

Karakteristik Saus yang Ditambahkan berbagai Persentase Kuning Telur Itik Asin

Characteristics of Sauces Incorporated with Various Percentages of Salted Duck Egg Yolk

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Abstrak : Telur itik asin merupakan produk telur tradisional yang populer diantara beberapa produk telur yang terbatas ditemukan di banyak negara Asia. Penambahan kuning telur asin dalam formulasi saus untuk mengembangkan saus berbahan dasar telur asin telah dilakukan. Rancangan Acak Kelompok digunakan sebagai desain penelitian. Penelitian ini dibagi menjadi lima perlakuan (20, 40, 60, 80, and 100% kuning telur asin terhadap susu yang digunakan). Parameter yang diamati adalah kelembaban, pH, warna (L^* , a^* , b^*), dan intensitas sensori (warna dan tekstur). Hasil penelitian menunjukkan bahwa penambahan kuning telur itik asin berpengaruh terhadap kadar air, pH, warna instrumental (L^* , a^* , b^*), dan intensitas warna dan tekstur ($P < 0,05$). Kadar air dan lightness sampel menurun dengan persentase penggunaan kuning telur asin yang lebih tinggi ($P < 0,05$). Sebaliknya, pH, redness, yellowness, intensitas warna, dan intensitas tekstur meningkat ($P < 0,05$). Penambahan kuning telur asin dalam saus dapat diterapkan untuk memberikan pilihan jenis saus yang bervariasi bagi konsumen.

Kata kunci : telur itik, telur asin, saus, fisikokimia, sifat sensori

Abstract: Salted duck egg is a popular traditional egg product among limited egg products found in many Asian countries. Incorporation of salted egg yolk in sauce formulation to develop salted egg-based sauce was conducted. Randomized Block Design was used as research design. This study is divided into five treatments (20, 40, 60, 80, and 100% of salted egg yolk to the ratio of milk used). Moisture, pH, color (L^* , a^* , b^*), and sensory intensity (color and texture) were evaluated. The result of this present study showed that incorporation salted duck egg affect moisture, pH, instrumental color (L^* , a^* , b^*), and color and texture intensities ($P < 0.05$). Moisture and lightness (L^*) of samples were decreased by higher percentage of salted yolk egg used ($P < 0.05$). In contrast, pH, redness, yellowness, color intensity, and texture intensity were increased ($P < 0.05$). To sum up, incorporation of salted egg yolk in sauce could be applied to provide varied optional sauce type for consumers.

Keywords: duck egg, salted egg, sauce, physicochemical, sensory properties

1. Introduction

Duck might considered as secondary poultry among various poultry types for human consumption, particularly for its meat [1, 2] with its limited traditional duck meat products [3]. Besides, duck also significant for its egg production, in which salted duck egg could be categorized as the most popular traditional duck egg product found in the mostly found in Asian contries.

Salted egg commonly produces from duck egg even though egg from chicken and quail could also be used. Its bigger size in eggs and pores make it easier to absorb salt, so it is preferred over other poultry egg

in salted egg production. At the same time, utilization of duck egg for producing salted egg also benefit because application of duck egg is not as much as that of chicken egg in other food products.

Salted egg commonly produces by coating or brining method. In coating method, eggs were coated with mixture of coarse salt and paste of clay/husk ash; while in brining method, eggs were immersed in saturated salt solution. Moreover, egg salting time might varied depend on desired salty taste, but commonly applied from some days to some weeks. This might also varied among region or countries due to its differences in salty intensity preferences. After

all, salted duck egg could be consumed alone or combined with rice during breakfast or lunch.

In commercial products, the using of salted egg as ingredient/component in other food products could be found in Chinese foods in form of cakes and pastries. It could be found in products such as mooncakes [4, 5, 6], *zongzi* [4, 5], egg puffs [4] particularly for its yolk. However, incorporation of salted egg in other food products, either in form of salted egg yolk or salted egg white, in previous researches were reported. Application of raw egg white in noodles [7, 8], raw salted egg white in meringues [9], steamed salted egg white in *sufu* [10], and salted egg yolk in mayonnaise [11, 12] were some of such reports.

