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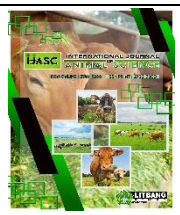

Functional Characteristics of Egg Consumption in Various Types of Markets Spread in North Sinjai District

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ABSTRACT

This study aims to determine the functional characteristics of egg consumption in various types of markets spread across North Sinjai District. The research design used analysis of variance (ANOVA) according to a completely randomized design (CRD) with 3 treatments and 3 replications. P1: Supermarkets, P2: Traditional Markets, P3: Retailers. This research uses purebred chicken eggs which are consumed with a total of 27 eggs. Parameters in this research are foam power, foam power and foam stability. The result of this research is that the type of market has no significant effect on the value of egg foam, egg foam and egg foam stability. The results of this study on foam power are supermarkets 543.81, traditional markets 673.98, and retail sellers 716.86. The bubble power is 205.67 ml for supermarkets, 222.33 ml for traditional markets and 285.67 ml for retail sellers. The foam stability is 95.72 ml for supermarkets, 94.27 ml for traditional markets and 94.28 ml for retail sellers. The conclusion of this study is that based on the results and discussion it can be concluded that the functional characteristics of eggs greatly influence the temperature and age of the eggs, retail sellers have a high foaming power of 716.86 ml and 285.67 ml of foaming power, whereas good foam stability is found in super markets 95.72 ml.

1. Introduction

Eggs are one of the foods consumed besides meat, fish and milk. The eggs consumed come from poultry such as chickens, ducks, geese and birds, but there are also small eggs such as fish eggs which are sometimes also used in dishes. Eggs that are suitable for consumption are consumption chicken eggs cultivated by smallholder farmers, of course they are brownish in color, contain lots of vitamins and OMMEGA 3, have thicker shells, do not contain chicken embryos, and of course are long-lasting. Eggs also generally contain the main components consisting of water, protein and fat [1].

[2] revealed that the older the egg, the diameter of the egg white will widen so that the egg white index becomes smaller. This change is caused by gas exchange between the outside air and the contents of the egg through the pores of the egg shell and evaporation of water due to storage time, temperature, humidity and porosity of the egg shell. Maintaining the quality of eggs so that they remain fresh from producers to consumers is the main problem in egg marketing. The possibility of a decrease in quality is not only caused by handling factors and environmental conditions at the marketing level.

Functional properties are the properties found in eggs, apart from their nutritional properties, which play a role in the processing process. The physical and chemical properties of proteins play an important role in determining the functional properties of eggs [3]. Therefore, changes to the physical and chemical properties of egg protein will also affect the functional properties of the egg.

The research results of [4] showed that the functional properties of purebred chicken eggs had a foaming power of 904.94%, a foaming power of 73.3% and a foam stability of 65.17%. Meanwhile, quail eggs showed that

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Ikhsan et al, International Journal of Animal Science 6 (1) 2024 hal. 12 – 16 ISSN 2086-5201 (Print)

the functional property values were lower, namely foam power of 657.00%, foam power of 72.8% and foam stability of 64.03%. Even though the foaming capacity of purebred chicken eggs is different from that of quail eggs, the stability of the foam is not significantly different.

The functional properties analyzed are foam power, foam power, and foam stability. Apart from that, infertile chicken eggs are also used to make a product, namely sponge cake, and then a preference test is carried out. In the surrounding community, eggs have spread widely and have become the main food for people who are not suited to consuming fish or meat. In order to obtain adequate nutrition, people need to know the functional characteristics of eggs that are good for consumption and those that are not suitable for consumption. The aim of this research is to determine the functional characteristics of eggs consumed in various types of markets circulating in North Sinjai District.

2. Method

2.1 Research Procedure

Research on chicken eggs for consumption starts with preparing the eggs for consumption from supermarkets, markets and retailers, cleaning them using a clean cloth. Crack clean eggs to measure the height of the white and yolk, then beat using a stand mixer for 6 minutes at medium speed to determine the froth and foam power. Observe the time the foam falls to determine the stability of the foam.

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 Foam Power

Data on the foaming power of consumed chicken eggs circulating in the North Sinjai sub-district market are presented in Figure 1.

