

Formula Optimization from *Halal* Lip Cream Variety with Tomato Extract (*Lycopersicum Esculentum* L.)

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ABSTRACT

The majority of the population of Indonesia embraces Islam, which is obliged to consume halal products. One of the most popular products is the lip cream variant. One of the forms and physical stability of *halal* lip cream variants is influenced by the selection and content of the base Wax. The *halal* aspect of the lip cream variant is viewed from the components and processing process. Tomatoes are used as natural dyes with a concentration of 5% to support the *halal* element. This research aims to get the optimal Wax base in the *halal* lip cream formula so that the variant can meet the necessities. This research was conducted experimentally by using a base comparison. The base Wax used in this research were Carnuba Wax (15%), Microcrystalline Wax (15%), and a combination of the two (6%:9%). The results showed an orange color variant, semi-solid form, rose smell, homogeneous composition, pH, spreadability, good smearing power, and not irritating. The adhesion test showed that F1 adhered well while F2 and F3 did not. In the stability test, F1 and F3 were stable, while F2 was unstable with the formation of 2 phases. Based on the evaluation of the *halal* lip cream variant showed the most optimal result, namely the F1 combination of Carnuba Wax and Microcrystalline Wax.

Keywords: Lip cream, halal cosmetics, thickener, tomato

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Introduction

The Muslim community around the world has increased from year to year. 30% of the total population in the world adheres to Islam. By 2025, it is estimated that the number of Muslims worldwide will increase by 35% [9]. Consuming halal products is an obligation for a Muslim.

Halal products have various forms ranging from food, beverages, medicines, and cosmetics. On the halhalal.com page, the list of countries that use the largest halal cosmetics is the United Arab Emirates (UAE), with a total expenditure of 4.9 billion dollars, and Indonesia, with total spending of 3.4 billion dollars [7].

Nowadays, the types of decorative cosmetics that function as lip dyes are in great demand by the public. When applied, this lip color provides a dry membrane that consumers prefer [1]. Lip color variants consist of several forms, such as crayon, liquid, and cream. The lip cream is a variant with a semi-solid to a liquid layout that functions as a lip moisturizer and has a longer resistance than the solid form [5].

Lip cream constituent components recreate an essential role in determining the quality of the variant. One of the forms and physical stability is influenced by the Wax base contained in the variant. The selection and level of Wax base used during formulation will affect the lip cream's characteristics. Several Wax bases are usually used in lip cream variants: Carnuba Wax,

Microcrystalline Wax, Beeswax, Candelilla Wax, Paraffin Wax and Spermaceti [12].

Colorants are needed to increase consumer appeal to lip cream variants. Tomatoes are halal natural ingredients used as active substances in lip cream variants. The attractive red color of tomatoes is due to the presence of lycopene.

Based on the explanation above, the researcher wants to get the optimal formula from halal lip cream base by using variations of Carnuba Wax (15%), Microcrystalline Wax (15%), and a combination of both (6%:9%). Determining and manufacturing formulas with optimal bases is carried out using several stages, namely modifying the procedure with different wax concentrations and evaluating the characteristics of each variant. Evaluation of the factors used in the organoleptic test, pH, homogeneity, spreadability, smearing power, adhesion, irritation, and stability.

Materials and Methods

Equipments and Materials

The tools used to manufacture halal lip cream variants include analytical balance, stirring rod, porcelain cup, UAE (Ultrasonic Assisted Extraction), rotary evaporator, blender, object glass, beaker glass, Erlenmeyer, funnel, filter, mortar, and stamper, measuring cup, dropper, knife, and water bath.

Halal ingredients used in the manufacture of lip creams include tomato extract, Carnauba Wax, methylparaben, castor oil, kaolin, Microcrystalline Wax, cetyl alcohol, dimethicone, titanium dioxide, tocopherol, equates, methanol, liquid paraffin, carbon paper, and a lip cream receptacle.

Extract Making

Making tomato extract using the juicer method with a blender. The results of the tomato juicer were filtered and added methanol. Then in the UAE (Ultrasonic Assisted Extraction), a rotary evaporator is carried out to produce a concentrated extract.

Lip Cream Making

Table 1. Tomato extract lip cream formulation

Ingredient	Function	Concentration (%)		
		F1	F2	F3
Tomato Extract	Natural dye	5	5	5
Carnauba wax	Thickener	6	-	15
Microcrystalline wax	Thickener	9	15	-
Castor Oil	Emolient	60	60	60
Setil Alcohol	Emolient	2	2	2
Kaolin	Texturixer	3	3	3
Dimetichone	Emolient	10	10	10
Tocopherol	Antioxi-dant	0,05	0,05	0,05
Titanium dioxide	Pigment	0,5	0,5	0,5
Methyl Paraben	Preserva-tive	0,3	0,3	0,3
Oleum Rose	Essence	qs	qs	qs
Liquidum Par-affin	Solvent	add 5 mL	add 5 mL	add 5 mL

