

Workshop of bar soap making from waste cooking oil to the students guardian of learning class sabumi muslim homeschooling community in Sariwangi, West Bandung Regency

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ABSTRACT

Community service in the form of a workshop on making solid soap from used cooking oil with the Sabumi Homeschooling Community aimed to utilize used cooking oil waste and reduce pollution caused by household waste, provide knowledge to the community about making solid soap, and open up entrepreneurial opportunities for the community. In general, the guardians of the Sabumi Homeschooling community and their students with raw materials derived from unused materials/daily household waste. The methods used the form trials of making soap from used cooking oil, counseling about waste cooking oil and making soap theoretically, demonstrations of making solid soap from used cooking oil raw materials, hands-on workshop on making solid soap from a mixture of palm oil and coconut oil raw materials, as well as assistance, reports, and consultations on solid soap printing results. This activity produces solid soap made from used cooking oil (pH 12), as well as solid soaps made from a mixture of palm oil and coconut oil. During the mentoring period, all participants were able to identify the process of curing solid soap, and 2 participants duplicated the process of making solid soap at home with their children.



KEYWORDS

Bar soap
Waste cooking oil
Homeschooling
Sabumi
Sariwangi



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1. Introduction

Cooking oil is needed by all households for their daily needs, both for cooking and frying. The type of cooking oil that is commonly used is oil derived from palm oil [1]. Palm cooking oil is available in large quantity in the market and the price is relatively cheaper than other types of cooking oil, which cause people interest to use this product. In addition to palm cooking oil, coconut oil is also commonly used in the community. Coconut oil has more benefits than just cooking oil, it can be used as a cosmetic raw material and has various benefits for health [2]. Coconut oil consists of medium chain fatty acids, one of which is lauric acid which is well known for its antimicrobial benefits [2], and saturated fatty acids as moisturizing and skin softening agents [3]. The high demand for cooking oil, brings new issues, namely the large volume of waste cooking oil. Cooking oil that has been used is commonly known as waste cooking oil. Waste cooking oil is cooking oil that had been used, generally with a deep-frying process for household and commercial needs [4]. Waste cooking oil is still widely used for the re-cooking process, to increase economic efficiency commercially, even though in terms of nutrition, waste cooking oil has decreased in nutritional value. Frying using waste cooking oil will form acrolein compounds which can cause an itchy throat [1]. Moreover, waste cooking oil also contains carcinogenic compounds that can trigger cancer in the body [1], [4], [5]. Theoretically, it is not suitable to use waste cooking oil because it undergoes changes in physicochemical properties after 10 times of use, indicated by an impurity content of 6.084%; free fatty acid content of 0.428%; peroxide number 53,098 Meq/kg; and a specific gravity of 0.914 gram/cm³ [6]. Usually, when people did not use waste cooking oil, it is simply dumped

into the drain through waterways, which cause clogged drain pipes. This is due to the physical properties of oil which can freeze at low room temperature (caused by rain, etc.). Direct disposal into rivers or waterways can hinder the oxygen and sunlight entering the waters, which can disrupt the life cycle of living things in the water and reduce the quality of waters. Thus, a solution is needed in utilizing the waste cooking oil to prevent pollution in the environment and interfere aquatic biota. Producing bar soap with waste cooking oil as raw material is an alternative to utilize waste that can save the environment and can bring economic added value.

Soap is the reaction result of fatty acids and alkali metals through a salting process. Soap can be used to wash body, clothes, dishes and cutlery. In the manufacturing process, additives can be added, such as fragrances and dyes, to increase sales value without causing irritation and skin problems [6], [7]. Soap is available in liquid and bar. Liquid soap is used by some people because it is practical and hygienic for shared use, but because the price in the market is relatively high, many users choose bar soap because it is cheaper, economical in use and easier to obtain. In addition, bar soap has extended function, apart from being a cleaning agent, it is often used as room accessories and souvenirs for certain events. This can increase the selling price of soap products and also increase the economic value of raw materials. Based on this review, it is necessary to conduct mentoring and workshop on making bar soap as a commodity with high selling value by utilizing waste cooking oil as a raw material. It is expected to increase public knowledge about soap making and at the same time utilize waste cooking oil. Mentoring and workshop on making bar soap from waste cooking oil was carried out for homeschooling class students guardian from the Sabumi Muslim Homeschooling community. The Sabumi Muslim Homeschooling Community is a group of Muslim family-based education actors (Muslim homeschooling) located in Bandung. This community is also a forum for friendship, sharing knowledge and enthusiasm in carrying out family-based education. In homeschooling education, the pleasure of learning, the flexibility of time and place is the main thing, as well as the non-formal curriculum that is added to homeschooling learning. Life skills are also included in the learning agenda, which supports students in getting access to formal education so that they can flexibly improve the quality of lives in the future. The purpose of this community service mentoring and workshop is to build students character who are ready to enter the community environment.

