

## THE AWARENESS OF RECYCLING THE USED OF COOKING OIL

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### Abstract

Cooking oil is widely used by many Malaysian especially for restaurants operators, food manufacturers and households. However, the used cooking oil unfortunately being dumped into drain and sewer, creating pollution. Even though there are organizations collecting the waste used cooking oil, but, most of the households did not have knowledge that used cooking oil can be recycled. The objective of this study is to investigate the awareness on the recycling used cooking oil among Pasir Gudang residents. To achieve the objective, the researcher used quantitative research method which is questionnaire, that being distributed among Pasir Gudang residents. From the analysis conducted, it was found that majority of the respondents did not aware the used of cooking oil can be recycled. Other than that, most of the respondent also did not know that there are individuals or companies which collecting and buying used cooking oil. A correlation coefficient meanwhile reveals that there was strong positive relationship between the Behavior factor and Communication factor.

**Index Terms**-- Cooking oil, used, recycle, Pasir Gudang

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### INTRODUCTION

Cooking oil played the most important role in every types of food in Malaysia especially for fried foods. Cooking oil basically is from palm oil, vegetable oil, coconut oil or virgin oil. The major users of cooling oil basically from restaurants, food manufacturers and households. Cooking oil not only acts as the heat transfer to prepare the food, but it helps in adding the taste of the foods itself. According to [1], cooking oil also helps in providing good taste, aroma and color of the foods. However, using too much cooking oil will lead to waste if improper management of waste cooking oil being practiced.

The increasing of human population affects the employing of frying method in foods preparation. The [2] reported that around 50,000 tons of wasted cooking oil produced from vegetable oils or animal fats, are disposed to the environment without proper treatment yearly in Malaysia. This is supported by [3] that stated most of the used cooking oil from households is being disposed into the drainage and soil. This habit will give negative impact to the environment if it is being practiced continuously. Others than that, this situation also shows that there is low of awareness in disposing wasted cooking oil.

### LITERATURE REVIEW

#### Definition of Used Cooking Oil

Used cooking oil can be defined as the oil that been contaminated by other elements. It might or might not be harmful to the surrounding. Therefore, due to its toxicity potential, many countries had introduced a few environmental regulations in order to have a safe disposal of oils. This action is to reduce destruction to the humans, natural environment and living organisms [4]. According [5], any forms of used oil consumed by household and any premises is considered as the abandoned oil that in the end can be recycled.

[6] stated that the used cooking oil from restaurants, households, food industries and others can be feedstock for biodiesel production. This statement agreed by [7] that stated used cooking oil not only can be recycled become biodiesel products.

But, with the technologies and researches that being conduct now used cooking oil can transform too many other products. There are many countries such as Australia, China, Germany, United Kingdom, United States, Spain and others take the initiatives by using the used cooking oil for biodiesel. Additionally, used cooking oil can be a good substitute in supplying the power in term of biodiesel production that can help to solve the problem such as fuel problem in rural area [8].

#### Advantages of Recycling Used Cooking Oil

[8]stated that by producing the biodiesel using used cooking oil, can help the development of rural area in developing countries. Moreover, it also encourages social enclosure in the urban area because the characteristic of biodiesel production itself is environmentally sustainable.

[9]report besides of being used as renewable energy like biodiesel, used cooking oil also can help lowering the cost of cleanup. This is because by keeping the used cooking oil to be recycled, it can save time and cost to clean up the drain and repair the pipe. Furthermore, the large scale of recycling used cooking oil nowadays can provide many jobs especially in biodiesel production. The fields that will gain which include information technology, engineering, sales, marketing, accounting and training.

#### Overview of Others Country that Already Recycle Used Cooking Oil

Based on the research by [10], Croatia has recorded a lower amount of collected waste cooking oils in the country from 2007 to 2012 by implementing regulations of the management of waste oil such as lubricant and edible oil in efficient way. The leading management of waste cooking oil is they recycle the waste of oil to a new product that can be used again instead of producing new product from a raw material. An efficient waste cooking oil management that have be implementing in the country give a big impact in keeping the environmental of Croatia in good and clean condition. Even though not all parties participated in waste cooking oil management, the republic of

Croatia strengthening the authorities for all parties to join the waste management.

