

## Food Quality of Traditional Snacks Reviewed from Physical, Chemical and Microbiological Aspects Sold in The Sayur Market of Magetan

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### Abstract

Traditional snacks are one component in culinary heritage. Traditional snacks have a good taste and appearance that tempts consumers, so that the value of quality and food safety needs to be considered. The purpose of this study was to observe, examine and analyze the quality of traditional snacks sold at the Sayur Market in Magetan Regency from physical, chemical and microbiological aspects. This type of research is a descriptive study which is designed based on a cross sectional approach, using descriptive analysis of the data in the table and expressed in narrative form. Samples of traditional snacks are *janggalan*, *lopis*, *cenil*, *jongkong* and *petolo*. Data collection was carried out by organoleptic observation including color, aroma, texture, and taste, as well as the content of food additives namely borax, formalin and rhodamine-B, and the number of germs. Three types of traditional snacks (*janggalan*, *petolo* and *lopis*) were found to be safe for consumption because they met the requirements. Based on the examination the number of germs, there were 2 types of traditional snacks found an average of 11,500 col / gr in *Jongkong* food and in *Cenil* food found an average of 27,733 col / gr, so that it is not in line with the quality standards in Decree of the Head of the Republic of Indonesia Food and Drug Supervisory Agency Number HK.00.06.1.52.4011 in 2009, concerning the determination of the limits of microbial and chemical contamination in food namely 10,000 colonies / gram. It means that based on the number of germs found in *Jongkong* and *Cenil* foods, the foods is not safe to consume because it does not meet the requirements.

**Keywords:** Traditional food quality, physical, chemical, microbiological aspects

### I. INTRODUCTION

Traditional snacks are important component in Indonesian culinary heritage. Not only because traditional snacks are delicious or unique in color and appearance, but also very full with elements of symbolism. In the past, many traditional dishes had special meanings and became part of offerings in rite of passage ceremonies, such as: pregnancy, birth, birthday, and death (Yuyun Alamsyah, 2006).

The positive value of traditional snacks is that they contain enough nutrients, and the quality of traditional snacks is much safer when compared to modern foods. Traditional snacks are more balanced in their nutritional composition (Anwar, F, 1999).

But traditional snacks in general also have weaknesses in terms of their safety against physical, chemical and biological or microbiological hazards. The existence of such contamination is often found and found due to the low quality of raw materials, processing technology, the lack of adequate sanitation and hygiene practices and the lack of awareness of producers who are handling traditional snacks (Nanuwasa, Franklin and Munir, 2007).

For this reason, food safety support is needed, namely the conditions and efforts needed to prevent the possibility of physical, chemical, biological contamination and other objects that can interfere, harm and endanger human health. While the quality of food is the value determined on the basis of food safety criteria, nutritional content and trade standards for food and beverage ingredients. In principle, food quality and safety is the responsibility between the government, food industries, society (producers) and consumers. Food quality and safety not only has a direct effect on human health, but also affects economic productivity and social development, both individuals and the state. Efforts to disseminate information on food security need to be made to the wider community because the increasingly tighter competition at the local, national and international levels. The Government has tried to protect the public from food that does not meet the requirements of food quality and safety, by issuing the Republic of Indonesia Law number 8 of 2000 concerning consumers protection, Republic of Indonesia Law number 36 of 2009 concerning health, and Republic of Indonesia Law number 18 of 2012 concerning food. Some of the problems encountered in the framework of developing food quality include unstable institutions, weak and not effective regulations and legislation, incompetent human resources, limited infrastructure, limited information on food quality and safety (Kepmenkes RI 942, 2003).

Traditional snacks are still very likely to be the cause of disruption in the consumer's body so that consumers fall ill. One way to maintain health is by consuming safe foods, namely by ensuring that traditional snacks are clean and avoid wholesomeness. There are so many things that can cause traditional snack foods are unsafe, one of which is due to contamination (Hermawan Thaheer, 2005).

Contamination that occurs in traditional snacks can cause these foods to become a medium for a disease. Diseases caused by contaminated food are called food-borne diseases (Susanna, Dewi and Budi Hartono, 2003).

