

A Study of Reused Frying Oil Utilization Behavior on Deep Fried Seller

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Abstract — The biggest air pollutant comes from motor vehicle which pertains 60%-70%. Position of street food court enables absorption of heavy metal emitted by motor vehicles. The use frying oil to fry may enhance the absorption of lead (Pb) and may exceed the maximum limit. The objective of the study was to understand lead content (Pb) of reused frying oil and knowledge and attitude of deep-fried about utilization of reused oil in Kendari in 2015. This study was an observational descriptive with laboratory assay. The number of samples was 48 seller and 48 samples of reused frying oil utilized by deep-fried seller in Kendari. The results of the study showed that the knowledge of seller about utilization of reused frying oil was good for 83% and the other 16.7% was less good. Regarding to attitude, 81.2% of sellers claimed positive attitude however, the other 18.8% showed negative attitude. Based on the laboratory assay, 8 samples (16.7%) of reused frying oil contained lead and illegible yet, the other 83.3% was eligible.

Key words— *Metal, Reused Frying Oil, Knowledge and Attitude.*

I. INTRODUCTION

Lead (Pb) is not bio-degradable and toxin remains. According to *International Agency for Research on Cancer* (IARC), each rise of lead (Pb) level on bloodstream by 10-20 µg/dl may decrease IQ level by 3 points [1].

The amount of lead in the air has been dramatically increased since industrial revolution was begun in European continent. Smoke was emitted through factory smokestack as well as motor vehicle mufflers. This condition happened daily therefore noticeably increased the level of lead in the air. This issue had been proved by a study of lead contained on ice layer in Greenland in 1969 (Palar).

A study about contamination of heavy metal on food and its impact toward health concluded that there were several

metals which were microelement and had no biological function at all [3].

Those metals were more dangerous and might cause toxicity on animals and humans which were lead (Pb), mercury (Hg), arsenic (As) and cadmium (Cd). Contamination of heavy metal on human can also be found through consumed food and water. This may happen as environment such as the air, water and soil was contaminated by those heavy metals [3].

Exposure on air pollution now becomes indispensable issue of daily life, especially in the high street of big cities. The air traffic in Indonesia has considerably role in contributing air pollution [4].

The biggest air pollution is from motor vehicle which reaches 60%-70%. As an illustration, in 2011, the increase of motor vehicle in West Sumatra pertained 11.2% per 455,855 units, from about 4,039,127 units in December, 2010 to 4,494,982 units in November, 2011 [5].

Indonesian certainly likes eating fast-food. The life style which requires time efficacy makes people prefer fast-food. Based on the data by Susenas, money allocated for food swelled by 3-5% during the year 1999-2005. This data depicts that during 1999-2004, about 80% of households in Indonesia consumed fast-food. Among 22 kinds of food, deep-fried was the most favorable fast-food. Data of consumption module (Susenas) 2002 stated that deep-fried was selected by 49% of Indonesia household [5].

Contamination of lead in the environment may be found on food, water, the air and drinking. Another source of lead pollution is kitchen utensils which are made from porcelain, especially those used for cooking and reserving food. Drinking water caught from lead pipe contains high level of water-soluble lead. One of the factors toward high contamination of lead in the air is the use of lead-gas which is still high in Indonesia to run vehicles [3].

Deep-fried is popular as it is cheap, accessible, and gives energy. Nevertheless, many people do not know yet about security of consumed food. One of the issues that makes deep-fried is not healthy is pollution level on it such as microbiological, chemical, and physical pollution. The position of street-food court enables the absorption of heavy metal emitted from motor vehicle. The level of lead contaminating street-food is influenced by duration of exposure, the longer the duration the higher the contamination of lead. This idea is along with a study that showed all deep-fried samples in street-food stall contained lead based on their duration of exposure. The average level of lead contamination

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for new deep-fried was 0.4287 pp., 0.8398 ppm after 3-hour exposure, and 1.1197 ppm after 6-hour exposure [6].

Analysis of lead contamination on frying oil before and after frying used by deep-fried seller in the area of traffic light in Medan concluded that reused frying oil contained lead (Pb), there should, therefore, consideration of its using. The utilization of oil to fry food in the area of traffic light may elevate lead level until exceeds the maximum level which is based on the hygiene and food sanitation principles in order to keep food from smoke exposure emitted by motor vehicle [7].

A study depicted that level of lead in all samples of reused frying oil was increased. Condition enabled the increase of this lead level was location of street-food court which was ± 20 meter from the traffic light in which the stop light was on about 151 seconds and the line of vehicle reached ± 90 meter [7].

The existence of deep-fried seller around traffic area in a dense city may exacerbate contamination of lead on the street-food. Various types of vehicle will stop during the red light and most of them keep the machine on. This condition causes air pollution by localized smoke which may elevate concentration of lead pollutant and lead to the exposure of this heavy metal on street-food as well as the frying oil.

Based on survey, there were several seller selling in the intersection of high street, traffic light, department stores, and even in the gas station, for instances, in the intersection of traffic police station Mandonga, Ade Swalayan store, Wuawua Jaya store, Lippo Plaza department store, and high traffic density site around the main gate of Halu Oleo university (UHO). Those locations are nearly 1 meter from walk side.

