STREET FOOD: ASSESSING ITS IMPACT ON PUBLIC HEALTH, ECONOMY, AND SOCIETY IN LIGHT OF NUTRITIONAL BENEFITS AND MICROBIAL RISKS – A NARRATIVE REVIEW

COMIDA DE RUA: AVALIANDO SEU IMPACTO NA SAÚDE PÚBLICA, NA ECONOMIA E NA SOCIEDADE À LUZ DOS BENEFÍCIOS NUTRICIONAIS E DOS RISCOS MICROBIANOS – UMA REVISÃO NARRATIVA

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ABSTRACT

Street food serves as a global culinary phenomenon, reflecting cultural diversity and enriching tourism experiences. However, concerns arise regarding its safety due to microbial contamination, posing significant public health risks. This narrative review assesses the interplay between street food, public health, economy, and society. It explores microbial risks, emphasizing deficient hygiene practices among vendors and inadequate infrastructure. Despite nutritional benefits, street food consumption contributes to foodborne diseases, disproportionately affecting vulnerable populations, especially in low- and middle-income countries. Moreover, street food vendors, predominantly women in developing nations, face socioeconomic challenges despite their crucial role in the economy. Legalizing and regulating street food operations are imperative for enhancing food safety, supporting livelihoods, and fostering socioeconomic empowerment. Overall, understanding and addressing the multifaceted impact of street food are essential for promoting public health and sustainable development.

KEYWORDS: Urban food trade, food handling, emerging foodborne pathogens, socioeconomic impact, food safety.

RESUMO

A comida de rua é um fenômeno culinário global, refletindo a diversidade cultural e enriquecendo as experiências turísticas. No entanto, surgem preocupações quanto à sua segurança devido à contaminação microbiana, o que representa riscos significativos para a saúde pública. Esta revisão narrativa avalia a interação entre a comida de rua, a saúde pública, a economia e a sociedade. Explora os riscos microbianos, enfatizando práticas de higiene deficientes entre os vendedores e a infraestrutura inadequada. Apesar dos benefícios nutricionais, o consumo de comida de rua contribui para doenças transmitidas por alimentos, afetando desproporcionalmente populações vulneráveis, especialmente em países de baixa e média renda. Além disso, os vendedores de comida de rua, predominantemente mulheres em nações em desenvolvimento, enfrentam desafios socioeconômicos, apesar de seu papel crucial na economia. A legalização e regulamentação das operações de comida de rua são imperativas para melhorar a segurança alimentar, apoiar meios de subsistência e promover o empoderamento socioeconômico. Em suma, entender e abordar o impacto multifacetado da comida de rua é essencial para promover a saúde pública e o desenvolvimento sustentável.

PALAVRAS-CHAVE: Comércio alimentar urbano, manipulação de alimentos, patógenos emergentes em alimentos, impacto socioeconômico, segurança alimentar.

INTRODUCTION

Street food is popular worldwide, captivating the taste buds of locals and tourists alike. This culinary trend reflects the rich tapestry of cultural diversity across the globe, offering a sensory journey through flavors and aromas unique to each region[1]. Around the world, there are numerous examples of street food that are part of the local food culture model, such as arepas in Venezuela, tacos in Mexico, kebabs in Turkey, dumplings in Russia, Central Asia, China, and Korea; or even fried or roasted insects as seen in Southeast Asia[2].

Beyond its gastronomic allure, street food plays a crucial role in enhancing the tourism industry, contributing to local economies, and maintaining a sustainable tourism system. Thus, street food is part of the tourist experience of many visitors to a region and/or country, acting as a gateway for visitors to immerse themselves in the authentic essence of a destination. Several destinations are focusing on street foods as an upcoming tourism product[1].

Street food vendors worldwide offer an extensive array of foods, which are heterogeneous regarding their ingredients, processing, handling, and consumption methods. It is possible to find everything from fresh fruits, fresh vegetables, and homemade cooked meals to highly industrialized packaged snacks and drinks[3].

