White Paper

You Are What You Eat: Bangladesh Food and Health Report 2025

future startup
Khaas Food

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About Khaas Food Limited

Khaas Food is Dhaka-based innovative agri-tech startup working toward a Bangladesh where safe agro food is the standard, not the exception. The company aims to build a world where every individual has access to responsibly sourced, safe and nutritious products at its originality that support their health and the health of the environment.

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Executive Summary

The connection between food and human health, recognized across ancient civilizations and religious traditions, is increasingly underscored by modern science. In Bangladesh, where food is central to cultural identity, this connection is particularly vital.

While Bangladesh has achieved significant food security, it faces a dual challenge: a rising burden of diet-related non-communicable diseases (NCDs) driven by changing dietary patterns, and pervasive food safety issues, including widespread food adulteration and unhygienic practices. These challenges inevitably compromise public health, leading to an estimated 2% loss in GDP from foodborne illnesses [1], and hinder economic growth and export potential.

Despite these hurdles, Bangladesh's food market is experiencing excellent growth, valued at $9 billion in 2022 [2], with the food processing sector alone contributing $8 billion and growing at 8% annually.[2]

Rapid urbanization, increasing disposable incomes, and a large youth population are fueling an accelerating demand for convenient, high-value, and, importantly, safe food products. This demand is particularly evident in the expanding modern retail, a consistent rise of safe food brands, and foodservice sectors.[3]

Consumers are increasingly aware of food safety issues and demonstrate a willingness to pay a premium for safe products, especially among higher-income and educated demographics.[5]

The landscape of food safety in Bangladesh is complex, marked by fragmented regulatory bodies, bureaucratic complexities, and insufficient enforcement, despite a robust legal framework like the Food Safety Act of 2013.[7] Supply chain vulnerabilities, including substantial post-harvest losses and inadequate cold chain infrastructure, further exacerbate these challenges.[8]

A new wave of safe food brands and agritech startups are taking on this challenge to meet the demand for trust and quality [9], while international and local development partners are actively engaged in strengthening regulatory frameworks and promoting sustainable practices.[12]

The future of safe food in Bangladesh requires a multi-pronged approach. This includes streamlining fragmented regulatory frameworks, investing in cold chain and traceability technologies, building robust public-private partnerships, and empowering farmers through comprehensive training.

Addressing these critical areas will help

mitigate public health risks, improve nutritional outcomes, and unlock significant economic potential, ensuring safe, nutritious, and affordable food for all.