Foodborne illness is one of the most numerous and most burdensome public health problems found in modern era. The disease has caused a lot of casualties in human life and caused a large amount of suffering, especially among consumers whose immune systems were disrupted. From a number of surveys of the extraordinary incidence of foodborne illnesses that have spread worldwide show that most cases of foodborne illness occur as a result of errors handling at the time of preparing the food either at home, catering services, canteen, school or in the market and others (WHO, 2006).

Based on the Decree of the Minister of Health of the Republic of Indonesia Number 942 / Menkes / SK / VII / 2003 concerning guidelines for hygiene food requirements, there are several aspects that are regulated in handling snacks, namely: food handlers, equipments, water, food ingredients, food additives, serving and peddling facilities. Some of these aspects greatly affect the quality of food.

Some factors that determine food safety include types of processed foods, ways of handling food ingredients, serving method, the duration between food was cooked and consumed, storage temperature both in raw food and cooked food, and the behavior of food handlers themselves (Zulkifli, H., 2008) .

The Food and Drug Supervisory Agency found food for fast breaking containing dangerous ingredients. From the sample test there were 13.16% of the types of food containing hazardous ingredients. Sampling and testing were done in 2,256 samples. Samples were taken at traditional markets, shops, supermarkets and places that sell food. A total of 1,959 samples (86.84%) met the requirements, 297 samples (13.16%) were found containing hazardous substances, namely formalin, borax, rhodamine-B, methanyl yellow, and the using of artificial cyclamate sweeteners that exceeded the safe limit in 297 samples (Roy Sparringa, 2013)

Food poisoning cases in East Java Province are still high both in terms of frequency of occurrence and number of cases. In 2009 there were 57 cases (18.69%), 2010 as many as 41 cases (9.03%) and 2011 as many as 50 cases (6.31% ) (Budi Rahaju, 2011).

The results of preliminary studies in the laboratory about the number of germs on traditional snacks sold at the Sayur Market in Magetan Regency are as follows: 1) Cenil: 24,000 col / gram. 2) Jongkong: 75,000 col / gram. 3) Lopis: 125,000 col / gram. 4) Petolo: 14,000 col / gram. According to the Regulation of the Head of the Food and Drug Supervisory Agency of the Republic of Indonesia Number HK.00.06.1.52.4011 of 2009 concerning the determination of the maximum limit of microbial and chemical contamination in food, the limit of the requirement is 10,000 col / gram, thus traditional lopis, jongkong, cenil and petolo snacks declared to exceed the limit / quality standard.

The purpose of this study was to analyze the physical, chemical and microbiological qualities of traditional snacks sold at the Sayur Market in Magetan Regency.

## **II. METHOD**

### ***A. Types of research***

This research is a descriptive study designed based on a cross sectional approach, because data collected at the same time and the variables studied are measured only once (Sastroasmoro Sudigdo & Ismael, S, 2002). Some of the advantages of using a cross sectional approach is that it can reduce research costs, the time needed is relatively short and work efficiency. Weaknesses that often happened in this approach are the weaknesses in maintaining validity (Murti, 2003).

### ***B. Research design***

This research uses descriptive method with cross sectional approach. Descriptive method to describe a situation in a community. Cross sectional approach is the approach used because in research the variables are measured only once at a time (Soekijo Notoatmojo, 2010). In principle, it is an effort to compare what happened with what was required. In other words, comparing the results obtained with the criteria or standards (quality standards) that have been established (Suharsimi Arikonto, 2007).

### C. Population and Sample

The population in this study were all types of traditional snacks sold at the Sayur Market in Magetan Regency. The sample in this study are snack foods 1) Janggelan. 2) Cenil. 3) Petolo. 4) Jongkong. 5) Lopis. These five types of foods were chosen as samples based on the results of a poll on consumers about the five types of snacks that consumers like most.

