http://heanoti.com/index.php/hn

RESEARCH ARTICLE

URL of this article: http://heanoti.com/index.php/hn/article/view/hn20108

# Behavioral Factors of Fruits Merchants of Formalin Content on Imported Apples in Fruit Market of Kendari City

**Isra Khairunissa Irwan Silondae[1(CA)]**

[1(CA)]Department of Environmental Health, Faculty of Public Health, Airlangga University, Indonesia; ichasilondae10@gmail.com (corresponding author)

## ABSTRACT

Apples as one of the commercial fruits consumed mostly by society are economically high value plants as world commodity moreover they are favorable and rich in vitamin. Formalin is a harmful preservative and is not allowed to be used on food. Although, formalin utilization is inhibited by the government, yet it is still used numerously by many sellers. This study aimed to understand behavioral factors of fruit seller toward formalin contents on imported apples of Fruit market in Kendari 2015. This study was descriptive with laboratory test to describe behavioral factors of fruit seller toward formalin contents through exhausted sampling technique. The object of study was 12 respondents with 48 samples of apples spread out of Fruit Market in Kendari City. The results of the study indicated that all knowledge of seller about formalin literally was good which was 100%, all attitude of seller about formalin was good which was 100%, and all practice of seller about formaline was good which was 100% of fruit sellers did not add formalin to the fruits. On the other hand, based on laboratory test it showed that 8 apples (16.7%) positively contained formalin. It is suggested to improve control and inspection periodically on apples to diminish prohibited preservative like formalin on fruits.

**Keywords**: Knowledge, Attitude, Practice, Formalin, Apples

## INTRODUCTION

The era of globalization and Indonesia's participation in institutions, such as World Trade Organization (WTO), Asean Free Trade Area (AFTA), Asia Pacifik Economic Cooperation (APEC), danAsean-China Free Trade Agreement (ACFTA) increasingly encouraging the government to be more open to imported products. Thus, the increase of imported fruit volume to Indonesia increases every year. The volume of imported fruits amounted to 503,125 tons in 2007 and in 2011 increased to 832,080 tons[(1)].

Apples as a commercial fruit that many people consume, is a plant that has a high economic value as a commodity world market, the fruit is popular and useful as one source of vitamins. Apples are agricultural commodities that are quite popular to be cultivated among farmers. This product is popular in almost all layers or social strata. So as a consumer product, demand for apple commodities almost never stagnated for both domestic and export needs[(2)]. The Law of the Republic of Indonesia Number 18 of 2012 on food protection stipulates food security is the condition and effort required to prevent food from possible biological, chemical, and other contaminants that may disrupt, harm, and endanger human health and not conflict with religion, beliefs and culture of society so it is safe to consume[(3)].

Formalin is a preservative commonly used as a disinfectant, fluid embalmers, tissue preservatives, insect repellent and to preserve corpses. However, because many foods are easily damaged and given the needs of producers is getting thinning, the people use it in the home industry as a food preservative such as in the manufacture of noodles and meatballs. The use of preservative of formalin on food from one side can benefit the producers with the addition of this preservative food can avoid microbes so that it has a longer shelf life. But on the other side of the preservative when entering into the body it can cause health problems[(4)].

The use of formalin in food is mostly done in Indonesia. The test results of the *Food and Drug Supervisory Agency* (BPOM) of 700 samples of food products taken from Java, South Sulawesi and Lampung, 56% of which contain formalin. The Jakarta BPOM (2005) study of food samples such as tofu, wet noodles and salted fish taken from traditional markets and supermarkets in Jabotabek shows more than 50% of the samples are positively containing formalin. Imported food from China that enters Indonesia also contains formalin. BPOM has conducted laboratory testing of foodstuff from China and stated positive containing formalin, so BPOM issued Public Warning No. KH.00.01.5.113 dated August 2, 2007 to 43 imported food products from China. Another study that also shows the use of formalin in foodstuffs is hastuti research (2010), in the study stated that all samples of salted

fish taken from the market Kamal, Socah, Bangkalan and from one market in Sampang identified the formalin is marked by the formation of red until purple after added 1,8-*dihydroxynaphthalene*-3,6-*disulfonate* reagent in $H_2SO_4$ as much as 72%[5].

