Physicochemical and Microbiological Characteristics of Healthy Drink that Contains Honey and Arabic Chicken Egg Yolk in Difference Age

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ABSTRACT

Mixing raw egg sin drinks such as healthy drink has become a habit for some people. The addition of egg yolk in beverages such as healthy drink should be supervised because the eggs used are still raw. The objective of this experiment was to analyze microbiological and physico chemical characteristics of healthy drink that contains Arabic chicken egg yolk and honey. Completer and omized design with two-factor factorial pattern was used in this experiments design. The first factor was honey addition (addition of honey and without addition of honey) and the second factor was the difference in age of the egg (day 2, day 5 and day 8). Data was processed by using ANOVA, then the results that showed significant effect was further analyzed by using Tukey's test. Up to eighth day, healthy drink that contains Arabic chicken egg yolk with addition of honey was safer than without addition of honey (Based on the SNI 01-7388-2009). The temperature of healthy drink increased significantly with honey addition. pH of healthy drink decreased significantly with honey addition and increased significantly during storage. The interaction between honey addition and the difference in age of the Arabic chicken egg had significant effectin viscosity, and water contents of healthydrink.

Key Words: Healthy drink, Arabic chicken egg yolk, honey, storage

INTRODUCTION

One is the use of eggs as an ingredient for healthy drink. Mixing raw eggs in drink like herbs medicine, energy drinks or food have become a habit for some people. The addition of egg yolk into drinks such as herbal medicine had to be supervised because it usually used raw egg. Raw eggs are easily contaminated by bacteria during storage. The objective of this research was to microbiological and physico chemical characteristics of healthy drink that contains honey and Arabic chicken egg yolk in difference age.

MATERIALS AND METHODS

Egg samples used in this study were Arabic chicken eggs which different age (day 2, day 5 and day 8). Arabic chicken egg yolk was treated by adding honey with the ratio 2:1.

Microbiological quality included: total plate count (TPC), *Salmonella*, *Escherichia coli* and *Coliforms*(DSN 1992). Physicalchemical properties testing conducted in this study include viscosity, temperature, pH value (AOAC 1995), and water contents (SNI 01-2891-1992).

Complete Randomized Design with two-factor factorial pattern was used in this experiments design. The first factor was the treatment of honey addition (with and without addition of honey) and the second factor was the difference in age of the egg (day 2, day 5, and day 8). Datawas analyzed by ANOVA, then the results that showed significant treatment effect was further analyzed by using Tukey's test. Data on the microbiological properties were analyzed descriptively.

RESULTS AND DISCUSSION

Microbiological Characteristics

Table 1. Microbiological characteristics of healthy drink that containsArabic chicken egg yolk with or without addition of honey in difference age

Difference age	Addition of honey	Without addition of honey
Total Plate Count CFU / g……..		
Day 2	$< 30\times10^1$ (1.5×10^1)	$< 30\times10^1$ (1.5×10^1)
Day 5	$< 30\times10^1$ (4×10^1)	$< 30\times10^1$ (7.5×10^1)
Day 8	$< 30\times10^1$ (6.5×10^3)	$< 30\times10^1$ (8.2×10^3)
Coliform ……..CFU / g……..		
Day 2	$< 30\times10^1$ (0×10^1)	$< 30\times10^1$ (0×10^1)
Day 5	$< 30\times10^1$ (0×10^1)	$< 30\times10^1$ (0×10^1)
Day 8	$< 30\times10^1$ (0×10^1)	$< 30\times10^1$ (0×10^1)
Salmonella / 25 g……..		
Day 2	Negative	Negative
Day 5	Negative	Negative
Day 8	Negative	Negative
E. coli ……..CFU / g……..		
Day 2	$< 30\times10^1$ (0×10^1)	$< 30\times10^1$ (0×10^1)
Day 5	$< 30\times10^1$ (0×10^1)	$< 30\times10^1$ (0×10^1)
Day 8	$< 30\times10^1$ (0×10^1)	$< 30\times10^1$ (0×10^1)