Based on the data from District unit of Technical service (UPTD) Samsat Kendari, the number of motor vehicle in Kendari remains increasing. The rise of motor vehicle using is considered as a the major factor for air pollution in Kendari. One of the impacts of this air pollution is contamination of food stuff especially frying oil which is used by street-food seller.

II. METHODS

This study is an observational description with laboratory assay. The assay was made in laboratory of Mathematics and Natural Sciences Faculty, university of Halu Oleo Kendari. The study was conducted in March, 2015. The number of samples was 48 sellers whom were determined through a simple random sampling technique.

III. RESULT AND DISCUSSION

a. Laboratory Assay of Lead

Table 1. The Result of Laboratory Assay of Lead (Pb) on deep-Fried Seller in Kendari

| Test Result | Number (n) | Percentage (%) |
|--------------|------------|----------------|
| Ineligible | 8 | 16,7 |
| Eligible | 40 | 83,3 |
| Total | 48 | 100 |

The result laboratory assay on the level of lead contained by reused frying oil unveils that among 48 samples, 40 samples (83.3%) were eligible based on SNI 3741:2013 which requires maximum limit of lead contained on frying oil is 0.1 mg/kg. this result was proved by Atomic Absorbance Spektrofotometry (AAS) indicating 40 samples did not indicate lead contamination on the oil.

However, the other 8 samples explained various results which were with code 03 = 0.42, sample 19 = 3.08, sample 21 = 5.96, sample 32 = 1.43, sample 33 = 2.11, sample 35 = 4.56, sample 38 = 0.69, sample 43 = 1.08 based on SNI 3741:2013 which requires maximum limit of lead contained on frying oil is 0.1 mg/kg. Since then, these 8 samples were ineligible.

Street-food is one of the high-risk foods of lead contamination. Some scholar especially dietary practitioners assume that street-food especially deep fried is actually a very hazardous food to consume and unhealthy. One of the major factors is condition around the deep fried seller which may lead to unhealthy food to consume. We may notice once we buy deep fried located near the street with high dense traffic, there will be much smoke exposed to the food.

The exposure of lead (Pb) on frying oil also is assumed as the habit of deep fried seller who always utilize reused frying oil in an open situation and the location of food stall is near the street. One of the characteristics of lead (Pb) is fat-soluble and oil-soluble, contaminated oil. Hence, all deep fried is basically contaminated by lead from the oil itself.

Existence of deep fried seller around high-dense traffic area exacerbates contamination of lead (Pb) on food. Various types of vehicle will stop during the red light and most of them keep the machine on. This condition causes air pollution by localized smoke which may elevate concentration of lead pollutant and lead to the exposure of this heavy metal on street-food as well as the frying oil.

Based on SNI 01-3741-2002, frying oil is food stuff with main composition of triglyceride from plants, with or without chemical change including hydrogenation, condensation, and already been purified (BSN, 2002). In the act of the head of BPOM of the republic of Indonesia Number HK.00.06.1.52.4011 in year 2009 about determination of maximum microbiological and chemical pollutant on food, maximum level of lead is 0.1 mg/kg.

Based on survey, there were several seller selling in the intersection of high street, traffic light, department stores, and even in the gas station, for instances, in the intersection of traffic police station Mandonga, Ade Swalayan store, Wuawua Jaya store, Lippo Plaza department store, and high traffic density site around the main gate of Halu Oleo university (UHO). Those locations are nearly 1 meter from street side.

Those intersections are high-dense traffic areas. In addition, consumers such as students and officers are prone buying deep fried in those locations. Through this situation, it is assumed that traffic around these locations can trigger pollution to frying oil by the smoke emitted by the motor vehicles which contain lead (pb). this idea is along with a study of Hasibuan in 2012 about the level of lead (Pb) on reused frying oil. The result of the study described that there was a sample of frying oil which was illegible based on a decree of the head of BPOM RI No. HK.00.06.1.52.4011 in 2009, yet the other 4 samples were eligible. The street-food

vendors in these 5 locations also did not understand about hygiene and food sanitation principles in keep the food away from exposure of lead (Pb) [7].

b. Knowledge of Deep fried Seller Utilized reused Frying Oil

Table 2. Distribution of Knowledge of Deep Fried Seller Utilized Reused Frying Oil in Kendari

| Knowledge about reused frying oil | Number (n) | Percentage (%) |
|-----------------------------------|------------|----------------|
| Less | 8 | 16,7 |
| Moderate | 40 | 83,3 |
| Total | 48 | 100 |

Knowledge is a result of know and is happened after someone sensing a certain object. In the dictionary of Bahasa Indonesia, knowledge or know is understanding after experiencing or been taught [8]. Due to these definitions, it can be concluded that knowledge is a know of human which is determined through experience, feeling, logic, and his intuition after sensing a certain object. Attitude which is based on knowledge will be more sustainable then that which is not. Assessment of knowledge can be made through interview or questionnaires about certain object desired by the subject of study of informant.