The results of the annual report of the 2010 Southeast Sulawesi Provincial *Food and Drug Monitoring Center* (BPOM) stated that of 1263 food samples tested, 0,07% contained formalin, 1,10% containing *rhodamine B*, 0,15% containing borax[6]. Head of Food Security of City Food Security Agency, Mrs. Hermin, together with Balai POM Kendari, found fresh fruit from PaiKendari POM test result in place using Test Kit. The results are quite apprehensive because some of the freshly tested positive foods containing formalin harmful ingredients in fruit markets are imported apples and red wine taken from outside Southeast Sulawesi[7].

Abuse of preserved preservatives is highly likely to be undertaken by small producers and home-scale industries. This is also due to weak supervision from the government and the lack of knowledge of producers. The knowledge, attitudes, and practices of a producer have a great influence on the image and quality of its merchandise. One of the factors that influence it is the behavior factor. Based on Bloom's theory, behavior is divided into three namely knowledge, attitude, and practice/action[8]. These three factors can be a risk factor for the use of harmful preservatives in the community. Although the percentage of events is quite low but, if not anticipated further will cause considerable risk factors. The purpose of this study was to determine the behavioral factors of fruit traders to the content of formalin imported apples in the fruit market of Kendari city.

## METHODS

The type of this research was descriptive with laboratory test that aimed to describe the behavioral factor of fruit traders to formalin content on imported apple of fruit market in Kendari. This research was conducted in July to August 2015, at Fruit Market, Colonel H. Abdul Hamid Street, Bende Village, Kadia Sub-district, Kendari. Formalin content analysis were performed at the Chemistry Laboratory of the Faculty of Mathematics and Natural Sciences (FMIPA) Halu Oleo University. Data analysis wasdone descriptively to the variables studied. The sample in this research was all fruit traders selling apple imports of red apple type, fuji apple, granny smith apple and malang apple sold in Kendari Fruit Market amount to 12 fruit merchants. Sampling technique in this research was exhausted sampling (saturated samples) that each store its researcher take each of imported fruit of red apple type, apple fuji, apple granny smith and apple malang that was counted 48 fruits.

## RESULTS

Laboratory test results formalin content on fruit can be seen in Table 1.

Table 1. Formalin test result based on apple Fruit type fruit market of Kendari City

| No. | Sample | Formalin Test Result | | | | Total | |
|---|---|---|---|---|---|---|---|
| | | Positive | | Negative | | | |
| | | f | % | f | % | n | % |
| 1. | Granny smithApple | 3 | 25 | 9 | 75 | 12 | 100 |
| 2. | Red Apple | 2 | 16.7 | 10 | 83.3 | 12 | 100 |
| 3. | Fuji Apple | 3 | 25 | 9 | 75 | 12 | 100 |
| 4. | Malang Apple | 0 | 0 | 12 | 100 | 12 | 100 |
| | Total | 8 | 16.7 | 40 | 83.3 | 48 | 100 |

From 12 stores tested, apple containing formalin samples were 8 (16,7%) consisting of apple granny smith of 3 (25%), red apples as much as 2 (16,7%), apple fuji of 3 (25%). The sample of apple fruit containing no formalin was 40 (83,3%) consisting of apple granny smith counted 9 (75%), apple red counted 10 (83,3%), apple fuji counted 9 (75%) and apple poor as many as 12 (100%).

Table 2. Distribution of fruit traders' knowledge of formalin in fruit market of Kendari City

| No | Knowledge of Formalin Use | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1. | Poor | 0 | 0 |
| 2. | Fairly | 12 | 100 |
| | Total | 12 | 100 |

All respondents were in good enough knowledge that was 12 people (100%).

Table 3. Distribution of trader’s attitudes on formalin use in fruit market of Kendari

| No | Attitudes of Formalin Use | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1. | Poor | 0 | 0 |
| 2. | Fairly | 12 | 100 |
| | Total | 12 | 100 |

The results showed that from 12 respondents, all respondents were in a pretty good attitude that was 12 people (100%).

Table 4. Distribution of trader's practices on formalin use in fruits in fruit market of Kendari

| No. | Practices on Formalin Use | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1. | Fairly | 0 | 0 |
| 2. | Good | 12 | 100 |
| | Total | 12 | 100 |

The results showed that from 12 respondents, all respondents were in good practice or action that was 12 people (100%).