A study prepared by [11], the demand of waste processed cooking oils or Used Cooking Oil in Hong Kong is high in the market such as biodiesel, animal foods and oleo chemicals. As a result, It has minimize the produce of waste oils and increasing the use of renewable energy to save the environment across Hong Kong. In the country also all food business are required to install grease traps to separate out the oil and grease before discharging it into the sewer. The separated grease can be used back for biodiesel industry as input for biodiesel production. Regarding to the use of grease oil in Hong Kong, data has been provided by Environmental Protection Department (EPD) Hong Kong has recorded a lower quantity of waste cooking oil dispose into the environment.

A survey conducted by [12] in Philippines demonstrate that the volume of used cooking oils has been dispose into the drain and it has contributed to hazardous environment to the city. Due to that, Philippines has taken a few steps of controlling the disposal of used cooking oils into the drain by modification of available pressurized cooking stove to achieve more efficient of processing the used cooking oils for a better purpose.

The modification of existing instrument is on the stove part which can increase the efficiency of used cooking oil process part. This equipment able to process back used cooking oils to be use back in commercial industry. It stated that the used cooking oil management system that has been implement in the city has reduce a huge amount of producing waste cooking oil which able the authority to keep their environment safe and clean.

**METHODOLOGY**

The objective of this paper is to identify the awareness of recycling used cooking oil among Malaysian people. To achieve the objective, this study used quantitative method, which is questionnaire, to collect the data. This study has used city of PasirGudang, as a sample for data collection.

The questionnaire design by researcher consist of three section; Section A covered the questions that are related with socio demographic information, Section B covers the awareness of respondent in PasirGudang about the recycling of used cooking oil and Section C covers the attitudes of respondent towards the recycling the used of cooking oil. The sampling used in this study is convenience sampling technique. For the sample size, this study follows the sample size provided by Krecjie and Morgan table (1970).

**RESULTS AND DISCUSSION**

Table 1 provide the results for Section A.

**Table 1. Demographic of Respondent**

Gender	Male	31.3%
	Female	68.7%
Age	Below 25 years old	32.8%
	26-40 years old	35.9%
	Above 41 years old	31.3%
Cooking Frequency	Daily	64.9%
	Once a week	15.3%
	Rarely	19.8%

From the Table, it can be concluded that majority of respondents that join this survey is female, that age between 26- 40 years old. Majority of them also cook every day. The result for Section B is shown in Table 2.

**Table 2. The Awareness About the Recycling of Used Cooking Oil**

How you dispose the used cooking oil?	Throw into trash	45.8%
	Pour into pipe and drain	46.6%
	Recycle	7.6%
Do you aware that used cooking oil can be recycle?	Yes	27.5%
	No	72.5%
Do you know that there are individuals/companies that collect and buy used cooking oil?	Yes	15.3%
	No	84.7%

From the result in Table 2, it was found that majority of the respondents did not have awareness about recycling the used of cooking oil. This can be shown when majority of them (92.4%) dispose the used cooking oil into the trash or pipe and drain. Majority of them (72.5%) also did not know that the used cooking oil can be recycle and there are actually individuals/company that collect and buy the used cooking oil. The result for Section C is shown in Table 3.

**Table 3. The Attitudes of Respondent Towards the Recycling the Used of Cooking Oil.**

Recycling of used cooking oil is a hard task	Strongly disagreed	3.1%
	Disagreed	5.3%
	Neutral	7.6%
	Agree	57.3%
	Strongly agree	26.7%
The authorities and NGOs need to initiate a good impact program regarding the recycling of used cooking oil	Strongly disagreed	1.5%
	Disagreed	1.5%
	Neutral	1.5%
	Agree	57.3%
	Strongly agree	38.2%

From the result in Table 3, it was found that majority of the respondents (84%) totally agreed that recycling of cooking oil is a hard task. This is look like more to excuse as recycling process of used cooking oil is not a hard task to do so. Other than that, majority of the respondents also (95.5%) hope the authority or any NGOs company can provide a campaign regarding the recycling of used cooking oil to increase their awareness about that matter.

