

UTILIZATION OF USED COOKING PALM OIL AS A STAPLE FOR ECO-FRIENDLY AROMATHERAPY CANDLE PRODUCTS

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Abstract - *Most Indonesians use cooking oil as an ingredient to process food. The continuous use of cooking oil has the potential to create household waste which certainly has various negative impacts. The problem of used cooking oil waste is also found in Sengerang Hamlet, Planjan Village, Saptosari District, where there are still many residents who have not been able to utilize used cooking oil waste properly. The Field Study and Community Service (KKN) program aims to solve this problem by utilizing household waste, namely used cooking oil, into environmentally friendly products in the form of aromatherapy candles. The research conducted by the collaborative KKN Group 121 used descriptive qualitative methods and data collection using structured interviews. This service activity was carried out using socialization and training methods regarding the making of aromatherapy candles. The participants were 25 PKK women in Sengerang Hamlet. The results of this activity are that participants are able to produce aromatherapy candles from used cooking oil and get aromatherapy candles packaged in glass cups. The existence of this activity is able to provide benefits to people's lives, especially for mothers in Sengerang Hamlet in utilizing used cooking oil into environmentally friendly products, namely aromatherapy candles so as to reduce the negative impact of household waste.*

Keywords: Household Waste, Used Cooking Palm Oil, Aromatherapy Candles

1. INTRODUCTION

Cooking oil is one of the basic household needs of Indonesian families (Ramadhani et al., 2023). In general, Indonesians prefer to process food using the frying method. Indonesians generally prefer frying food rather than using other cooking methods such as boiling (Soekarnoputri, 2022). According to the Badan Pangan Nasional (in Adi Ahdiat, 2024) in 2023, the average Indonesian consumes 9.56 kg/capita/year of cooking oil. This amount of cooking oil consumption increased by 0.9% compared to the previous year and is predicted to increase again in the following years.

Using the same cooking oil repeatedly is not recommended as it can lead to a decrease in its quality. One of the phenomena encountered in the frying process is the deterioration of the quality of oil used repeatedly at relatively high temperatures (160-180 °C), so cooking oil should only be used a maximum of 3 times (Mishra et al., 2023). The more people who process food by frying repeatedly, the more waste cooking oil will be produced (Mannu et al., 2020). Used cooking palm oil, which is cooking oil that has been used repeatedly, is often regarded as a waste that has no value and is only considered as an item to be thrown away (Zidane & Fredy, 2023).

Precipitating used cooking oil can lead to environmental problems if disposed of improperly (O. Olu-Arotiowa et al., 2022). Used cooking oil is a type of waste due to its elevated acid and peroxidase numbers. Used cooking oil contains carcinogenic compounds during the frying process. The continuous disposal of used cooking oil waste can harm the environment and the survival of human life (Yusuf, 2010). Used cooking oil that is absorbed into the soil will pollute the soil so that the soil becomes infertile. In addition, used cooking oil waste discharged into the environment also affects the mineral content of clean water (Wardhani et al., 2022).

In the Sengerang hamlet, one of the main problems related to household waste management is the lack of knowledge about the utilization of used cooking oil. The lack of socialization and education about the potential and benefits of used cooking oil makes residents less aware of the ways that can be done to process or utilize the waste in an environmentally friendly way. Education and training programs that explain how used cooking oil can be processed into useful products, such as laundry soap or biodiesel, are minimal. With better information, the community could be more involved in more sustainable waste management practices.

Before the initiative or knowledge of the utilization of used cooking oil, the common practice in Sengerang hamlet was to dispose of used cooking oil directly into the sewer or into the surrounding environment. This is a less responsible method of disposal and has the potential to cause negative impacts on the environment. Residents are generally unaware that used cooking oil can cause blockages in drains and contribute to environmental pollution issues. This habit is practiced due to the lack of alternatives that are considered easy and practical. As a result, used cooking oil that is disposed of carelessly can pollute soil and water, and potentially cause health impacts to humans and ecosystems.

