INTERNATIONAL JOURNAL OF ANIMAL SCIENCE

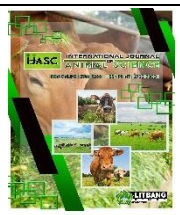
Volume 6 (1) 2020 pp. 6-11

ISSN 2684-6799 (Online)
ISSN 2086-5201 (Print)

INTERNATIONAL JOURNAL OF ANIMAL SCIENCE

Available online

Journal Page is available at http://animalsciencejournal.unisla.ac.id/index.php/asj



Acidity Level of Chicken Egg Consumption by Soaking Coffee Leaves

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ARTICLE INFO

Article history:
Received 24 January 2020
Revised 30 April 2020
Accepted 2 December 2020
Available online xxx

Keywords:
Acidity Level
Egg
Soaking
Quality
Coffee Leaves

IEEE style in citing this article: [citation Heading]
F. Fulan and F. Fulana, "Article Title," International Journal of Animal Science : Jurnal Ilmiah Fakultas Peternakan Universitas Islam Lamongan, vol. 6, no. 1, pp. 1-10, 2020. [Fill citation heading]

ABSTRACT

This research aims to determine the acidity level of chicken eggs consumed by soaking coffee leaves. This research method used a Completely Randomized Design (CRD) consisting of 4 treatments with 3 replications, namely R0: Without soaking coffee leaves (control), P1: 10% soaking coffee leaves, P2: 20% soaking coffee leaves and P3: 30% soaking coffee leaves. The variables measured are pH (degree of acidity), water content, total titration acid. The results of this study showed that the treatment had no significant effect on the average water content. The level of preference for consumption of eggs is found in the 0% treatment. The results of this research on yolk pH (egg yolk pH), namely 0% coffee leaf immersion, amounted to 6.47, 10% coffee leaf immersion, amounted to 7.63, 20% coffee leaf immersion, amounted to 8.20, 30% coffee leaf immersion , amounting to 9.53. pH of albumen (pH of egg white) soaking coffee leaves 0%, amounting to 6.73, soaking coffee leaves 10%, amounting to 7.87, soaking coffee leaves 20%, amounting to 8.40, soaking coffee leaves 30 %, amounting to 9.57. The water content with 0% coffee leaf immersion is 91.00, 10% coffee leaf immersion is 93.33, 20% coffee leaf immersion is 91.66, 30% coffee leaf immersion is 92.66. on the total titration principle of 0% coffee leaf immersion, amounting to 6.90, 10% coffee leaf immersion, amounting to 2.40, 20% coffee leaf immersion, amounting to 5.40, 30% coffee leaf immersion, amounting to 11.10. The conclusion of this research is that consumption eggs soaked in coffee leaves have a significant effect on yolk pH, albumen pH and total titratable acid but have no significant effect on water content

1. Introduction

Eggs are a food source of protein that is popular among people from children to adults. [1], the protein content in eggs is 13%. The protein in eggs has high quality and is used as a benchmark for determining the quality of protein from other ingredients, because the protein in eggs has a complete amino acid composition. Eggs will easily be damaged if not handled properly. In general, damage that occurs to eggs includes natural, physical, chemical and microbiological damage due to bacteria entering through the pores of the egg shell [3]. This perishable nature is due to the egg shell easily cracking and breaking, followed by other damage resulting from the evaporation process of CO_2 and water in the contents of the egg which comes out through the pores of the egg shell.

Storing chicken eggs at room temperature has a limited shelf life of 10-14 days. Eggs that are stored for too long can cause changes in the contents of the egg [3]. To maintain the quality of eggs so that they do not decline in quality to the point of rotting during storage, post-production egg management needs to be carried out. The soaking ingredients that can be used to preserve eggs are ingredients that contain tannin. Tannins are complex chemical compounds consisting of polyphenolic compounds which can prevent bacterial growth by damaging/wrinkling the bacterial cell walls, disrupting the enzymatic reaction process in bacteria which can inhibit plasma coagulation and inhibit enzyme production.

https://doi.org/10.30736/asj.v6i1.125

ISSN 2684-6799 (Online)
Irpan et al, International Journal of Animal Science 6 (1) 2024 hal. 6 – 11 ISSN 2086-5201 (Print)

One of the preservatives used for the egg soaking process is coffee leaves. [4], coffee leaves contain chemical compounds in the form of alkaloids, piphenol and flavonoids. This content is known to have antimicrobial effects, one of which is by causing an anti-adhesion effect on bacteria. The mechanism of anti-adhesion properties occurs due to the bond between the dissolved substances and sugar residues, polysaccharides, glycoproteins and glycolipids which can be used by bacteria for adhesion. Based on the capabilities of the coffee leaf content, research is needed to prove the potential of coffee leaf extract. This is the background so that further research needs to be carried out regarding soaking eggs in coffee leaf extract tanning agent to get effective and efficient results.

