

## **An'Nur Homemade Dishwashing Soap from a Mixture of Used Cooking Oil and Aloe Vera Gel**

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**Abstract:** Domestic or non-domestic consumers tend to use cooking oil repeatedly to reduce the cost of buying new cooking oil and unknowingly it can affect health. In addition, the disposal of used cooking oil by consumers into waterways, rivers and soil cause water and soil pollution which in turn disrupts the ecosystem. The objective of this study was to produce dishwashing soap from a mixture of used cooking oil and aloe vera gel. The second objective was to identify consumers' perceptions of dishwashing soap from used cooking oil and aloe vera gel from the aspect of product quality. This study was conducted using quantitative design by using survey method to identify consumer perceptions of the products produced. A total of 35 users from Felda Gunung Besout, Perak were sampled for the study. Data collected through questionnaires were analyzed using Statistical Package for Social Science version 26. Descriptive analysis (frequency, percentage and mean) was used to identify consumers' perceptions of the dishwashing soap products produced. The result show that the level of consumers' perception from aspect of product quality are at high (mean=3.84, std=.223). Mean for performance and features at high level respectively. The result of this innovation is an initiative to support the government's intention to foster recycling practices among the community in Malaysia. The production of dishwashing soap from used cooking oil can reduce environmental pollution as well as creating jobs and generate side income easily.

**Keywords:** Used cooking oil, Dishwashing soap, Aloe Vera gel

### **1. Introduction**

Used cooking oil (UCO) is a domestic or commercial waste as a result of oil ignition such as using it for frying in cooking. Reusing cooking oil could cut cost and expenditure for domestic and commercial consumers. However, it is also one of the reasons to health complications in our society. UCO disposal into water stream such as sink will be clogged, thus, drains and rivers would be contaminated and affect ecosystem marine. Based on the study [1] in regards to the disposal of UCO, a few cafeterias in Malaysia had stated that 10 establishments disposed UCO directly into the sink while

seven of them disposed UCO in the bin together with leftovers. This situation could lead to land and water pollution [2-4].

Research in [1] stated that used cooking oil needs to be thrown and reused as a new product. Other researcher has found that UCO can be recycled as soaps [5]. UCO is needed to be recycled to curb underground water pollution and indirectly prolong the usage of the UCO albeit as a new product [6].

Therefore, researchers have been producing soaps by reusing used cooking oil to avoid pollution onto the environment. Produced dishwashing soaps is mixed with natural aloe vera extract to help moisturizing hands and prevent them from dryness. This dishwashing soap innovation to reuse UCO aims to bring awareness and perception of daily consumers that UCO can be recycled and avoid reusing UCO for cooking as it could be hazardous to our health.

Two elements from Garvin's Product Quality Dimension [7] in relation to product's quality, performance and features, are used as guidance to craft An'Nur Homemade dishwashing soap. This study aims to produce dishwashing soaps used cooking oil with natural aloe vera extract and also to identify consumers' perceptions on An'Nur Homemade dishwashing soap based on perspective product quality.

With the combination of UCO and natural aloe vera extract, it is hoped that this soap can remove dirt and oil from the surface of plates and cooking utensils such as pans and pots.

It also does not cause itchiness, rash and does not dry the skin of the hands, suitable for sensitive skin and long-lasting. Natural aloe vera extract mixed into this dishwashing causes the skin of the hands to become soft. What differentiates this product from other products on the market, this product uses natural ingredients such as UCO, natural aloe vera extract and natural lemon oil. Just like other dishwashing soaps on the market, this dishwashing soap also has a lot of foams and comes with a refreshing lemon scent.

## 2. Materials and Methods

### 2.1 Materials

Below is the list of materials and apparatus that are used to produce An'Nur Homemade dishwashing soap (**Figure 1**);

- Waste cooking oil
- Natural aloe vera extract
- 2 measuring beakers for water and soap
- Spatula
- Food blender
- Knife
- Cutting board
- Digital scale
- Lemon essential oil
- Colouring powder
- Filtered water
- Lye
- Hand gloves
- Face masks



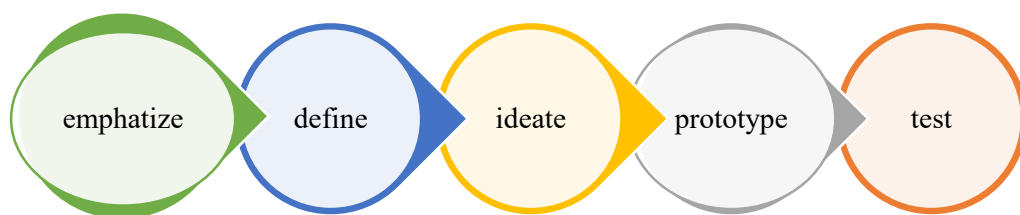
**Figure 1: List of materials and apparatus that are used to produce An'Nur Homemade dishwashing soap**

## 2.2 Methods

Study on An'Nur Homemade dishwashing soap will go through two phases which are Development Phase and Evaluation Phase