Until the eighth day, healthy drink that contains Arabic chicken egg yolk with addition of honey more safe than without addition of honey (Based on the SNI 01-7388-2009). Wulandari et. al. (2012) reported based on total plate count test, duck egg yolk was safe to eat until day 8 of storage. Otherwise based on coliform test, duck egg yolk wasnot safe to eat until day 8 of storage. Contamination of *Salmonella*, *E. coli* and *Coliform* were not found in healthy drink that contains Arabic chicken egg yolk with addition of honey and without addition of honey. Antibacterial activityof honeyis causedby several things, i.e. osmoticeffects, acidity and hydrogenperoxide (Molan, 2006).

pH

Table 2. pH value of ofhealthy drink that contains Arabic chicken egg yolk with or without addition of honey in difference age

Difference age	Addition of honey	Without addition of honey	
Day 2	5.64±0.04	6.15±0.02	5.89^{b}
Day 5	5.76±0.07	6.18±0.07	5.97^{ab}
Day 8	5.82±0.06	6.23±0.10	6.03^{a}
Average	5.74^{B}	6.19^{A}	

Note : Means in the same coloumn with different superscript differ significanly (P<0,05)
Means in the same row with different superscript very differ signifancly (P<0,01)

The addition of honey made reducing of pH value because honey has pH at 3.65-4.96 and chicken egg yolk has pH at 6-6.5. pH increased during storage, this might be caused by H_2O and CO_2 evaporation in the eggs. Evaporation of CO_2 in the egg caused by compounds that break down into NaOH, $NaHCO_3$, and NaOH will decompose back into ions Na^+ and OH^- (Silverside and Scott 2000).

Temperatures

Table 3. Temperature of ofhealthy drink that contains Arabic chicken egg yolk with or without addition of honey in difference age

Difference age	Addition of honey	Without addition of honey
Day 2	28.60±0.75	28.20±0.66
Day 5	28.63±0.40	27.27±0.49
Day 8	28.10±0.36	27.93±0.32
Average	28.44^{A}	27.8^{B}

Note : Means in the same row with different superscript very differ significanly (P<0,01)

Temperature of healthy drink that contains Arabic chicken egg yolk with addition of honey was higher than without addition of honey. Honey contains carbohydrates especially fructose which is nutrients as an energy source.

Viscosity

Table4. Viscosity of healthy drink that contains Arabic chicken egg yolk with or without addition of honey in difference age

Interaction	Factor A x Factor B	Viscosity (dpa.s)
1	ET_0D2	$3.67±0.49^{A}$
2	ET_0 D5	$2.73±0.25^{B}$
3	ET_0 D8	$2.60±0.10^{B}$
4	ET_1 D2	$0.93±0.06^{C}$
5	ET_1 D5	$0.73±0.21^{C}$
6	ET_1 D8	$0.60±0.10^{C}$

Note : Means in the same coloumn with different superscript differ significanly (P<0.01)
T_0 : without addition of honey, T1 : with addition of honey

The addition of honey decreased on viscosity of healthy drink and decreased during storage. The addition of honey decreased the solid content in the healthy drink. During storage, viscosity decreased was caused by the dilution of honey and eggs. Evaporation occurs during storage of CO_2 from the albumen and yolk

Water Contents

Table 5. Water contents of healthy drink that contains Arabic chicken egg yolk with or without addition of honey in difference age

Interaction	Factor A x Factor B	Water Content (%)
1	ET_0 D2	$55.70±0.00^{A}$
2	ET_0 D5	$41.45±0.86^{BC}$
3	ET_0 D8	$42.62±0.57^{BC}$
4	ET_1 D2	$54.50±0.00^{A}$
5	ET_1 D5	$42.89±0.11^{B}$
6	ET_1 D8	$41.14±0.26^{C}$

Note : Means in the same coloumn with different superscript differ significanly (P<0.01)
T_0 : without addition of honey, T1 : with addition of honey

The interaction between addition of honey and the difference in age of the egg had significant effectin water contents (based on Table 5). Water contents decreased during storage, this might be caused by H_2O and CO_2 evaporation in the eggs.

CONCLUSION

Until the eighth day, healthy drink that contains Arabic chicken egg yolk with addition of honey more safe than without addition of honey. Based on microbiological characteristics, arabic chicken egg yolk was safe to drink until eigth day storage.

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