Sauce is important thickened liquid produced by cooking that usually added to the food to increase food liking. It is used during cooking or added after final cooked products produced. The latter usually applied to smear nuggets, sausages, burger, fried chicken, or sometimes added to meatballs noodle soup, bakmi, fried noodle, fried rice, etc.

In Indonesia, sauces mostly found in form of tomato and chili sauces; while some others might be found in limited quantity in form of oyster sauce, etc. However, sauce could also be developed from cooked salted egg yolk to create typical salted yolk flavor. Its ground particles might still be able to mix with other common sauce components rather than salted egg white.

In fact, incorporation salted egg yolk to the sauce formulation might affected sauce characteristics. Thus, related sauce attributes particularly moisture, pH, color, and some sensory intensities need to be evaluated.

2. Material and methods

2.1. Material

Fresh duck eggs were brought from a wet market in Padang. Ingredients to produce salted eggs (coarse salt, husk ash, water) and sauces (UHT full cream milk, margarine, fine salt, white pepper powder) were also prepared.

2.2. Methods

2.2.1 Salted egg yolk production sauce formulation and its cooking

Salted eggs were prepared conventionally for 2 week salting period with coating method using coarse salt-husk ash paste. Salted yolks were collected after half hour cooked using boiled method. Sauce production was conducted as adapted from a guideline [13] with modification, particularly in salted egg yolk percentage as could be seen in **Table 1**. The production is started by put 8 grams of margarine into a heated pan. Subsequently ground salted egg

yolk were added (as fitted with treatment) and mixed until no lump observed. Then, 100 grams of UHT full cream milk were added and mix well.

Table 1. Developed formulation with incorporation of salted egg yolk

Ingredient (gr)	Treatment				
	A	B	C	D	E
Margarine	8	8	8	8	8
Salted egg yolk	20	40	60	80	100
UHT full cream milk	100	100	100	100	100
White pepper powder	1	1	1	1	1
Salt	1	1	1	1	1

After that, 1 gram of white pepper powder and 1 gram of salt were also sprinkled. The mixture was stirred to form final thicken liquid.

2.2.2 Laboratory analysis

Moisture analysis was determined using oven method [14]. pH was measured by mixing sample and distilled water in ratio 1:2 prior to analyzed using a pH meter. Instrumental color (L*a*b*) was performed using a hunter lab colorimeter (Color Flex EZ, USA). Color intensity (1= white; 7= reddish orange) and texture intensity (1= very watery; 7= very thick) were developed using 7-point scale and evaluated by 50 panelists [15].

2.2.3 Statistical analysis

This study was carried out using Randomized Block Design (RBD). Statistical data were determined using SPSS. Data were subjected to ANOVA, and significant difference was established at 0.05.

3. Result and discussion

Moisture content of sauce treated with various percentages of salted egg yolk is presented in **Figure 1**.

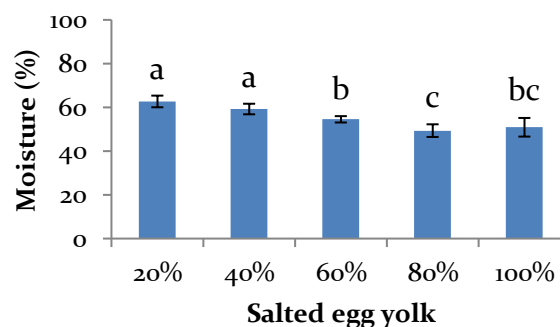


Figure 1. Moisture content of sauce treated with various percentages of salted egg yolk

Above figure epitomized a decreasing percentage in moisture by higher percentage of salted egg yolk incorporated in sauce formulation ($P < 0.05$). This related to the moisture content of egg yolk itself (34.32%). This means that about two-third of salted egg yolk composition composed of total solid. Thus,

this higher total solid decreased the moisture content of sauce that dominated by liquid full cream milk that had lower total solid.