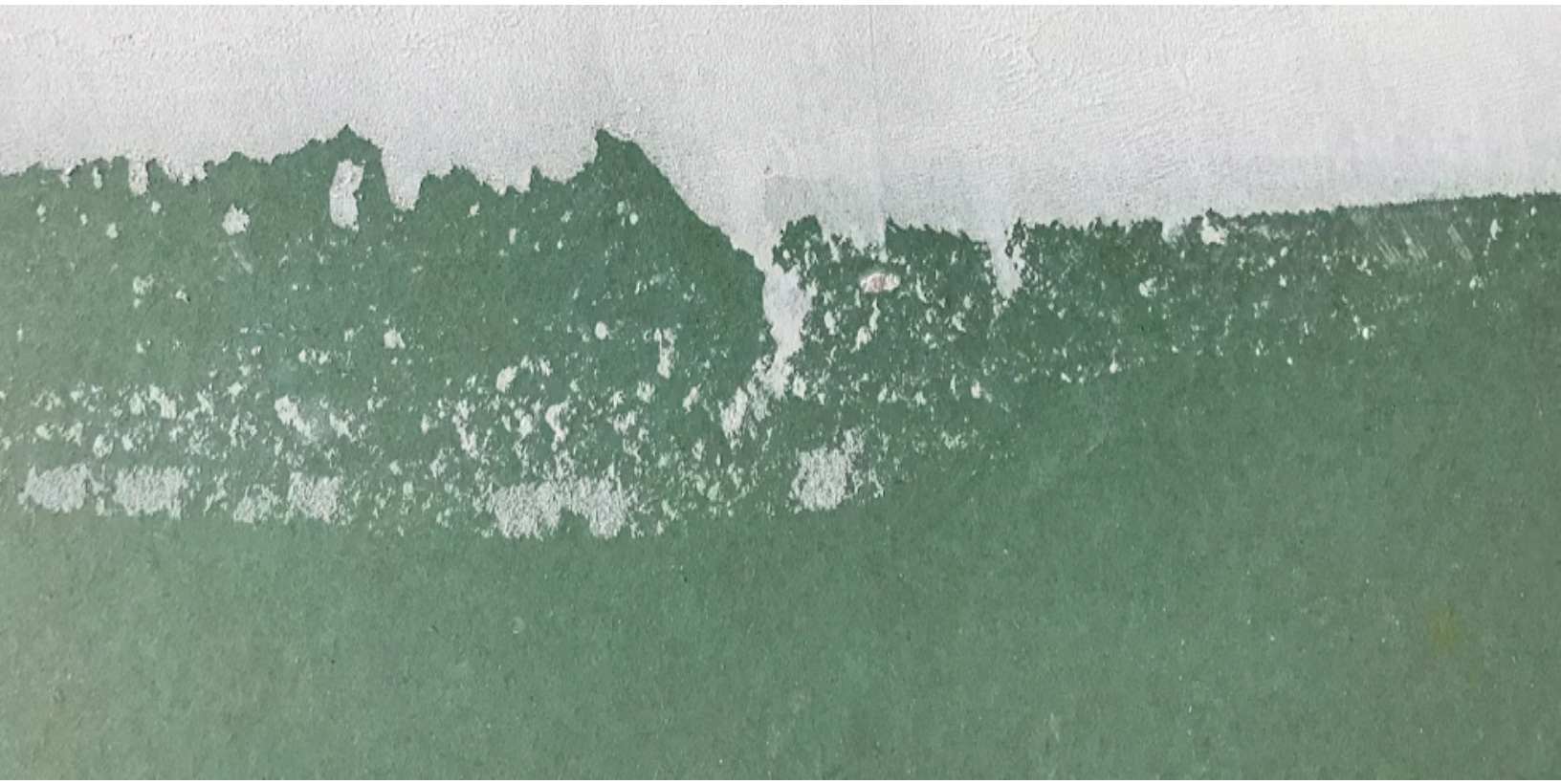
This whitepaper explores the intricate relationship between food, dietary habits, and health outcomes in Bangladesh. It aims to provide a comprehensive understanding of why food remains central to good health and why it demands greater public and policy focus addressing key challenges such as rising food safety concerns, the increasing demand for safe and natural food, and the emergence of a safe food industry. By analyzing current obstacles and highlighting opportunities, the paper aims to provide a strategic roadmap for stakeholders working toward a healthier food environment for all Bangladeshis.

The report is structured in two parts. Part One—the Foundational Role of Food in Health—delves into food's critical impact on health and examines how escalating food safety issues pose a collective public health threat requiring urgent action.

Part Two—the State of Safe Food in Bangladesh—Market Dynamics, Key Trends, and Future Pathways—goes deeper into the food safety challenges in Bangladesh, investigates the growth of the safe food sector, pioneered by emerging brands catering to health-conscious consumers, and proposes actionable recommendations to strengthen food safety standards nationwide.

Ultimately, this report underscores the need for greater attention to what we eat, how food shapes our health, the mounting challenges of food safety in Bangladesh, the rise of the safe food industry, and the necessary shifts in policy thinking to ensure safer food for all.

Part I: The Foundational Role of Food in Health



Credit: Photo by Josep Martins

1.1. Historical and Cultural Significance of Food and Health

The understanding that food plays a critical role in good health stretches back thousands of years across diverse cultures and ancient medical practices.

From the earliest recorded medicinal texts of ancient Egypt, such as the Ebers Papyrus, which prescribed specific foods like goose fat for pain relief and liver for night blindness, to the emergence of ayurvedic medicine in India where food was considered a critical component of well-being, the connection between food and good health has long been recognized.[21]

In ancient Greece, around 400 B.C., the physician Hippocrates, often hailed as the father of Western medicine, articulated this relationship with the saying, "Let thy food be thy medicine and thy medicine be thy food".[1] Hippocrates recognized that food has a direct impact on a person's health, affecting both the body and the mind.[1]

Traditional Chinese Medicine, dating back to the 3rd century B.C., further solidified this understanding. The first Chinese medical book, Huang Di Nei Jing (The Yellow Emperor's Book of Medicine), listed specific grains, fruits, animals, and vegetables for optimal health, representing the world's first known dietary guidelines.[21]