## DISCUSSION

The result of analysis based on laboratory test by using schiff reagent method, on apple fruit studied, it found the content of preservative formalin at 8 samples of apple in fruit market of kendari city consisting of apple granny smith counted 3 pieces, red apple as much as 2 pieces, apple fuji as many as 3 pieces. While apples that do not contain formalin that was 40 pieces consisting of apple granny smith as many as 9 pieces, red apples as many as 10 pieces, apple fuji as many as 9 pieces and 12 poor apples.

Thus, it can be seen the use of formalin in apples in the fruit market of Kendari City in 2015. Use of formalin is not allowed in any food as small as any number in accordance with Permenkes RI No. 1168/Menkes/ PER/X/1999. Formalin is not allowed in the food, because in the long run can trigger the development of cancer cells. Formalin is very dangerous if inhaled, swallowed or related to the skin as it may cause irritation of the respiratory tract, allergic reactions and burns. The side effects of formalin use are not directly visible. This effect is seen only cumulatively, unless someone has high doses of formaldehyde poisoning. Formaldehyde poisoning can lead to stomach irritation and allergies. Formalin is also carcinogenic and mutagen. In very high levels formaldehyde can lead to the failure of blood circulation which leads to death[(6)].

Based on the results of research conducted in this study, the understanding of traders about preservatives, especially formalin on apples there are 100%, who have good knowledge. All respondents know formalin should not be used to preserve the fruit that is 100% and the average respondent about formalin dangerous for health that is 91.7%.

Knowledge can also be given by education level. Likewise that happens to fruit traders in the fruit market city kendari. One of the factors that can affect the consumer is the respondents who get education only up to the level of senior high school as many as 41.7% junior high School as many as 25% and primary school as many as 33.3%.

A person's knowledge is not only known by the environment, one's level of education, information sources, experiences, and extension activities as well. From the results of research conducted on information sourced from news on television. This is supported by Hasbah's (2009) study which states that well-informed traders tend to see frequent television appearances around formalin. Formalin that has been busy discussed in this mass media should be a source of knowledge for the community for more information about this prohibited food additives. Already, not many respondents in Indonesia about formalin that does not exist in food[(9)].

In addition, based on the results of this study also there is no impact that will occur as consumers consume apples containing formalin even though they megetahui formalin is harmful from the mass media. It is also seen in the respondents answers most of the respondents who assume there will not be anything that consume fruit that is formalin and in the opinion of respondents, there has never been a buyer who says ill after consuming apples. In this case, it will not appear shortly after consuming foods containing formaldehyde. Formaldehyde compounds will be absorbed in the body cumulatively and will look its effects after consuming foods containing formalin for a long time[(10)].

Attitude is essentially a tendency to take action from a person against an object by declaring signs to like or dislike the object. Attitude is a part of passive human behavior. A person's attitude toward an object depends on one's knowledge of the object. Attitude is basically an inner response to the stimulus it receives. Wrong knowledge of an object then the attitude formed against the object is also wrong. Bad attitudes can be influenced by several factors such as the level of education and knowledge. Both of these can affect the attitude of a person so it can perform actions/practices[(11)].

In this study explained that the attitude of respondents about the use of formalin quite good. This is justified on the result of research that there are 83.3% stated do not agree formalin used to preserve fruit and there are 66.7% express disagree formalin used in making food.

Respondent's attitude is also depicted from the statement given there are 50% states do not agree formalin usage on the fruit need not be prohibited/regulated by the government. The Law of the Republic of Indonesia Number 18 of 2012 on food protection stipulates food security is the condition and effort required to prevent food from possible biological, chemical, and other contaminants that may disrupt, harm, and endanger human health and not conflict with religion, beliefs and culture of society so it is safe to consume[(3)].

This good attitude can be formed from the knowledge of fruit traders who are quite adequate about formalin. The attitude embedded in the trader is a reflection of things he already knows and believes in, resulting in such an attitude.

Practice or action is a person's response or concrete reaction to a stimulus or object. This response is already in the form of action which involves the psychomotor aspect or one has practiced what is known or addressed[12].