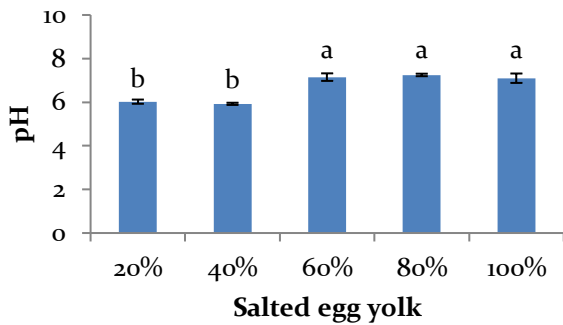


Figure 2. pH of sauce treated with various percentages of salted egg yolk

Moreover, moisture of salted egg yolk used for formulated the sauces was in range of other report. A reference [16] found that 14 days salted egg yolk contain 20.05-36.21% of moisture (interior to

exterior). Those lower than that of fresh egg yolk (43.51%). The increase in water content in the 100% treatment compared to 80% with the addition of salted egg yolk was caused by the isoelectric point being reached. At the isoelectric point at pH 7.10, hydration is smallest so the water content decreases [17]

pH of sauce treated with various percentages of salted egg yolk could be seen in Figure 2. Increasing pH by higher salted egg yolk incorporated in sauce formulation was noticed (<0.05).

As the main component, UHT milk also contributed to the pH of samples. pH of UHT milk normally in ranged of 6.5-6.61 [18]. While others affected by pHs of margarine, white pepper, and salt. Since pH of salted egg yolk used was 7.1, increased of pH of sauces with various percentages of salted egg to about pH 7 was noticed. Moreover, pH of salted egg itself recorded in this research is equal to pH in other report [19] but from 18 days salting period.

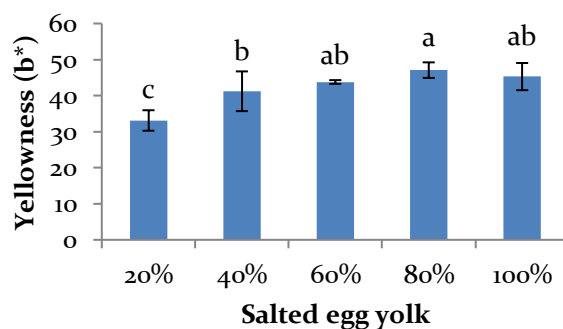
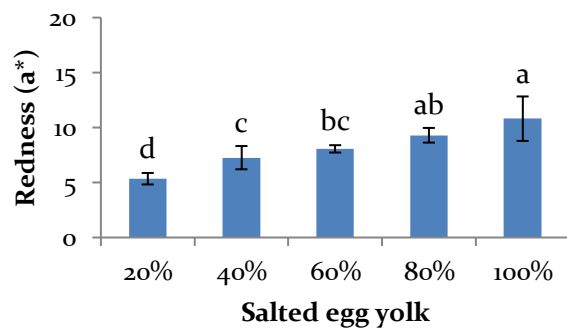
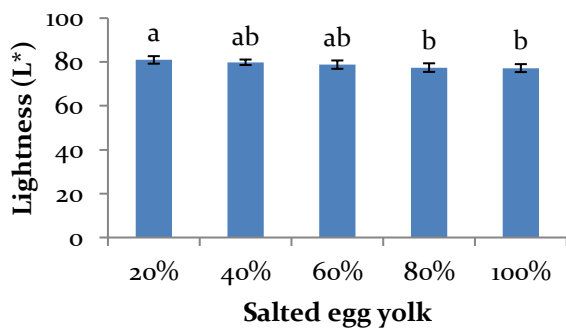


Figure 3. Lightness (L*), redness (a*), and yellowness (b*) of sauce treated with various percentages of salted egg yolk