Studies indicate that the escalating consumption of street food plays a pivotal role in addressing food security challenges within burgeoning urban populations. Street foods have garnered recognition as a strategic intervention to mitigate nutritional deficiency diseases[4]. Nevertheless, particularly in low- and middle-income countries (LMIC), apprehensions arise regarding the safety of street food owing to the precarious conditions prevalent during its preparation and vending, encompassing deficient infrastructure such as a lack of potable water, sanitation facilities, and proper waste disposal[3]. These suboptimal conditions potentiate the contamination of food by pathogenic microorganisms, leading to the manifestation of foodborne diseases (FBD).

Indeed, the contamination of food with pathogens, along with their persistence and proliferation, has emerged as a paramount public health concern. According to Hassanain et al.[5], foodborne pathogens represent a substantial burden and pose challenges to public health, particularly impacting vulnerable demographics such as children, pregnant women, the elderly, and

individuals with compromised immune systems. In LMIC, diarrheal diseases stemming from contaminated food or water sources continue to account for the mortality of millions annually.

Through a multidisciplinary lens encompassing microbiology, public health, and socioeconomic perspectives, this narrative review sets out to connect the dots between the enjoyment of street food and the pressing need for public health protection. By digging into the characteristics of microbial foodborne diseases, delving into the hygiene challenges faced by street food vendors, and exploring how street food impacts local economies and empowers women in developing nations, we aim to provide a comprehensive understanding of the complex interplay between street food, microbial risks, and societal impacts.

METHODOLOGY

The review encompassed studies published between 2010 and 2023, sourced from PubMed and Google Scholar databases. Relevant articles were identified using the search terms "foodborne diseases," "street food," "foodborne pathogens," "microbiological food safety," "socioeconomic status," "hygienic practices," and "public health."

We included book chapters, research papers, and review articles with English abstracts and accessible full texts in either English or Portuguese. Exclusion criteria were applied to articles not directly relevant to the topic or only tangentially related, ensuring a focused and reliable review. Theses or dissertations were not considered.

This methodological approach was employed to select literature that offers a comprehensive understanding of the subject matter, thereby enhancing the credibility and depth of the review.

LITERATURE REVIEW

CHARACTERISTICS AND IMPACTS OF MICROBIAL FOODBORNE DISEASES

The association between food consumption and human diseases has been recognized since ancient times, when Hippocrates (460 B.C.) reported a strong connection between the food consumed and human illness[6]. However, it wasn't until 2015 that FBD gained significant attention as a development priority, following the publication of the first global estimated burden of FBD by the WHO. This report highlighted that FBD pose a health burden comparable to that of malaria,

HIV/AIDS, or tuberculosis, commonly referred to as the 'big three,' seriously compromising human health in LMIC[7]. The results of this study showed that each year, 1 out of 10 people falls ill due to the consumption of food contaminated with microbial or chemical agents, resulting in 600 million illnesses, 420 000 deaths and the loss of 33 million healthy years of life globally[8].

Therefore, FBD encompass all clinical events resulting from the consumption of food or beverages contaminated with pathogenic microorganisms, such as viruses, bacteria, and parasites, or with chemical substances harmful to health, including pesticides, microbial toxins, and heavy metals[9]. Microbiological contamination is identified as the major source of hazards[10,11]. It is estimated that approximately 70% of FBD result from food contaminated with microorganisms[12]. Thus, in this context, FBD can be more commonly defined as any disease resulting from the consumption of food contaminated with microorganisms or their toxins[13].

Accordingly, FBD can be classified as either foodborne infection or foodborne intoxication. Foodborne infection occurs when individuals consume food containing live pathogens, leading to an infection as these pathogens grow in the human host[14]. In some cases, a toxicoinfection (formerly known as toxin-mediated infection) may occur as a result of toxins formed in the digestive tract after consuming food containing the bacteria[12]. In contrast, foodborne intoxication is caused by consuming food contaminated with toxins produced by microorganisms that have multiplied in the food; in other words, the microorganisms themselves do not cause illness[14].