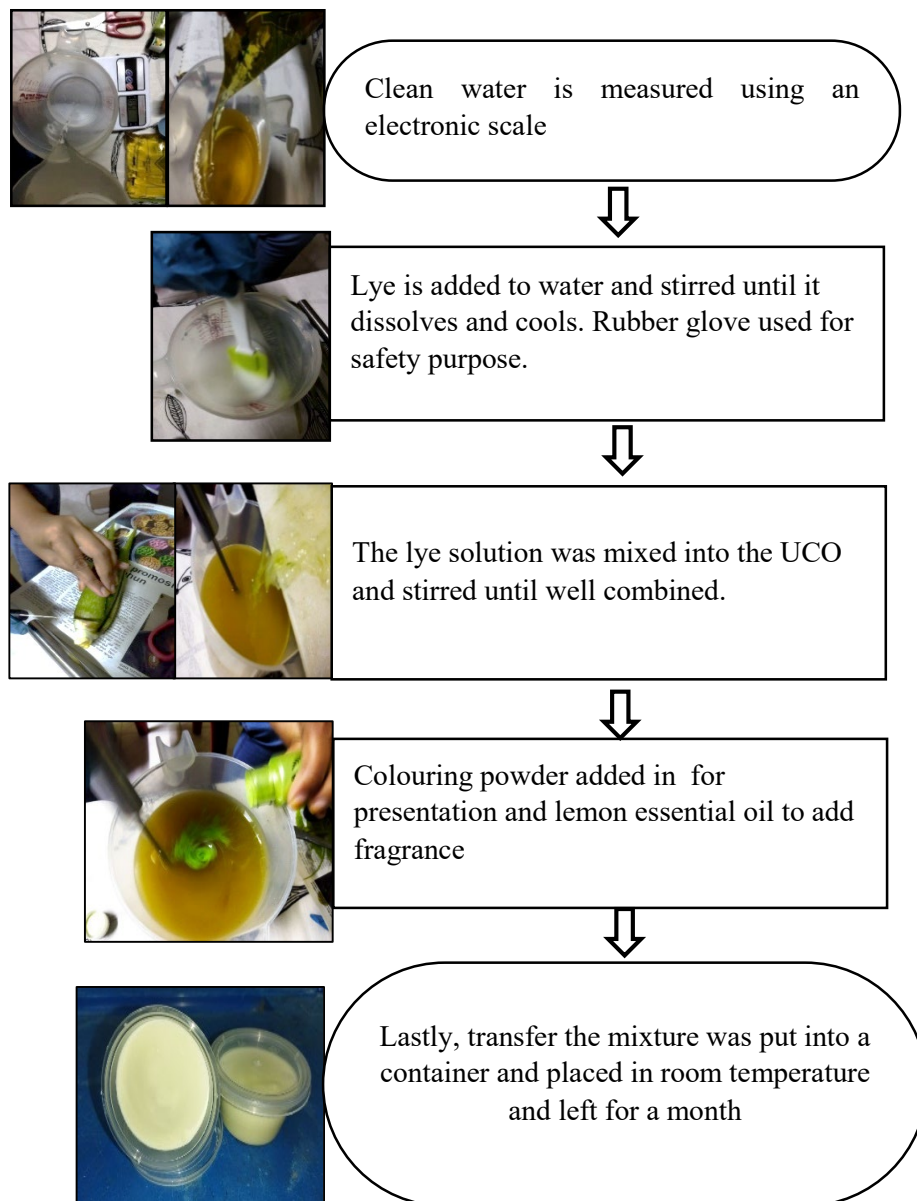
### 2.2.1 An'Nur Homemade dishwashing soap Development Phase

During the development phase, researcher uses Five Phase Model Design Thinking process which involves empathize, define, ideate, prototype and test. (**Figure 2**). This is to ensure the development process is smooth and clear.



**Figure 2: Five phase of design thinking process**

**Figure 3** shows the process to produce An'Nur Homemade dishwashing soap. Used cooking oil, air, natural aloe vera extract and lemon oil essence are mixed in accordance to their measurement and sored for a month before then can be used for commercial. The dishwashing soaps are stored at room temperature. After a month, researchers will make evaluation on the produced dishwashing soaps.



**Figure 3: An'Nur Homemade dishwashing soap production process**

### 2.2.2 An'Nur Homemade dishwashing soap Evaluation Phase

This study was conducted using quantitative method by using survey method approach. This study uses questionnaire survey as an instrument. A total of 35 consumers from Felda Gunung Besout, Perak were sampled for the study. Surveys are based on Product Quality Dimension [7] and involved element performance and features. The surveys are divided into three main sections. Section A contain the demographic of the samples such as genders, races, occupations and incomes. Section B contain items to identifying the perspective of respondents about An'Nur Homemade dishwashing soaps based on the performance of product. Lastly, Section C focuses on identifying respondents' perspective about An'Nur Homemade dishwashing soaps based on its features. 5-point Likert scale used in Section B and C. 5-point Likert scale levels include 1=Strongly disagree, 2=Disagree, 3=Agree dan 4=Agree and 5=Strongly Agree.

