



## **Assesment Of Facilities, Equipment, And Hygiene Practices Among Snack Vendors In Semarang City Market**

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### **Abstract**

Street food vendors play an important role in providing food for the community, but hygiene and sanitation aspects are often overlooked. Poor hygiene and sanitation among street food vendors can potentially cause cross-contamination by microorganisms such as *E. coli*, *Salmonella*, and *Staphylococcus aureus*, which pose a health risk to consumers. Unsuitable facilities and equipment, as well as personal hygiene practices that do not meet standards, are the primary factors contributing to these issues. This study aims to assess the sanitation conditions of the market environment and the personal hygiene levels of vendors at Semarang City Market by comparing their compliance with Ministry of Health Regulation No.942/Menkes/SK/VII/2003. The study was conducted from July 2024 to March 2025. This is a descriptive observational study with a cross-sectional approach. The sample consisted of 34 vendors from 16 markets in Semarang City, selected through purposive sampling. Data were collected through observation and interviews using instruments such as checklists and questionnaires. The results showed that 50% of the vendors' facilities met the criteria, 62% of the equipment was in good condition, and 77% of the vendors had good personal hygiene. The descriptive results indicated that most markets in Semarang City had vendors with good personal hygiene, totaling 26 people (77%). However, many shortcomings were still found, such as the absence of handwashing facilities, improper storage of equipment, and the lack of use of aprons and handwashing before handling food. Personal hygiene was the aspect with the highest level of compliance compared to facilities and equipment. The conclusion of this study is that by expanding the sample size and adding several environmental sanitation criteria comprehensively, significant results can be observed.

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### **Introduction**

Street food is an important part of the Indonesian diet, especially in urban areas such as Semarang. However, sanitation and hygiene issues surrounding street food remain a serious public health concern. According to the WHO, approximately 76 million cases of foodborne illness occur each year in the United States Union, causing more than 325,000 hospitalizations and 5,000 deaths (Ministry of Health Republic Indonesia, 2016). In Indonesia, the POM Agency recorded 53 extraordinary incidents of food poisoning in 2017, with 24.53% of them caused by street food (Damat, 2020). Poor hygiene and sanitation among street food vendors can potentially cause cross-contamination by microorganisms such as *E. coli*, *Salmonella*, and *Staphylococcus aureus*, which are hazardous to consumer health. Unsuitable facilities and equipment, as well as personal hygiene practices that do not meet standards, are the dominant factors causing this problem (Umar, 2023). Based on an inspection of 34 vendors in 16 traditional markets in Semarang City, it was found that: only 50% of facilities met sanitation requirements, 62% of equipment was in good condition, and around 77% of vendors had good personal hygiene. However, 0% of vendors were found to wash their hands before handling food, and only 44% used aprons and head coverings,

indicating a significant gap between knowledge and hygienic practices. This study is important to directly assess the condition of facilities, equipment, and personal hygiene levels among street food vendors based on the standards set forth in Ministry of Health Regulation No. 942/Menkes/SK/VII/2003 (Soedibyo, 2003). These findings are expected to serve as a basis for policy intervention, education, and supervision to improve food safety in traditional markets. Contamination that occurs in food and drinks can cause the food to become a medium for disease. Diseases caused by contaminated food are called food-borne diseases (Susanna, 2022).

Foodborne illnesses are one of the most common and burdensome public health problems ever encountered in modern times. The disease takes a heavy toll on human life and causes a great deal of suffering, especially among infants, children, the elderly and those who are immunocompromised. The Central Food and Drug Monitoring Agency noted that during 2004 in Indonesia there were 82 cases of food poisoning which caused 6500 victims to become ill and 29 people died. As many as 31% of poisoning cases were caused by food originating from catering services and home-made. Children are at high risk of contracting disease through food or drink. Children often become victims of foodborne disease due to consumption of food prepared at home or in school canteens or purchased from street vendors. Traditional food generally has weakness in terms of safety against biological or microbiological, chemical or physical hazards. The dangers or contaminants often exist and are discovered due to the low quality of raw materials, processing technology, inadequate, sanitation and hygiene practices and lack of awareness of workers and producers who handle traditional food (Serli, 2003). The traditional market also contributes to Local Generated Revenue (PAD), that is why its existence deserves attention as a form of service provided by the Municipal Government. The improvement of PAD attained from the traditional market can be shown from table. Related to that matter at the substantive level, the traditional market contributes to the employment and also sustains societal economy development particularly for those at the lower-middle class, mainly because of its leverage for the tourism sector. Besides the traditional market, the existence of the street vendors also preserves prospective potentials for Surakarta. Not only contributing to the PAD, the street vendors also play a role in the informal sector employment, particularly after the crisis of 1998. After that crisis, the number of the street vendors was getting too large that they deployed the green areas and public facilities. This situation came out as the background for the local government to assign the policy of the street vendor management. Considered as the following factor and the satellite of traditional market management, the street vendors management is in one package with the traditional market revitalization since the existence of the street vendors itself is signified as the logical consequence of the lack of the traditional market management (Holidin, 2014).