Indiscriminate disposal of used cooking oil contributes to environmental pollution in Sengerang hamlet. Used cooking oil dumped down the drain or into the environment

can contaminate soil and water. When used cooking oil enters the sewer, it can cause blockages that impede the flow of water and result in flooding. In addition, oil that enters the soil can contaminate groundwater sources and damage soil quality, which in turn affects plant growth and soil health. This pollution also has the potential to harm human health, especially if the used cooking oil contaminates water sources used for daily purposes. With increased awareness about these adverse impacts, there will be more impetus to seek more environmentally-friendly solutions in the management of used cooking oil.

Collaborative KKN group 121 recognized used cooking oil as an asset that can be put to good use by making aromatherapy candles, so we held a socialization activity on the use of used cooking oil in Sengerang Hamlet. This socialization uses a visual approach by direct practice carried out by PKK (Pemberdayaan dan Kesejahteraan Keluarga) women. The things that distinguish the activities of utilizing used cooking oil in Sengerang Hamlet from previous research, namely research conducted by Agustine, et al, students of Syekh Yusuf Islamic University Tangerang who conducted socialization activities in Tegal Kunir Kidul Village, Mauk District, Tangerang Regency, are in terms of the utilization of used cooking oil itself. Agustine, et al utilized used cooking oil to be processed into soap (Nurlatifah et al., 2022), while the utilization of used cooking oil that we practice with the women of Segerang Hamlet is processed into aromatherapy candles. In addition, the difference between this research and previous research conducted by Wahyuni and Rojudin (2022) is the material hardener in making candles. We use stearin as a hardener for candles with the consideration that according to the sources we get, stearin is easier to obtain, the physical wax is sturdier, the lifetime is longer, and the melting is less. Whereas the research conducted by Wahyuni and Rojudin (2022) used paraffin as a candle hardener.

2. METHOD

The method of writing this research is to use a qualitative descriptive method. Qualitative descriptive methods produce data in the form of writing and spoken words, observable behavior, images, and numbers that are not obtained from statistical processing (Muhammad, 2011). With descriptive qualitative methods, researchers can answer research problems that have general data, such as the results of interviews and observations (Yuliani, 2018). The data collection technique used in this research is structured interviews with residents of Sengerang hamlet. In the interview, the researcher asked several questions such as, What do you use waste cooking oil for, and do you know what used cooking oil is used for? To overcome the problem of cooking oil waste in Sengerang hamlet, the solution that can be done is to socialize the use of used cooking oil, one of which is aromatherapy candles. Socialization is the activity of conveying ideas that help people to adjust to how to adapt and think (Ilmiyah et al., 2022). The following is an explanation of the tools and materials needed and an explanation of the candle-making procedure:

A. Tools and materials

The tools and materials used in making candles are 240 ml of used cooking oil, bleaching earth or charcoal, 80 grams of stearin, leftover wax-based crayons, fragrances or essential oils, cotton thread wicks, toothpicks, molding cups, stoves, used cans or pots for mixing ingredients, and stirrers.

B. Work procedures

The making of this candle starts by first purifying the used cooking oil using bleaching earth or charcoal. This process takes one day to completely purify the oil. Therefore, in the socialization, this process was carried out before the socialization day arrived because it took a long time, but in order for the PKK women to still know how to purify used cooking oil, the PKK women were still given a demo in the purification. After purification, heat 240 ml of used cooking oil and stearin (3:1) over low heat, stir until the stearin melts, and then turn off the stove. Third, add used crayons (which have been shaved) as colorants and stir until smooth. Fourth, add enough fragrance (essential oil) to make the candle smell good. Fifth, pour the wax mixture into a glass mold that has been given a wick.