Most foodborne infections are primarily caused by bacteria and viruses. Among the bacteria causing infection or toxicoinfection are members of the *Enterobacteriaceae* family, such as *Escherichia coli*, *Salmonella* spp., and *Shigella* spp., as well as *Campylobacter* spp., *Listeria monocytogenes*, *Clostridium perfringens*, *Bacillus cereus*, and *Vibrio cholerae*[12]. From an epidemiological standpoint, the most significant human enteric viruses are hepatitis A (HAV) and norovirus (NoV)[5,6,11].

However, it is essential to note that human enteric viruses form a functional rather than a taxonomic group. Thus, viruses belonging to different genera and families are associated with foodborne infections. These include, in addition to NoV (*Caliciviridae*) and HAV (*Picornaviridae*), the hepatitis E virus (HEV) (*Hepeviridae*), rotaviruses (*Reoviridae*), enteroviruses (e.g., Poliovirus and Coxsackievirus) (*Picornaviridae*), adenoviruses (*Adenoviridae*) and astroviruses (*Astroviridae*)[11,15,16].

Bacteria also play a significant role in food intoxication, with examples including *Staphylococcus aureus* (causing staphylococcal intoxication) and *Clostridium botulinum* (causing botulism). Furthermore, various species of filamentous fungi produce toxic metabolites called mycotoxins, which can be highly harmful to humans, leading to mycotoxicosis[17].

The course of FBD is usually benign, and foodborne intoxication has a shorter incubation period compared to foodborne infection. For instance, the incubation period in *Salmonella* infection is commonly reported as 6–72 h, but is usually 12–36 h. In contrast, the onset of symptoms in *S. aureus* intoxication is rapid, ranging from 30 min to 8 h, but usually 2–4 h[18].

The most common clinical symptoms of FBD include diarrhea, vomiting, abdominal cramps, headaches, nausea, malaise, fever, and dehydration[12]. Nevertheless, the severity of the disease varies depending on the etiology, ranging from mild to severe and potentially leading to death. For instance, FBD caused by NoV typically follows a benign course, resulting in acute and self-limiting gastroenteritis. In stark contrast, specific FBD, such as hepatocellular carcinoma triggered by aflatoxins (recognized as the most critical mycotoxins due to their toxic potential and ubiquitous prevalence) exhibit a high mortality rate[7].

Considering only viruses, foodborne infections may lead to a variety of illnesses unrelated to intestinal tissue, depending on the target organ where virus multiplication occurs. In this context, there are two types of human enteric viruses: 1. capable of primarily multiplying in the intestine, resulting in acute gastroenteritis with typical symptoms including watery diarrhea and vomiting; 2. capable of multiplying elsewhere in the body, causing minimal enteric symptoms before producing clinical disease at a distant site. The latter may lead to diseases with a high degree of severity, such as poliomyelitis, meningitis, encephalitis, myocarditis, pericarditis, and hepatitis[15,19].

In the context of bacterial toxins, a range of outcomes can arise depending on the specific bacterial agent involved. *Staphylococcus aureus* is renowned for its production of enterotoxins, which induce rapid-onset gastroenteritis. This condition is typically characterized by the abrupt onset of nausea and vomiting following the consumption of contaminated food. Notably, while the cooking process can eliminate *S. aureus*, it is insufficient to inactivate its heat-stable enterotoxins[11]. In contrast, the anaerobic bacterium *C. botulinum* produces a potent neurotoxin that is labile in foods. Once absorbed in the intestine, this toxin can lead to the paralysis of cranial nerves, resulting in impaired vision, drooping eyelids, difficulty swallowing, and impaired speech. The paralysis

spreads in a symmetrical and descending manner; in 10% of cases, death occurs due to respiratory or cardiac paralysis[17].

