



HYGINE COMPLIANCE AND RISK FACTORS IN INDIAN STREET FOOD

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Abstract

India is well known for its street food, and a sizable portion of the populace enjoys the distinctive street cuisine found in each Indian city. Only when food is pure, fresh, and devoid of dangerous substances like pathogenic microorganisms can it be considered nourishing. Foods that are contaminated or infected put people's health at risk and lower their quality of life. The food safety of street food has always been a concern because eating these roadside foods has been suggested or reported to potentially increase the risk of foodborne illnesses. This is because street food can easily become contaminated from a variety of sources, including improper handling, traditional processing methods used in the preparation, and poor personal hygiene of food handlers. In order to enhance the microbiological quality of street foods, new demands have emerged, such as educating sellers about health issues and ensuring the use of proper hygiene practices.

Key words: Ethnobotanical, Pharmacological, Indian saffron, Curcumin, Street Food, Foodborne illness.

Eating a healthy diet is a key factor in determining one's health. There are two key components to wholesome food: first, it must have a high nutritional value; second, and just as crucial, it must be free of harmful ingredients and agents that could impair health and result in foodborne illnesses. Thus, ensuring food safety is crucial to preserving health.

The most basic human requirement is food. One of the sustainable development objectives to change the world is to eradicate hunger. Food availability alone is insufficient; in order for food to fulfil its role in growth and development, it must be safe and free of infections. When food is pure, fresh, and devoid of dangerous substances like harmful microorganisms, it is the only source of nutrition. Contaminated or infected food poses a health risk and lowers one's quality of life.

In light of this important aspect, the World Health Organization continued to focus on food safety in 2015 that is, making food safe from farm to plate. Additionally, the World Health Organization has provided five guidelines for safer food: maintaining cleanliness, separating raw and cooked food, completely preparing food, maintaining safe temperatures, and using water and raw materials (WHO, 2015).

It is a useful manual for everyone who handles food, including customers and sellers. Significant economic growth is occurring in India. As a result, "eating out" has grown to be a significant aspect of daily living, particularly in cities (Kashyap et al., 2004). As a result, street food is expanding quickly. Street food offers a variety of fresh, delicious, easily accessible, and reasonably priced dishes. Particularly in the street and other comparable public spaces, merchants and hawkers prepare and sell a variety of "ready to eat" foods and beverages (FAO, 2011). Street foods are crucial for maintaining the population's nutritional state as well

as the culture and social legacy of societies (Rane, 2011). The national policy for urban street food vendors estimates that there are about 10 million street vendors in India.¹

According to some surveys, street sellers make up about 2% of a city's population; this percentage is probably going to rise. Every city in India has its own distinctive street cuisine, and a sizable portion of the populace enjoys these treats. Table 1 displays the most popular street food in India.

For many low-income individuals, the current socioeconomic conditions, and the influx of unorganized labour, street foods are popular due to their distinctive flavour, variety, affordability, convenience, and accessible means of obtaining a nutritionally balanced meal outside the home (Chauhan et al., 2015). Contrary to these possible advantages, it is also acknowledged that street food vendors are frequently impoverished, illiterate, and lack the skills necessary to handle food safely. Accordingly, street food is thought to pose a serious threat to public health. The significance of street food safety has been emphasized by this study.

The construction of this study involved a thorough investigation of the literature on street meals. The food safety element of street foods is discussed here, along with an evaluation of the research on the subject.

Table-1: Popular street foods of India

Street food	Description
1.Chaat	It is a tangy spicy mix of potato, crispy fried Indian bread, curd, chickpeas, onion with varied ingredients like lemon, pomegranate seeds, chaat masala, salt, chilli, tamarind and different chutneys.
2.Panipuri/Puchka/Gol gappay/ gup-chup	Unleavened Indian bread fried crisp and filled with potato, onion and chickpeas served with sweet and tangy masala pain (Spicy water).
3. Dahi Bhalla/ dahibarey/ thayirvada/ Dahi bara	Fermented urad dal fluffy bhalles drizzled with sweetened curd, tangy chutneys and chaat masala.
4.Chole bhature	It's a combination of chana masala (spicy white chickpeas) and fried bread made from soft wheat(maida). It is accompanied by onion, pickle and green chutney.
5.Poha jalebi	It is lightly fried flattened rice is cooked with onion, potato, peas, curry leaves, mustard seeds, cumin seeds and topped with sev, onion, tomato. It is served with a unique combination of hot piping jalebies (a sweet type).
6.Kachori	Kachori is round balls made from maida flour and dough filled with onion/potato/ yellow moong dal /peas and served with chutney made from tamarind, mint or coriander.
7.Samosa	Samosa is a triangle-shaped fried or baked dish with a savoury filling such as spiced potato, onion, peas etc. and accompanied by mint, coriander chutney.