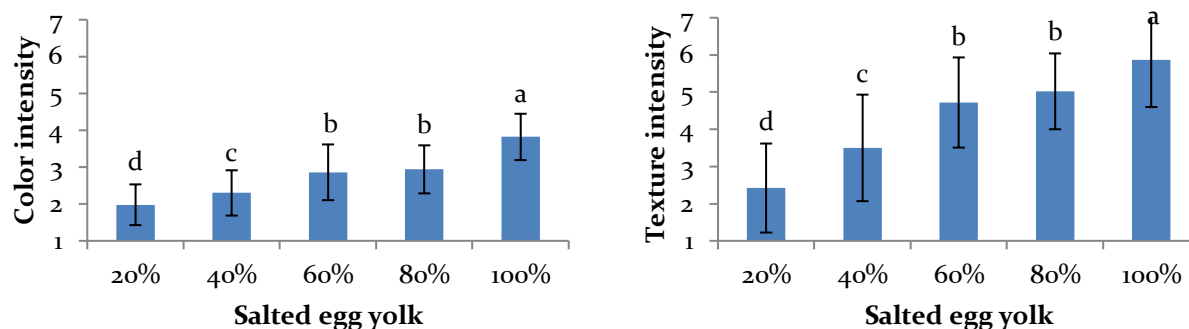


Figure 4. Color and texture intensities of sauce treated with various percentages of salted egg yolk

Instrumental color (L^* , a^* , b^*) of sauce treated with various percentages of salted egg yolk is provided in Figure 3. Data showed decreasing result in lightness (L^*) by higher incorporation of salted egg yolk in formulation ($P < 0.05$). In contrast, redness (a^*) and yellowness (b^*) were decreased ($P < 0.05$).

As highlighted in a previous research [20], some factors might cause the form of salted egg yolk color. Those are egg yolk dehydration, pigment released from the yolk, as well as lipid and protein oxidations during egg salting process. In this present study, color of the only salted egg yolk were 68.93 (lightness), 18.64 (redness), and 55.14 (yellowness). Accordingly, the basic color from the salted egg contributed to increasing of redness and yellowness, and decreasing of lightness of the sauces.

Color and texture intensities of sauce treated with various percentages of salted egg yolk are shown in Figure 4. Color intensity is significantly increased by incorporation of salted egg yolk ($P < 0.05$). The intensity is ranged from pale yellow (control) to deep yellow (treatment E).

Carotenoids are natural pigments in egg responsible for the color of raw egg yolk and still existed in salted egg yolk. In general, this pigment is associated with yellow, orange, or reddish color. Previous report [21] noted that the main carotenoids found in egg are lutein and zeaxanthin. In 14 days salting period, salted duck egg yolk contain 1280 and 801 $\mu\text{g}/100\text{ g}$ egg yolk of lutein and zeaxanthin, respectively.

Thus, basic pigments in salted egg yolk contributed to color intensity of sauces in which color of milk and margarine as the based pigments. Higher percentage of salted egg yolk used resulting more intense yellow color formed.

Similar to the result in color intensity, texture intensity also exhibited significant different result. Increasing result in texture intensity by incorporation of salted egg yolk is noticed ($P < 0.05$). Texture intensity is ranged from slightly fluid (control) to slightly thick (treatment E).

As in the earlier explained, salted egg yolk might composed of about two-third of total solid. The higher percentage of salted egg yolk added to the formulation, the viscosity of sauces was gradually elevates.

Egg yolk is significant for its emulsion ability and gel formation as heat induced [23]. In general, salting increase viscosity of duck egg up to 3-5 times [23]. Thus, after being changes into solidified form due to boiling and continues used into sauces formulation, the viscous sauced treated with salted egg yolk is formed.

4. Conclusion

Incorporation of salted egg yolk in sauces formulation decreased moisture, and lightness; but increase pH, redness (a^*), yellowness (b^*), color intensity, and texture intensity ($P, 0.05$). Panelist prefer color intensity and texture intensity parallel on percentage of salted duck egg yolk. Further studies are required to find suitable percentage for consumer preferences.

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