In addition to the etiology, the severity of FBD is intricately linked to factors such as the microbial load present in the food, as well as the socioeconomic and immune system conditions of individuals. The most severe cases tend to occur in the elderly, young children, individuals with compromised immune system function, and those residing in the world's poorest regions[6,17.]

Globally, children aged under 5 years are disproportionately affected by FBD. Despite making up only 9% of the world's population, they experience 38% of all FBD cases and represent 30% of deaths related to FBD. Africa and South-East Asia exhibit the highest incidence of FBD and the highest mortality rates across all age groups. People living in the poorest areas of the world, constituting 41% of the world's population, experience 53% of all FBD cases and represent 75% of deaths related to FBD. In total, over 90% of the burden of FBD falls on LMIC[7].

Various foods can serve as potential vehicles for pathogenic microorganisms involved in a FBD outbreak, defined as the occurrence of two or more cases of similar illness resulting from the ingestion of a common food[6]. Commonly implicated in FBD outbreaks are perishable foods, such as raw or undercooked poultry, meat, seafood, and unpasteurized dairy products, which may harbor viruses and bacteria like *Salmonella*, *Escherichia coli*, and *Listeria monocytogenes*. Additionally, fresh produce, including leafy greens and fruits, has been associated with FBD due to contamination with enteric pathogens. Moreover, raw eggs and sprouts are recognized as potential sources of *Salmonella* and other foodborne pathogens[5,20].

While in high-income countries (HIC) most FBD result from consuming animal products (derived from livestock or aquatic animals) and contaminated fresh produce (fruits and vegetables), very little information exists on the foods that are the source of FBD in LMIC. In these countries, fewer animal products and fresh produce are consumed, but these foods are mainly sold fresh in informal markets and are often heavily contaminated[7].

Low- and middle-income countries are particularly vulnerable to the risk of FBD due to unsafe food preparation; poor individual and collective hygiene; inadequate production, handling, and storage conditions; low level of literacy and education; and a lack of insufficient implementation of food safety legislation. These risks are particularly pronounced in street food vending[21].

STREET FOOD HYGIENE CHALLENGES

The intricate nature of street food vending amplifies the risk of microbial contamination, as these environments often lack the controlled conditions found in traditional food establishments. Thus, inadequate hand hygiene, cross-contamination, and improper storage of ingredients are common factors contributing to the heightened risk of microbial contamination in street food[11].

While food can be contaminated at any point in production and distribution, the primary responsibility lies with food handlers, who play a central role in ensuring the sanitary quality of food throughout the production chain[5]. Food handlers can carry pathogens such as HAV, NoV, *Escherichia coli*, *Salmonella*, *Shigella*, *Campylobacter*, and *S. aureus*, eventually transferring these foodborne hazards to consumers[11,21]. The hands of food handlers serve as the most significant vehicle for transferring organisms from feces, nose, and skin to food[22]. Therefore, the frequency of microbial contamination largely depends on the hygiene practices of food handlers, as well as their aseptic methods for handling, preparing, and storing food items[23].

Previous investigations, as exemplified by Souza et al.[24] and Bereda et al.[10], underscore the pivotal significance of acknowledging heightened susceptibility to FBD associated with street food consumption. This susceptibility is attributable to suboptimal hygiene practices among food handlers. As we navigate the intricate terrain of food safety, it becomes increasingly imperative to direct research efforts towards unraveling the complexities of street food hygiene. This undertaking not only enhances our understanding of the perils posed by these gastronomic offerings but also establishes a foundation for targeted interventions and strategies to mitigate potential health risks arising from microbial contamination.

Common deficiencies in food handling practices among street food vendors can frequently be ascribed to the lack of education or training in fundamental food hygiene, including Good Manufacturing Practices and Good Hygiene Practices[4]. Additionally, many street vendors operate in environments deemed unsuitable for food preparation and vending. Due to the necessity of proximity to their target customer base, these vendors often conduct their activities in public spaces characterized by substantial crowds, such as bus terminals, industrial areas, schools, hospitals, and markets[10].

