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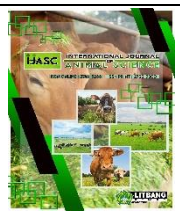

Acidity Levels and Water Content of Eggs Consumed in Various Types of Markets in North Sinjai District, Sinjai Regency

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ABSTRACT

This research aims to determine the level of acidity and water content of eggs consumed in various types of markets spread across North Sinjai District. This research method uses a Completely Randomized Design (CRD) with 3 treatments and 3 repetitions. P1: Supermarket, P2: market traditional, P3: Retail Seller. The variables measured are pH (degree of acidity), water content, total titrated acid. The results of this research show that the treatment did not have a significant effect on the average water content and total titratable acid. The level of preference for consumption of eggs is found in supermarkets. The results of this research on the pH of yolk were supermarket 7.78, traditional markets 7.62, and retail sellers 7.21. The pH of albumin is 6.84 in supermarkets, 6.95 in traditional markets, and 6.98 in retail sellers. In water content, namely supermarkets 59.35%, traditional markets 55.29%, and retail sellers 53.45%. In the total titrated acid that is supermarket 15.37, traditional markets 15.59, and retail sellers 20.14. Conclusion from this research is based on the results and discussions can be concluded that egg consumption in various types of markets has a real influence on water content and total titratable acid.

1. Introduction

Purebred chicken eggs are a food that contains quite high protein with a complete amino acid composition. In general, purebred chicken eggs are the livestock food most often consumed by the public. Purebred chicken eggs contain high nutrition, continuous availability, and relatively cheaper prices compared to other eggs, making purebred chicken eggs very popular with consumers.However, like other livestock products, purebred chicken eggs are a perishable food. Technology during storage is very careful so that it can protect eggs from decreasing quality [1].

Eggs consumed by Indonesian people generally come from farmed poultry. The types of eggs that are widely consumed are chicken eggs, quail eggs and duck eggs. Purebred chicken eggs are more widely used in everyday life because they are easy to process and use for community needs such as ingredients for mixing food, ingredients for making bread, medicine, and so on. Purebred chicken eggs have a round to oval physical shape with different sizes, depending on the type of animal, age and genetic characteristics. Eggs are composed of three parts, namely egg shell, egg white and egg yolk [2].

Eggs have several advantages that are worth considering, such as reducing weight, good for eyesight, building muscle mass, good for pregnant women, and good for bones. Eggs also have disadvantages in certain conditions, consuming eggs can have negative effects on the body, such as consuming too many eggs can increase the level of bad cholesterol in the body and trigger the risk of diabetes and consuming too many eggs can cause kidney problems.

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The distribution of eggs from distributors to retailers has shown a physical decline [3]. The longer the egg storage period results in the weight and height of the egg white being lower while the pH of the egg white becomes higher [4]. Research results [5] also show that during storage, egg weight decreased from approximately 61 grams to 57 grams after 10 weeks of storage. Egg white height also decreased from 7.05 mm to 4.85 mm. Likewise, microbial contamination of eggs has increased [5]. The aim of this research is to determine the level of acidity and water content of eggs consumed in various types of markets in North Sinjai District, Sinjai Regency.

2. Method

2.1 Research Procedure

In this research, 5 purebred chicken eggs were used each obtained from several places, namely supermarkets, traditional markets and retail sellers. The work procedure for this research is to clean the chicken eggs from dirt that sticks to them using a rag or tissue, weigh the eggs to determine the weight of the chicken eggs, place the weighed chicken eggs in the egg tray so that the eggs do not broken, then the egg is broken and placed in a container to measure pH, total titrated acid, and water content.

