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Organoleptic and Hedonic Quality of Salted Chicken Eggs with the Brick Salting Method

Muhammad Ali Shodiqin[1*], Imam Ma'ruf[2]
1Agricultural Product Technology Study Program, Affiliation Name. Example: Islamic Education, KH. A. Wahab Hasbullah University
2Agricultural Product Technology Study Program, Affiliation Name
3Third Author's Study Program, Affiliation Name
*E-mail:shodiqinali418@gmail.com(corresponding author email only)

ABSTRACT

This study aims to analyze the organoleptic and hedonic quality of salted chicken eggs against the duration of incubation using the brick salting method. This study has 4 variants of incubation time with the code: ABB with a storage time of 3 days, BCC with a storage time of 5 days, CDD, with a storage time of 10 days and DFF with a storage time of 15 days. The method used in this study is data collection through organoleptic tests and hedonic tests with panelists. The results showed that the longer the storage, there was an increase in salt content and significant changes in the texture and taste of salted eggs. This study is an experimental RAL study involving 10 panelists. Sensory analysis used advanced ANOVA and BNT tests with a level of 5%. The results showed that the DFF egg variant had the softest texture among all salting treatments.

Keywords: *Salted eggs, storage, quality, organoleptic, physicochemical.*

INTRODUCTION (font size 12pt)

Salted eggs are one of the preserved products and also processed eggs that have a long shelf life and have a salty taste (Yusuf, 2007). The preservation process with salt solution not only increases the shelf life, but also provides added nutritional value, making it one of the complementary foods in various dishes. The high demand for salted eggs makes this product an important commodity in the local food market.
According to Wulansih (2008), quality salted eggs have a fairly salty taste, reddish egg yolks, a salty impression, and slightly oily edges, yellowish egg whites, and a good aroma and taste. Making salted eggs involves several important stages, starting from selecting quality eggs to the soaking process in a salt solution. Salting eggs can be done by soaking the eggs in a saturated salt solution (wet method) and by wrapping/wrapping the eggs with
salt dough, and ash (dry method) (Lukito et al., 2012). The selected chicken eggs must be fresh and have intact shells to ensure the final quality of the product. The soaking process in the salt solution affects the level of salt penetration into the eggs, which has an impact on taste and texture.
During the preservation process, various chemical and physical changes occur in salted eggs. For example, increasing the salt content in eggs can cause changes in texture, where the eggs become more chewy and dense. In addition, changes in pH and water activity also occur, which can affect the microbiological stability of eggs (Sari et al., 2021). Understanding the interactions between these factors is essential to improving the quality of the resulting product.
The review of salted egg quality also includes organoleptic analysis, which assesses aspects of taste, aroma, and texture. This assessment is crucial to determine the level of consumer acceptance of the product. The results of research by Budiarto et al. (2019) showed that the sensory quality of salted eggs is greatly

influenced by storage time and salt concentration, which leads to consumer preferences.
This study aims to evaluate the effect of storage time on the quality of salted chicken eggs. By understanding the dynamics in the manufacture and storage of salted eggs, it is expected that the results of this study can provide useful information for producers and consumers. The findings of this study will be an important reference in improving the quality and competitiveness of salted egg products in the market, as well as contributing to the development of the food processing industry in Indonesia.

METHOD (font size 12pt)

The research methods used in this study include aspects of time and place of research, research tools and materials, experimental design, as well as recipes and methods for making salted chicken eggs.

Time and Place of Research

This research was conducted on May 22, 2024 in Badas Village, Sumobito District, Jombang Regency, East Java.

Research Tools and Materials

The tools used are basins, pans, sieves, hammers, sieves, and sacks. The materials used are chicken eggs, coarse salt, water, and red bricks.

Experimental Design

This study applies an experimental design with an experimental method with a Completely Randomized Design (CRD) of one factor with a comparison of the storage time of salted chicken eggs consisting of 4 treatments, namely with the code ABB (storage time 3 days), BCC (storage time 5 days), CDD (storage time 10 days), and DFF (storage time 15 days). All treatments were treated with the same composition of red brick, water and salt.