**CONCLUSION**

From the result presented in Table 1,2 and 3, it can be conclude that majority of the respondents in PasirGudang did not have awareness about recycling of used cooking oil. Majority of them still used easy way to dispose the used cooking oil by pour into the trash or pour into the pipe and drain. They also did not know about the existence of individual/company that can collect and buy the used cooking oil. This show that the government need to enforce something like awareness campaign, to increase the awareness of people about the proper way to dispose the used cooking oil, like what has been implement by others country. This not only can educate people about the recycling process, but also can help the environment to be healthier.

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**REFERENCES**

1. Ibrahim Kabir, MohdRusli Yacob, Alias Radam. (2014). IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT). *Households' Awareness,*

- Attitudes and Practices Regarding Waste Cooking Oil Recycling in Petaling, Malaysia*, 45-51.
2. Loh Soh Kheang, Choo Yuen May, Cheng Sit Foon, Ma Ah Ngan. (2006). *Journal of Palm Oil Research* Volume 18. *Recovery And Conversion Of Palm Olein-Derived Used Frying Oil To Methyl Esters For Biodiesel*, 247-252.
  3. Haruhiro Fujita, Wataru Iijima, Katsuyuki Nakano, Joko Prayitno, Hiroe Tsubaki, Genshiro Kitagawa. (2015). *International Conference on Circuits and Systems (CAS 2015) . A Comparative Study of Waste Cooking Oil Recycling Programs in Bogor and Niigata Cities and GHG Emission Reduction by Recycling*, 169-172.
  4. Hanna Prokkola, Toivo Kuokkanen, Ulla Lassi . (2012). *Green and Sustainable Chemistry . Material-Efficient Utilization of Waste Oils—Biodegradability and Other Chemical Properties of Vegetable Recycling Oils*, 133-139.
  5. Gubovicova, M. (2015). *Cooking Oil Collection Program - From Useless Oil to Useful Biofuels*. Retrieved October 15, 2017, from Open Ideo: <https://challenges.openideo.com/challenge/renewable-energy/ideas/cooking-oil-collection-program-from-useless-oil-to-useful-biofuels>
  6. Woodhead, J. (2015, February 19). *Campaign promoting recycling of used cooking oil*. Retrieved October 25, 2017, from Almerimar Today: <http://almerimartoday.com/index.php/almerimar-news/1284-campaign-promoting-recycling-of-used-cooking-oil>
  7. D. C. Panadare, V. K. Rathod. (2015). *Iranian Journal of Chemical Engineering. Applications of Waste Cooking Oil Other Than Biodiesel: A Review*, 55-72.
  8. Aldara da Silva César, Dayana Elizabeth Werderits, Gabriela Leal de Oliveira Saraiva, Ricardo César da Silva Guabiropa. (2016). *Renewable and Sustainable Energy Reviews. The potential of waste cooking oil as supply for the Brazilian biodiesel chain*, 246-253.
  9. fuels, s. a. (2017, May 18). *The Benefits of Recycling Cooking Oil*. Retrieved October 20, 2017, from Smart Alternative Fuels: <https://smartalternativefuels.com/blog/the-benefits-of-recycling-cooking-oil>
  10. Tahir Sofilić, Vlatka Šomek- Gvoždak, Ivan Brnardić. (2014). *ECOLOGIA BALKANICA. Croatian Experience in Waste Oil Management*, 109-119.
  11. Council, E. M. (2014). *A Study to Promote Recycling of Plastic, Paper and Used Cooking Oil in Hong Kong*. Hong Kong.
  12. Consorcio S. Namoco Jr., Venerando C. Comaling, Cerilo C. Buna, Jr. (2017). *ARPJ Journal of Engineering and Applied Sciences. UTILIZATION OF USED COOKING OIL AS AN ALTERNATIVE*, 435-442.

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