B.V Prastowo et al, International Journal of Animal Science 3 (3) 2020 hal. 72 – 75
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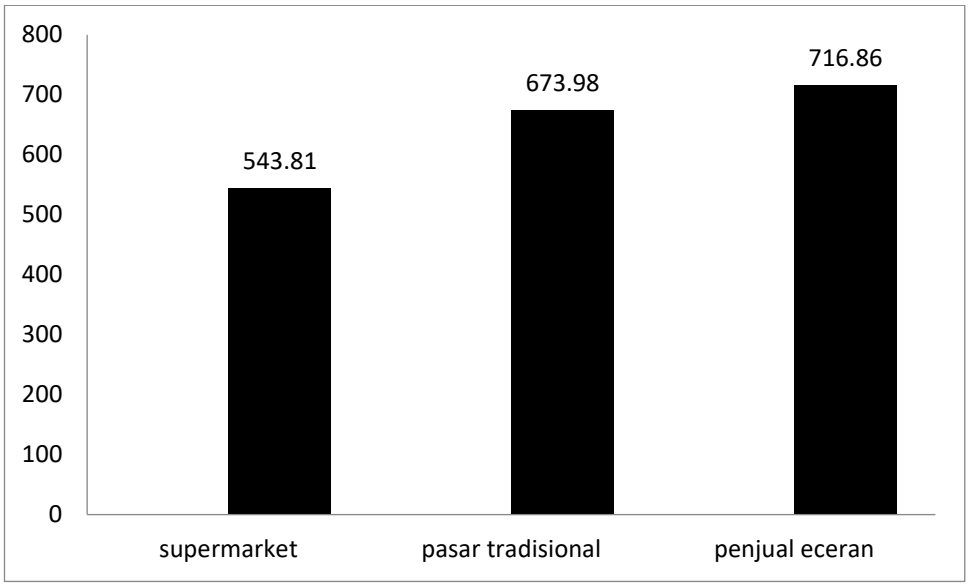

Figure 1. Foaming capacity of chicken eggs consumed from various types of markets circulating in North Sinjai District.

The results of statistical analysis showed that the functional characteristics of eggs had no significant effect (P>0.05) on the foaming power of eggs. This is due to the influence of the age of the eggs circulating in traditional markets. The length of egg storage can also be a factor in reducing the quality of the eggs, thereby affecting the foaming capacity of the eggs. This is in accordance with the opinion of [6] which states that the longer eggs are stored, the longer the foaming power of the eggs will decrease.

Temperature also greatly affects egg quality. According to [3], factors that influence the decline in egg quality are storage age, shell texture, temperature and relative humidity during storage. where eggs from supermarkets are mostly stored at a temperature of 18 ^{0}C, while from markets and retail sellers the storage temperature is approximately 25-28 ^{0}C. According to [7] ideal consumption storage is at a temperature of 27 ^{0}C with humidity of 60%.

Based on Figure 1, it can be seen that three repetitions of the foam power in the supermarket with the result being 543.81 ml was the lowest, the market was 673.98 ml and the highest foam power was found at the retail seller at 716,867. The total mean value of treatment in this study was 644.89%. The value obtained was higher from [8] research on egg white flour products fermented by *Saccharomyces cereviciae* (bread yeast) namely 523.07% and from [6] research on fresh egg whites it was higher, namely 688.32%. This is because in this study the eggs used did not vary in age.

3.2 Foaming Power

Data on the foaming power of consumption chicken eggs circulating in the North Sinjai sub-district market are presented in Figure 2.

The results of statistical analysis showed that the functional characteristics of eggs had no significant effect (P>0.05) on the foaming power of eggs. In each treatment, supermarkets had the lowest foaming power, namely 205.67 ml, traditional markets had 222.33 ml, and retail sellers had the highest foaming power, namely 285.67 ml. This is due to the long storage time of eggs, storing eggs for a long time can reduce the stability of the emulsion and foam but actually increases the foaming power of the eggs [9]. Temperature can also affect the foaming power of eggs, according to research [10] egg temperature also affects the ability of egg whites to form foam.

Based on Figure 2, it can be seen that the quality of foam in supermarkets is the lowest quality of foam because it is only 205.67 ml when compared to traditional markets and retail sellers. As we know, eggs are sourced from super markets where the storage temperature is cooler so the froth power is low. Meanwhile, the highest froth quality is from retail sellers with a froth power of 285.67 ml because the froth power is 8 times more than the initial volume. Good foam has a foaming power of 6 to 8 times the volume of egg white [11].

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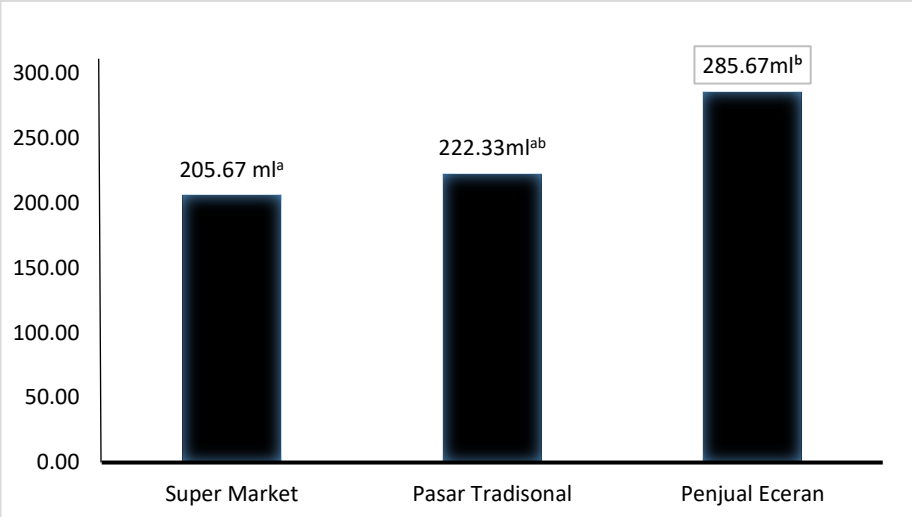

Figure 2. Foaming power of chicken eggs consumed from various types of markets circulating in North Sinjai District.