The consistency of this fundamental idea across ancient Egyptian, Indian, Chinese, and Greek civilizations indicates a long-held human comprehension of the direct link between dietary intake and physical condition, predating modern scientific understanding by millennia.[21]

1.1.1. Food in Religion

In Islamic tradition, food holds a paramount position, extending beyond its role as mere sustenance for the human body. It is regarded as a profound blessing (Ni'mah) and a vital provision (Rizq) bestowed by Allah, the Almighty.[21] This understanding instills a deep sense of responsibility and gratitude in Muslims towards the food they consume.

The Holy Quran frequently emphasizes the importance of consuming food that is lawful

(Halal) and wholesome (Tayyib).[22] This dual requirement signifies that in Islamic tradition, food should be permissible according to religious law and simultaneously be of good quality, nutritious, and safe for consumption.[23]

The primary purpose of eating in Islam is to provide the body with the necessary strength and energy to fulfill religious obligations (Ibadah) and maintain good health, which is considered an Amanah (trust).[22] This perspective elevates the act of eating to one with spiritual significance.

The teachings and recommendations of Prophet Muhammad (PBUH) offer further guidance on food and eating. The Prophet (PBUH) consistently emphasized moderation in all aspects of life, including dietary habits, as exemplified by the well-known Hadith that advises filling one-third of the stomach with food, one-third with drink, and leaving one-third for air.[7]

Maintaining rigorous hygiene standards before and after meals was a consistent practice of the Prophet (PBUH), with numerous narrations highlighting the importance of thoroughly washing hands.[25] Furthermore, the Prophet (PBUH) diligently taught the practice of mentioning the name of Allah (Bismillah) before starting a meal and expressing praise to Him (Alhamdulillah) upon its completion.[21] Wastefulness of food was strongly discouraged by the Prophet (PBUH), with practices such as licking one's fingers after eating and picking up fallen morsels.[21]

Additionally, the Prophet (PBUH) recommended certain foods that are now widely recognized for their significant health benefits, such as dates, honey, milk, and olives.[7] This indicates an early and profound understanding of the intricate link between diet and overall health.

Beyond Islamic tradition, other major religions also offer profound perspectives on the relationship between food, health, and spiritual well-being.

Hinduism: The Hindu faith emphasizes living in harmony with nature and showing compassion and respect for all of God's creations, which strongly encourages vegetarianism based on the concept of *ahimsa* (non-violence).[26] While not all Hindus are strict vegetarians, beef and pork are prohibited.[26] Food is believed to affect both the body and mind, and a proper diet is considered vital for spiritual development.[26]

Hindu dietary codes categorize food into three types based on their effect on the body and temperament: *Tamasic* (impure, producing negative emotions), *Rajasic* (producing strong emotions and restlessness, including meat, eggs, fish, and pungent spices), and *Sattvic* (non-irritating, purifying, including fruits, nuts, whole grains, and vegetables).[26]

Purity of food is seen as necessary for enlightenment, and food is consumed not just for survival but to maintain mind/body equilibrium.[26] Customs include offering food to God before consumption (*prasada*) and reciting prayers of thanks.[26] Moderation

is also emphasized, with teachings to "eat in moderation, when you feel hungry, foods that are agreeable to your body".[27]

Buddhism: While there are no universally strict dietary laws in Buddhism, practices vary significantly across traditions.[28] All schools, however, incorporate rituals involving food, emphasizing receiving and eating food with gratitude and reverence, and discouraging greed.[28]

Many Buddhists follow a lacto-vegetarian diet, consuming dairy but avoiding eggs, poultry, fish, and meat, though some may consume meat if the animal was not specifically slaughtered for them.[29]

Certain traditions also advise against "five pungent spices" (onions, garlic, scallions, chives, and leeks).[28] Fasting is a common practice, often observed from noon until dawn the following day, as a means of self-control and freeing the mind.[28]

Judaism: Jewish dietary laws, known as *kashrut* (Kosher), are extensive and derived from biblical principles.[30] These laws prohibit the consumption of certain animals, such as pork and shellfish.[30]

Permitted land animals must have cloven hooves and chew their cud (e.g., cows, sheep, goats), while permitted fowl include specific domestic species like chicken and turkey.[30] Fish must have both fins and scales to be considered kosher.[30]