### D. Research variable

The independent variable is the type of traditional snacks. The dependent variable is the organoleptic aspect: color, smell, texture and taste. Chemical aspects: borax, formalin, rodhamin B. Microbiological aspects: number of germs in traditional snacks. Disturbing variables are characteristics of traditional snack food makers including education level, level of knowledge about organoleptic, borax, formalin, rodhamin B, number of germs, attitude towards the use of borax, formalin, rodhamin B on the practice of making traditional snacks.

### E. Research sites

1) Sayur Market in Magetan at Mayjen Sungkono Street, Magetan Regency , as the sampling location. 2) Chemical and Microbiological Laboratory of Diploma III Environmental Health Study Program , Magetan Campus, TripanditaStreet Number 6 Magetan, as a location for physical and microbiological examination 3) Pharmacy warehouse and health laboratory at Tripandita Street number 19 Sukowinangun, Magetan Regency as the location for Chemical examination.

### F. Assessment criteria

Data Analysis and Processing Techniques

- o Data processing. a) editing: an effort to re-check the correctness of the data obtained or collected. Editing can be done at the data collection stage or after data is collected. b) tabulating: entering the data that has been obtained into the table to facilitate data analysis.
- o Data analysis: data analysis is described in table form by analyzing the results of organoleptic tests, the results of the borax, formalin and rhodamine-b examination laboratories compared with the Republic of Indonesia Health Minister Regulation number 33 of 2012 concerning Food Additives and Republic of Indonesia Government Regulation number 28 of 2004 about Rhodamine-B is an additional dye that is prohibited to use in food products. The results of laboratory examinations on the number of germs compared to the standard quality standards Decree of the Head of the Drug and Food Control Agency Number HK.00.06.1.52.4011 in 2009 concerning the determination of the limits of microbial contamination in food.

## III. RESULTS

### A. Results of Examination on Physical Aspect of Traditional Snacks Quality

Table 1. Organoleptic Test Results on Traditional Snacks

No	Sample	Examination	Organoleptic Test			
			Colour	Aroma	Texture	Tase
1.	Janggelan	Control	Black	typical	Chewy	Tasteless
		1	Black	typical	Chewy	Tasteless
		2	Black	typical	Chewy	Tasteless
		3	Black	typical	Chewy	Tasteless
2.	Lopis	Control	White	typical	Soft	Sweet
		1	White	typical	Soft	Sweet
		2	White	typical	Soft	Sweet
		3	White	typical	Soft	Sweet
3.	Cenil	Control	Pink	typical	Chewy	Tasteless
		1	Pink	sour	A little soft	A little sour

No	Sample	Examination	Organoleptic Test			
			Colour	Aroma	Texture	Tase
		2	Pink	sour	A little soft	A little sour
		3	Pink	sour	A little soft	A little sour
4.	Jongkong	Control	Black	typical	Soft	Sweet
		1	Black	Smell of burn	A little soft	Sour sweet
		2	Black	Smell of burn	Soft	Sour
		3	Black	Smell of burn	A little soft	Sour sweet
5.	Petolo	Control	Pink	typical	Soft	Tasteless
		1	Pink	typical	Soft	Tasteless
		2	Pink	typical	Soft	Tasteless
		3	Pink	typical	Soft	Tasteless

### Results of examination on Chemical Aspect of Traditional Snacks Quality

Table 2. Borax Examination Results on Traditional Snack Foods

No	Sample	Examination	Results	Quality Standard	Quality
1.	Janggalan	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
2.	Lopis	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
3.	Cenil	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
4.	Jongkong	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
5.	Petolo	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good

Table 3. Formalin Examination Results on Traditional Snack Foods

No	Sample	Examination	Results	Quality Standard	Quality
1.	Janggalan	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
2.	Lopis	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
3.	Cenil	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
4.	Jongkong	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
5.	Petolo	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good

Table 4. Rhodamine-B Test Results on Traditional Snack Foods

No	Sample	Examination	Results	Quality Standard	Quality
1.	Janggelan	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
2.	Lopis	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
3.	Cenil	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
4.	Jongkong	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good
5.	Petolo	1	Negative	Negative	Good
		2	Negative	Negative	Good
		3	Negative	Negative	Good

