

THE EFFECT OF STORAGE TIME IN DIFFERENT TEMPERATURE ON NATIVE CHICKEN EGG HAUGH UNIT AND YOLK INDEX

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Abstract

Three hundred sixty native chicken eggs was test on the effect of storage time in different temperature on haugh unit and yolk index. The aim of this research is to get the effect of storage time in different temperatures : 30⁰ – 32⁰C (RH 54%), 28⁰ – 29⁰ C (RH 58%) and 15⁰ – 18⁰ C (RH 80%); on native chicken eggs haugh unit and yolk index. This experiment used Completely Randomized Design (CRD) on three different temperatures (30-32⁰C, 28-29⁰C and 15-18⁰C) and each treatment was repeated six times. Results indicated that the lowest temperature (15-18⁰C) has the highest haugh unit (89.96) and yolk index (0.45); and when the temperature raised (28-29⁰C and 30-32⁰C) the haugh unit and yolk index was lower (72.80 and 0.29; 73.15 and 0.30 respectively).

Key words: native chicken, haugh unit, yolk index and storage time.

INTRODUCTION

In Indonesia, there are many types of local chickens with different characteristics from one species to another species. Native chicken is a local non-specific chicken, which kept by many rural communities. The ability of native chickens to produce eggs during a certain period, are varies depending on the maintenance system (Diwyanto and Prijono, 2007)^[2]. It is known that the egg quality besides the genetics traits, will be influenced by the storage time of the eggs. One of the official standards quality in a sense that specific numerical values have been assigned and recognized. The measurement of egg white or albumen quality in Haugh Unit. Haugh unit values ranging from 100 down to a practical minimum of 20 (Nesheim et.al., 1979)^[4]. Native chickens in Indonesia, has a Haugh unit average of 82.43 (Sri Sulandari et al, 2007)^[5]. The height of the albumen is one of the principal characteristic used to judge the interior egg quality. Height of 8 to 10 mm are considered as indicators of superior interior quality (Bell and Weaver, 2002)^[1]. The quantity of thick albumen in the freshly laid egg is affected by genetics, duration of continuous production and environmental factors.

The yolk index is a measure of the standing-up quality of the yolk; obtained by dividing the height of the yolk by its average diameter.

Average values for fresh eggs usually fall between 0.42 and 0.40 (Bell and Weaver, 2002)^[1]. According to Gavril and Usturoi (2011)^[3], the yolk index of Romania hens, which egg was stored until 35 days in different temperatures, are between 0.23 to 0.36. According to Bell and Weaver, (2002)^[1], as the yolk becomes flattened, the yolk index is low. When the value is 0.25 or more lower, the yolk is so weak.

MATERIALS AND METHOD

The quality properties (the Haugh Unit and Yolk Index) of the native chickens, were analyzed on 360 eggs that have been storage for 42 days in different temperature (30-32⁰C, 28-29⁰C and 15-18⁰C) and each treatment was repeated six times. The experiment used Completely Randomized Design (CRD).

RESULTS AND DISCUSSION

1. The Haugh Unit

In Table 1, there are the haugh unit of the eggs that have been stored for 42 days, at 30⁰ – 32⁰C (RH 54%), 28⁰ – 29⁰ C (RH 58%) and 15⁰ – 18⁰ C (RH 80%).

Table 1. The Haugh Unit of the eggs that stored in different temperatures

| REPLICATIONS | T-1 (30 ⁰ – 32 ⁰ C; RH 54%) | T-2(28 ⁰ – 29 ⁰ C; RH 58%) | T-3 (15 ⁰ – 18 ⁰ C; RH 80%) |
|--------------|---|--|---|
| I | 87.40 | 83.47 | 93.30 |
| II | 79.45 | 85.65 | 93.85 |
| III | 68.90 | 75.48 | 92.15 |
| IV | 70.48 | 67.25 | 90.90 |
| V | 60.78 | 60.78 | 81.88 |
| VI | 69.80 | 66.25 | 87.72 |
| TOTAL | 436.81 | 438.88 | 539.80 |
| AVERAGES | 72.80 | 73.15 | 89.96 |

The averages of Haugh Unit scale are between 72.80 till 89.96. The lowest is from the eggs that have been stored in 30⁰ – 32⁰ C (RH 54%) and the highest is the eggs that have been stored at 15⁰ – 18⁰ C (RH 80%). The lowest temperatures gave the highest Haugh Unit; because of the increase of the temperature, it will evaporate the albumen and then the Haugh Unit scale will be more lower. According to Bell and Weaver (2002)^[1], one of the occasioned that the

Haugh Unit scale decreased by the environment factor (the temperature and RH).

2. The Yolk Index

In Table 2, there are the Yolk Index of the eggs that have been stored for 42 days, at 30⁰–32⁰C (RH 54%), 28⁰–29⁰ C (RH 58%) and 15⁰–18⁰ C (RH 80%).

Table 2. The Yolk Index of the eggs that stored in different temperatures

| REPLICATIONS | T-1 (30 ⁰ – 32 ⁰ C; RH 54%) | T-2 (28 ⁰ – 29 ⁰ C; RH 58%) | T-3 (15 ⁰ – 18 ⁰ C; RH 80%) |
|--------------|---|---|---|
| I | 0.42 | 0.43 | 0.52 |
| II | 0.37 | 0.35 | 0.48 |
| III | 0.30 | 0.29 | 0.44 |
| IV | 0.24 | 0.26 | 0.45 |
| V | 0.21 | 0.23 | 0.43 |
| VI | 0.20 | 0.22 | 0.42 |
| TOTAL | 1.74 | 1.78 | 2.74 |
| AVERAGES | 0.29 | 0.30 | 0.45 |

Results indicated that the range of the native chicken yolk index that have been storage for 42 days in Bandung, West Java Indonesia is 0.20 up until 0.48 with the average 0.34. When the temperature rise, the yolk index more lower (0.45 for 15⁰ – 18⁰ C and 0.29 for 30⁰ – 32⁰ C). Comparing with Gavril and Usturoi (2011)^[3] result, that the range of the native chicken yolk index that have been storage for 35 days is 0.23 up until 0.36 with the average 0.30. The fact about the different of yolk index very point out by environment factors. The reality of temperature in Bandung, about 15 – 32⁰ C. Beside that, the length of storage also has effect on yolk index, where the eggs was storage for 42 days; different with Gavril and Usturoi (2011)^[3] results where the eggs was storage only just for 35 days.

CONCLUSIONS

The effects of storage time in different temperature on native chicken eggs haugh unit and yolk index, showed that :

1. Native chicken eggs haugh unit will be lower when the temperature rise, at temperature 15⁰ – 18⁰C the haugh unit 89.96 but at temperature 30⁰ - 32⁰C the haugh unit average are 72.80.
2. Native chicken eggs yolk index will also lower as the temperature rise. At temperature 15⁰ – 18⁰C the yolk index 0.45 but at temperature 30⁰ - 32⁰C the yolk index average are 0.29.

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