Some members of the homeschooling Muslim Sabumi community who live around north and west Bandung often gather to do learning activities together for their children, at Sariwangi Indah II complex no.25, West Bandung Regency. While waiting for the children to study with the teachers who were invited, the mothers were also enthusiastic to learn and carry out activities together. They plan schedule activities for their children, as well as for themselves in each week. Reviewing education and religion books, studying with ustadzah, creating crafts, cooking classes, and learning how to make soap from waste cooking oil. Besides high enthusiasm for learning, this community also encourages how to apply minimal waste in daily life. Learning how to use waste cooking oil, which contribute to household waste, is an interesting topic and it is accepted with great enthusiasm in this community. Additional applicative skills such as soap making involve theoretical knowledge and can be used as entrepreneurial opportunities. Therefore, mentoring and workshop on making bar soap for the students' guardians in the homeschooling Muslim Sabumi community is expected to be implemented and can be taught to homeschooling children with adjustments to their education level. Besides supporting homeschooling learning, in which parents as educators and teachers, mentoring and workshop on making bar soap is also expected to encourage the entrepreneurial spirit of parents and open entrepreneurial opportunities on a home industry scale, both household needs as well as accessories and souvenirs. For instructor, mentoring and workshop on making bar soap from waste cooking oil is part of Community Service, in implementing the tridharma of higher education to apply academic theoretical knowledge. It is expected that tridharma application could be useful for the community, especially in daily life, moreover, it can open entrepreneurial opportunities and improve welfare. Community service in the form of workshop on making bar soap from waste cooking oil with the Sabumi Homeschooling Community aims to: (1) utilize waste cooking and reduce pollution caused by household waste, (2) provide knowledge to the community about making bar soap, (3) open

entrepreneurial opportunities for the community in general, and especially for the guardians of the Sabumi Homeschooling community students (4) provide students with raw materials derived from daily household waste.

2. Method

Mentoring and workshop on making bar soap was carried out at the Sariwangi Indah Complex, which participated by students Guardian of Sabumi Muslim Homeschooling Community in the Sariwangi area, West Bandung. The instructor consists of two lecturers and two students who assisted the preparation stages and workshop process. This activity was carried out on October 26 – November 2, 2018 through several stages, as following:

- Trial in making soap from waste cooking oil; at this stage, the lecturers and students conducted trial of soap making from waste cooking oil, who would follow and as instructors in this activity. The waste cooking oil as raw material was purified using bagasse and allowed to stand for 3 days until the physical impurities from the used cooking oil sedimented and the color of oil became brighter. Then, processed the waste cooking oil as raw material which had been pre-treated became bar soap. The waste cooking oil that has been pre-treated was partially stored and used for the demo process with the participants. The indicator of success in this stage was obtained the best and most easily applied formulation for the workshop participants.
- Socialization about waste cooking oil and soap making theory; this stage aims to socialized about the risk of reusing waste cooking oil for frying and dumped it directly into the environment (both water and soil). Moreover, instructor also introduced the potential of cooking oil to be converted into useful and valuable products. The success indicator in this stage is the understanding of workshop participants about the risk and the potential benefit of cooking oil which can be processed to a high usability and good marketability product.
- Demonstration about making bar soap from used cooking oil; at this stage, an experimental demonstration of making bar soap from waste cooking oil was carried out. The process started from pre-treatment of dirty waste cooking oil by using bagasse, then demonstrated how to make bar soap with waste cooking oil as raw material. The success indicator at this stage is participants can understand and observe directly how to do pre-treatment on waste cooking oil.
- Hands-on workshop on making solid soap from a mixture of palm oil and coconut oil; at this stage the participants practiced how to make bar soap from palm oil and coconut oil, it is expected that participants can used directly the bar soap for daily needs at home. The success indicator of this stage is that the participants directly make bar soap.
- Mentoring, reporting and consulting about bar soap; at this stage, consultation was carried out during the soap waiting period, regarding the reaction or appearance of the product. In this stage, participants were also assisted to make soap independently in their respective homes. Consultations were carried out interactively through WhatsApp groups. Mentoring was carried out for approximately one week after workshop. Success indicator of this stage was participants can understand and solve problems that may arise during the soap waiting period and when trying to make soap independently after workshop.