2.2 Research design

This research was carried out experimentally using a Completely Randomized Design (CRD) with 3 treatments, each treatment having 3 replications, with 45 eggs used. This treatment consists of:

P1: Supermarkets
P2: Traditional Market
P3: Retail sellers

2.3 Data Analysis Technique

Data obtained from experiments and tests in the laboratory were then analyzed statistically using ANOVA (Analysis of Variance). Analysis of variance by comparing F count with F table. If the calculated F value > F table at the 5% level then the effect of the treatment is significantly different [5]. F count is used to determine the source of variation and differences in observed variables due to the influence of treatment.

The RAL mathematical model (completely randomized design) is as follows:

$$Yij = \mu + \alpha i + \in ij$$

Yij : Observation response variable.
μ : Average value of observation results
αί : Effect of treatment i
∈ij : Influence of experimental error from the i-th treatment and j-th replication
Where : i: Treatment (1, 2 and 3)
j : Deuteronomy (1, 2 and 3)

3. Results and Discussion

3.1 pH Yolk

The pH (Potential hydrogen) of yolk in the study showed a significant difference (P<0.05) which can be seen in Figure 1.

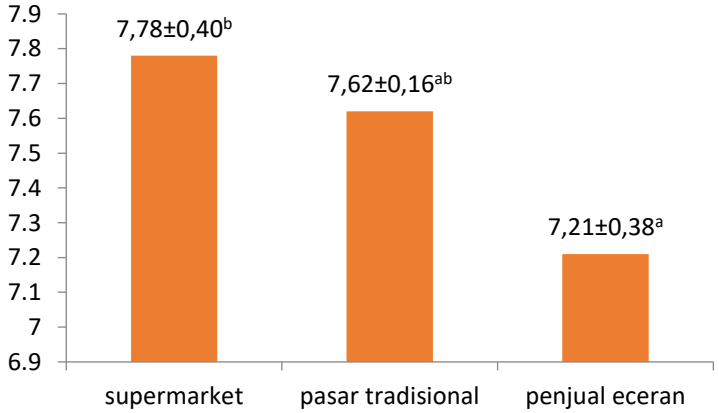

Figure 1. Yolk pH diagram. Different superscripts indicate significant differences (P<0.05).

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The results of the analysis of variance showed that research on egg consumption in various types of markets had no significant effect (P<0.05) on the pH of yolk. A very significant difference could be seen in the treatment of supermarkets 7.78%, traditional markets 7.62%, and retail sales 7.21 %. The diagram shows that the pH of yolk from all treatments is included in the large category. However, if seen based on the yolk pH indicator, eggs from all market groups meet the requirements of SNI 3926 2008 as consumption eggs. This shows that the pH of yolk is very suitable for consumption in supermarket treatments [6].

The best value of several treatments lies in the supermarket value (7.78 ± 0.40) where the pH value of good yolk ranges from 0.40 – 0.42. This is in accordance with research by [6] which shows that the amount of contamination e. Coli in broiler chicken eggs will affect egg yolk and the effect of room temperature storage (supermarket).

[7] stated that the quality of egg yolk depends on room temperature (supermarket), whereas the treatment of traditional markets and retail sellers of egg yolk produced will have little effect. This is in accordance with research by [7] which states that treatment management influences the amount of bacterial contamination in egg yolk conditions more than in supermarket treatments, but because it is thought that the eggs are old and stored at temperatures directly exposed to the sun, the The total number of yolk produced by bacteria is greater [7].

3.2 pH Albumen

The pH of broiler egg albumen in this study showed no significant difference (P>0.05), which can be seen in Figure 2.