Even though many modern culinary delights and international restaurants have developed throughout Indonesia, the snack market still has a strong appeal. The existence of snack markets is not only tempting in terms of taste but also offers an authentic culinary experience and is rich in cultural heritage. Market snacks are often prepared using hereditary recipes that have been around for centuries. This maintains the authenticity and distinctive taste, which is difficult for modern food to imitate. Previous generations of the same family prepared many market snacks. Ancient recipes and traditional techniques are taught from parents to their children, ensuring the continuation of culinary traditions. Some raw materials in market snacks are only sometimes available in supermarkets or modern markets. Therefore, market snack sellers often rely on traditional sources of raw materials in their culture. Cooking and processing ingredients in market snacks often use traditional techniques requiring special skills. This creates a unique and quality taste that is difficult to achieve with modern cooking methods. The custom of serving market snacks at traditional events, celebrations, or specific cultural celebrations also maintains the desirability of these recipes. This food has become a symbol of local culture and identity. People often are loyal to certain market food vendors they have visited for years. This maintains demand for traditional market snacks and supports the business desires of sellers. Affordable prices make traditional market snacks easily accessible to everyone, including those on a limited budget. This makes market snacks a favorite food among various communities. Despite their affordable prices, traditional market snacks often provide excellent value. Traditional market snacks can be found in many places, such as markets, street vendors, and roadside carts. This makes it easy to access and a quick and convenient option for meals or snacks. Market snacks are often obtained in large portions to enjoy and enjoy with family or friends. This

creates a fun and affordable social experience. Most market snacks have substantial cultural and historical value. People can enjoy and maintain traditional culinary heritage at affordable prices without paying high costs. One of the significant advantages of market snacks is the variety of choices. Snack markets offer a wide variety of food, from sweet to savory, so almost everyone can find something to suit their taste. Each region in Indonesia also has its typical market snacks, so tourists and locals have many different culinary options to explore. This diversity of choices allows everyone to find something they like in traditional market snacks (Enggriani, 2023).

## Methods

This study used a descriptive observational method with a cross-sectional design. The population consisted of 34 traders in 16 large markets in Semarang City, selected using purposive sampling. The instrument used was an observation checklist based on Minister of Health Decree No. 942/Menkes/SK/VII/2003. Analysis was performed descriptively through frequency distribution tabulation.

## Results

### 1. Age Of Respondents

**Tabel 1** Distribution Of Respondents By Age

Variable	Range	Frequency	Percentage
Age	20-29 year	1	2.9
	30-59 year	26	76.5
	60-66 year	7	20.6
	Total	34	100.0

Based on the age distribution table of 34 respondents, 76.5% of traders were aged between 30 and 59 years old, while 2.9% were aged between 20 and 29 years old.

### 2. Gender

**Tabel 2** Distribution Of Respondents By Gender

Variable	Category	Frequency	Percentage
Gender	Male	5	14.7
	Female	29	85.3
	Total	34	100.0

Based on the table showing the gender distribution of the 34 respondents, the majority of traders were female, namely 29 people (85%). Meanwhile, there were 5 male respondents (14.7%).

### 3. Highest Level of Education

**Tabel 3** Distribution Of Respondents By Highest Level Of Education

Variable	Category	Frequency	Percentage
Highest Level Of Education	Not In School	11	32.4
	Elementary School	3	8.8
	Junior High School	18	52.9
	Senior High Schoo	2	5.9
	Total	34	100.0

Based on the distribution table of the 34 respondents' highest level of education, 18 respondents had completed that level of education, 52.9% of whom had a junior high school education, and at least 2 respondents (5.9%) had a senior high school/vocational high school education.

#### 4. Respondent Income

**Tabel 4** Distribution Of Respondents By Income

Variable	Range	Frequency	Percentage
Respondent Income	<3.000.000	24	70.6
	>3.000.000	10	29.4
	Total	34	100.0

Based on the income distribution table of 34 respondents, 24 people had an income of less than Rp. 3,000,000 (70.6%), and 10 respondents had an income of more than Rp. 3,000,000 (29.4%).