3. Results and Discussion

The trial of making bar soap, as presented in [Fig. 1](#), was carried out on October 1-5 2018 at the Chemical Engineering laboratory of the Politeknik TEDC Bandung. This trial was conducted to obtain the most practical pre-treatment technique and also to obtain the best formula for the composition of soap with a mixture of palm oil and coconut oil as raw materials, which could minimize obstacles in the practice. The best formulations and the most practical methods could help workshop process, namely providing the easiest method for the participants to duplicate independently in their respective homes,

and also can be used as entrepreneurial ideas. After getting the best formulation and method, coordination was carried out with the students guardians of the Sabumi Homeschooling Community for Mentoring and Workshop on Making Bar Soap at the Kompleks Sariwangi Indah, Sariwangi, Bandung Barat.



Fig. 1. Soap making trials

The trials included the pre-treatment method of waste cooking oil. The waste cooking oil taken from household waste had a thick color and contains a lot of physical impurities, therefore it is needed to carry out pre-treatment to overcome this issue. The initial treatment of waste cooking oil used bagasse as a filter. Bagasse was obtained from the rest mills of ice cane traders [8], then it was cleaned, dried and cut. The smaller size of bagasse, increased the contact surface area and the adsorption capacity [9], which is more effective in pre-treatment process of waste cooking oil. The pre-treatment process of waste cooking oil is described in Fig. 2. Besides filtering physical impurities, bagasse can also absorb color [10], moisture content and free fatty acids from waste cooking oil [11], [12].



Fig. 2. Filtering process of used cooking oil with bagasse

After the trial process, the next activity was mentoring and demonstration of making bar soap from waste cooking oil. Soap produced by utilizing waste cooking oil was only used as demo by lecturers and students who served as instructors, because the pre-treatment of waste cooking oil with bagasse took a

longer duration (3-5 days of filtering and precipitation) [9]–[13], which could hamper workshop activities. Demonstration activities are presented in Fig. 3. After mentoring and demonstration of making soap with waste cooking oil as raw material, then the workshop participants practice making bar soap with a mixture of palm oil and coconut oil as raw materials. Palm oil is commonly used in making bar soap because it is inexpensive and easy to obtain. Adding coconut oil as a raw material is intended to add value on soap product. Based on its benefits, coconut oil has additional benefits as an antimicrobial [2] and skin softener [3]. Adding coconut oil as a mixture of raw materials was expected to obtain similar benefits, thereby increasing the advantage and selling value [14].



Fig. 3. Demonstration process of making solid soap from used cooking oil

Students' guardians of the Sabumi Homeschooling Community were very enthusiastic in this workshop, as presented in Fig. 4. They considered this workshop has detail procedures that were easy to duplicate and could be applied as teaching materials for children who are members of Sabumi Homeschooling. In addition, the students' guardian interested in running a bar soap souvenir business. This is a good idea for entrepreneurial opportunities, utilizing waste and save the environment from pollution.



Fig. 4. Workshop process of Soap Making

Fig. 5 (a) is a soap made from waste cooking oil with a pH of 12. Fig. 5 (b) is a soap made by participants, from a mixture of palm oil and coconut oil. During the mentoring period, all participants were able to identify the curing process of the bar soap, and there were two participants who duplicated the process of making bar soap at home with their children.