3. RESULTS AND DISCUSSION

A. The use of used cooking oil in Sengerang Hamlet

In this section, the researchers provide several questions about used cooking palm waste. Question 1 is “what do you use waste cooking oil for?”, and Question 2 is “do you know what used cooking oil is used for?”. These questions were answered by PKK women in the Sengerang Hamlet. The following are the questions and the answers that have been answered by PKK women in Sengerang Hamlet:

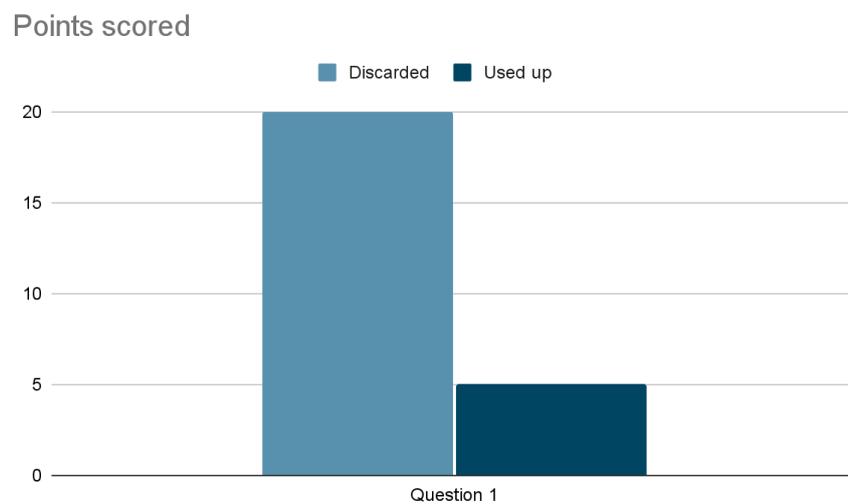


Figure 1. Question 1

From the table above, it can be seen that the average PKK woman in the Sengerang Hamlet always discards their waste of cooking oil. If this continues for years, the waste oil will cause serious environmental damage. Proper waste management is needed to

overcome this problem. Good waste management will generate many benefits for local residents. One good waste management in this case is to recycle the waste oil into useful products. Products from the waste, if sold, will also increase income for residents of Sengerang Hamlet. Therefore, the researcher asked the residents of Sengerang Hamlet with question number 2. The following are answers by PKK women related to the utilization of used cooking oil waste:

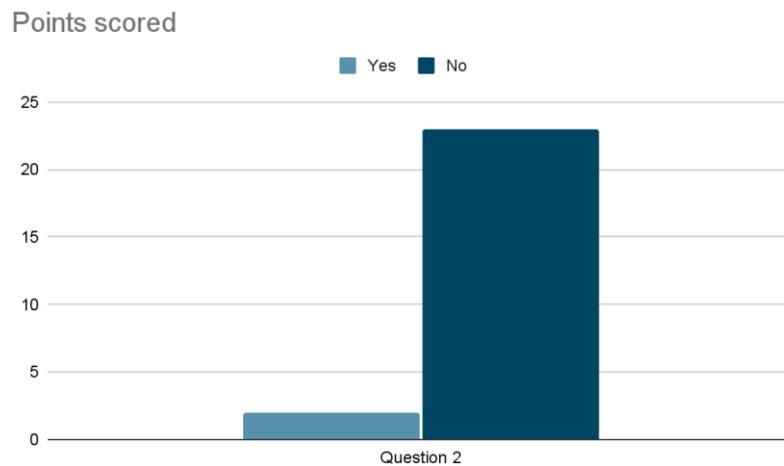


Figure 1. Question 2

From the data above, 23 PKK women do not know how to utilize used cooking oil waste into useful products. This shows that there is still a lack of good management of used cooking oil waste from PKK women in Sengerang Hamlet. In response to this, the collaborative KKN Group 121 chose to introduce or socialize how to turn used cooking oil waste into products, namely aromatherapy candles.

B. The socialization of utilization of used cooking oil

The main purpose of this socialization activity is to foster awareness of environmental care and provide understanding and knowledge about the utilization of used cooking oil waste. The approach to this socialization is in the form of the material presentation conducted by student representatives of the collaborative KKN 121 group, namely Zulfa Devi, and direct practice. This activity was attended by 25 (twenty-five) people who were PKK women in Sengerang Hamlet. The reason this socialization activity is focused on PKK women is because the role of PKK women is more dominant in the household. This is because the information conveyed is related to maintaining family health, besides that, making this craft can be used as a means of meeting daily needs.