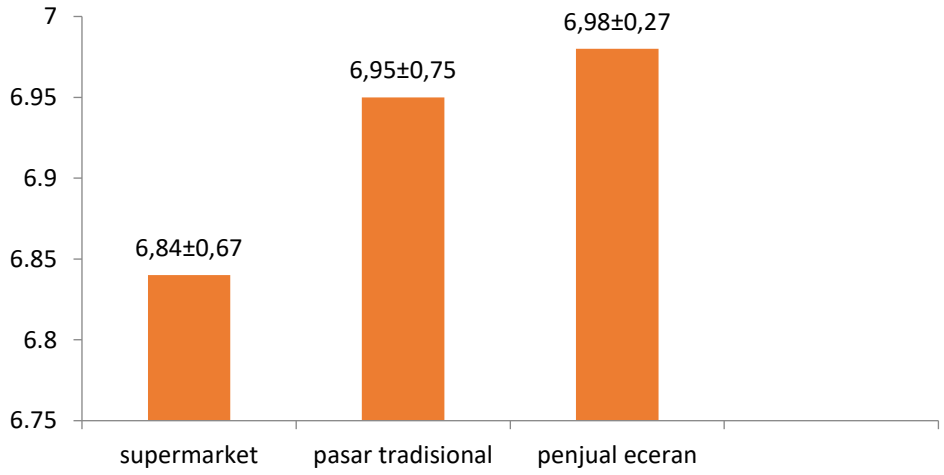

Figure 2. Albumin pH diagram.

The results of analysis of variance showed that albumen pH did not have a significant effect (P> 0.05) on research on acidity levels and water content in consumption eggs. Based on this diagram, it can be seen that consumption eggs provide a better albumen pH value in the retail sales treatment compared to the supermarket and traditional market treatment, in the supermarket treatment the resulting value is 6.84% while in the traditional market it increases by 6.95%. The best value of several treatments lies in retail sales with a value of 6.98%. If consumption eggs are stored longer, the pH of the albumen increases and becomes smaller, this is because the pH of consumption egg albumen becomes increasingly dilute due to the uncertain temperature.

Albumen pH increases due to consumption eggs being stored for several days at a less stable temperature which is accelerated by the increase in albumen pH. [8] that changes in albumen pH in consumption eggs are caused by temperature exchange between the outside and the contents of the egg through the pores of the egg shell and evaporation of water as a result of long storage and the influence of temperature. The higher the storage temperature and the longer the storage time, the more the albumen pH increases [8]. The loss of CO through the shell pores causes the concentration of bicarbonate ions in the egg white to decrease and damages the buffer system. This causes the pH of the egg to rise and the egg white to become alkaline [9].

3.3 Water content

The water content in the study showed no significant difference (P>0.05) which can be seen in Figure 3.

The results of the analysis of variance showed that the treatment of consumption eggs in various types of markets had no significant effect (p>0.05) on the water content value of consumption eggs. Different treatments and storage times at room temperature will affect the water content of consumption eggs. Supermarket treatment has a real influence on the water content value of consumption eggs. Storing consumption eggs for a long time at

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room temperature can cause consumption eggs to experience a significant increase. This increase occurs because stable room temperature results in a reduction in the air cavity. The research results of [8] explain that stability of water content can occur due to room temperature when storing consumption eggs.