¹ <http://www.nasvinet.org>

8.Bhelpuri	Puffed rice and sav tossed with potato, onion, masala and tangy coriander and sweet dates chutneys.
9. Pav bhaji	Pav bhaji is a spiced mixture of mashed vegetables in a thick gravy served hot with a soft white bread roll usually cooked on a flat griddle.

Assessment of street food safety

Since street food is typically prepared in unhygienic settings by the sellers, there is always cause for concern over its safety. These foods are more likely to be contaminated because of the unfavourable conditions under which they are manufactured and sold. Food contamination can result from improper food handling, preparation, and storage; inadequate hand washing; poor personal hygiene practices of food workers; individuals who appear healthy but carry pathogens that can infect others; and improperly cleaned and sanitized eating and cooking areas, utensils and equipment; using food from unapproved sources; contaminating food, utensils, and equipment with flies, roaches, and other insects and vermin.

Water used for drinking and cleaning is frequently contaminated due to unsanitary handling and storage. Furthermore, there are major health risks associated with the usage of artificial colours like metanil yellow. Poor environmental conditions are exacerbated by the lack of proper rubbish removal facilities.²

Numerous food-borne illnesses are brought on by street cuisine. According to the World Health Organization's 2015 estimate of the worldwide burden of foodborne illnesses, 4,20,000 people die and 1 in 10 get sick from eating tainted food each year. Approximately 125,000 young children die each year from food-borne illnesses, putting children under the age of five at significant risk. Worldwide, diseases caused by eating tainted food are a major contributor to illness, disability, and mortality. Numerous locations in India and other countries have reported food-borne illnesses linked to eating street food.³ Street foods have been linked to a number of foodborne bacterial infection and poisoning cases. These foods, as well as the ready-to-eat items consumed in restaurants or households, can spread diseases like cholera, hepatitis A, typhoid, and others. Due to the improper use of chemicals, the presence of pathogenic bacteria, environmental toxins, and a disregard for good manufacturing practices (GMPs) and good hygiene practices (GHPs), street meals are frequently linked to diarrheal illnesses.⁴

Escherichia coli, *Enterobacter* spp., *Shigella* spp., *Staphylococcus aureus*, and *Salmonella* spp. were found in milk and milk products, according to studies on food safety conducted throughout India. The vegetable salad contained *Yersinia* and *Escherichia coli*⁵. Bacterial pathogens (a single celled microorganism that invades a host and causes disease by multiplying and releasing harmful toxins.), including *Pseudomonas aeruginosa* (causes infections mainly in people who are sick or have weak immune system) in samosas (25%), *Escherichia coli* (32%) and *Staphylococcus aureus* in kachori (27%), *Salmonella* spp. in samosas (36%), batatawada (12%), and pakode (7%), have been found most frequently in Indian street foods⁶.

According to Tambekar et al. (2011), there have been reports of a high incidence of *E. coli* in food items from the city of Amravati. This could be due to contaminated utensils, contaminated water, or poor hand-washing habits.

² Solanki, 2011; Tambekar *et al.*, 2008

³ FAO, 2011; Gadi et al., 2013; Garode &, 2012; Das et al., 2010; Kumar et al., 2014; Marwaha et al., 2018.

⁴ Barro et al., 2006.

⁵ Sabbithi et al., 2014; Kumar et al., 2017

⁶ Tambekar et al., 2008

This was followed by *Staphylococcus aureus* infection, which might be brought on by cuts, burns, open wounds, hands running through hair or scratching the scalp, and the sellers' unclean clothes. Karnataka street meals were found to include coliforms and enterococci⁷.