The event was hosted by Imas Meilani, a student of collaborative KKN group 121 as the master of ceremony (MC). After the event was opened, the MC invited the speaker to deliver his material related to the increase in waste in Sengerang Hamlet, how to utilize the waste, alternative solutions, and how to process waste into useful products to overcome environmental pollution problems. Participants were very enthusiastic about participating in this activity. This can be seen from how the participants listened to the

entire material presented by the speaker. The presentation session of this activity can be seen in the following picture:



Figure 3. Presenter



Figure 4. Audience

The next step is to introduce the process of utilizing waste into candles from used cooking oil waste and will be practiced directly by the participants. In this session, the speaker invited residents to participate in making this craft. Two residents were selected to participate in every stage of making from the beginning to the finished product. The tools and materials used in making this craft are 240 ml of purified cooking oil, 80 grams of stearin, the remaining wax-based crayon, fragrance or essential oil, cotton thread wick, toothpick, printing cup, stove, can or used pot for mixing ingredients, and stirrer.

The steps in making this craft are, First, prepare all the materials and tools needed, in this case, used cooking oil that has been purified. Before the socialization, the collaborative KKN students took the used cooking oil at the residents' houses and processed (purified) first with bleaching earth. The tools used in the candle-making process should not be used for cooking because they have been exposed to chemicals. After all the materials and tools are ready, proceed to the next step. Second, heat 240 ml of used cooking oil and stearin (3:1) over low heat, stirring until the stearin melts and then turn off the stove. Third, add the used crayon (which has been shaved) as a colorant and stir until mixed. Fourth, add enough fragrance (essential oil) to make the candle smell good. Fifth, pour the wax mixture into a glass mold that has been given a wick. The process of making and the results of the candlecraft can be seen in the following picture:



Figure 5. Training

The speaker conveyed another alternative that can be done to purify used cooking oil besides using bleaching earth, namely by using charcoal, because it is more easily obtained. The speaker also conveyed another way to utilize used cooking oil as a candle directly by using used cooking oil then given a wick and enforcer and then turned on. Various benefits can be taken from the processing of this waste into aromatherapy candles. Making this craft can help reduce environmental pollution caused by household waste. Making this craft can also be a business opportunity for the community, so it can create jobs and increase residents' income if the craft is followed up with mass production. Through the PKK women's group, this activity can be a means of community empowerment, encouraging collaboration between communities with candle-making skills training. This activity is a sustainable solution that can support environmental and economic sustainability, and increase awareness of the environment and health in the community. It is also expected that this activity will be used as a means to reduce the production of household waste generated in Sengerang Hamlet.

The residents of Sengerang Hamlet who attended looked enthusiastic and responded positively to this socialization activity. The results of candle crafts made from used cooking oil in this activity were brought home and collaborative KKN 121 students provided guidance on how to make this craft to be re-practiced at home so that it is hoped that the benefits of this activity can be sustainable and can become a business opportunity for the community. However, to achieve this, it is necessary to increase exploration, innovation, production, and distribution to develop human resources in utilizing resources in the surrounding environment. This is a challenge that must be faced. To overcome these challenges, there is a need for synergy between related agencies and appropriate technology that is considered to improve the quality of human resources and community productivity.



Figure 6. Appreciation



Figure 7. Appreciation

4. CONCLUSION

Based on the results of the research that has been conducted, it is known that the service activities of the collaborative KKN 121 are able to provide new knowledge and skills for mothers in Sengerang Hamlet regarding the utilization of used cooking oil into environmentally friendly products, namely aromatherapy candles. The utilization of used cooking oil into aromatherapy candles can be an alternative in solving household waste problems because it can utilize waste that is produced continuously into a product that is useful for daily life. In addition, processing used cooking oil into aromatherapy candles can minimize negative impacts which can certainly harm the community if no alternative solution is found. With this activity, it is hoped that it can be a sustainable solution that can increase public awareness in Sengerang Hamlet so that it can create a healthy and pollution-free environment. In the economic aspect, the utilization of used cooking oil is expected to be a business opportunity for the community so as to create jobs and increase community income, especially residents in Sengerang Hamlet.