The total average value in the treatment in this study was 237.89%, while the value in [9] research had a higher foaming power, namely 330.11%. This is caused by the age of the egg, the longer the age of the egg can cause a decrease in egg weight and white, but increases the volume of egg white foaming power [12].

3.3 Foam Stability

Data on the stability of consumption chicken egg foam circulating in the North Sinjai sub-district market is presented in Figure 3.

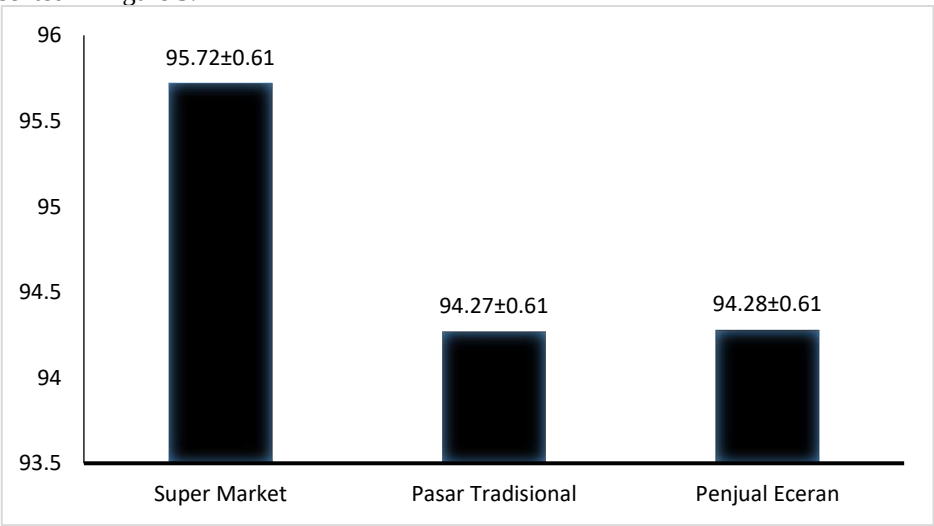

Figure 3. Stability of foam for chicken eggs consumed from various types of markets circulating in North Sinjai District.

The results of statistical analysis showed that the functional characteristics of eggs had no significant effect (P>0.05) on foam stability. In each treatment, supermarkets had the highest foam stability, namely 95.72 ml, while markets had the lowest stability, namely 94.27 ml, but it was not much different from retail sellers which had foam stability of 94.28 ml.

Based on Figure 3, the treatment shows that the eggs with the best foam stability are in supermarkets because the leakage percentage is only 2.72%, causing the foam stability to be higher at 95.72 ml compared to the others. Meanwhile, the low quality of egg stability is found in eggs sourced from traditional markets because the drain percentage is 6.42 and the foam stability is only 94.27 ml. This is due to the measure of the ability of the foam structure to remain firm within 5 minutes. The flow rate greatly affects the stability of the foam, if the flow rate is low then the stability will be high and vice versa. The reason for the high stability of foam in traditional markets is because the eggs are only 2 days old.

B.V Prastowo et al, International Journal of Animal Science 3 (3) 2020 hal. 72 – 75
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The total average value in this research treatment was 94.76%. This value is lower than [6] research on fresh chicken egg whites showing foam stability of 96.31%. This is due to the use of eggs that are 2 days old so they have high nutritional content. This is in accordance with research by [9] which states that storing eggs for a long time can result in a decrease in foam stability due to the weakening of ovomocin which acts as a water binder, thereby impacting the stability of other foams. Meanwhile, the low quality of egg stability is found in eggs sourced from the lower central market in traditional markets because the leakage percentage is 6.42 and the foam stability is only 93.58. This is due to the measure of the ability of the foam structure to remain firm within 5 minutes. The flow rate greatly affects the stability of the foam, if the flow rate is low then the stability will be high and vice versa. The reason for the high stability of foam in supermarkets is because the eggs are only 2 days old. This is in accordance with research by [4] that foam stability was high at week 0 of storage. This happens because ovomucin as a water binding protein is still strong so the stability of the foam is high (the volume produced is small).

4. Conclusions

The conclusion of this research is that the functional characteristics of eggs greatly influence the temperature and age of the egg, in retail sellers it has a high foaming power of 716.86 ml and foaming power of 285.67 ml, while good foam stability is found in the super market at 95.72 ml.

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