Measurements of the practice of using formaldehyde were performed using indirect behavioral measures. Indirect behavioral measurement is by interviewing activities that have been done a few hours, days, or months ago. Interviews were conducted using a questionnaire, so the results obtained from the practice variables derived from the respondents recognition.

The results obtained from this study were 12 respondents (100%) who did not practice the use of formalin in apples or do good practice. The practice they do is a habit they do every day that is just selling the fruits they get from distributors. The apple they sell on average take from South Sulawesi and some take from prosperous fruit shop.

In addition, while doing this research in the fruit market researchers get rotten apples on display. This is because apples are old and no consumers are buying so rotten apples are separated and left alone. As for how to maintain the quality of the fruit they sell so as not to quickly rot by way of wrapping the apple.

Formalin is a preservative whose actual use is not for food, but rather as an antiseptic, germicide, and non-food preservative. And formalin becomes dangerous not only when mixed with food, but also in the air and enter through the breathing and skin. Formalin can react with almost any substance in the cell. Reacts to the skin, reacts to the stomach, reacts quickly to the mucous membrane of the respiratory and digestive tract, and rapidly oxidizes to formic acid in the body especially in the liver and red blood cells. Prolonged use of formaldehyde (chronic) will result in impaired digestion, liver, kidney pancreas, central nervous system, menstruation, and cancer.

However, based on the practice of formalin use all respondents claimed not to use formalin as a preservative of formalin on the merchandise they sell. This is because they only as a retail trade/trader who sells products from distributors and directly sold to consumers as well as imported apples also has a long marketing line up to the fruit merchants in Fruit Market of Kendari.

The emergence of food additives is used for food conditions to stay well. The effort is done because the calculation of time distribution and food endurance itself, so that the effect of the use of preservatives. In the process of food handling needs to pay attention to other aspects such as human health as a component of the food itself. In the sense that if the preservatives are found to have adverse health effects then their use should be reconsidered, discontinued or replaced with other safer preservatives[13].

Efforts to realize public health widely through healthy and safe food for consumption are shared responsibilities, including government through relevant agencies, food producers and the community itself. Food producers should be able to ensure the safety and health of the products they produce, they include production processes, materials used, storage and distribution. The government through the Food and Drug Supervisory Agency (BPOM) is the only competent that on food safety and health issues consumed by the community is expected to increase its performance to continue to realize the quality of public health widely. Community participation is also important in order to participate in supervising the food products in the market.

Law No. 18 of 2012 on Food prohibits food production business actors by deliberately using prohibited substances used as food additives, including formalin. In addition, the distribution of formalin trade has been regulated in Regulation of the Minister of Trade No. 44/M-DAG/PER/9/2009 concerning Procurement, Distribution and Control of Dangerous Materials.

In this regulation is arranged in such a way that formalin trade is limited and closed. The government's established and revised regulations clearly govern the use of harmful food additives. But in fact the circulation and use of hazardous food additives is still a lot in the community.

The current state of society can easily buy such materials in chemical stores, traditional markets and stalls. This condition should be of concern to the government that the distribution of these hazardous additives should be strictly monitored, suppose that only pharmacies or drugstores/chemicals with distribution licenses can sell the ingredients, the pharmacy or drugstore must send a sale and purchase report each month to the Government Agency responsible for overseeing the distribution of such Department of Commerce or the Regional Trade Service, and BPOM. If it violates or fails to transmit reports and sells freely, the distributor is revoked of its license and is criminally charged and is required to pay a fine. As well as evaluate distribution permit of all distributors.

In addition, efforts should be made to improve knowledge in the community as a user or as a manufacturer and distributor about the danger of using additional hazardous foodstuffs. People should be aware of the dangers of harmful food additives, natural ingredients that substitute these additives, the community can selectively choose and differentiate consumption-safe foods, thereby reducing the demand for foods with hazardous additives. This effort needs to be done by all parties, both central government, regional government and all parties who participate in preventing the use of hazardous additives. And as a society must be smart and smart to choose food consumed, must be able to distinguish foods that are safe for consumption. So we can maintain health.