As a result, the preparation or vending locales frequently exhibit suboptimal cleanliness, inadequate illumination, and proximity to potential sources of contamination. The surfaces utilized for food preparation by certain vendors may retain residues from prior food processing, posing a

risk of cross-contamination. Most of these food items remain uncovered, thereby becoming susceptible to exposure to flies and dust, providing an environment conducive to the proliferation of foodborne pathogens[22]. As noted by Noor[23], popular street food items in Bangladesh are often displayed in open spaces, potentially aimed at swiftly capturing consumer attention. Unfortunately, these items are stored improperly and lack appropriate protective packaging.

The risks associated with street-vended food are further compounded by the use of substandard raw materials during preparation, improper handling practices, and inadequate hygiene standards among vendors. In LMIC, street-vended food is frequently prepared in suboptimal environmental conditions, such as in proximity to municipal waste disposal sites, fostering the proliferation of insects and rodents capable of contaminating food[4]. The absence of essential infrastructure at sales locations, including access to running potable water, washing facilities, toilets, and organized waste disposal, poses a significant health risk to consumers by potentially facilitating the transmission of microbial diseases through contaminated food.

Street food contamination is closely linked to improper waste disposal practices, with waste generated during food processing often discarded in close proximity to vending areas. Inadequate provisions for liquid drainage and waste disposal contribute to the indiscriminate dumping of waste onto streets and nearby locations, transforming these areas into habitats for rodents, breeding grounds for flies, and conducive environments for the proliferation of microorganisms[22].

Water assumes a pivotal role as a raw material in the realm of street food vending. Whether employed for drinking, food washing, incorporation as an ingredient, or utilized in the food processing and sanitation of equipment, utensils, and hands, contaminated water poses a substantial risk to public health. Consequently, it serves as a vehicle for enteropathogens such as *E. coli*, *Salmonella* spp., HAV, and NoV, among others. Owing to the scarcity of potable water in numerous regions, a considerable proportion of vendors resort to water reuse, particularly for cleaning used utensils and dishes. This extensively contaminated water stands as a primary source of diarrheal diseases for consumers of street food[22].

In numerous impoverished, LMIC characterized by a low overall educational level, access to running potable water remains unavailable at street food vending points. Hand and utensil washing practices often involve the use of bowls or buckets, frequently without the use of soap. These unhygienic practices serve as evident triggering factors for the onset of diseases resulting from the consumption of contaminated street food[23]. Consequently, the quality of water utilized in

the preparation of street food stands as one of the primary contributing factors to the microbiological risks associated with these food items[13].

The utilization of substandard water by street food vendors has been extensively documented in various studies. For example, an analysis of street food samples in Trinidad and Tobago revealed that 35% of the food items were contaminated with *E. coli*, while 57.5% of the water used by vendors exhibited coliform contamination. Similarly, in Pune, India, an examination of water samples from storage tanks employed by certain vendors indicated that 29.6% of these samples failed to meet WHO drinking water standards, surpassing legally established coliform limits. Moreover, water used for dishwashing by vendors in Ouagadougou, the capital of Burkina Faso, was found to harbor pathogens such as *Salmonella* and *Shigella*[22].

In a study conducted with street vendors in a city in Ethiopia, it was observed that 73% of them prepared some foods on the same surface more than twice. The preparation surfaces exhibited a lack of cleanliness in 83.3% of the surveyed cases, with 39.4% of the vendors claiming to clean the preparation surface before its reuse. A mere 12.9% utilized an apron for cooking or serving food, while 75% handled food with bare hands. Notably, all interviewees handled money while simultaneously serving food. Even in instances where electricity was available, none of the vendors could store food in refrigerators. In summary, 86% of sellers prepared food under unhygienic conditions[10].

