

CONDITION OF FOOD SANITATION AND HYGIENE IN EAST BANDUNG, WEST JAVA

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Abstract. Food security is one of the health problems in Indonesia which is related to the lack of knowledge of how the production process, the hygiene and health of the food. This study aims to describe the sanitary and hygienic conditions of food sold by merchant in Cibiru, Bandung City, West Java. The study was conducted in May-June 2017 by determining five sampling location based on the number of merchant in Cibiru. Data was obtained through questionnaire filling of 40 respondents at each sampling point which was then analyzed to find out the characteristics of social-demographic of the respondents, personal hygiene, and support of environmental sanitation. The results shows that the sanitation and hygiene of food in the aspect of knowledge of personal hygiene showed that the food handler was experienced food processors (88%) and 12% had no experience even though their last education was not linear with their trading profession. In addition, respondents' knowledge of individual hygiene shows that out of the nine aspects observed, 33% are in the high category, 11% are moderate and 56% are in the low category. Aspects of environmental sanitation and other support of food sanitation show that the conditions are in the clean and adequate category. All of these aspects can be used as a basic consideration in further counseling about food hygiene and food processing so that it can avoid unpredictable outbreaks.

Keywords: Environmental, food, hygiene, Sanitation, UIN Sunan Gunung Djati Bandung

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INTRODUCTION

Condition of food sanitary and hygienic become one of the important aspects that must be considered by everyone, both consumers and those who process food (food handlers). In the world, this aspect is important because it relates to several cases such as food poisoning (foodborn deases). Bubzy & Roberts (2009)

reported that in the United States there were 75 million cases of food poisoning each year with 325,000 people treated and 5200 cases of death. In addition, it was reported by WHO that as many as 18% of children under the age of five experience death due to diarrheal diseases (Boschi et al, 2010). One of the study shows that food processors (food handlers) are

one of the main causes of contaminated food (Campos et al, 2009).

Indonesia is one of the developing countries that has a high level of food industry development. Increasing fast food needs by some people makes them choice to buy of available food (instans) rather than processing food by self. Therefore, food contamination by food processors can occur and is a major cause of food poisoning if they ignore the basic rules of processing in the process. In Indonesia, every food processor or food seller is required to have a license or a course / training on food processing. During the training, food processors were informed about the causes of food poisoning, transmission agents, the importance of maintaining personal hygiene and the techniques of processing the good foods. Based on information from Depkes RI (2004) through the POM agency, reported that in Indonesia there had been extraordinary outbreaks of food poisoning as many as 153 cases in 25 provinces that occurred during the year (January to December) in 2004. There were 7,347 cases of food poisoning reported with 45 people who died.

The hand of food processing is one of the fast mediator for the spread of microorganisms that can cause contamination of food. This can happen if they ignore the importance of washing hands before processing food. Some microorganisms that can be found in the hands of food processors are *Escherichia coli* and *Staphylococcus aureus* (Lues & Tonder, 2007). Food processors can also be a medium for the spread of microorganisms during and after they are infected by gastrointestinal disease (Bas et al, 2006). Food processors should have good hygiene techniques so that the spread of contamination can be reduced which can further protect consumers from food poisoning. Therefore, to ensure that food processors have the correct knowledge in food

processing techniques, it requires knowledge, attitudes and techniques in processing food (Martins et al, 2012; Abdul-Mutalib et al, 2012). In addition to food processing, environmental sanitation is another aspect that must be considered clean. Several studies reported that in food equipment can also be found microorganisms or other germ colonies that cause food poisoning such as *E. coli* (Cahyaningsih et al, 2009; Suryani, 2009). These microorganisms are not only abundant in water bodies (Wardhana et al, 2017), but can be abundant in food sources that humans consume. This shows that research on sanitation and food hygiene is very important to be done to complete data that can be used in policy determination. This study aims to explain how sanitary and hygienic conditions of food are sold by food merchant in Cibiru, East Bandung, West Java.

MATERIALS AND METHODS

This research was conducted in Cibiru, East Bandung, West Java with a total of 160 respondents representing four area of Cibiru. The selection of respondents was based on a random technique by tracing along the village road that was ready to be interviewed. The questionnaire used in this study refers to previous studies and modified (Abdul-Mutalib et al, 2012; Avrilinda & Kritiastuti, 2016; Tety, 2017; Sutanto & Kuntani, 2016). Previously, the contents of the material interviewed have been validated and verified by those who are competent in their fields (Lecturers in the Biology Education Study Program). Kuosioner's reliability was also tested first for Biology students, UIN Sunan Gunung Djati Bandung. The component was used in this study are social demographic respondents, hygiene of food processing, and environmental sanitation.

Data on social demographic characteristics of respondents consist of gender, age, education, level of education, and length of work. Age groups are classified into two divided, namely young groups (17-35 years old) and adults (36 years and over). Educational linearity is classified into two groups, namely those who have linearity with their trading professions and those who do not. Experienced aspects are grouped into experienced (working more than one year) and not experience (working less than one year).