According to Sudershan et al. (2009), handling and extended storage conditions are inadequate critical control points for contamination of both street foods and water samples. Eighty percent of the street food samples in Tumkur's various sites had pathogen contamination.

Cut fruits, panipuri, bhelpuri, noodles, fried rice, and lemon rice with *S. aureus* (18.75%), *E. coli* (7.26%), and *Salmonella* spp. were the next most contaminated foods (19.79%). (Kumar et al., 2017) (5.20%)

Poor personal hygiene among food workers, a lack of heat processing procedures during preparation, and often contaminated serving utensils used at vending outlets could all be contributing factors to elevated pathogen counts. Therefore, cross contamination between dishwater, food preparation surfaces, and the food itself is a key source of contamination. This is evident not just from the hands of the food sellers but also from the dishes, clothes, and water used during dishwashing and handwashing.

Despite being aware that eating street food might lead to foodborne illnesses, most consumers ignore these health risks (Bryan, 1998). Flies can spread foodborne illnesses, yet the majority of foods are not protected from them. Street food is rarely stored at safe temperatures. Food contamination by *E. Coli*, *Salmonella typhi*, *Pseudomonas* species, *Staphylococcus aureus*, or *Proteus* species during preparation, post-cooking, and other handling phases is linked to potential health hazards⁸.

Strategy for street food safety

Numerous health-related issues are raised by the conditions under which street food is made and sold. The implementation of a system of hazard analysis and critical control points (HACCP) has been spurred by public health authorities' and consumers' rising concern about food safety due to media reporting of foodborne outbreaks (Boards & Tranter, 1986). The Codex Alimentarius Commission (CAC) defines the HACCP system as a system that recognizes, assesses, and manages risks that are important for food safety (Moterjemi, 2001). The following seven principles make up the HACCP system: (i) conduct a hazard analysis; (ii) determine the critical control points (CCPs); (iii) establish critical limits; (iv) establish a system to monitor control of CCP; (v) establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control; (vi) establish a procedure for verification to confirm that the HACCP system is working effectively; and (vii) establish documentation concerning all procedures and records appropriate to these principles and their application⁹. The HACCP approach would be a good tool to gain knowledge about the causes of high microbial counts.

The Food Safety and Standard Authority of India (FSSAI), the Prevention of Food Adulteration Act (PFA), Agriculture Grading and Marketing (AGMARK), Fruit Product Order (FPO), and other regulatory procedures are used in India to ensure quality control with reference to food items. In 2000, the Bureau of Standards (BIS) introduced a HACCP certification scheme for the food industry; nonetheless, it is imperative that laws be tailored to local situations. Different street cuisines have varying propensity to spread disease causing chemicals.

Therefore, gravies, cooked rice, and low-acid dairy, egg, and meat products all of which encourage bacterial growth are more likely to spread disease than dry baked goods, dried grains, and properly sugared and acidulated diets. Foods that are cooked through and eaten immediately are safe, but precooked foods that are

⁷ Gautami et al., 1995; Girish et al., 2002

⁸ Hanoshiro et al., 2005; Ghosh et al., 2007

⁹ Gupta et al., 2010

kept at a temperature between 15 and 40 degrees Celsius for longer than four hours carry a significant danger. Unauthorized additives are more likely to be present in meals and drinks with strong colours. When feasible, street selling should be included by urban development initiatives and formally acknowledged as a component of the food supply system. Some vendors may be able to get further advantages including financing for business improvement with formal recognition. It is critical to avoid stifling this vital supply source with overly stringent regulations. Instead, then punishing merchants, emphasis should be placed on education. In order to establish the proper regulations for their operations, street vendors should be grouped based on the kind of food they sell and how mobile they are. Compared to mobile units that sell whole meals, snacks, or beverages made by the vendors in bulk, those that merely sell bottled beverages or low-hazard food products need far less management. Therefore, it is strongly recommended that government efforts be developed to provide these street food vendors with more knowledge, education, and communication about food safety and hygiene.

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