

Counseling Acts of Response to Formaldehyde in Tofu and Fish with Deformalization in Sumurboto Area

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Abstract—Formaldehyde is a chemical that use as an antiseptic, germicide, anti bacterial agent, and preservative in food processing. It is harmful for food preservative, it can be an impact for human body health. In short terms effects, formaldehyde can cause irritation of respiratory trac, vomiting, and dizziness. If people take formaldehyde continuously, it will cause liver, heart, brain, and others component of human body become bad function. In this research, PKM-M team make some research to know the impact of formaldehyde in food. This research use tofu and fish which contained formaldehyde. PKM-M team make an activity, that is counseling about formaldehyde inside of fish and tofu. This study conducted in Sumurboto villages. The counseling techniques is consists of member meetings, site surveys, cooperation permits, coordination meeting, giving materials, and simulations. This techniques is aims to provide society in Sumurboto understand about formaldehyde's damage for food in example fish and tofu. In other to understand the damage of formaldehyde is implemented in fish and tofu, it called by deformalization. Deformalization is a technique to know how to choose an healthy food which not consist of formaldehyde.

Keywords— Formaldehyde, Counseling technique, Deformalization.

I. INTRODUCTION

Sumurboto village is an area with a crowde population. There are 10474 people in the area of ± 84.54 Ha with a population density of 12389 inhabitants/km². The majority of Sumurboto residents work as traders, especially as a processed tofu sellers. There are about 1135 people who have not graduated from elementary school. This suggests that low educational backgrounds make them less aware of the dangers of chemical substances in food, especially formaldehyde. This makes the absence of awareness about the dangers of formaldehyde among traders that lead to the stigma that formalin is used to preserve food [1].

At the end of 2005, rampant rumors were reported in print and electronic media that substances harmful to human health, such as formaldehyde (or formalin), borax (sodium tetraborate, natural minerals), textile dyes, and other chemicals, are used in materials food [2].

Formaldehyde is a commercial solution which concentration of 10-40% of formaldehyde. The actual function of formaldehyde is an antiseptic, germicide, and non-food preservative [3]. In the food industry, formaldehyde is used as anti-bacterial agent and preservative in food processing. It widely used in food processing for its bleaching effect and also as a preservative in order to prevent spoilage by microbial contamination. Formaldehyde is also used as a preservative in dried foods, fish, certain oil and fats and disinfectants for containers [4]. However, formaldehyde is used as a food additive which is useful to extend the shelf life of foodstuffs. Formaldehyde is a harmful chemical for human health. The impact of formaldehyde on human health can be an acute or chronic. In the short-term effects include irritation of respiratory tract, vomiting, dizziness, and burning sensation in

the throat. If taken continuously for long periods of time, can cause damage to the liver, heart, brain, spleen, pancreas, central nervous system, and kidney [5].

Formaldehyde is metabolised naturally in our bodies by normal metabolism and can also be found in the air, natural food, some skin-care products as well as preservatives in processed food, especially in dried and frozen food [6]. If the amount of formaldehyde is small, it does not harm health. However, it can cause minor to serious problems such as pain, vomiting, coma and possible death when with large doses of formaldehyde is taken [7]. Formaldehyde an acceptable daily intake (ADI) of 0.2 mg/kg body weight has been set by the United States Environmental Protection Agency [8].

To reduce the misuse of formaldehyde, the PKM-M team conducted outreach counseling on formaldehyde in tofu and fish by deformalynization. The target of this program is the Sumurboto's society which aims to provide an understanding of the dangers of formaldehyde for human health, how to differentiate between formalized food ingredients and provide knowledge on how to deformalinize formaldehyde levels in food.

Besides, public also advised to wash and cook the fish thoroughly as formaldehyde is water soluble and it could be dissipated upon heating. When formaldehyde is released into water, it does not move into other media but it is broken down because formaldehyde is readily soluble in water, alcohols and other polar solvent [9].

