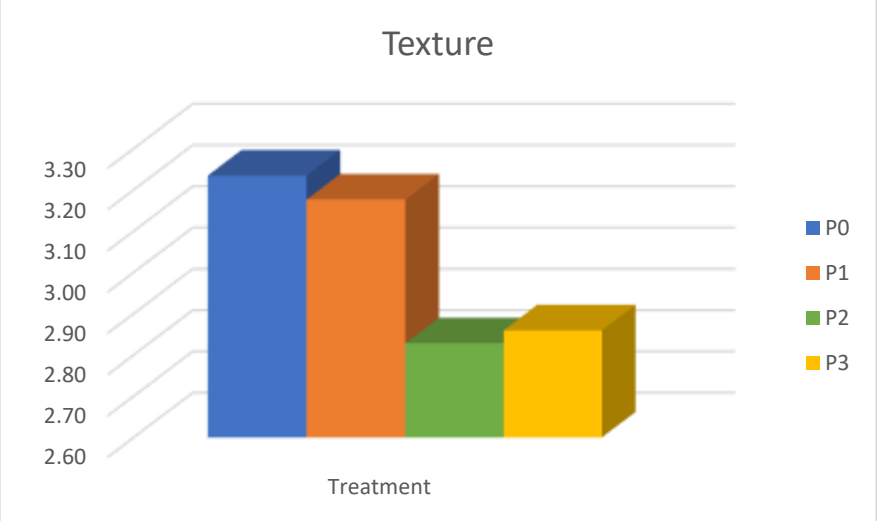

Figure 1. Graphics of texture chart on quail meat

The treatment of the feed given had a significant effect on the texture of quail meat (P<0.05). The texture of meat is determined by muscle fibers (myofibrils), while myofibrils are composed of filaments that contain connective tissue that surrounds the constituents of the meat. Muharram Fajrin Harahap (2017). The increase in the size of the muscle fibers with increasing age causes the texture of the meat of older animals to become coarser and the tenderness to decrease. Texture related to the tenderness of meat is influenced by various factors. Meat tenderness is largely determined by at least three meat components, namely: 1) myofibril structure and contraction status, 2) connective tissue content and degree of cross-linking, and 3) water holding capacity by meat protein and meat juice (Soeparno 1992).

Effect of Treatment on Flavor

The results of the analysis of variance showed that the feed treatment had no significant effect (P>0.05) on the flavor of quail meat between treatments, both without giving a combination of black cumin flour and noni leaf flour (P0-control) or with the addition of a combination of black cumin flour additional feed. and noni leaf powder (P1-P3).

Flavor is one of the parameters in sensory testing of the physical quality of broiler chicken meat. The smell of meat very quickly gives an impression on consumer acceptance because it can be smelled from a close distance even though they haven't seen the product directly. Even so, flavor is a very subjective taste and smell, because everyone has different sensitivities and preferences.

The treatment given was not significantly different between treatments because they were on the same score, namely on a scale of ≥3 (smelling quite fishy). Syamsuryadi (2017) that the flavor of poultry meat is influenced by several factors such as gender, nation, cage environment, slaughter environment, conditions before slaughter, intramuscular fat and meat water content.

The Effect of Treatment on Tenderness

One that affects the physical quality of meat is tenderness. The results showed that the feed treatment P0, P1, P2 and P3 had no significant effect (P>0.05) on tenderness of quail meat. So there is no significant difference in each treatment. This can be caused by relatively the same feed and age of livestock. In addition, it could also be caused by the high crude protein content in noni leaf flour (Morinda citrifolia L) and black cumin flour (Nigella sativa), each of which was given 2% of the total ration given. Tenderness occurs when the amount and strength of collagen increases with increasing age, so that covalent cross-linking increases during livestock growth and development (Arip Anjaya et al., 2019).

Soeparno (2009) adds that the tenderness of meat is also influenced by several factors, namely pre-slaughter (antemortem) factors including genetics, management, species, animal physiology, and age. Factors after cutting (postmortem) include withering, freezing, processing methods, and the addition of softening agents.

Effect of Treatment on Juiceness

The results of the analysis of variance showed that there was no significant effect (P>0.05) on the effect of meat juice/wetness (juiceness) between treatments, both without giving the additional feed combination of black cumin flour and noni leaf meal or by giving the combination of these additional feeds.

The impression of juice / wetness (juiceness) is related to the degree of wetness of quail meat when pressed or chewed. The results showed that all treatments were not significantly different because they had scores on a scale of ≤3 (sufficient juiceness). Soeparno (2005) states that the low meat juice content is caused by high cooking losses to minimum cheese which can be achieved when the meat pH is ± 6.0. Soeparno (2005) adds that meat of good quality relatively contains more juice than meat of low quality.

The Effect of Treatment on the Likeliness Level

The results of the analysis of variance showed that there was no significant effect (P>0.05) on the level of preference for quail meat between treatments, both without giving a combination of black cumin powder and noni leaf meal as well as by giving a combination of black cumin powder and noni leaf meal.

Organoleptic tests on the level of preference for quail meat show the level of consumer acceptance of the overall sensory properties of quail meat, especially those related to flavor and taste. Purwana et al. (2018) states that apart from flavor, consumer acceptance is also influenced by the taste of the food itself. Taste is considered more dominant by consumers compared to other quality characteristics. Taste and flavor are influenced by the type of feed, processing methods and seasonings used. In each treatment it did not show a significant difference, which was at a score of ≤ 3 (fairly preferred). The treatment given did not affect the level of panelists' preference for quail meat. Panelists' acceptance of quail meat is subjective, which varies depending on which side can make them satisfied with their physiological and sensory responses (Nur, 2022). The study of Sundari et al. (2013) showed that the level of panelist acceptance of broiler meat was not affected by the level of addition of turmeric extract nanocapsules in the feed. This could be due to the satisfaction derived from meat consumers depending on physiological and sensory responses among individuals (Soeparno, 2005). Dita et al. (2016) stated that the more black cumin added, the more bitter and astringent the after taste would be. Thayalini (2015) added that the saponin content in black cumin is 0.139 mg/100 g. Saponins have solubility properties that are easily soluble in water and insoluble in ether, taste bitter (Andien et al., 2021). Good quality meat has a relatively savory taste and pleasant flavor (Warsito et al., 2015) for the spices used, because spices play an important role in providing the taste and flavor that consumers like.

CLOSING

Conclusion

Based on the research results obtained, it can be concluded that from several organoleptic tests on quail meat including color, texture, flavor, tenderness, juiceness and level of preference, only texture had a significant effect in general, treatment P2 (raising using herbs showed a significant difference between treatments P0 ,P1 with P2,P3.

Suggestion

It is recommended that in future studies, physical tests other than organoleptic be carried out such as: pH values of broiler meat, cooking losses, and water holding capacity of meat.

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