A study conducted among street vendors in Uberaba, Brazil, has brought to light numerous deficiencies related to hygienic-sanitary conditions. Noteworthy among these findings is that only 23.3% of the surfaces subjected to analysis met the established cleanliness standards. The contamination level of hands by fecal thermotolerant coliforms and/or coagulase-positive staphylococci (probably *S. aureus*) was deemed unsatisfactory in approximately 47% of food handlers. Furthermore, a significant portion of vendors, specifically 46.7%, handled food without the use of protective coverings on their hands. Concurrently, 53.3% managed both money and food simultaneously, 53.3% utilized finger accessories, and 60% employed cloths during the cleaning process of surfaces intended for the packaging of food for sale[24].

The practice of wearing finger accessories while preparing food is identified as a critical error due to its potential to foster the accumulation of dirt and microorganisms, consequently increasing the risk of hand contamination and subsequent transmission of microorganisms to food. Similarly, the use of cleaning cloths represents a significant source of microorganisms. The

prevailing humidity conditions on these cloths encourage the persistence of high bacterial populations, which can be transferred to hands or surfaces involved in food preparation and packaging, ultimately posing a risk to the safety of the food itself[24].

The identification of *S. aureus* in food serves as an indicator of post-production human contamination, frequently originating from deficient hygiene practices encompassing hands or materials[25]. As an integral component of the normal human microbiota, *S. aureus* inhabits niches such as the skin and nasal passages. Consequently, the contamination of street foods can be directly ascribed to the food handler during processing or vending.

In the course of its proliferation within food matrices, as expounded earlier, *S. aureus* possesses the capability to produce enterotoxins that, upon ingestion, precipitate foodborne intoxication[10]. It is paramount to emphasize that these bacteria exhibit heightened susceptibility to elevated temperatures and sanitizing agents; hence, their presence on hands may denote suboptimal personal hygiene and, consequently, an escalated risk of foodborne contamination[24].

The detection of *E. coli*, *Shigella dysenteriae*, *Klebsiella*, and *Enterobacter* signifies potential fecal contamination. While specific strains of *E. coli* are non-pathogenic, *E. coli* enterohemorrhagic (EHEC) possesses the capacity for toxin production, with serotype O157:H7 being implicated in hemorrhagic colitis, hemolytic-uremic syndrome, and thrombosis purpura thrombocytopenic[25].

The presence of *Salmonella* spp. is linked to inadequate sanitation and suboptimal personal hygiene practices. Despite the traditional association of *Salmonella* Enteritidis with raw eggs, reports underscore the pathogen's resilience on the surfaces of diverse fresh fruits, such as melons, for durations ranging from 7 to 14 days[10].

Certain fungi, including *Aspergillus flavus, Aspergillus niger*, *Penicillium* sp., and *Fusarium* sp., are commonly found in street foods, disseminating through spores and entering foods via dust and soil. The presence of these fungi in food elicits significant concerns owing to their potential to generate mycotoxins[25]. Taniwaki et al[26] reported the presence of aflatoxigenic fungi and aflatoxins throughout the Brazil nut chain. The authors identified elevated levels of aflatoxins in Brazil nut samples sold in street markets in the Amazon, with one unshelled sample containing over 150 µg/kg and one shelled sample with 140 µg/kg. The authors highlighted that these samples were ready for consumption and posed a substantial risk to consumers. This is particularly alarming considering that in 2010, the Codex Alimentarius Commission recommended a maximum level for

total aflatoxins in Brazil nuts for further processing of 15 µg/kg and for ready-to-eat products of 10 µg/kg.

THE SOCIOECONOMIC IMPACT OF STREET FOOD AND WOMEN'S EMPOWERMENT IN DEVELOPING ECONOMIES

Street foods are celebrated in many developing economies for providing numerous business opportunities to small-scale entrepreneurs. With urbanization and changes in consumption habits, including travel, the number of people consuming street food has increased[27]. In LMIC alone, it is estimated that 2.5 billion people eat street food daily. In many sub-Saharan African countries, street food accounts for more than 50% of food intake[28].