2. Method

2.1 Research design

This research design was carried out experimentally using a completely randomized design (CRD) with 4 treatments and 3 replications. The research treatment is as follows:
R0: Without soaking coffee leaves (control)
R1: 10% soaking coffee leaves
R2: 20% soaking coffee leaves
R3: 30% soaking coffee leaves

2.1 Sample Determination Technique

2.1.1. 1. pH (Potential Hydrogen)

To find out the pH contained in consumption chicken eggs, we can find out by dipping a pH meter into the yolk and albumen and then leaving it until the pH meter reading is stable. The value displayed on the pH meter monitor screen. After the measurement, the pH meter is then rinsed with distilled water and dried with a tissue.

2.1.2. Water content

Water content was determined by drying 20 ml of the sample in an oven at 102 ºC then cooling in a desiccator and weighing. Drying is carried out for 24 hours. Water content is calculated using the formula:

$$Water\ content = \frac{\mathrm{W1}\ \ \mathrm{W2}}{\mathrm{W1}} \times 100\ \%$$

Information :
W1: Initial sample weight
W2: Weight after drying

2.1.3. Total Tyrated Acid

The method for measuring total titration acid, the sample is weighed at 5 grams, then diluted first with distilled water, then put into an Erlenmeyer flask, 100 mL of distilled water is added and then homogenized. The sample was tested by taking 25 ml using a pipette and putting it into a different Erlenmeyer flask, dissolving the sample by adding 2-3 drops of phenolphtalint indicator first, then titrating with 0.1 N NaOH solution until the color turned pink.

Then the total titrated acid is calculated using the formula :

$$TAT\ (\%) = \frac{\mathrm{V} \times \mathrm{N} \times 90}{W} \times 100\%$$

Information :
W: sample volume (ml);
V: volume of NaOH solution, (ml);
N: normality of NaOH solution;

2.2 Data Analysis Technique

The data obtained in this research was processed using. Analysis of variance was based on a completely randomized design (CRD) with 4 treatments and repeated 3 times, and if there was a significant effect, it was continued with the Duncan test. The statistical model used is as follows;

$$\mathrm{Yij} = \mu + \alpha\mathrm{i} + \in \mathrm{ij}$$

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Yij : Observation response variable.
μ : Average value of observation results
αi : Effect of treatment i
$\in ij$: 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 Yolk pH

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

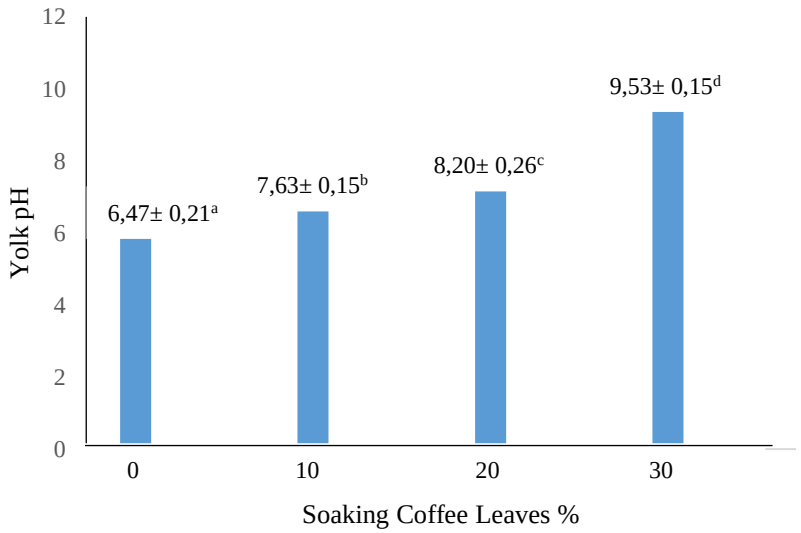

Figure 1. Yolk pH value

Note: Different superscripts indicate significant differences (P<0.05).

The results of the analysis of variance showed that the treatment of coffee leaves on consumption eggs had a significant effect (P<0.05) on the yolk pH index value. Treatment without soaking coffee leaves was 6.47, soaking eggs with 10% coffee leaves was 7.63, soaking eggs with 20% coffee leaves was 8.20 and soaking eggs with 30% coffee leaves was 9.53. Figure 1 shows that the yolk pH from all treatments is included in the normal category, namely 6.0.