Salted Egg Recipe

Every 1kg of fine red brick uses 250 grams of coarse salt and 220 ml of water.

How to make Salted Chicken Eggs

First, soak the eggs in water for 2 minutes. If there are any eggs that float, just throw them away, because the eggs are not good, Then clean the eggs thoroughly. Be careful when cleaning them so that the eggshells do not break or crack, Mix the crushed bricks that are really fine with water. Stir well. Do not let it runny. Form into a paste, Add salt. Stir again. You can stir it using your hands or a spatula, Coat the eggs with soil until they clump like clay or stone. Approximately until the thickness reaches 3 cm, Put them in a bucket one by one, Sprinkle the eggs that have been coated with soil with enough bricks, Let stand for 15 days, After the process is complete. Boil the eggs over low heat. Do not let the water boil so as not to damage the eggs. Boil for 1 hour, Salted eggs are ready to serve.

RESULT AND DISCUSSION (font size 12pt)

In the results and discussion section below, a detailed analysis of the sweetness test, yeast aroma, texture, and hedonic test through the ANOVA table will be presented, with the aim of providing an in-depth understanding of the significant differences between the 4 variants of salted chicken eggs that have different incubation times.

Result (font size 11pt)

This study aims to analyze the effect of storage time on the physical, chemical, and sensory qualities of four variants of salted chicken eggs processed with a similar method. These variants of salted chicken eggs were stored for different periods, namely 3 days, 5 days, 10 days, and 15 days.
Each variant was analyzed based on the following parameters: egg texture, egg yolk color, egg aroma, preference/hedonic. In addition, a sensory test was also conducted through panelists to assess preferences for the four variants.

A. Hedonic Test Results

Based on the results of the hedonic test, there was no significant difference in the level of consumer preference for the four variants of salted chicken eggs tested. This shows that even though there are variations in storage time, consumer preferences for the product remain consistent. Thus, producers have the flexibility to choose the duration of storage without significantly affecting the level of consumer preference.

Figure 1. BCC Code

1. ANOVA table test results

This study uses the ANOVA table as the main analysis tool. In its use, the ANOVA table is used to analyze significant differences between the averages of several groups or treatments in this study. The data analysis process involves statistical data processing, including:

a. Salted egg texture test results

In this study, researchers focused on the analysis of salted egg texture to evaluate whether the applied treatment could affect the final texture results. Based on the results of the ANOVA conducted, it was found that there was a significant difference in the texture of the salted eggs tested. The calculated F value for texture (4.261745) was greater than the F table at a significance level of 5% (3.558571), indicating that the observed differences were not coincidental, but rather the result of the treatment given.

This means that researchers can conclude that there are certain factors in the salted egg processing process that affect the final texture. This finding is important for product development, because texture is one aspect that greatly affects the quality and consumer preference for salted eggs. Researchers should consider this finding in the next steps, such as in refining production methods or in further research to determine the specific factors that have the most influence on texture.

Table 1. anova salted chicken egg texture

SK	DB	JK	KT	F. Count	F. Table 5 %
Panelists	9	31,225	3.46944	1.525627	2.4562811
Texture	3	29,075	9.691666	4.261745	3.5545571
Error	27	63,675	2,274107		
Total	39	123,975			

Description: Analysis in Table 1. shows that the calculated F value for the texture of salted chicken eggs (4.261745) is higher than the F table value at a significance level of 5% (3.5545571). This means that there is a difference in preference for the texture of salted chicken eggs.

b. Average texture of salted chicken eggs

The results of the 5% BNT test showed that the DFF egg variant had the softest texture compared

to other variants, namely CDD, BCC, and ABB. This difference was statistically significant, indicated by the results of calculations involving significant limits (BtT.s.) and t-critical values in the analysis test.

According to Santoso et al. (2020) variations in salting methods and storage times can affect the texture of salted eggs. In the study, eggs that were stored longer tended to have a denser texture due to the dehydration process. This finding is consistent with the test results shown, where the DFF variant had the softest texture, this is related to differences in treatment or salting duration compared to other variants.