Data collected through questionnaires were analyzed using Statistical Package for Social Science version 26. Descriptive analysis (frequency, percentage and mean) was used to identify consumer perceptions of the dishwashing soap products produced. Interpretation for mean score for each consumers' perceptions of the An'Nur Homemade dishwashing soap shown in **Table 1**.

**Table 1: Interpretation of mean score of identifying consumers' perceptions of the An'Nur Homemade dishwashing soap [8]**

Mean	Interpretation
1.00 – 1.33	Low
1.34 – 2.66	Average
2.67 – 4.00	High

### 3. Results and Discussion

Research Question 1: Could dishwashing soaps made from used cooking oil and authentic aloe vera extra be produced?

Dishwashing soap made from UCO with aloe vera mixed in could be produced after a month in storage at room temperature. It can be seen as in **Figure 4**. The texture is solid, non-sticky and doesn't exude smell like cooking oil. Once testified by researchers, these soaps could remove stains and oil on the surface of plates and cooking utensils like pots and pans. Moreover, run tests had shown no rashness, itchiness and skin dryness upon applying the dishwashing soap. One of the researchers that has sensitive skin had shown no side-effects unlike those soaps from markets. This dishwashing soap produces lots of bubbles and has the fragrance of refreshing lemon. Upon the completion of run tests by researchers, the dishwashing soaps are given to respondents to identify their perceptions upon applying the dishwashing soap.



**Figure 4: An'Nur Homemade dishwashing soaps ready and can be used**

Research Question 2 : What are consumers' perceptions on dishwashing soap made from use cooking oil and natural aloe vera extract?

**Table 2** shows that mean for consumers' perceptions on An'Nur Homemade dishwashing soap holistically at a high level (mean=3.84, std= .223). From the aspect of product quality, it shows that both mean performance and features are at higher level, 3.85 and 3.82 respectively. This reflects that respondents agree on the performance of An'Nur Homemade dishwashing soap to be able to remove oil stains and leftovers, do not make skins itch / rash, dry and peel but moisturize hands and last longer. In the aspect of features, it is shown that respondents favour An'Nur Homemade dishwashing soap for its natural materials, refreshing lemon fragrant, produce lots of bubbles and suitable for sensitive skins.

**Table 2: Mean of product quality**

No.	Items	Mean	Std
<b>Performance</b>		<b>3.85</b>	<b>.245</b>
1	An’Nur Homemade dishwashing soaps work well removing oil stains.	3.91	.284
2	An’Nur Homemade dishwashing soaps work well scrubbing off leftovers.	3.94	.236
3	An’Nur Homemade dishwashing soaps do not make hands itch and rash.	3.83	.453
4	An’Nur Homemade dishwashing soaps do not make hands dry and peel	3.83	.382
5	An’Nur Homemade dishwashing soaps moisturize hands skin	3.74	.505
6	An’Nur Homemade dishwashing soaps last long.	3.86	.403
<b>Features</b>		<b>3.82</b>	<b>.247</b>
1	I favour An’Nur Homemade dishwashing soap because it is made from natural materials	3.91	.373
2	I favour An’Nur Homemade dishwashing soap because of its refreshing lemon fragrance.	3.86	.355
3	I favour An’Nur Homemade dishwashing soap because it produces lots of bubbles	3.74	.443
4	I favour An’Nur Homemade dishwashing soap because it is suitable for sensitive skin	3.77	.490
<b>Product quality</b>		<b>3.84</b>	<b>.223</b>

#### 4. Conclusion

Based on the data collection on respondents’ perceptions, it shows that they are holistically at high reading. This shows that An’Nur Homemade dishwashing soap receives good reception by respondents. Positive feedback from respondents proves that dishwashing soap made from UCO are effective and could compete with products from the markets. The addition of authentic aloe vera extract into UCO has also proved that it moisturizes and softens hands. Therefore, it is clear that An’Nur Homemade dishwashing soap could replace dishwashing soap products from the markets that make hands skin itch, dry, and peel.

Low production cost to produce An’Nur Homemade dishwashing soap with the best quality gives this product to compete against the other dishwashing soaps from markets. The calculation has defined the price value to sell in the market for An’Nur Homemade dishwashing soap at an affordable price of around RM 5.

The innovation of this dishwashing soap made from used cooking oil aims to raise awareness and change people’s perceptions that UCO are recyclable, curb their tendency to reuse the same cooking oil multiple times which could lead to health complications and to inform them that used cooking oil is not a wastage but could be used to reel in incomes. Also, the usage of An’Nur Homemade dishwashing soap is one way of saving as dishwashing soaps made from used cooking oil are affordable, cheaper and last longer.

Further research on used cooking oil should be made. Some of the researches that could be made are making soaps aside dishwashing soaps by using UCO like laundry soaps. Moreover, researches based of used cooking oil to produce products aside from soaps should be made.

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