Based on the yolk pH indicator, eggs from all groups have met the requirements of SNI 3926 2006 as consumption eggs. This shows that the pH of yolk is very suitable for consumption without soaking coffee leaves and soaking treatment with 10% coffee leaves. The best value was obtained without treatment with a value of 6.47 where the pH value of good yolk ranged from 6.40 – 6.42. This is in accordance with research by [5] which shows that the amount of Ecoli contamination in purebred chicken eggs will affect egg yolk and the effect of room temperature storage (by soaking eggs in 30% coffee leaves).

[6] states that the quality of egg yolk depends on room temperature (by soaking eggs with 30% coffee leaves), whereas in the treatment without soaking and by soaking eggs with 10% coffee leaves and by soaking eggs with coffee leaves 20% of the egg yolk is 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.

3.2 Albumen pH

The results of research regarding the pH of broiler egg albumen in the study showed that the effect was not significant (P>0.05) which can be seen in Figure 2.

https://doi.org/10.30736/asj.v6i1.125

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Irpan et al, International Journal of Animal Science 6 (1) 2024 hal. 6 – 11 ISSN 2086-5201 (Print)

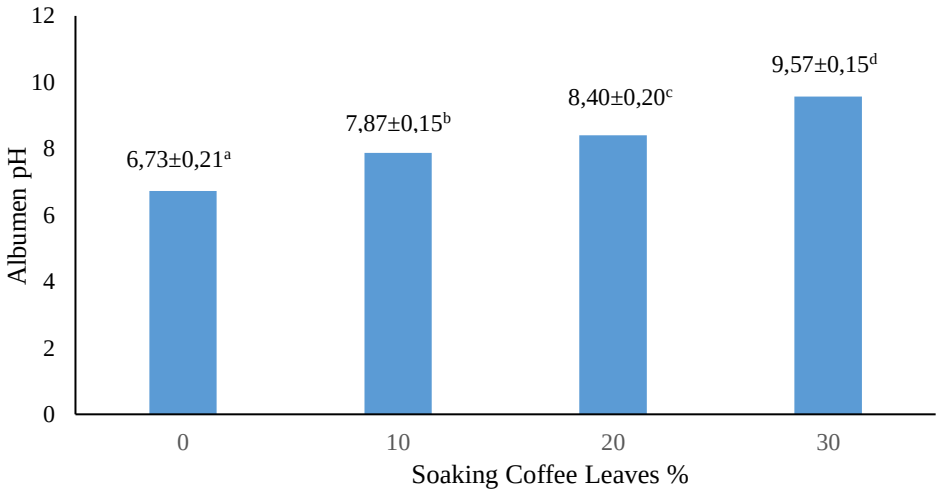

Figure 2. Albumen pH value

Note: Different superscripts indicate significant differences (P<0.05).

The results of analysis of variance showed that soaking coffee leaves in various types of treatment had a significant effect (P> 0.05) on albumen pH. Based on this picture, it can be seen that consumed eggs provide a better albumen pH value in the 30% coffee leaf soaking treatment compared to the 0% coffee leaf soaking treatment, the 10% coffee leaf soaking treatment and the 20% coffee leaf soaking treatment. in the 0% coffee leaf soaking treatment the resulting value was 6.73, while in the 20% coffee leaf soaking treatment the value increased by 8.40%. The best value of several treatments lies in soaking the coffee leaves 30% with a value of 9.57. If the eggs for consumption are stored longer, the pH of the albumen increases and becomes smaller.

The albumen pH increases due to consumption eggs being stored for several days at a stable temperature which is accelerated by the increase in albumen pH. [8] stated 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. The loss of CO_2 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 results of research regarding water content in the study showed that there was no significant effect (P>0.05) which can be seen in Figure 3.