The aspect of the personal hygiene knowledge parameter consists of nine questions. Respondents are given the choice "yes" and "no" for these two parameters. The results of taking the respondents' knowledge data are classified as low (if the results are <50%), moderate (50-75%) and high (> 75%). The aspects of environmental sanitation that are examined consist of the physical condition of the kitchen and dining area which consists of seven variables and physical conditions of supporting facilities consisting of eight variables. Furthermore, the physical condition of the environment is described and compared with the conditions that should be. The aspects of food sanitation and hygiene consist of four variables (food equipment conditions, storefront conditions, use of sterofom and food packaging materials) which are further classified into two, namely good (value > 50%) and not good (value <50%)

RESULTS AND DISCUSSION

The results showed that the gender of food processors were male (53%-84 of 160 respondents) and 47% (76 of 160 respondents) were female. In addition, 81.25% (130 out of 160 respondents) were not linear with their profession, and 88% (140 out of 160 respondents) food processors were experienced in

processing food. The complete data of other variables observed in this study can be seen in Table 1. While, Respondents' knowledge of personal hygiene shows that out of the nine aspects observed, 33% are in the high category, 11% are moderate and 56% are in the low category. The complete data can be seen in Table 2.

Table 1. Socio-demography condition of responden (n = 160)

Variable	n (%)
Type of study population	
Hotel	0 (0)
Small Restaurant	101 (63.13)
Bar	2 (1.25)
Cafe	23 (14.38)
Meat shop	4 (2.50)
Juice shop	21 (13.13)
Cake shop	9 (5.63)
Have product licence	
Yes	9 (5.63)
No	151 (94.38)
Gender	
Women	76 (47)
Men	84 (53)
Age	
Young	64 (40)
Adult	96 (60)
Linierity	
Not Linier	130 (81.25)
Linier	30 (18.75)
Experience of merchant	
Not experience	20 (12)
Experience	140 (88)
Merchants status	
Private property	109 (68.13)
Rent	51 (31.88)
Place of merchant managed by	
Owner	142 (88.75)
Not owner	18 (11.25)

Table 2. Respondents' knowledge to personal hygiene (food handler) (n = 160)

Question	n (%)	
	Yes	No
Do the food handler use a head cover when processing food?	32 (20)	128 (80)
Do food handlers use clean clothes when processing food?	139 (86.9)	21 (13.1)
Do food handlers use closed shoes?	12 (7.5)	148(92.5)
Do food handlers wash their hands before processing food?	69 (43.1)	91(56.9)
Do food handlers dry their hands after washing hands?	71 (44.4)	89 (55.6)
Do food handlers smoke when processing food?	8 (5)	152 (95)
Does the food handler not harrow the hair?	132 (82.5)	28 (17.5)
Does the food handler not touch the body when processing food?	105 (65.6)	55 (34.4)
Do food handlers use masks when processing food?	9 (5.6)	151 (94.4)

Several important points that must be considered based on the nine aspects observed, there are the use of head covers, the use of closed shoes, hand washing before and after processing food and the use of masks. This is an important aspect that must be improved in processing food. The use of closed shoes is important to avoid direct accidents when processing food. In addition, it can also prevent the carrying of microorganisms from the feet by the wind so that it can contaminate food. Hand washing both before and after processing food is very important to do considering that the hand is the main agent for the spread of microorganisms. Based on the results of research by Pratami et al. (2013) showed that microorganisms in the hands such as *Staphylococcus saprophyticus*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Serratia liquefaciens*, *Serratia marcescens*, *Pseudomonas aeruginosa*, *Enterobacter aerogenes*, *Citrobacter freundii*, *Salmonella sp*, *Basillus cereus*, and *Neisseria mucosa* can contaminate food and cause food poisoning due to microorganisms cause of disease. In addition, the use of masks is also an important aspect that must be considered. The use of masks when processing food can avoid dirt such as the fall of saliva from the mouth on processed food. Paujiah, et al.

The use of masks can reduce the incidence of inhalation of the smell of hot foods such as chili which can interfere with the concentration of food processing. Dangers of respiratory tract infections can occur if the use of tools such as masks is not done because one of the functions of using this mask is to control the occurrence of air droplets such as respiratory infections (WHO, 2007).

Condition of environmental sanitation which consists of the physical condition of the kitchen and eating place as well as the conditions of other supporting facilities can be seen in Tables 3 and 4. The physical condition of the kitchen and eating place is an important supporting aspect whose condition must be in good and clean condition so that the processed food is protected from the physical contamination sources (Lelieveld et al, 2012). The existence of kitchen and dining area, floor cleanliness, floor conditions, wall and plafond conditions, adequate lighting and the presence of ventilation are in good and clean condition considering the percentage shows a value above 50%. As for the condition of the existence of changing rooms for food processors, the majority do not have them (84.4%). Every food processor should use special clothing to process food. Its use is not put together with

ordinary clothes that are used daily. This is done to avoid the attachment of microorganisms to clothing that comes from other activities so that the presence of changing rooms needs to be owned by every food business person.