**B. Results of Examination on Microbiological Aspect of Traditional Snack Quaity**

Table 5. Test Results on Number of Germs in Traditional Snack Foods

No	Sample	Examination	Measurement	Results	Standard Quality	Quality
1.	Janggelan	1	Colony/gr	7,700	10,000	Good
		2	Colony/gr	7,300	10,000	Good
		3	Colony/gr	8,000	10,000	Good
	Average			7,666	10,000	Good
2.	Lopis	1	Colony/gr	8,500	10,000	Good
		2	Colony/gr	7,000	10,000	Good
		3	Colony/gr	9,800	10,000	Good
	Average			9,800	10,000	Good
3.	Cenil	1	Colony/gr	25,000	10,000	Not Good
		2	Colony/gr	22,000	10,000	Not Good
		3	Colony/gr	21,200	10,000	Not Good
	Average			21,200	10,000	Not Good
4.	Jongkong	1	Colony/gr	11,500	10,000	Not Good
		2	Colony/gr	12,500	10,000	Not Good
		3	Colony/gr	10,500	10,000	Not Good
	Average			11,500	10,000	Not Good
5.	Petolo	1	Colony/gr	520	10,000	Good
		2	Colony/gr	750	10,000	Good
		3	Colony/gr	650	10,000	Good
	Average			640	10,000	Good

Table 6. Recapitulation of Inspection Results of Traditional Snacks Food From Physical, Chemical and Microbiological Aspects

No	Parameters	Traditional Snack Foods				
		Janggelan	Lopis	Cenil	Jongkong	Petolo
1.	Organoleptic	Eligible	Eligible	Not Eligible	Not Eligible	Eligible
2.	Borax	Negative	Negative	Negative	Negative	Negative
3.	Formalin	Negative	Negative	Negative	Negative	Negative
4.	Rhodamin B	Negative	Negative	Negative	Negative	Negative
5.	Number of Germs	Eligible	Eligible	Not Eligible	Not Eligible	Eligible

## IV. DISCUSSION

### A. *Traditional Snack Food Quality Viewed From Physical Aspects*

Based on Table 1 shows that the results of organoleptic examination on 5 types of traditional snacks there are 3 types of traditional snacks that have fulfilled the requirements of organoleptic test and there are 2 types of traditional snacks namely jongkong and cenil from organoleptic tests showing results that do not meet the requirements.

Traditional snacks that do not meet the requirements are considered haven't fulfilled several factors in maintaining effective food sanitation. These factors are related to: 1). Food Factors. a). Food sources: whether it is obtained from agriculture, livestock, fisheries, or other. Food sources must meet sanitation requirements to prevent contamination or pollution. For example, agricultural products are polluted by human manure or by insecticides. b). Transportation of Foodstuffs: The way to transport food must meet sanitation requirements, whether the means of transportation have refrigeration and cover. The transportation is carried out from the source of foods to the market or from the source to the storage area to ensure the foods are not contaminated by contaminants and not damaged. For example transporting food using refrigeration equipment. c). Food storage: not all food is consumed immediately but maybe some is stored on a small scale at home or on a large scale in a warehouse. Food storage is made in such a way that animals such as mice, insects can not nest. If not using a shelf, under space must be provided to make the compartment easy to clean, the air temperature in the warehouse must not humid to prevent mold growth, has sufficient air circulation, the bottom wall of the warehouse must be painted white so that it makes easier to see mouse tracks, a road must be available in the warehouse. d) Marketing of foodstuffs: the place of sale or market must fulfill sanitation requirements, among others: cleanliness, lighting, air circulation, and having refrigeration equipment. Markets that meet the requirements are supermarkets. e) Food processing: food processing must meet sanitation requirements, especially in the case of kitchen cleanliness and cooking utensils. f). Food serving: serving food must meet sanitation requirements, which are free from contamination, clean and closed, and can meet the appetite of the buyers. g). Food storage: processed food is stored in a place that meets sanitation requirements, in a cupboard or cooling device. 2). Human Factors: people who work at the food processing stage must meet sanitation requirements, such as individual health. The individual does not have an infectious disease, and is not a carrier of an illness. For personal who serves food must meet the conditions such as cleanliness and neatness, have good ethics and manners, good appearance and skills to bring food with special techniques, and take part in a periodic health examination program every six months or every year. 3). Care Factors: cleanliness and storage of food processing equipment must meet sanitation requirements.