#### 5. Length of Service

**Tabel 5** Distribution Of Respondents By Length Of Service

Variable	Range	Frequency	Percentage
Length Of Service	<15 tahun	18	52.9
	>15 tahun	16	47.1
	Total	34	100.0

Based on the distribution table of the 34 respondents' length of service, 18 respondents (52.9%) had less than 15 years of service, while 16 respondents (47.1%) had more than 15 years of service.

#### 6. Facilities

**Tabel 6** Distribution Of Respondents By Facilities

No.	Facilities	Conditions				Total
		Eligible n	Eligible %	Ineligible n	Ineligible %	
1.	Street food sold by vendors must be prepared in such a way that it is protected from contamination.	16	47%	18	53%	34 100%
	a. easy to clean	34	100	0	0	34 100
2.	b. space available for:					
	1. clean water	18	53%	16	47%	34 100%
	2. food storage	0	0%	34	100%	34 100%
	3. prepared food storage	0	0%	34	100%	34 100%
	4. equipment storage	0	0%	34	100%	34 100%
	5. washing area (utensils, hands, food)	0	0%	34	100%	34 100%
	6. trash area	0	0%	34	100%	34 100%
3.	When selling food, certain requirements must be met and it must be protected from dust and contamination.	23	68%	11	32%	34 100%

Based on the distribution table of 34 respondents, 16 facilities (47%) met the construction requirements to protect food from contamination, while 18 facilities (53%) did not meet the requirements. This shows that most vendors do not yet have the ideal construction to ensure food safety from potential contamination, such as dust, insects, or direct exposure to the outside environment.

## 7. Equipment

**Tabel 7** Distribution Of Respondents By Equipment

No	Equipment	Conditions				Total
		Eligible	Ineligible	n	%	
1.	The equipment used to process and serve snacks must be suitable for its intended use and meet hygiene and sanitation requirements.	11	32%	23	68%	34 100%
2.	a. Used equipment is washed with clean water and soap	18	53%	16	47%	34 100%
	b. Then it is dried with a clean dryer/cloth.			18	53%	16 47% 34 100%
	c. The clean equipment is then stored in a place that is free from contamination.	19	56%	15	44%	34 100%
3.	Do not reuse equipment that is designed for single use only.	33	98%	1	2%	34 100%

Based on the distribution table of 34 respondents, 11 vendors (32%) used equipment that was suitable for its intended purpose and met hygiene and sanitation requirements. However, the majority of vendors, 23 people (68%), use equipment that does not meet the requirements. This indicates that most vendors still pay insufficient attention to the suitability and cleanliness of equipment in the processing and serving of street food.

## 8. Personal Hygiene

**Tabel 8** Distribution Of Respondents By Personal Hygiene

No.	Personal Hygiene	Conditions				Total
		Eligible	Ineligible	n	%	
1.	Not suffering from contagious diseases	30	88%	4	12%	34 100%
2.	Covering wounds (open wounds/boils or other wounds)	34	100%	0	0%	34 100%
3.	Maintain cleanliness of hands, hair, nails, and clothing	33	97%	1	3%	34 100%
4.	Wear an apron and head covering.	15	44%	19	56%	34 100%
5.	Wash hands every time before handling food.	0	0%	34	100%	34 100%
6.	Touch food using tools/equipment or gloves.	30	88%	4	12%	34 100%
7.	Do not smoke or scratch any part of the body (ears, nose, mouth, or other parts).	34	100%	0	0%	34 100%
8.	Do not cough or sneeze in front of food that is being served, and cover your mouth and nose when doing so.	34	100%	0	0%	34 100%

Based on the distribution table of 34 respondents' personal hygiene, the majority of food handlers (88%) did not suffer from easily transmissible diseases, while the rest (12%) were still found to be in a condition that could potentially transmit diseases.

## 9. Inspection of Facilities, Equipment and Personal Hygiene

**Tabel 9** Distribution Of Respondents By Inspection Of Facilities, Equipment, and Personal Hygiene

No.	Variable	Conditions				Total
		Eligible	Ineligible	n	%	
1.	Facilities	17	50%	17	50%	34 100%
2.	Equipment	21	62%	13	38%	34 100%
3.	Personal Hygiene	26	77%	8	23%	34 100%

Based on the data obtained, it can be concluded that the variable of personal hygiene is the aspect most frequently fulfilled by respondents, followed by the variable of equipment, and finally the variable of facilities. The gap in the variables indicates the need for intervention or improvement in the provision of supporting facilities. Cleaning equipment shows that some have none at all, and some do not even wear complete personal protective equipment when serving food.