Other aspects of environmental sanitation conditions are related to facilities owned by businesses. The existence of toilets, the use of toilets by consumers, cleanliness of toilets, and waste disposal are important aspects in describing the cleanliness of a food selling place. When viewed from the percentage of the existence of toilets, more than half do not have this facility. This is because the locations surveyed have various types of businesses so that the existence of these toilet facilities is not a very necessary thing as well as juice sellers, cake shop and meat shop. The condition of the drine pipe also still has not been separated between pipes with water for processing food and for other activities such as fire extinguishers and coolers. This pipe separation is intended so that the water channel used to process food is not united with other water channels because the standardization of drinking water raw materials used to treat food must be fulfilled. Disposal of waste from trading activities shows that more than 60% of the waste is discharged into drains/sewers and only about 20% waste is finally discharged into septi tanks. The end of this waste disposal must be considered because the waste produced can damage the environment or water pollution. Another impact is that it can cause groundwater pollution which can further contaminate the water used for sanitation activities of the surrounding community (Herlambang, 2018), as is the case in Bandung. Special treatments such as the manufacture of separate sewage channels and the manufacture of organic and inorganic waste holes are one of the solutions in waste management. The sales sol-

id waste is stored in a viable container (> 50%) and disposed of in a waste storage facility provided by the seller himself or the government.

Table 3. Condition of environmental sanitary (Physic Condition of kitchen and dining room) (n = 160)

Parameter	n (%)
The merchant have kitchen and dining room?	
Yes	141 (88.1)
No	19 (11.9)
Cleanliness of the floor	
Clean	113 (70.6)
Not Clean	47 (29.4)
Floor condition	
Concrete	32 (20)
Tile	109 (68.1)
Earth	0
Stone	19 (11.9)
Condition of wall and phlapon	
Concrete	95 (59.4)
Tile	36 (22.5)
Stone	5 (3.1)
Earth	24 (15)
Satisfy ventilation	
Yes	79 (49.4)
No	81 (50.6)
Satisfy lighting	
Yes	97 (60.6)
No	63 (39.4)
The dressing room	
Yes	25 (15.6)
No	135 (84.4)

Other supporting aspects of sanitation and hygiene of the foods studied are sanitation and hygiene in terms of serving food such as food equipment, storefronts, use of styrofoam, and the type of food packaging used. The results show that as many as 50% are in the good category and the rest are in the bad category

(Table 5). The food equipment used looks clean and decent, but for more convincing, microbial tests must be carried out to see whether microorganisms are still found on the food equipment used or not. The presence of microbes in food equipment such as plates has been reported by Cahyaningsih et al. (2009). Furthermore, it was explained that the behavior in cleaning eating tools should be soaked first to remove dirt that sticks hardly to the food appliance. The storefront condition must be closed to avoid organisms such as flies that land on food. Furthermore, the use of styro-

foam in serving food is also an important thing that must be avoided. This is related to the danger caused by the reaction between food and styrofoam. This material contains toxic compounds such as styrene monomers which can interfere with the health of its users (Ela et al, 2016). The use of natural ingredients for food packaging is intended to see how far food vendors care about the surrounding environment. It is expected that in the future the food vendors can wrap the food they sell using wrappers made from natural ingredients.

Tabel 4. Condition of environmental sanitation (support facility of food hyginene) (n = 160)

Variable	n (%)
The merchant have toilete facility?	
Yes, separates	22 (13.8)
Yes, not sparates	44 (27.5)
Nothing	94 (58.8)
Fasility can using by consumer	
Yes	44 (27.5)
No	116 (72.5)
Using vacum tool for dry the toilet	
Yes	6 (3.8)
No	154 (96.3)
Condition of water pipe	
Separate between the pipe for food produce with other pipe	32 (20)
The pipe use toaagether for all activity	115 (71.9)
The pipe come from neighbors	12 (7.5)
Nothing	1 (0.6)
Bathroom condition	
Sit down toilet	12 (7.5)
Squat toilet	54 (33.8)
Nothing	94 (58.8)
Final flow of liquid waste	
Sapti tank	37 (23.1)
Open areas	8 (5)
Water chanel	108 (67.5)

Variable	n (%)
Others	7 (4.4)
Type of container for save the solid liquid	
Worthed	85 (53.1)
Not worthed	64 (40)
Nothing	11 (6.9)
Where are the solid waste dumped?	
The container provided by government	67 (41.9)
Disposal around location	40 (25)
Private disposal	51 (31.9)
Others	2 (1.3)

Tabel 5. The support of food sanitation and hygiene (n = 160)

Variable	n (%)	
	Yes	No
Clean food equipment?	149 (93.1)	1(0.6)
Storefront closed?	64 (40)	96 (60)
Which foods are served using Styrofoam?	21 (13.1)	139 (86.9)
What kind of food packaging is made from natural ingredients?	36 (22.5)	124 (77.5)

The conclusions of this research show that the respondents knowledge of personal hygiene is included in the several category i.e high (33%), moderate (11%) and low (56%). Aspects of food and environmental sanitation other support show that conditions are in the clean and adequate category for several variables. Based on the results of this study it is advisable to conduct sanitation and hygiene counseling on food handler who have not met the standards. In addition, it is necessary to do microbial tests contained in food equipment and additive substances test on processed food ingredients.

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