### B. *Results of Traditional Snacks Food Quality Checks Viewed from Chemical Aspects*

- i. **Borax examination:** Based on Table 2 shows that the results of the chemical examination on five types of traditional snacks are all negative containing borax, this result means that these foods meet the quality standard requirements of Health Minister Regulation number 33 of 2012 concerning Food Additives. Borax is one of the food additives which is prohibited from being used in food.

According to the Indonesian National Encyclopedias and Encyclopedias, the word borax comes from the Arabic word bauraq, and the Malayan term is *tingkal* which means white, is a soft crystal containing boron, colorless and easily soluble in water. Borax is  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$  sodium salt, which is widely used in various non-food industries.

Foods that contain borax consumed in excessive amounts will cause brain, liver and kidney disorders. A great amount of Borax consumption containing in food and absorbed in the body, will be stored accumulatively in the liver, brain or testes. In high doses, borax will cause symptoms of dizziness, vomiting, diarrhea, abdominal cramps, cyanis and compulsions. In young children and infants, the dose in the body as much as 5 grams or more, can cause death. While for adults, death occurs at a dose of 10-20 grams or more.

- ii. **Formalin examination:** Based on Table 3 shows that the results of chemical tests on five types of traditional snacks are all negative in containing formalin, this result means that the food meets the quality standard requirements based on the Minister of Health Regulation No. 33 of 2012 concerning Food Additives. Formalin is one of the food additives that are prohibited from being used in food. Formalin is the trade name of formaldehyde solution in water with levels of 30-40%. Formalin usually also contains 10-15% methanol alcohol which functions as a stabilizer so that the formaldehyde is not polymerized. Formalin on the market can also be obtained in a diluted form with formaldehyde levels

of 30.20 and 10%. In addition, in liquid form, formalin can be obtained in tablet form, each of which has a weight of 5 grams.

The use of formaldehyde in food can cause poisoning in the human body, with symptoms of difficulty swallowing, nausea, acute abdominal pain accompanied by vomiting, bloody diarrhea, nervous system depression, or circulatory disorders. Consumption of formaldehyde in high doses can lead to convulsions, haematuria and haematomesis which end in death. Formalin injection with a dose of 100 grams can cause death within 3 hours.

- iii. **Rhodamin-B examination:** Based on Table 4 shows that the results of chemical examinations on five types of traditional snacks are all negative containing Rhodamin B, from this result means that the food meets the quality standard requirements based on RI Government Regulation No. 28 of 2004, Rhodamine B is an additional dye that is prohibited from using it in food products. Rhodamine B can cause respiratory tract irritation, skin irritation, eye irritation, irritation of the digestive tract, poisoning, and liver disorders, but until now there are still many manufacturers using Rhodamine B in the food and beverage products they produce. Rhodamine B's dyestuff even though it has been banned, there are still many producers who deliberately add Rhodamine B dyes for food products as red coloring, for the reason that the colors are very good, easy to get, and cheap. Most of these products do not include codes, labels, brands, types or other data. The producers use dyes to improve the red color of the food which is reduced (faded) due to the addition of other ingredients. Rhodamine B can accumulate in the human body and is carcinogenic which in the long run causes diseases such as cancer and tumors in human organs. The characteristics of foods that use rhodamine B coloring, such as: the color is striking, bright shiny, the color is not homogeneous (some are clotted), there is a little bitter taste. For this reason various government regulations are issued to protect consumers as well as giving information / instructions for small industrial entrepreneurs, about chemical additives that are harmful to human health (M. Lies Suprapti, 2005).

Minister of Health Regulation number 33 of 2012 concerning Food Additives. Rhodamine B is a synthetic chemical dye commonly used to color various kinds of textiles. However Rhodamine B is often misused to color various kinds of food and drinks (Budiawan and Arini, 2007).