Table 2.average texture of salted chicken eggs

Variants	Average texture
DDF	2.8 a
CCD	4.7 b
BCC	4.8 b

Conclusion : The DFF egg variant has the softest texture among all the salting methods

c. Egg yolk color test results

The yellow color of salted eggs is an important indicator of quality, which can be influenced by various factors, such as the type of feed, the length of the salting process, and the manufacturing technique. In this study, a test was conducted on the intensity of the salted egg yolk color using the ANOVA (Analysis of Variance) method.

The test results showed no significant variation in the color of salted egg yolk based on the treatment given. Statistically, this is indicated by the calculated F value which is smaller than the F table, which indicates that the difference in the color of the egg yolk in the tested samples did not occur by chance, but rather due to the treatment applied during the salted egg making process. Based on the test results in Table 1, it is known that the use of pigment extracts affects the quality of the color of salted eggs. Good quality salted eggs have a reddish egg yolk color (Wulansih, 2008),

By understanding the relationship between treatment and egg yolk color results, researchers can recommend optimal procedures to produce consistent and quality salted egg yolk color. These results can also be used as a reference in the development of salted egg products in the future, to improve the visual appeal as well as the nutritional quality of the product.

Table 3. Anova egg yolk color

SK	DB	JK	KT	F. Count	F. Table 5 %
Panelists	9	21.5	2,388888	1.922222	2.4562811
Egg yolk	3	10.1	3.366666	1.751444	3.5545571
Error	27	51.9	1.922222		
Total	39	83.5			

Description: Analysis in Table 3. shows that the calculated F value for the texture of salted chicken eggs (1.751444) is higher than the F table value at a significance level of 5% (3.5545571). This means that there is no difference in the color of salted chicken egg yolks.

d. Salted chicken egg aroma test results

The results of the salted chicken egg aroma test showed that there was no significant difference in aroma preferences among salted egg samples. According to (Prof. Hanny Wijaya) stated

that results like this indicate that aroma is not a significant differentiating factor between the samples tested. In this case, manufacturers may need to focus on other attributes such as taste or texture that may have a greater influence on consumer preferences.

This is in accordance with the opinion of Winarno (1997) who stated that the organoleptic parameters for this taste are closely related to the aroma produced by the egg because in a food other supporting factors are needed, including the sense of smell. Aroma testing is carried out to identify consumer preferences for the aroma of the product and to measure whether the aroma meets consumer expectations.

Table .4 Anova salted chicken egg aroma

SK	DB	JK	KT	F. Count	F. Table 5 %
Panelists	9	24.6	2.733333	0.938931	2.4562811
Egg aroma	3	15.4	5,133333	1,763358	3.5545571
Error	27	78.6	2.911111		
Total	39	118.6			

Description: Analysis in Table 4. shows that the calculated F value for the aroma of salted chicken eggs (1.763358) is higher than the F table value at a significance level of 5% (3.5545571). This means that there is no difference in the aroma of salted chicken eggs.

e. Salted chicken egg preference test results

Salted eggs are one of the traditional food products widely consumed in Indonesia. The salting process provides a distinctive taste and aroma, which is the main attraction for consumers. In addition, texture and appearance are also important factors in determining consumer preference for this product. To find out how much consumers like salted eggs, a preference test or hedonic test is conducted. This test aims to evaluate whether there are differences in preferences between the various salted egg samples tested.

According to Dr. Rudi Wicaksono, in cases where there is no significant difference in preference, manufacturers can focus their efforts on other aspects of the product, such as improving production efficiency or adding added value through packaging or marketing, rather than changing the existing product formula.

Table .5 Anova of preference for salted chicken eggs

SK	DB	JK	KT	F. Count	F. Table 5 %
Panelists	9	20.4	2,266666	0.794805	2.4562811
Egg aroma	3	20.5	6.833333	2,396104	3.5545571
Error	27	77	2.851851		
Total	39	117.9			

Description: Analysis in Table 5 shows that the calculated F value for preference of salted chicken eggs (2.396104) is higher than the F table value at a significance level of 5% (3.5545571). This means that there is no difference in preference of salted chicken eggs.