## CONCLUSION

Formalin content of apples in Fruit Market of Kendari based on laboratory results that there are 8 samples of apples containing formalin from 48 samples examined. Knowledge of fruit traders about the use of formalin in apples in Fruit Market of Kendari, overall respondents have a good knowledge about formalin.The attitude of fruit traders about the use of formalin in apples in Fruit Market of Kendari, overall has a pretty good attitude.Practice or action of fruit traders on the use of formalin in apples at Fruit Market of Kendari, all respondents did not add formalin preservatives to the fruit they sold.

## REFERENCES

1. Anggasari P. The Influence of Ethnocentrism on Attitudes, Preferences and Behavior of Local and Imported Fruits Purchases (Pengaruh Ethnosentrisme terhadap Sikap, Preferensi dan Perilaku Pembelian Buah Lokal dan Impor). Jurnal Manajemen & Agribisnis. 2013;10(2).
2. Ariyanto HD. Effect of Adding Sugar to Alcohol Productivity in Making Wine Made with Disposable Apple using Nopkor MZ 11 (Pengaruh Penambahan Gula Terhadap Produktivitas Alkohol Dalam Pembuatan Wine Berbahan Apel Buang (Reject) Dengan Menggunakan Nopkor MZ 11). Jurnal Teknologi Kimia dan Industri. 2013;2(4): 226-232.
3. Poma RD. Test Formalin in Wet Noodles For Sale in the Campus of State University of Gorontalo Year 2013 (Uji Kandungan Formalin Pada Mie Basah Yang Dijual Dilingkungan Kampus Universitas Negeri Gorontalo Tahun 2013). Skripsi. Gorontalo: Universitas Negeri Gorontalo; 2013.
4. Cahyadi W. Food Additives (Bahan Tambahan Pangan). Jakarta: BumiAksara; 2006.
5. Endarwati S. Modified Carbon and Gold Electrodes with Polypyrrole / Crude Acid for Formalin Determination (Modifikasi Elektroda Karbon dan Emas dengan Polipirol/Asam Humat untuk Penentuan Formalin). Surabaya: Institut Teknologi Sepuluh Nopember; 2011.
6. Saparinto C, Hidayati D. Food Additives (Bahan Tambahan Pangan). Yogyakarta: Kanisius; 2006.
7. BPOM. Results of Food Intensification Monitoring (Hasil Pengawasan Intensifikasi Pangan). Badan POM Kendari; 2014.
8. Notoatmodjo, S. 2003. Health Education and Health Behavior (Pendidikan dan Perilaku Kesehatan). Jakarta: Rineka Cipta; 2003.
9. Hasbah. Description of Wet Noodle Traders' Knowledge on Behavior of Addition of Borax and Formalin on Wet Noodles at canteen of "X" University, Depok in 2012 (Gambaran Pengetahuan Pedagang Mie Basah Terhadap Perilaku Penambahan Boraks dan Formalin pada Mie Basah di kantin-kantin Universitas X Depok Tahun 2012). Skripsi. Fakultas Kesehatan Masyarakat, Universitas Indonesia: 2012.
10. Nelly. Qualitative Analysis of Formalin Content in Tofu Sold in Traditional Markets in Medan Area Sub-district and Medan Tembung Sub-district in 2011 (Analisis Kualitatif Kandungan Formalin dalam Tahu yang Dijual di Pasar-pasar Tradisional di Kecamatan Medan Area dan Kecamatan Medan Tembung Tahun 2011). Skripsi. Fakultas Kedokteran Universitas Sumatera Utara; 2011.
11. Asriani N. Screening and Epidemiological Studies on the Use of Rhodamine B and Borax on Siomay and Siomay Sauce Snacks, Elementary Schools in Kendari City 2015 (Skrining dan Studi Epidemiologi Penggunaan Rhodamin B dan Boraks pada Siomay dan Saus Siomay Jajanan Sekolah Dasar di Kota Kendari Tahun 2015). Skripsi. Fakultas Kesehatan Masyarakat, Universitas Halu Oleo; 2015.
12. Notoatmodjo S. Introduction to Health Education and Health Behavior Sciences (Pengantar Pendidikan Kesehatan dan Ilmu Perilaku Kesehatan). Yogyakarta: Andi Offset; 1993.
13. Rina. Description of the Terasi Manufacturer's Attitudes about Formalin in Semarang (Gambaran Sikap Produsen Terasi Tentang Formalin di Semarang). Skripsi. Universitas Muhamadiyah Semarang; 2008.