Each ingredient in the formula is prepared and weighed. Then melted separately in a water bath, the wax bases are Carnauba Wax, Microcrystalline Wax, and the fat grounds are castor oil, cetyl alcohol, and dimethicone at a temperature of 85°C. The temperature of the fat base and wax base is lowered to 65°C. The mortar and stamper are heated using boiling water until they are superheated. After the superheated mortar is added, the melted wax phase is added. Then, add the fat stage little by little and grind it vigorously. Kaolin is added little by little until a creamy mass is formed. Tocopherol and titanium dioxide were added and ground until homogeneous. After that, methylparaben was added until homogeneous and allowed to cool down. Tomato extract and oleum rose were added in the last step and homogenized until the variant was in the form of lip cream. The homogenized lip cream is put into the receptacle.

Extract Making

1. Organoleptic Test

Organoleptic testing is usually done using the five human senses, which are used to define shape, color, and smell. If the variant meets the necessities such as color, aroma, smooth texture, and is evenly applied to the lips, the variant can be declared good [8]

2. Homogeneity Test

The homogeneity test determines the presence of coarse grains in the variance caused by the lack of mixing between the ingredients. The homogeneity test was carried out using an object glass. The lip cream variant that has been made is smeared evenly on the object glass. Lip cream variants are declared homogeneous if there are no coarse grains [13].

3. pH Test

The pH test was carried out using a calibrated pH meter and washing using aqua dest. The base was made by weighing as much as 0.5 grams of the lip cream variant of tomato extract. Then, dissolved using a beaker and added 50 ml of distilled water. After that, heat in a water bath until the lip cream variant dissolves. Wait for the variant to cool, and measure the pH. The resulting pH value in the variant must match the lip pH, which is 4.0-6.5 [13].

4. Smear Test

Testing the smear is done visually. The lip cream variant is applied to the back of the hand five times. The smearing power test is harmful if only a little color attachment exists. Meanwhile, if many colors are attached, the variant can be said to be good [10].

5. Adhesion Test

Adhesiveness testing is usually carried out using adhesive test equipment after the variant is smeared on a glass slide and added to a load of 1 kg for five minutes. After that, the package is removed. Then, the time it takes to separate the slides from each other is estimated. The lip cream variant can be suitable if it has a stickiness of >60 seconds [13].

6. Spreadability Test

The spreadability test was carried out by placing 1 gram of the lip cream variant sample on a slide. Then at the top, add another glass object. After that, add a load on it weighing 125 grams for 1 minute and estimate the diameter. Lip cream has good spreadability if the test results are 5-7 cm [5]. The spreadability test is one of the evaluations to determine how fast the lip cream variant is used on the lips [11].

This test was carried out using the room temperature storage method to see the stability of the variant at a temperature of 25 - 30°C. Lip cream variants were observed on day 0, day 5, day 10, and day 15. The parameters observed were the presence or absence of changes in shape, color, and small [6].

7. Irritation Test

A variant irritation test was carried out using panelists. The test was carried out by applying a variant of lip cream to the back of the panelists' ears. The variant is said to be non-irritating if there is no redness, itching, and swelling in the smeared area [5].

Result and Discussion

Organoleptic Test

From the results of organoleptic testing, the F1, F2, and F3 variants have an orange color. The orange color in the variant is due to the use of tomatoes as a dye. Lip cream variants F1, F2, and F3 are semi-solid. It follows the definition of lip cream, a variant that has a semi-solid to a liquid form that functions as a lip moisturizer and has a longer resistance than the solid form

[5]. In addition, the lip cream variant made has a rose smell due to the expansion of rose oleum.

Homogeneity Test

The test results show that F1, F2, and F3 are homogeneous, with no coarse grains found when observed visually. The homogeneity of a variant can be seen in the presence of coarse grains [13].

pH Test

Based on the study’s results, the more Microcrystalline Wax, the higher the pH of the lip cream variant and vice versa. The more Carnauba Wax, the lower the pH of the lip cream variant. It shows that the base wax affects the pH of the lip cream variant. The results of the observation of the pH test on F1 have a pH value of 5.990. F2 has a pH value of 5.993, and F3 has a pH value of 5.697. The results of the pH test have met the safe pH of the skin, which is between 4.5-6.5. Cosmetic variants are made with a pH equal to or close to the skin’s physiological pH. The more acidic and alkaline variants that touch the skin, the more difficult it will be to neutralize them, and can cause the skin to become cracked, dry, and susceptible to infection [18].

Smear Test

The results of the smear test of all formulas have good results. Shown from an even variant when applied to the back of the hand. The lip cream variant is said to have good slathering power if the color that sticks to the skin is abundant and evenly distributed [17].