Based on the results, it can be seen that knowledge of deep fried seller was in moderate level, there was inadequate level of lead on frying oil. As is presented on master table of analysis of reused frying oil utilization on deep fried seller in Kendari in 2015, it can be noticed in the third position, the knowledge level of respondents was moderate however, there was lead level which was inadequate, those are 0.42 $\mu\text{g/g}$, 3.08 $\mu\text{g/gr}$, 5.96 $\mu\text{g/g}$, 1.43 $\mu\text{g/g}$, 2.11 $\mu\text{g/g}$, 04.56 $\mu\text{g/g}$, 0.69 $\mu\text{g/g}$.

Education level is a long-term process using sistematic and organized procedures, in which managerial labor learns cocnptual and theoritical knowledge for general purposes [9].

The result of the study indicated that respondents' knowledge about lead (Pb) as a dangerous heavy metal found on vehicle's smoke and should not be in frying oil, 37.5% or 18 vendors were categorized low.

This study also depicted that 40 respondents (83.3%) had moderate level of knowledge however the other 8 respondents (16.7%) did not. Thus, it can be seen that knowledge level of deep fried seller in Kendari was moderate.

Along with this study, a research about characteristic, knowledge, attitude, and practice of household mothers over utilization of reused frying oil in Tanjung Semangat Village in 2010 unveiled that the knowledge of mother was mostly moderate for 63 people (63%) [10]. The other study about characteristic of knowledge, attitude and practice of deep fried seller over utilization of reused frying oil in the area of West Sumatera university in 2011 showed that based on interview, 21 vendors (67.7%) had good category of knowledge, yet 10 vendors (32.3%) had moderate level and none with less good level of knowledge [11].

c. Attitude of Deep fried Seller Utilized reused Frying Oil

Table 3. Distribution of attitude of Deep Fried Seller Utilized Reused Frying Oil in Kendari

| Attitude about reused frying oil | Number (n) | Percentage (%) |
|----------------------------------|------------|----------------|
| Negative | 9 | 18,8 |
| Positive | 39 | 81,3 |
| Total | 48 | 100 |

Newcomb stated that attitude is a readiness or willingness to act and is not an actuation of certain motive. Attitude is not an act, however becomes a predisposition act or activity. Assessment of attitude can be made directly or indirectly. Direct assessment can be collected by directly asking or asking statement of informant toward a certain object [8].

Attitude is an internal ability to act in decision making, moreover if there is possibility to react. Someone with strong attitude can distinctively choose from many options, in contrast those who do not have strong attitude will be doubtful in determining their possible action [11].

Regarding to the study result, it can be seen that attitude of deep fried vendors was moderate. There was inadequate level of lead on frying oil. As is shown in the master table of analysis of reused frying oil utilization on deep fried seller in Kendari in 2015, in the third position, respondent's attitude was positive however, there was inadequate level of lead which was 0.42 $\mu\text{g/gr}$. In 19ths, respondent's attitude was positive, yet there was inadequate level of lead which was 3.08 $\mu\text{g/gr}$. In 32nds, respondent's attitude was positive, yet there was inadequate level of lead which was 1.43 $\mu\text{g/gr}$. In 33rds, respondent's attitude was positive, yet there was inadequate level of lead which was 2.11 $\mu\text{g/gr}$. In 35ths, respondent's attitude was positive, yet there was inadequate level of lead which was 4.56 $\mu\text{g/gr}$. And in 38ths, respondent's attitude was positive, yet there was inadequate level of lead which was 0.69 $\mu\text{g/gr}$.

This study showed that respondents' attitude over frying facilities protected from the exposure of vehicles smoke and dust, there were 47.9% or 23 vendors categorized negative.

This study also depicted that 39 respondents (81.2%) had positive attitude, however the other 9 respondents (18.8%) had negative one. Thus, it can be seen that knowledge level of deep fried seller in Kendari was positive.

Operational attitude can be expressed in form of speech or action which reflects reaction of his attitude over a certain object, either to human, event, situation or others. As a reaction, hence attitude may be linked to 2 options, there are favorable to express positive attitude and unfavorable to express negative attitude. In positive attitude, reaction tends to approach, favor, and expect certain object [11].

Along with this study a research made by Ferrat, there were 36 respondents (72%) who had positive attitude, yet the other 14 respondents (28%) had negative one. In addition, showed that attitude of household mothers over utilization of reused frying oil in Tanjung Semangat Village in 2010 was positive for 97 respondents (97%). The other study about characteristic of knowledge, attitude and practice of deep fried seller over utilization of reused frying oil in the area of West

Sumatera university in 2011 showed that 20 respondents (64.5%) had good level of attitude over utilization of reused frying oil and 11 respondents (35.5%) had moderate level [9].

Attitude can be determined as a tendency to react (either positively or negatively) over a certain object or situation. Attitude is an emotional (affective) assessment besides cognitive knowledge and tendency to act [9]. Attitude can also be an opinion but in this case is still different with knowledge. Knowledge toward an object is different with attitude toward the same object [6].

ACKNOWLEDGMENT

We would like to extent our thanks to all respondents the city of Kendari, Southeast Sulawesi, Indonesia, for allowing conducting some observational survey and interview.

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