REFERENCE LIST

- Adi Ahdiat. (2024). *Konsumsi Minyak Goreng per Kapita Indonesia Naik pada 2023* | Databoks. Databoks.
<https://databoks.katadata.co.id/datapublish/2024/04/22/konsumsi-minyak-goreng-per-kapita-indonesia-naik-pada-2023>
- Ilmiyah, F., W, S. N. A., N, I. A. Q., & Zunaidi, A. (2022). *Sosialisasi Penanggulangan Tingginya Angka Pernikahan Dini di Desa Tambakrejo-Wonotirto-Blitar*.

- Komatika: Jurnal Pengabdian Kepada Masyarakat*, 2(2), 29–33.
<https://doi.org/10.34148/komatika.v2i2.508>
- Mannu, A., Garroni, S., Ibanez Porras, J., & Mele, A. (2020). Available Technologies and Materials for Waste Cooking Oil Recycling. *Processes*, 8(3), 366.
<https://doi.org/10.3390/pr8030366>
- Mishra, S., Firdaus, M. A., Patel, M., & Pandey, G. (2023). A study on the effect of repeated heating on the physicochemical and antioxidant properties of cooking oils used by fried food vendors of Lucknow city. *Discover Food*, 3(1), 7.
<https://doi.org/10.1007/s44187-023-00046-8>
- Muhammad. (2011). *Metode Penelitian Bahasa*. Ar-ruzz Media.
- Nurlatifah, I., Dine Agustine, & Dadang Sujana. (2022). Pemanfaatan Limbah Minyak Jelantah Menjadi Sabun Di Desa Tegal Kunir Kidul. *Dinamisia : Jurnal Pengabdian Kepada Masyarakat*, 6(2), 452–459.
<https://doi.org/10.31849/dinamisia.v6i2.9220>
- O. Olu-Arotiowa, A. Odesanmi, B. Adedotun, O. Ajibade, I. Olasesan, O. Odofin, & A. Abass. (2022). REVIEW ON ENVIRONMENTAL IMPACT AND VALOURIZATION OF WASTE COOKING OIL. *LAUTECH Journal of Engineering and Technology*, 16(1).
<https://laujet.com/index.php/laujet/article/view/527>
- Ramadhani, A. N., Malik, A. F., & Fitriana, W. R. (2023). Utilization of Wasted Cooking Oil and Essential Oil of Sweet Orange Peel (*Citrus sinensis*) as Aromatherapy Candles. *Equilibrium Journal of Chemical Engineering*, 7(2), 191.
<https://doi.org/10.20961/equilibrium.v7i2.80308>
- Soekarnoputri, M. (Director). (2022, March 17). *WEBINAR Cegah Stunting untuk Generasi Emas Indonesia Bersama Megawati Soekarnoputri* [Video recording].
<https://www.youtube.com/watch?v=f5RhDQywuck>
- Wahyuni, S., & Rojudin, R. (2022). Pemanfaatan Minyak Jelantah dalam Pembuatan Lilin Aromaterapi. *PROCEEDINGS UIN SUNAN GUNUNG DJATI BANDUNG*, 1(54), 1–7.
- Wardhani, D. P., Setyaningsih, E., & Widyaningrum, P. W. (2022). *Pengolahan Limbah Minyak Jelantah Menjadi Sabun Pada Karang Taruna Bakti Manunggal*. 5(1).
- Yuliani, W. (2018). *METODE PENELITIAN DESKRIPTIF KUALITATIF DALAM PERSPEKTIF BIMBINGAN DAN KONSELING*. 2(2).
- Yusuf, Y. (2010). Penyuluhan dan Pelatihan Pemanfaatan Limbah Minyak Goreng (Minyak Jelantah) Sebagai Bahan Baku Pembuatan Sabun Cair. *Warta Pengabdian Andalas*, 16(25), 195–206.
- Zidane, M. I. I., & Fredy, M. (2023). Pengolahan Limbah Minyak Jelantah Menjadi Lilin Guna Mengurangi Pencemaran Lingkungan Di Desa Bening. *PROSIDING PATRIOT MENGABDI*, 2(1), 01.