## Discussion

This study examined the feasibility of facilities, equipment, and personal hygiene among street food vendors in Semarang City Market based on the standards set forth in Ministry of Health Regulation No. 942/Menkes/SK/VII/2003. The results showed variations in compliance with hygiene and sanitation standards among vendors. The majority of street food vendors are female (85.3%) with a dominant age range of 30–59 years (76.5%). The educational level of most respondents only reached junior high school (52.9%), and most had an income below Rp3,000,000 per month. This reflects that street food vendors generally come from a lower-middle socioeconomic background. Limited education and low income are suspected to be factors contributing to a lack of understanding of the importance of implementing hygiene and sanitation practices. These findings align with the study by Hetty Ismainar et al. (2022), which showed that educational level correlates with food vendors' hygiene practices (Ismainar, 2022).

In terms of facilities, only 18% of traders meet all sanitation requirements. Most street vendors do not provide essential facilities such as hand washing stations, equipment storage, or closed trash bins. This condition is a serious concern because without adequate facilities, comprehensive hygiene practices are impossible to implement. The lack of intervention from market managers or relevant agencies poses a unique challenge in creating a hygienic market environment. This finding reinforces the research by Wawoh et al. (2017), which states that limited facilities greatly influence the poor sanitation of street food (Wawoh, 2017). The condition of the equipment is also far from standard, with 68% of respondents using equipment that does not meet sanitation requirements. Most traders do not wash the equipment properly or store it in a closed place. In addition, the reuse of disposable equipment is still found. This practice increases the risk of cross-contamination, particularly by pathogenic bacteria such as *E. coli* and *Salmonella*. This aligns with the findings of Sari et al. (2020) that unhygienic equipment is one of the main causes of food poisoning in traditional markets (Nurhayati, 2020).

Personal hygiene is the aspect with the highest level of compliance (77%), although there are still shortcomings in important practices such as washing hands before handling food, which is not done by all respondents (0%). The use of protective gear such as aprons and head coverings is also low (44%). Although behavioral aspects such as not smoking or sneezing near food are well adhered to (100%), hand hygiene as a key element of food hygiene has not yet become a habit. This indicates that vendors' practical understanding is still partial and has not yet addressed the fundamental principles of preventing biological contamination. As stated in the study by Putri et al. (2022), unclean hands are the primary cause of microbial contamination in street food. The overall inspection results show that facilities are the aspect with the lowest level of compliance, followed by equipment, and finally personal hygiene. This gap indicates that although individual behavior is quite good, supporting factors from the environment and facilities are still inadequate. However, all three are closely interrelated in maintaining food safety. Therefore, policy interventions should be directed toward providing basic hygiene facilities, intensive training, and regular monitoring of street food vendors (Nahdiyani, 2022).

Traditional market Traditional markets are a form of market that carries out its operations traditionally, where traders sell various goods, including food, vegetables, fruit, clothing, household equipment, and other merchandise. These traditional marketplaces are usually permanently located in city centers or urban areas. They follow a routine operational schedule with specific days to operate and offer various products, including food, clothing, household supplies, flowers, and others. In traditional markets, buyers and sellers interact directly, where sellers display their wares in their booths or stalls, and haggling over prices is expected. In addition, traditional markets have a strong sense of local culture and traditions, including elements such as distinctive architecture, local music, and traditional dishes. These markets are often an essential part of the cultural heritage of a region with a long history. Traditional markets have a significant role in shopping activities and social information exchange in many communities worldwide. They contribute to the local economy and promote regional culture and identity. Even though modern markets and retail continue to develop, conventional markets still play an essential role in people's daily lives. Market snacks are food usually served in miniature form or pieces and sold in traditional markets or street vendors. Market snacks often have a variety of flavors and textures and can be sweet, savory, or even a sweet-savory mix. This dish is integral to Indonesia's culinary heritage and is often served on special occasions, such as celebrations and traditional ceremonies (Mayasari et al., 2021). Market snacks are often prepared using hand-me-down recipes that have existed for centuries, maintaining their authenticity and distinctive taste, which is difficult for modern food to imitate. Local traders often sell them in traditional markets, and the simple packaging and manufacturing process open for customers to see makes the eating experience more intimate and warm. The authenticity of the taste of market snacks often matches Indonesian people's taste preferences, making them popular and loved (Enggriani, 2023). Indeed, the increase in chronic diseases such as diabetes and high cholesterol, the prevalence of eating disorders such as anorexia and obesity, the need to strengthen immunity against epidemics and the growing population make the healthy food sector an attractive market. The healthy food market therefore represents an opportunity for companies that want to develop products with an approach that is affordable and attractive to society. With their increasing contribution to daily energy intake, especially in recent years, healthy snacks stand out as growing submarket under the healthy food segment umbrella. In addition, in the success of micro and macro environmental analysis, it is important to exchange information with stakeholders who can monitor and evaluate environmental trends. Stakeholders should be approached holistically and understanding a sector should start from understanding its stakeholders. For the reason, it is impossible to properly comprehend the micro and macro environmental elements that perspectives of its suppliers, buyers, producers, distributors, sellers and customers (Senturk and Cakir, 2023)