Fig. 5. (a) soap made from used cooking oil, (b) bar soap (made from palm oil and coconut oil)

The mentoring activities had a positive impact on the participants. Data in “Fig 6” shows the active response of participants after attending an offline mentoring. It was 100% of the participants took part in the offline mentoring until finish, from presentation about the theory, discussion and question and answer, demonstrations of making soap from used cooking oil, until making bar soap. Furthermore, interactive online assistance was carried out through WhatsApp groups. 100% of the participants were able to complete the soap making process until curing process and cutting soap bar.

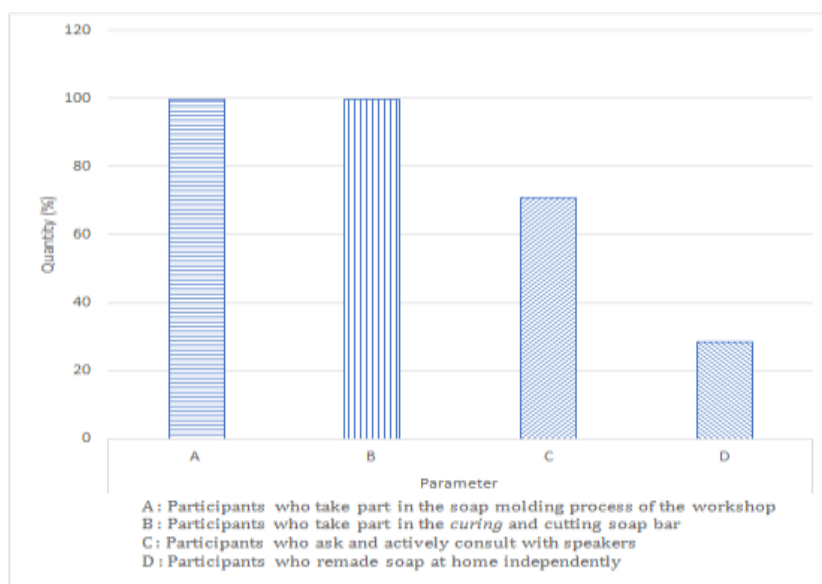


Fig. 6. Response to participant's activity after the workshop

All participants identified the curing process of their own soap and reported any progress in the soap-making process. As many as 71% of participants asked questions and consulted online with instructors, consulting the condition of soap whether it has reached the curing period, whether it can be used or not,

and the nearest chemical place or shop to buy the chemicals material. After the offline mentoring, the participants brought their own soap, and also provided with dried bagasse as a medium for purifying waste cooking oil. The consultation continued until 29% of the participants succeeded in duplicating the process of making bar soap independently at home with their children. Mentoring have provided basic knowledge for the participants as a minimum provision as an actor of minimal waste lifestyle, and creating new business opportunity. Learning and doing activities in groups in the community can also be an opportunity for sharing business, to get grow together, so that the challenges faced can be solved more easily and the burden they carry becomes lighter. It is also possible to hold a follow-up mentoring with more in-depth material, both related to various formulations of soap-making ingredients, variations of oil sources that can be used for soap making and their benefits, how to calculate the number of soaps and applications that can be used, until molding and create motifs on bar soap, or even develop into a mentoring for making liquid soap. Learning and doing activities in groups in the community can also be an opportunity for joint business in order to grow together, solve the challenges more easily and lighter the burdens. This workshop should be conducted regularly with an integrated and continuous theme, to optimize partisipants' knowledge. Moreover, Sabumi is a family-based educational community, in which motoric activities are needed as part of the students' learning program. Fig. 7 shows a group photo of instructor and workshop participants. It is expected that the knowledge and practice during the workshop can be useful for the daily life of all participants, arise caring environment attitude, especially able to open up business opportunities and increase income for participants in general and all members of the community in general.



Fig. 7. Photo session of speakers and participants in bar soap making workshop

4. Conclusion

Mentoring and workshop on soap making help the community in general, and the participants from the Sabumi Homeschooling Community in particular, to pay attention on their environment and managing household waste carefully to restrict environmental pollution, both water and soil. In addition, the practice of processing waste and/or raw materials into products that has added value and sale value can open entrepreneurial opportunities for participants. This activity can be developed and expanded, both the material and the area, to increase people awareness towards environment, and realizes that waste can be converted into useful and high-value products.

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