Discussion (font size 11pt)

In food product evaluation, sensory tests such as color, aroma, texture, and liking play an important role in assessing product quality and consumer perception. These tests aim to determine how well a product is accepted by consumers based on various sensory attributes. Discussion of the results of these tests is not only important for understanding consumer preferences but also for better product development.

1. Salted chicken egg yolk color

   In addition to taste, color in a product, especially food products, plays an important role in consumer acceptance. If a product has an attractive color, it can increase consumer appetite to try the food. Setyaningsih (2008) in Lesmayati (2014) added that color is the most important quality attribute, even though a food product has high nutritional value, good taste and good texture, but if the color displayed is less attractive, it will cause the food product to be less in demand by consumers. Testing with the sense of sight is still very important in sensory testing of color in food products (Putri, 2011). If sensory testing shows significant color variations between samples, this could be an indicator of differences in quality or production processes.

   The color of the egg yolk before salting is yellow, the color will change to brownish yellow, dark brown, orange, or bright yellow after going through the salting process. The change in yellow color is related to the loss of water and some fat that becomes free from the egg yolk. Water content affects the concentration of pigments (Oktaviani, (2012) in Masykuroh (2016).

2. The aroma of salted chicken eggs

   Aroma or smell testing is one of the important tests because it can provide assessment results on the acceptability of the product (Kartika, et al., (1988) in Lesmayati, (2014). Aroma can be used as an indicator of damage to processed food products. Salted eggs that are no longer suitable for consumption will smell very pungent/rotten. Aroma has an important function in processed food products, because before consuming, the aroma of the food will usually be smelled by the sense of smell (nose), if the aroma of the product is too pungent or seems bland, it will make consumers not interested in consuming it**.**Therefore, control over the quality of raw materials and production processes is very important to maintain the desired aroma.

   Masykuroh (2016) added that a good aroma of salted eggs is that it does not smell of ammonia, does not smell rotten, and does not smell other unwanted odors. The rotten odor is formed from compounds such as ammonia, H2S, indole, and amine which are the results of protein breakdown by microorganisms.

3. Salted chicken egg texture

   Texture is a sensory aspect that is directly related to the experience of consuming food products. The texture of salted eggs is influenced by water content, namely where reduced water content causes the texture of salted eggs to become harder. In the salting process, the ability of NaCl to bind water has a greater affinity than protein, causing the distance between protein molecules to be closer so that the interaction between protein molecules is stronger.

   The strong bond causes the protein to coagulate, causing the protein texture to become more chewy. In addition, the texture of egg white can be influenced by several factors, namely protein content, heating temperature, ionic strength and interaction with other components (Nurhidayat et al., 2013). Budiman et al., (2012), added that the level of chewiness that tends to increase is due to the influence of water content, a small water content will produce a chewy texture.Changing textures from batch to batch can disrupt the consumer experience and decrease their liking for the product.

4. Salted chicken egg favorite

   Overall liking is an attribute that combines all sensory aspects into one final assessment. The dominant taste of salted eggs is salty, but there is also a savory sensation produced by the fat content in the egg yolk. According to hedonic theory, humans naturally have a preference for salty and savory (umami) flavors, because these two flavors are usually associated with the nutritional content needed by the body, such as sodium and protein. As explained by Moskowitz et al. (2004) in their study of hedonic responses to food, saltiness is one of the five basic tastes that has great potential to produce eating satisfaction.

Salted eggs are often used in various types of food, such as rice, porridge, and side dishes. This variety of uses increases the appeal of salted eggs because consumers can enjoy them in various ways. A study conducted by Yulianto et al. (2017) showed that versatile food products tend to be preferred because they give consumers the freedom to combine them with other foods, thus enriching their eating experience.

CONCLUSIONS (font size 12pt)

Based on the results of the aroma, egg yolk, and preference test, no significant differences were found among the four variations tested. This indicates that in general, these variations have similar aroma and egg yolk characteristics, and are preferred at relatively the same level by the panelists. However, there are significant differences in egg texture among the four variations. This indicates that the variations tested affect egg texture, which may be influenced by factors such as processing methods or additional ingredients used, so further testing is needed to find the storage / salting time.

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