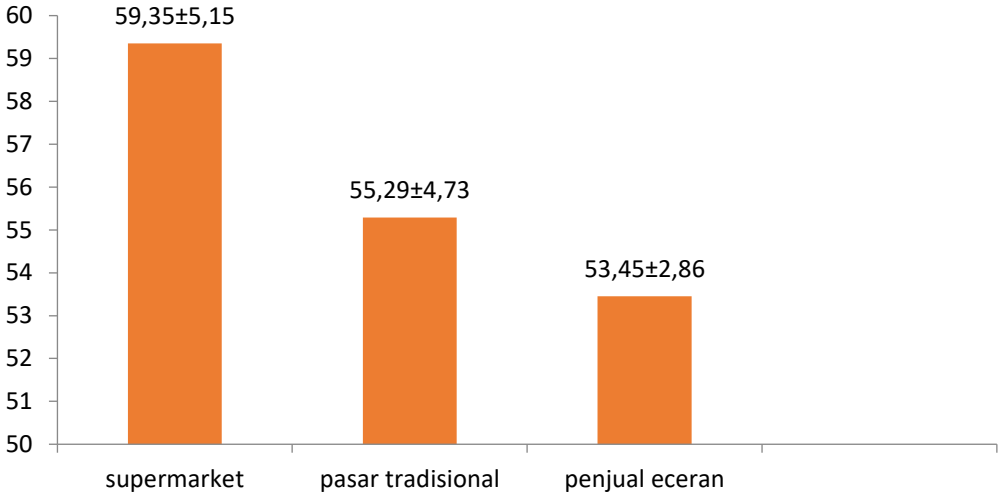

Figure 3. Water Content Diagram

The lowest water content in consumption eggs was shown in traditional market treatments (55.29%), and retail sales (53.29%). During the storage process and room temperature, the water content for each treatment showed different differences. It is suspected that the consumption egg treatment had a significant impact on each water content treatment. As the level of water content in consumed eggs decreases, the water content tends to decrease. The decrease in water content is also influenced by the temperature intensity of egg consumption. This is in accordance with the results of [10] which states that the water content of consumption eggs ranges from 65.5% - 73.6%, therefore the water content in traditional market treatments and retail sales has decreased due to different room temperatures outside a certain range. . The research results are supported by [11] who stated that the decrease in water content could be caused by the evaporation of CO_2 in consumption eggs due to long storage and unstable room temperatures.

3.3 Total Titrated Acid

The total titrated acid in the study showed no significant difference (P>0.05) which can be seen in Figure 4.

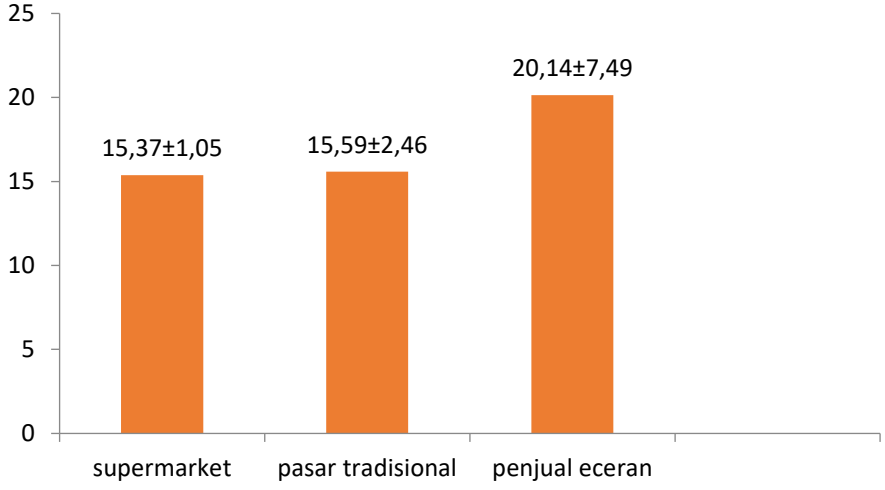

Figure 4. Total Titrated Acid Diagram

The results of the analysis of variance showed that the total titrated acid in research on consumption eggs in various types of markets showed no significant effect (P>0.05). Total titrated acid showed an increase in retail sales treatment of 20.14%. Even though there is no real difference between supermarket and traditional market treatments, the total production of titrated acid during the process has decreased due to an increase in the number of bacteria that can break down carbohydrate and protein compounds in food into acid compounds and water [12].

The retail sales treatment shows that the longer consumption eggs are stored, the total titration acid

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produced increases, this is due to the increase in the total amount of titration acid that occurs in consumption eggs. This increase in total titrated acid is proportional to the unstable room temperature and the length of storage in consumption eggs. This increase is also related to the microorganisms that grow in consumption eggs. This is in accordance with research on increased growth of microorganisms which causes cell growth caused by unstable weather conditions. and changing room temperature.

4. Conclusions

Based on the results and discussion of the research that has been carried out, it can be concluded that consumption of eggs in various types of markets has a significant effect on water content and total titratable acid.

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