A fundamental rule is the prohibition of mixing meat and dairy products, requiring separate utensils and preparation areas.[30] All blood must be drained from meat and poultry before consumption, and fruits and vegetables are permitted but must be inspected for insects.[30] Milk and eggs are only kosher if they come from kosher animals

Table 1: food, faith, and well-being across different religions

Religion	Purpose of Eating	Dietary Laws/Prohibitions	Practices & Recommendations
Islam	Food is a profound blessing (Ni'mah) and vital provision (Rizq) from Allah. It instills a deep sense of responsibility and gratitude. The primary purpose is to provide strength and energy for religious obligations (Ibadah) and maintain good health (Amanah), elevating eating to spiritual significance.	Food must be lawful (Halal) and wholesome (Tayyib), meaning permissible by religious law and also of good quality, nutritious, and safe.	Prophet Muhammad (PBUH) emphasized moderation in eating. Rigorous hygiene was a consistent practice. Mentioning Bismillah before eating and Alhamdulillah upon completion is taught. Wastefulness is discouraged. Prophet Muhammad (PBUH) recommended foods like dates, honey, milk, and olives for health benefits.
Hinduism	Emphasizes living in harmony with nature and showing compassion and respect for all of God's creations. Food is believed to affect both the body and mind. A proper diet is considered vital for spiritual development. Purity of food is necessary for enlightenment, and food is consumed to maintain mind/body equilibrium.	Encourages vegetarianism based on ahimsa (non-violence). Beef and pork are prohibited. Food is categorized into three types: Tamasic (impure, producing negative emotions), Rajasic (producing strong emotions and restlessness, including meat, eggs, fish, pungent spices), and Sattvic (non-irritating, purifying).	Customs include offering food to God before consumption (prasada) and reciting prayers of thanks. Moderation is emphasized, with teachings to "eat in moderation, when you feel hungry, foods that are agreeable to your body". Sattvic foods like fruits, nuts, whole grains, and vegetables are considered purifying.

Judaism	Jewish dietary laws, known as kashrut (Kosher), are extensive and derived from biblical principles.	Prohibits the consumption of certain animals, such as pork and shellfish. Permitted land animals must have cloven hooves and chew their cud (e.g., cows, sheep, goats). Permitted fowl include specific domestic species like chicken and turkey. Fish must have both fins and scales to be considered kosher. A fundamental rule is the prohibition of mixing meat and dairy products, requiring separate utensils and preparation areas. Milk and eggs are only kosher if they come from kosher animals.	Specific preparation rules include the draining of blood from meat and poultry. Inspection of fruits and vegetables for insects is required.

1.2. Modern Scientific Perspectives on Food and Health

Modern science today finds that there is a critical link between what we eat and our health. In their fascinating book *Good Energy: The Surprising Connection Between Metabolism and Limitless Health*,

The book details how food choices impact insulin sensitivity and glucose management, emphasizing food quality and nutrient density rather than simple calorie counting and how specific foods can either support or hinder metabolic pathways regardless of caloric content. These perspectives highlight a holistic approach where food is not merely sustenance but a fundamental element of overall good health and life.[24]

The scope of nutritional science has broadened considerably to address the growing prevalence of complex chronic diseases, recognizing that these conditions are often influenced by a multitude of dietary and lifestyle factors.[11]

Furthermore, the gut microbiome, the complex community of microorganisms residing in our digestive system, is now recognized as an important factor in human health.[21]

Casey Means MD and Calley Means argue that minimally processed whole foods are the foundation for metabolic health and identified processed foods as disruptors of healthy metabolic function.

Research has demonstrated that the composition and activity of this microbial community are significantly influenced by our dietary choices, and that the gut microbiome is intricately linked to various health conditions, including obesity, type 2 diabetes, and cardiovascular disease.[21]

This growing understanding of the gut microbiome's crucial role in health opens up exciting new avenues for dietary interventions specifically aimed at improving overall well-being and preventing the onset of chronic diseases.[21]

Scientific investigations have shown that the food we consume directly alters the types and populations of bacteria in our gut, and that the overall health and balance of the microbiome have significant implications for a wide range of bodily functions and disease risks.[2]