This extension program includes the provision of materials related to the definition of formaldehyde, the main use of formaldehyde, the dangers of taking formaldehyde, as well as the theory of deformalinization of formaldehyde levels in foodstuffs; provides an example of how to know the presence of formaldehyde in the food material visually and

experimentally simple, and practice how to deformalize tofu and fish with special treatment.

The long-term outcome is that a formaldehyde deforminization counseling program with deormalization is expected to reduce the problem of formaldehyde abuse in food, reduce the effects of formaldehyde by reducing formaldehyde levels in food by deormalization and maintaining a healthy lifestyle without formaldehyde [10].

II. METHODS

The counseling technique is used for successful training techniques. It have been conducted by the College Creativity Program team consist of member meetings, site surveys, cooperation permits, coordination meetings, giving materials, lectures, simulations, and discussions.

Members meetings aim to unite the member's perception with the chairman. They discuss general issues such as program sustainability, plan for next steps, and share assignments with each member.

Site survey aims to see the educational background of the community and the region in more detail. The educational background influences the program objectives. The condition of society will affect the way of delivery in practice. Area condition is useful to determine the location of the program.

Conducting permits aim to establish good relationships between Colleges Creativity Program team and program partners. Licensing is done in the village of Sumurboto. Licensing consists of licensing implementation and implementation support components. Implementation support components consist of spot permitting, and borrow equipment. Cooperation to strengthen training techniques and seek support with agencies or others.

Before begin the program, we share the materials of the program in the brochure. Then, the program begin by answer the questin in the questioner for about 5 minutes. Then, the Lecturer giving the theory verbally and looking fed up. Aimed at providing clearer information about the dangers of formaldehyde, the main use of formaldehyde, how to know the content of formaldehyde in food, how to deormalize food.

Simulation of the display to delivery of matter by direct sampling in a sample model to make it easier to understand. Aims to provide a direct description of how to know the level of formaldehyde and how to deormalization. We checkout the level of formaldehyde in the food using visual and simple experiment. A simple experiment involving only turmeric to test it.

Discussion is a problem-solving process by allowing participants to ask questions and be answered by other participants as well as by presenters. So that can be sharing each other to be able to answer questions or suggestions given.

III. CASE STUDY

A case study was conducted in Semarang, Indonesia, to inspect society of urban-village of Sumurboto to give knowledge about formaldehyde-counseling and deormalization. The requirements to be participants in this research are over 24 years old and already married. The potential participants were first approached and asked if they

agreed to participate in the survey. Fifty three respondents participated in this survey. Profile of the respondents who participated in the survey is shown in table I.

To inspect consumers' awareness towards preservatives, we questioned if they knew that it is any food preservatives had society in circulate. About 69.81% of the respondents were know about preservatives for eaten. Other respondents still think that preservatives is same for any food-using. This result is specifically depicted in Fig. 1. Note that from 53 respondents, none of them had previously know about formaldehyde-knowledge.

TABLE I. Profile of the respondents.

Variable	Percentage
Age in years	
24-33	15.1
34-43	22.7
44-53	34
54-63	24.4
>64	3.8
Occupation	
Public Servant Employee	20.8
Others	79.2
Educational Level	
Undergraduate Level	32.1
Senior High School Level	35.8
Others	32.1

A logistic regression was then employed to estimate the model in (1). Table II summarizes the empirical result the logit equation's estimated coefficients with respect to consumers' intention in Semarang to know about formalin. Note that none variables are statistically significant. Society in Semarang do not have impact of age, information of formalin and function of formaldehyde to knowing about formaldehyde. Social media give more information concerning formaldehyde. About 83.02% of the respondents agreed that the easy ways to get information formaldehyde with social media.

