

A Scientific Overview on Non-Susceptible Bacterial Pathogens in Ready-to-Eat Street Foods

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DESCRIPTION

Street food is a popular dietary choice worldwide, particularly in urban areas where convenience and affordability drive consumer preferences. While street foods offer cultural diversity and accessibility, they also pose significant food safety risks. Among these risks are non-susceptible bacterial pathogens—microorganisms resistant to commonly used antibiotics, which can lead to serious health consequences. This article explores the prevalence, sources, and health implications of non-susceptible bacterial pathogens in ready-to-eat street foods.

Understanding non-susceptible bacterial pathogens

Non-susceptible bacterial pathogens are defined as strains of bacteria that exhibit resistance to one or more antibiotics. This resistance can arise from various factors, including genetic mutations, horizontal gene transfer, and selective pressure from the overuse or misuse of antibiotics in human medicine and agriculture. Common non-susceptible pathogens associated with foodborne illness include:

- *Salmonella* spp. particularly *Salmonella enterica*, which has various serovars that can cause gastroenteritis.
- *Escherichia coli* (*E. Coli*) specifically, *E. coli* O157.
- *Staphylococcus aureus* known for producing enterotoxins that can cause food poisoning.
- *Listeria monocytogenes* are serious pathogen that can lead to listeriosis, especially in vulnerable populations.

Mechanisms of antibiotic resistance

Antibiotic resistance in these pathogens can occur through several mechanisms, including:

Enzymatic degradation: Bacteria can produce enzymes that inactivate antibiotics.

Alteration of target sites: Changes in the bacterial cellular structures where antibiotics exert their effects can render the drugs ineffective.

Efflux pumps: Some bacteria can expel antibiotics from their cells, reducing drug concentrations and effectiveness.

Sources of non-susceptible pathogens in street foods

Contamination during food preparation: Street food is often prepared in environments with inadequate hygiene practices, increasing the likelihood of contamination. Factors contributing to contamination.

Improper handwashing: Vendors may not adhere to proper hand hygiene, transferring pathogens from contaminated hands to food.

Cross-contamination: Raw ingredients, particularly meats, can introduce bacteria to ready-to-eat foods if cutting boards and utensils are not sanitized properly.

Ingredients and raw materials: The sourcing of ingredients plays an important role in the presence of non-susceptible pathogens. Animal Products of meats and dairy products can harbor resistant strains of bacteria, especially if sourced from farms that use antibiotics.

Vegetables and fruits contamination can occur from soil, water, or during handling, where resistant bacteria from animal waste may be present.

Environmental factors: Street food vendors often operate in environments that lack sufficient infrastructure, such as proper waste disposal, refrigeration, and clean water sources.

Temperature abuse of foods that are not stored or cooked at appropriate temperatures can allow bacterial growth. Contaminated Water for cooking or washing food can introduce pathogens.

Prevalence of non-susceptible pathogens in street foods

Several studies have reported the prevalence of non-susceptible bacterial pathogens in street foods.

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Salmonella spp.: Research has shown that *Salmonella* is frequently isolated from various street foods, with some strains exhibiting multi-drug resistance. A study in Southeast Asia indicated a resistance rate of up to 50% against commonly used antibiotics.

E. coli: A significant proportion of street food samples have been found to harbor pathogenic *E. coli*, with many strains resistant to ampicillin and tetracycline.

Staphylococcus aureus: This pathogen is often found in street foods, especially those containing dairy. Studies reveal a high prevalence of enterotoxin-producing strains, which can lead to foodborne illnesses.

Listeria monocytogenes: Although less common in ready-to-eat foods, instances of *Listeria* contamination have been documented, particularly in salads and sandwiches prepared with contaminated ingredients.

Health implications of non-susceptible pathogens

The presence of non-susceptible bacterial pathogens in ready-to-eat street foods poses several health risks:

Increased severity of foodborne illness: Infections caused by antibiotic-resistant bacteria can lead to more severe health outcomes due to limited treatment options. Patients infected with non-susceptible strains may require more intensive medical interventions, such as hospitalization or the use of broader-spectrum antibiotics.

Public health threats: The emergence of non-susceptible bacterial pathogens represents a significant public health concern. Outbreaks of foodborne illnesses linked to street foods can rapidly spread in communities, particularly affecting vulnerable populations such as the elderly, pregnant women, and immunocompromised individuals.

Economic impact: Foodborne illnesses can lead to economic losses through healthcare costs, loss of productivity, and

diminished consumer confidence in street food vendors. Outbreaks can result in regulatory actions, including temporary closures and increased scrutiny of vendors.

Prevention and control strategies

To mitigate the risks associated with non-susceptible bacterial pathogens in street foods, several strategies can be implemented

Improving food safety practices: Street food vendors should adhere to strict food safety protocols. Regular training on handwashing, proper food handling, and cross-contamination prevention. Authorities should conduct routine inspections to ensure compliance with food safety regulations.

Monitoring and surveillance: Public health agencies should establish monitoring programs to track the prevalence of non-susceptible pathogens in street foods. Regular collection and testing of food samples from street vendors to identify contamination levels. Monitoring antibiotic resistance trends in foodborne pathogens can inform public health interventions.

Consumer education: Raising awareness among consumers about the potential risks of consuming street foods can encourage safer choices with visible hygiene practices and good reputation. Advising consumers to ensure that food is properly cooked and served hot.

CONCLUSION

The presence of non-susceptible bacterial pathogens in ready-to-eat street foods is a significant public health concern that necessitates immediate attention. Addressing this issue requires a multifaceted approach involving improved food safety practices among vendors, enhanced surveillance and monitoring, and consumer education. By adopting these strategies, we can mitigate the risks associated with street foods while preserving their cultural and economic value. Continued research and collaboration among stakeholders are essential for ensuring the safety of street food and protecting public health.