1.3. The Bangladeshi Context: Culture, Diet, and Emerging Health Challenges

Bangladesh, a country rich in culture and heritage, places food at the center of its social fabric, where it extends beyond mere sustenance to an important component of cultural celebrations, communal gatherings, and the forging of strong social bonds.[21]

The deep-rooted significance of food is perhaps best captured in the popular saying "Machh-e-Bhat-e-Bangali," which translates to "Fish and rice make a Bengali," underscoring the importance of these two food items in the national identity and daily diet.[21]

While Bangladesh has made significant strides in achieving food security and attaining self-sufficiency in the production of staple crops, the country continues to grapple with substantial and multifaceted challenges at the intersection of food and health. These include concerns related to food safety, the widespread prevalence of adulteration, and the persistent problem of malnutrition.

aimed at building healthier dietary habits or improving food safety practices must be approached with cultural sensitivity, carefully considering established traditions and deeply ingrained preferences.

The critical role of food in human health has gained renewed attention in medical and public health discourses in recent years. In Bangladesh, where traditional dietary wisdom has long emphasized balance and moderation, emerging scientific evidence confirms what generations have intuited: food is medicine.

The traditional Bengali diet, rich in

The Bangladeshi food system has been shaped by the country's distinctive geography, characterized by its numerous rivers and a tropical monsoon climate, conditions that have historically favored the abundant production of rice and fish.[32]

Over time, the country's culinary landscape has evolved into a rich tapestry of flavors, influenced by historical interactions with Mughal, Persian, Turkish, and Arabic culinary traditions, which have been integrated with regional variations that reflect the diverse array of local ingredients and customs found across the country.[32]

Furthermore, the increasing prevalence of non-communicable diseases (NCDs) is emerging as a growing public health concern, with evolving dietary patterns and the rising consumption of unhealthy, processed foods playing a significant role in this trend.[25]

The profound cultural importance of food in Bangladesh suggests that any interventions

freshwater fish, vegetables, and pulses, has historically provided a nutritionally balanced foundation for good health. However, rapid urbanization and globalization have precipitated significant dietary shifts. The urban Bangladeshi diet increasingly incorporates processed foods high in refined carbohydrates, unhealthy fats, and added sugars, nutrients strongly associated with metabolic disorders and NCDs.

As the country of 171 million continues its remarkable economic transformation, the relationship between food consumption patterns and health outcomes has emerged as a critical concern for policymakers, healthcare professionals, and citizens alike.

Amid these concerning trends, a countervailing movement emphasizing food as the foundation of health has begun to emerge. Healthcare providers increasingly prescribe dietary modifications as first-line interventions for managing chronic conditions.

1.4. The Evolving Science of Diet and Nutrition: Why Safe and Right Food Matters

Food safety and nutritional adequacy represent twin imperatives for public health. Unsafe food, contaminated with microbial pathogens, chemical residues, or adulterants, poses immediate and long-term health risks. Meanwhile, nutritionally inadequate diets contribute to both undernutrition and diet-related non-communicable diseases (NCDs).

Beyond acute illness, chronic exposure to food contaminants, such as heavy metals in certain fish species and mycotoxins in improperly stored grains, may contribute to long-term health consequences including cancer, kidney damage, and neurodevelopmental disorders. Nutritionally, the right food choices are essential for addressing complex malnutrition challenges.

The fast food culture has been growing rapidly in Bangladesh, especially among the younger generation, influenced by urbanization, exposure to Western media, and a rise in dual-income households.[1] [2]A study among urban college-going adolescents in Bangladesh found a high prevalence of fast food consumption: 68.1% reported consuming fast food, with 64% doing so frequently.

A healthy diet is critical for overall health, supporting well-being, optimal growth and development, and providing crucial protection against all forms of malnutrition, as well as NCDs.[5] Conversely, dietary patterns characterized by high intakes of salt, free sugars, and unhealthy fats are now recognized as a primary risk factor contributing to the global burden of disease.[33]

Modern nutritional science, while a relatively young field of study, has achieved remarkable progress in showing the intricate connections between dietary intake and the development of chronic diseases.[13] Contemporary research increasingly underscores the importance of consuming whole, unprocessed foods and adopting overall healthy dietary patterns, rather than focusing solely on the intake of isolated individual nutrients.[17]