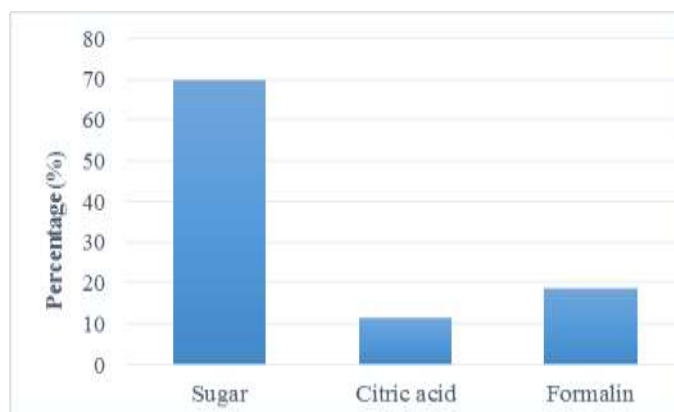


Fig. 1. Consumers' awareness towards preservatives when.

To investigate consumers' awareness towards formaldehyde, we questioned if they knew that it is formaldehyde impact, effect to our body and deormalization method. We delivered question in two situation, previous and after seminar is begun. In part 1 (Previous seminar is begun) about 77.36% of the respondents know about formaldehyde. Respondents agreed that the

formaldehyde is safe to food-eaten is 47.17%. Only 45.28% know about to reduce formaldehyde in food or deformalinization method. Concept of previous seminar is respondents not give information anything about formaldehyde. In part 2 (After seminar is begun) about 77.36% of the respondents said that formaldehyde is dangerous chemical. Only 50.94% know about other dangerous chemical or formaldehyde using food. Respondents know about effect of formaldehyde in our body is 73.58%. After seminar, respondents given information all about deformalinization in meat and tofu, but only 75.47% of the respondents understood deformalinization. From logistic regression, it can conclude X1 (a metric variable for the consumer's age), X2 (a metric variable for the square of the consumer's age), X3 (dummy variable for knowledge about what formaldehyde including secure food preservatives), X4 (dummy variable for knowledge about what someone knows about benefit of formaldehyde) not affect someone knows about formaldehyde.

TABLE II. Logistic regression result.

Independent Variable	b	exp(b)	Standard of Error	Significance
Constant	-0.905	0.405	5.142	0.860
X ₁	0.096	1.100	0.232	0.680
X ₂	-0.001	0.999	0.003	0.618
X ₃	0.431	1.540	0.745	0.563
X ₄	0.537	1.711	0.888	0.545

^aNote: Level of significance above 10%

IV. CONCLUSIONS

A counseling acts of response to formaldehyde in tofu and fish with deformalinization aim to provide counseling in order to understand about the danger of formalin for residents in Sumurboto area, Semarang regency; to provide counseling in order to understand how to know the content of formalin in tofu and fish for residents in Sumurboto area provided with counseling; to provide counseling in order to understand the deformalinization of formalin content in tofu and fresh fish. The principle used is deformalinization of formalin content in tofu and fresh fish. The method used is counseling technique for know how to choose tofu and fish without formalin; to know how to test the formalin content in tofu and fish; to know how to decrease the formalin content in tofu and fish using deformalinization technique. We conclude that 77,33% participants can understand the counseling materials.

APPENDIX

The questionnaires before seminar is begun, respondent must answer this section:

No.	The questionnaires
1.	Do you know of harmless food preservatives?
2.	what kind of food preservatives you thought not harmful?
3.	Do you know formaldehyde?
4.	What is formaldehyde for food preservatives?
5.	Where do you find out about formaldehyde?
6.	Have you ever heard the term deformalinization
7.	How to reduce formaldehyde levels?

The questionnaires after seminar is begun, respondent must answer this section:

No.	The questionnaires
1.	What do you know about formaldehyde?
2.	Beside formaldehyde, what do you know the other harmful food preservatives?
3.	Does formalin cause dangerous diseases?
4.	Commonly contained foods?
5.	What is deformalinization?

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