The important role of the food environment and food system in the health of populations, communities and individuals is a prominent topic in the public health domain. This is largely due to the rise in obesity and diabetes worldwide. Worldwide trends of increasing weight gain and obesity are reported in children and the trend among children to eat unhealthy energy-dense food has increased. The food environment, defined broadly as the collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choice and nutritional status, provides the most important context in which childhood obesity should be considered. A study in Soweto South Africa for example showed that sugar-sweetened beverages are sold and advertised with increased intensity within close proximity to schools. Although few South African data are available, it has been argued that the cost of a healthier diet is beyond the reach of the poor in the country. Globally, the higher cost of healthy diets may explain socio-economic disparities in diet quality and it is well described in the literature that healthier diets cost more than unhealthy diets (Faber, 2018).

Street vending provides for employment and income generation for the poor as well as accessible and cheap services. A particular type of street vending, that of food be it unprocessed semi-processed and prepared 'can be found on nearly every corner of the world and such foods have been on sale for thousands of years'. Further street food vending has provided for a 'growing form of employment, stability, and profitability, characterized by a high proportion of trade, most vendors being micro-entrepreneurs, and vendors' average incomes being generally higher than the official minimum wage and many vendors earn as much as school teachers or government clerks, but failure is also frequent'. This further research on street food entrepreneurship seems viable, as the past achievements of such micro-enterprises in terms of

providing profitability, high income (revenue) generation and consequently stability. For owners and their families, may seemingly derive from marketing practices. Hence a particular aspect of street food entrepreneurship will be considered in this research, that of entrepreneurial marketing. Street food vendors are, in most cases, an integral part of the BOP informal food economy. Defines street foods as 'ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers especially in streets and other similar public places'. The foods are 'minimally processed to highly processed foods that are sold on streets and other public places, consumed on the spot and/or ready to take home or delivered to the work place, including catering'. Such foods are usually not expensive, are nutritional, are mostly based on traditional knowledge, tend to follow the seasonal pattern of farming, thus allowing for varied diets, and are widely distributed in both urban and rural areas. Street food enterprises are commonly family or one-person businesses (usually defined as micro enterprises), mostly run by women, and vendors can be mobile vendors, for example on foot and bicycles, semi-mobile, for example using push carts, or stationary vendors that sell from a stall (Hilmi, 2020). Studies have shown that prospective customers determine the value of the merchandise based on both monetary and non monetary cost. It was discovered that recreation, which has an non monetary value attaced to it, was the single most important motivating factor leading to increased footfall at a regional shopping centre. Additionally, it contributes to creating store patronage intentions (Katiyar, 2016)

## Conclusion

The majority of street food vendors in Semarang City Market are women (85.3%) with a dominant age range of 30–59 years (76.5%). The most common educational attainment is junior high school graduates (52.9%), with the majority earning less than Rp3,000,000 and having worked for less than 15 years (52.9%). Only 50% of vendors' facilities meet the required standards, and only 18% comply with all sanitation aspects of facilities as per Ministry of Health Regulation No. 942/Menkes/SK/VII/2003. Most vendors lack essential facilities such as handwashing stations, food/equipment storage areas, and closed trash bins. 62% of equipment meets cleanliness and proper use standards. However, 47% of vendors still do not wash and store equipment properly. Reuse of single-use equipment was also found in 2% of respondents. Personal hygiene was the aspect with the highest compliance rate (77%). All vendors maintained personal cleanliness, such as covering wounds, not smoking, and not sneezing near food. However, none of the vendors (0%) washed their hands before handling food, and only 44% used aprons and head coverings.

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