Adhesion Test

The adhesion test results showed that F1, F2, and F3 had adhesive power of 69.3 seconds, respectively; 10.3 seconds; 40 seconds. The adhesion of a suitable variant is more than 60 seconds [2]. The longer the time for the variant to attach to the tool, the better the variant and vice versa. The less time the variant has to stick to the device, it means that the variant will be challenging to attach to the lips [3]. From the results of the adhesion test above, it is said that F1 has good adhesion because it is >60 seconds.

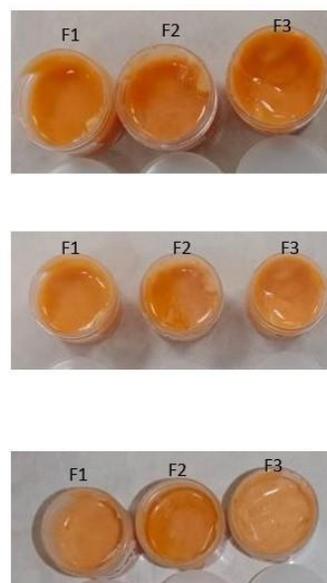
Spreadability Test

Lip cream variants are easy to spread if their diameter is about 5-7 cm [5]. The results of the dispersion test showed that all formulas met the necessities, namely F1 (6.67 cm); F2(6.6 cm); F3(5.77cm). The three recipes have good dispersion because they have 5-7 cm values.

Irritation Test

The research data showed that all formulas (F1, F2, and F3) did not show irritation behind the ear when the variant was applied and left for 15 minutes. The variant is said to irritate the skin if redness, itching, and swelling occur on the skin that is smeared by the lip cream variant [5].

Stability Test



Picture 1. The Stability Test

The The stability test of the halal lip cream variant was carried out for 15 days by observing the changes in shape, color, and smell of the lip cream variant stored at room temperature (25°-30°C). Each lip cream variant was tested on days 5, 10, and 15. Based on the observations, the three lip cream variant formulas showed that F1 and F3 had no change in variant conditions and were homogeneous and stable. While in F2 on days 10 to 15, it is not stable. The formation of 2 phases characterizes this instability. One factor that affects the formula’s flux is the absence of Carnauba Wax as a thickener. On F2, only use Microcrystalline Wax. Although it can be used as a thickener in lip cream variants, Microcrystalline Wax is more functional in binding solvents and oils (holds sweat on lip cream) [5]. There is no combination of Microcrystalline Wax and other thickeners; there will be 2 phases in the variant.

Product Halal Evaluation

A. Materials Used

Table 1. Halal Lip Cream Variant Ingredients

Ingredient	Critical Point	Non Critical Point
Tomato Extract		V
Carnauba wax		V
Microcrytalline wax		V
Castor Oil		V
Cetyl Alcohol		V
Kaolin		V
Dimetichone		V
Tocopherol		V
Titanium dioxide		V
Methyl Paraben		V
Oleum Rose		V
Liquidum Paraffin		V

Halal or not, a product can be seen from its ingredients. Tomato extract is used as a natural dye and is declared a non-halal critical point because the making process does not include any additives that make the extract unlawful. The halalness of an ingredient can be seen from the existing halal certificate. Based on the examination results, all materials used in this research, namely tomato extract and castor oil are included in *halal* ingredients [14]. Other materials such as kaolin, dimethicone, titanium dioxide, methylparaben and paraffin liquid are also included in the Halal Positive List in Material on the LPPOM-MUI decree Number SK12/Dir/LPPOM MUI/VI/20. Moreover, Carnauba Wax, Microcrystalline Wax, and tocopherol are halal ingredients (Apriyantono, 2003). And the last one is cetyl alcohol is halal on the ministry of religion decision decree Number 1360/2021.

B. Making Process

The production process must comply with Islamic law to fulfill the halalness of a product, namely in terms of quality, safety, and cleanliness during production, following the *halal* quality management system. The cleanliness of a product affects the halalness of the products produced. Hygiene aspects must be applied in halal studies so that the effects are not harmful. In processing and using tools during production, unclean things (*najis*) must be avoided to fulfill the requirements for halal and suitable products [18].

In Law No. 33 of 2014 concerning the guarantee of *halal* products, the *halal* product process (PPH) is all aspects of activities in ensuring the halalness of a product which includes the supply of materials, packaging, processing, sales, distribution, storage, and presentation of products.

The *halal* variant of the lip cream made in terms of the processing process uses a decision tree to identify critical storage points and production lines contained in the 2008 LPPOM-MUI *halal* assurance system guide. In the manufacture of tomato extract, *halal* lip cream, starting from material procurement, material storage, and line production, is spared and not mixed with *najis*. Thus, based on the decision tree, the *halal* lip cream variant from the tomato extract was not included in the *halal* critical point variant [15].

Conclusion

Based on the results of research: The optimal halal lip cream variant formula for tomato extract is F1 which has a combined base of Carnauba Wax and Microcrystalline Wax with a ratio of 6:9. *Halal* lip cream variants are made into the *halal* category based on the results of the *halal* product evaluation.

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