According to the National Policy for Urban Street Vendors in India, street vendors make up nearly 2% of the population in cities and towns[4]. In the country, the number of street food stalls is constantly growing, increasing from 920,000 in 2008 to 1.2 million in 2013. This growth is indicative of the rising trend in people choosing to dine outside their homes[29].

A significant portion of the rapidly growing urban population in developing countries remains unabsorbed into the formal job market. Consequently, these individuals have turned to various self-employed income-generating activities, such as selling food on the streets[4].

Globally, the commercialization of street food is considered a multi-million-dollar undertaking, involving numerous businesses that provide a source of employment and support the livelihoods of millions of low-income people in developing countries, contributing significantly to the economy[4,21]. For instance, in Malaysia, there are an estimated 100,000 street food vendors with a total annual sales volume surpassing US$ 2 billion[4]. In South Africa, it is estimated that street food vending employed around 18% of citizens in the sector in 2022[21].

Therefore, street food emerges as a crucial source of income, particularly for women in developing countries who often lack formal education[28,30]. In most cases, these female entrepreneurs, often single or widows with dependent children, work in this sector to support their families due to limited opportunities in the formal sector[21]. Studies conducted in African countries have shown that women constitute the primary workforce among street food vendors[31]. For example, 53% and 75% of street food vendors in Senegal and Burkina Faso, respectively, are women[4]. Furthermore, the educational levels of these street vendors in African countries are generally low, with more than 20% of them being illiterate[31].

A study on street food consumption by Haitian schoolchildren found that the majority consumed street food daily, providing them with an estimated 400 Kcals per day. In fact, the Food and Agriculture Organization (FAO) and World Health Organization (WHO) have highlighted that the greatest benefit of street foods is their ability to meet per capita calorie and protein requirements at an inexpensive cost (approximately one dollar)[30].

Despite the significant socio-economic role played by food street vendors, these individuals are frequently overlooked by governmental institutions in LMIC. Rather than formalizing their activities, successive municipal administrations subject them to persecution, resulting in frequent incidents of looting and arrests by police authorities. Failure to legalize their operations reflects a disregard for the underlying structural issues within the local economy, perpetuating a cycle of prolonged informalization as vendors strive to carve out their livelihoods[21].

CONCLUSION

Street food, a global culinary phenomenon, represents a rich tapestry of cultural diversity, captivating taste buds while offering a gateway to authentic regional experiences. However, the allure of street food must be balanced against the backdrop of pressing public health concerns, particularly in LMIC, where inadequate infrastructure and hygiene practices amplify the risk of FBD. Despite its gastronomic and economic significance, the street food sector grapples with challenges that intersect health, economic, and social realms.

Microbial foodborne diseases continue to pose a significant burden, particularly in LMIC, where over 90% of FBD cases occur. The prevalence of FBD underscores the urgent need for improved food safety practices, with street food serving as a focal point for intervention. Studies underscore the pivotal role of street food vendors in FBD transmission, highlighting deficiencies in hygiene practices, inadequate sanitation, and the use of substandard raw materials. Understanding the complex interplay between microbial risks and societal impacts is paramount to designing targeted interventions that safeguard public health while preserving the vibrancy of street food culture.

Beyond health considerations, street food emerges as a vital economic lifeline for millions of individuals, particularly women, in LMIC. Street food vending offers employment opportunities and sustains livelihoods, contributing significantly to local economies. However, the informal

nature of street vending often leaves vendors vulnerable to persecution and marginalization by governmental institutions. Formalizing the street food sector through legalization and providing access to training and resources is crucial for empowering vendors and fostering sustainable economic growth.

In conclusion, addressing the multifaceted challenges posed by street food necessitates a holistic approach that integrates health, economic, and social perspectives. Strengthening food safety regulations, promoting hygiene education, and formalizing the street food sector are essential steps towards fostering a safer, more inclusive, and economically vibrant street food environment. By bridging health, economic, and social realities, we can harness the potential of street food as a driver of cultural exchange, economic empowerment, and public health resilience in communities worldwide.

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