Safe and nutritious food provides the essential "information" and raw materials that our bodies require to function optimally.[22] In essence, food acts as a form of medicine, playing a crucial role in maintaining our health, preventing the development of disease, and even aiding in the treatment of existing conditions.[22] Dietary patterns that are rich in whole

[1] https://prdatta.com/blog_details&id=105

[2] https://www.sciencedirect.com/science/article/abs/pii/S2451847619300818

grains, vegetables and fruits, legumes, and nuts, while being low in salt, added free sugars, and unhealthy fats, offer substantial and well-documented health benefits.[33]

Moreover, nutrient-dense foods, such as those rich in omega-3 fatty acids found in fish, antioxidants present in fruits and vegetables, and complex carbohydrates found in whole grains, have been shown to support optimal brain health and potentially reduce the risk of developing depression, anxiety, and cognitive decline.[20] Notably, dietary patterns that are rich in a diverse range of plant-based foods are consistently associated with increased longevity and a lower overall risk of premature death.[20]

The science of diet and nutrition is a constantly evolving field, with its primary focus having shifted over time from addressing and preventing nutritional deficiency diseases to a more comprehensive understanding of the intricate role that diet plays in the prevention of chronic diseases and the promotion of overall health and wellness.[11]

1.5. The Politics of Food and Agriculture: Systemic Shifts

Bangladesh's food system has undergone profound transformations over the last few decades. From chronic food insecurity and famine vulnerability in the 1970s, the
The adoption of high-yielding varieties, expansion of irrigation infrastructure, and government policies supporting agricultural intensification have contributed to a threefold increase in rice production over five decades. This agricultural revolution has fundamentally altered Bangladesh's food security landscape, reducing hunger and improving dietary energy availability for millions.

However, these productivity gains have

Simultaneously, Bangladesh's food distribution and retail landscape has undergone dramatic restructuring. Traditional wet markets, which historically served as the primary food sourcing channels, now compete with supermarkets, convenience stores, and e-commerce platforms.

The organized food retail sector has grown at an annual rate of 15% since 2020, fundamentally altering how Bangladeshis access food.

country has achieved remarkable progress toward self-sufficiency in staple crop production, particularly rice.

entailed significant environmental and health trade-offs. The intensification of agriculture has led to increased utilization of chemical inputs, with pesticide use rising by 175% between 2000 and 2024.

Studies by the Bangladesh Agricultural Research Council have detected pesticide residues exceeding maximum limits in 32% of vegetable samples from major urban markets, raising serious food safety concerns.

These systemic changes reflect broader political and economic forces. Agricultural policies have prioritized caloric sufficiency over dietary diversity and nutritional adequacy.

Food safety regulation has struggled to keep pace with the rapidly evolving food environment, and economic liberalization has facilitated the entry of multinational food corporations, bringing both new options and new health challenges for Bangladeshi consumers.

1.6. The Rise of Safe and Natural Food Across Markets

In this overall context of intricate connection between food and health, global markets have witnessed a significant shift toward safer, more natural food options,

The global organic food market size was projected at $228.38 billion[3] in 2024 and is expected to reach $660.25 billion by 2034, expanding at a CAGR of 11.20% from 2025 to 2034. Similar growth trajectories have been observed for clean label products, regeneratively grown foods, and minimally processed alternatives to ultra-processed options.

In Bangladesh, the market for certified safe and natural foods remains relatively nascent but is expanding rapidly. According to 6Wresearch, the Bangladesh organic food market was valued at $143 million in 2025 and is projected to reach $225 million by 2031, with a compound annual growth rate (CAGR) of 9% for that period.

Several factors have contributed to this growth:

- Rising middle-class
- Increasing health consciousness

driven by increasing consumer awareness, regulatory pressures, and sustainability concerns. This trend has gradually permeated Bangladesh's food landscape, albeit with distinctive local characteristics.

- Growing awareness of linkages between pesticide exposure and health risks
- Growing availability of alternative safe food brands
- Expanding retail channels dedicated to safe food options
- Internet influence amplifying food safety concerns

Leading supermarket chains like Shwapno, Agora, and Meena Bazar have established dedicated sections for organic, pesticide-free, and naturally grown produce, reporting 30-40% annual sales growth in these categories.