Rhodamine B in large and repeated amounts causes cumulative properties, namely respiratory tract irritation, eye irritation, digestive tract irritation, poisoning, and liver disorders. Rhodamine B has an LD50 of 89.5 mg / kg if it is injected in mice intravenously (Wirasto, 2008).

#### ***B. Results of examination of Traditional Snacks Quality viewed from Microbiological Aspects.***

Based on table 5 of the microbiological aspects of the number of germs in traditional snacks from the five samples examined, the number of food germs was 7666 col / gram, on the average lopis was 8,433 col / gram, the food cenil averaged 22,733 col / gram, jongkong was 11,500 col / gram on average and petolo food averaged 640 col / gram. According to the Decree of the Head of the Republic of Indonesia Food and Drug Supervisory Agency Number HK.00.06.1.52.4011 in 2009 concerning the determination of the limits of microbial and chemical contamination, the samples of janggolan, lopis and petolo still meet the quality standards, while the cenil and jongkong foods do not meet the requirements, (exceed) quality standard of 10,000 col / gram.

Traditional foods generally have weaknesses in terms of their safety against biological or microbiological, chemical or physical hazards. The existence of hazards or contamination is often found because of the low quality of raw materials, processing technology, the lack of adequate sanitation and hygiene practices and the lack of awareness of workers and producers handling traditional food (Nanuwasa, Franklin and Munir, 2007).

Some factors that determine food safety include: types of processed foods, ways of handling food ingredients, serving, the duration of time between the food was cooked and consumed, storage temperature both in raw food and cooked food, and the behavior of food handlers themselves (Zulkifli, H., 2008).

Four principles of food hygiene and sanitation include healthy and clean behavior, food handlers, food sanitation, equipments sanitation, and sanitation of food processing facilities. They can be contaminated with microbes due to several things namely: using dirty cloths to clean tables, clean furniture and others, stored food without lid so insects and mice can reach it, and sick food processors or disease carriers (Kusmayadi, Aji and Dadang Sukandar, 2007)

The results of the study showed that only 6.6% of food handlers who wore aprons at work and found 11.1% of food handlers who had habit of scratching their heads and nose when working. The property of food vendors in the form of food cabinets that are displayed in stalls and canteens are mostly not covered, or the cover is in the form of thin curtain cloth that is rarely closed, especially when buyers are crowded. Therefore, some flies can easily contaminate the food being sold (Arisman, 2000).

In food, known of decaying germs and disease-causing germs (pathogenic germs). Decaying germs may not cause consumers to become ill, but their growth in food will cause damage to food (eg. mucus, changes of smell, color and taste) so that food is no longer safe for consumption. Pathogenic bacteria are the cause of food poisoning. Pathogenic germs do not always cause changes in appearance, smell, color or taste of food. So, it is impossible to judge a food contaminated with pathogenic germs by smelling, seeing or tasting it. The only way to protect ourselves from these germs is to apply the principles of sanitation and good food handling (Anonimous, 2001).

## V. CONCLUSION

The quality of traditional snacks food reviewed from physical aspects that meet the requirements are janggolan, lopis and petolo. Those that do not meet the requirements are cenil and jongkong.

The quality of traditional snacks from chemical aspects: janggolan, lopis, cenil, jongkong and petolo foods meet the requirements in line with the Minister of Health Regulation number 33 of 2012 concerning Food Additives that do not contain borax, formalin and rhodamine B.

The quality of traditional snacks from microbiological aspects that meet the requirements are janggolan, lopis and petolo. Those that do not meet the requirements are cenil and jongkong, based on the Decree of the Head of the Indonesian Drug and Food Control Agency No. HK.00.06.1.52.4011 in 2009 concerning the determination of the limits of microbial and chemical contamination.

Analysis of physical, chemical and microbiological qualities of three types of traditional snacks, namely janggolan, petolo and lopis, meet the quality standard requirements and two types of traditional snack, jongkong and cenil, do not meet the physical requirements and microbiological quality standards based on the Decree of the Head of Drug and Food Supervisory Agency RI No. HK.00.06.1.52.4011 in 2009 concerning the determination of the limits of microbial and chemical contamination.

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