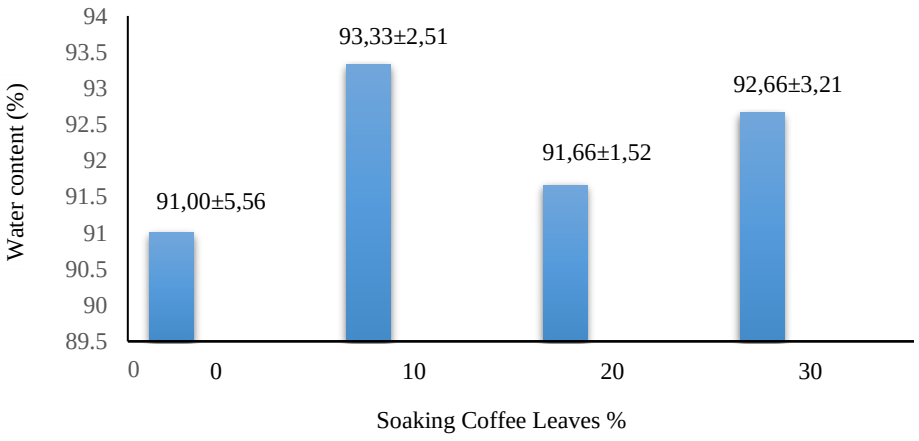

Figure 3. Water Content

https://doi.org/10.30736/asj.v6i1.125

Irpan et al, International Journal of Animal Science 6 (1) 2024 hal. 6 – 11
ISSN 2684-6799 (Online)
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The results of the analysis of variance showed that the treatment of coffee leaves in various types of treatment had no significant effect (P>0.05) on the water content value of consumption eggs. Coffee leaves resulting from pruning are usually just thrown away so they need further utilization because apart from having a taste that is as delicious as coffee beans, coffee leaves also contain quite high levels of tannin [10].

The lowest water content after treatment and before treatment was higher at 93.33 ± 2.51. It is suspected that the consumption egg treatment had a significant impact on each water content treatment. The decrease in water content is also influenced by the temperature intensity of egg consumption. This is in accordance with the results of [11] which states that the water content of consumption eggs ranges from 65.5% - 73.6%, therefore the water content in the treatment without soaking, the 10%, 20% soaking treatment and the 30% soaking treatment experienced The decrease is due to the room temperature being higher than the 0% immersion temperature.

3.4 Total Titrated Acid

The results of research regarding total titrated acid in the study showed a significant effect (P>0.05) can be seen in Figure 4.

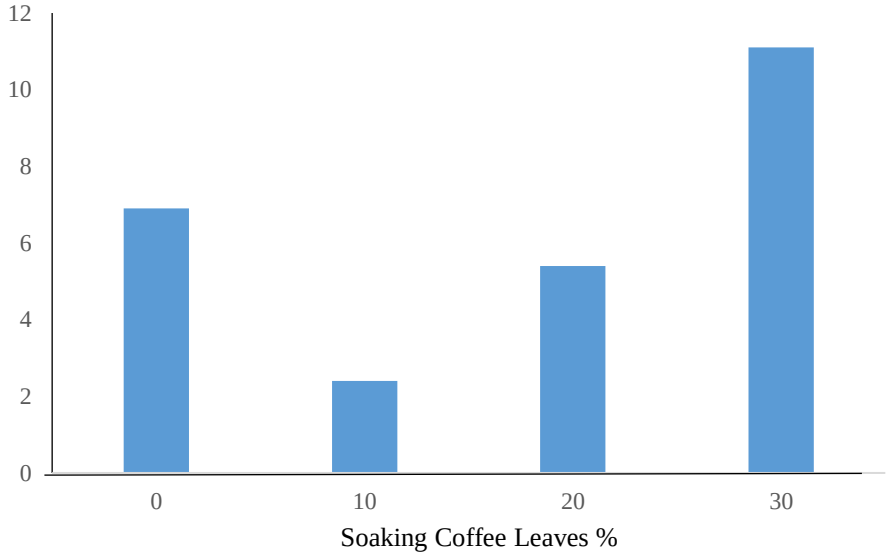

Figure 4. Total Titrated Acid

Note: Different superscripts indicate significant differences (P<0.05).

Figure 4. shows that the total titrated acid showed an increase in the 30% treatment by 11.10 and there was a real difference between the treatment with 10% immersion, 2.40, 20% immersion treatment, 5.40 and the treatment without 0% immersion, amounting to 6.90, the total production of titrated acid during the process decreased due to an increase in the number of bacteria that can break down carbohydrate compounds and proteins in food into acid compounds and water [12].

The 30% treatment shows that the longer the consumption eggs are stored, the total titration acid produced increases, this is due to the increase in the total amount of titration acid that occurs in consumption eggs. Storing eggs for too long will result in a decrease in the quality of the egg interior and the size of the air cavity. [13], states that the longer the storage time will result in more evaporation of liquids and gases which will result in larger air cavities. A decrease in egg quality occurs if it is caused by physical damage and evaporation of water, carbon dioxide, ammonia, nitrogen and hydrogen sulfide from inside the egg, therefore it is necessary to handle eggs by preserving them [13].

4. Conclusions

The conclusion of this research is that consumption eggs soaked in coffee leaves have a significant effect on yolk pH, albumen pH and total titratable acid but have no significant effect on water content.

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