3 https://www.globenewswire.com/news-release/2025/04/17/3063594/0/en/Organic-Food-Market-Size-to-Attain-USD-660-25-Billion-by-2034.html

Table: Bangladesh Food Market Snapshot

Bangladesh Organic Food Market

$143M

2025 Market Size
Projected: $225M by 2031
CAGR: 9.0%

Global Organic Market

$228.38B

2024 Market Size
Projected: $660.25B by 2034
CAGR: 11.20%

Part II: The State of Safe Food in Bangladesh: Market Dynamics and Future

Credit: Photo by Nik

2.1. The Imperative of Safe Food in Bangladesh

Food safety in Bangladesh transcends a mere public health concern, evolving into a critical economic and developmental issue that influences national progress, international trade, and consumer confidence. The intricate and interconnected nature of modern food supply chains amplifies the challenges inherent in ensuring food integrity, thereby elevating food safety testing to a crucial industry component. This heightened importance is driven by a growing global awareness of foodborne risks and increasingly stringent regulatory demands.[21]

Bangladesh confronts severe food safety issues rooted in widespread food adulteration, poor hygiene practices, and limited resources for effective monitoring.[21] These challenges are further compounded by the nation's hot and humid climate, which provides an ideal environment for rapid microbial growth in perishable food items.[21]

The persistent nature of these challenges, despite increasing public awareness and regulatory efforts, indicates deeply entrenched systemic issues that necessitate comprehensive, multi-faceted interventions rather than superficial adjustments.

This economic impact underscores that food safety is not merely a health imperative but a fundamental pillar of national economic stability and public welfare.

The economic repercussions are substantial, with foodborne illnesses alone accounting for an estimated 2% loss in Bangladesh's Gross Domestic Product (GDP).[1]

Foodborne illnesses affect an estimated 26 million individuals annually in Bangladesh [1], with economic losses for Dhaka city alone reaching a staggering US$1.65 billion annually for just six of the most common foodborne illnesses.[34]

Key Insights:

- **Foodborne illnesses** represent the largest economic burden at $3.5 billion annually, equivalent to 2% of Bangladesh's GDP
- **Supply chain vulnerabilities** and post-harvest losses cost an additional $2.4 billion per year
- **Dhaka city alone** accounts for $1.65 billion in losses from just six common foodborne illnesses, highlighting urban concentration of impacts
- These figures demonstrate the critical need for comprehensive food safety reforms and supply chain improvements

2.2. Current Landscape of Food Safety Challenges

Bangladesh's food safety landscape is characterized by a confluence of deeply rooted issues spanning adulteration, unhygienic practices, regulatory deficiencies, and supply chain vulnerabilities, all exacerbated by environmental factors.

Critical Findings:

Food Safety Crisis:

- 70%+ of common foods are adulterated
- 52% of food samples contaminated (BFSA 2019)
- 32% of vegetables exceed pesticide limits
- Pesticide use 70% above world average

Health Consequences:

- 26-30 million affected by foodborne illness
- 28% adults overweight/obese
- 18-22% adults with hypertension
- 12% with diabetes/pre-diabetes

Data Sources: BFSA studies, national health surveys, WHO reports, and food safety research
Multiple estimates provided where different studies show varying results

2.2.1. Prevalence of Adulteration and Contaminants

Food adulteration is widely perceived as an epidemic in Bangladesh.[1] Public surveys indicate that most participants estimate 70% or more of common food items, including fish, milk, and vegetables, are

The substances used for adulteration are diverse and highly hazardous, encompassing bacterial pathogens, agrochemical residues such as pesticides and antibiotics, and toxic food preservatives like formalin and carbide.[21] Disturbingly, industrial pigments and textile dyes are also employed.[32] Analysis has shown that the levels of toxic substances in some samples can be up to 20 times higher than the maximum limits set by the European Union.[32]

One particularly alarming example of food adulteration in Bangladesh is the prevalent use of formalin in fish. Formalin, a known human carcinogen, is frequently added to or sprayed on fish as a preservative to prevent spoilage and maintain a deceptively fresh appearance during the often lengthy transportation and storage processes involved in getting the product to market.[21]

Studies have consistently reported high rates of formalin contamination in popular fish varieties, such as Rui, with some investigations indicating that a significant percentage of the tested samples contain

The pervasive nature of adulteration is

subject to adulteration.[32] A 2019 study conducted by the Bangladesh Food Safety Authority (BFSA) revealed that 52% of food samples collected nationwide were contaminated.[1]

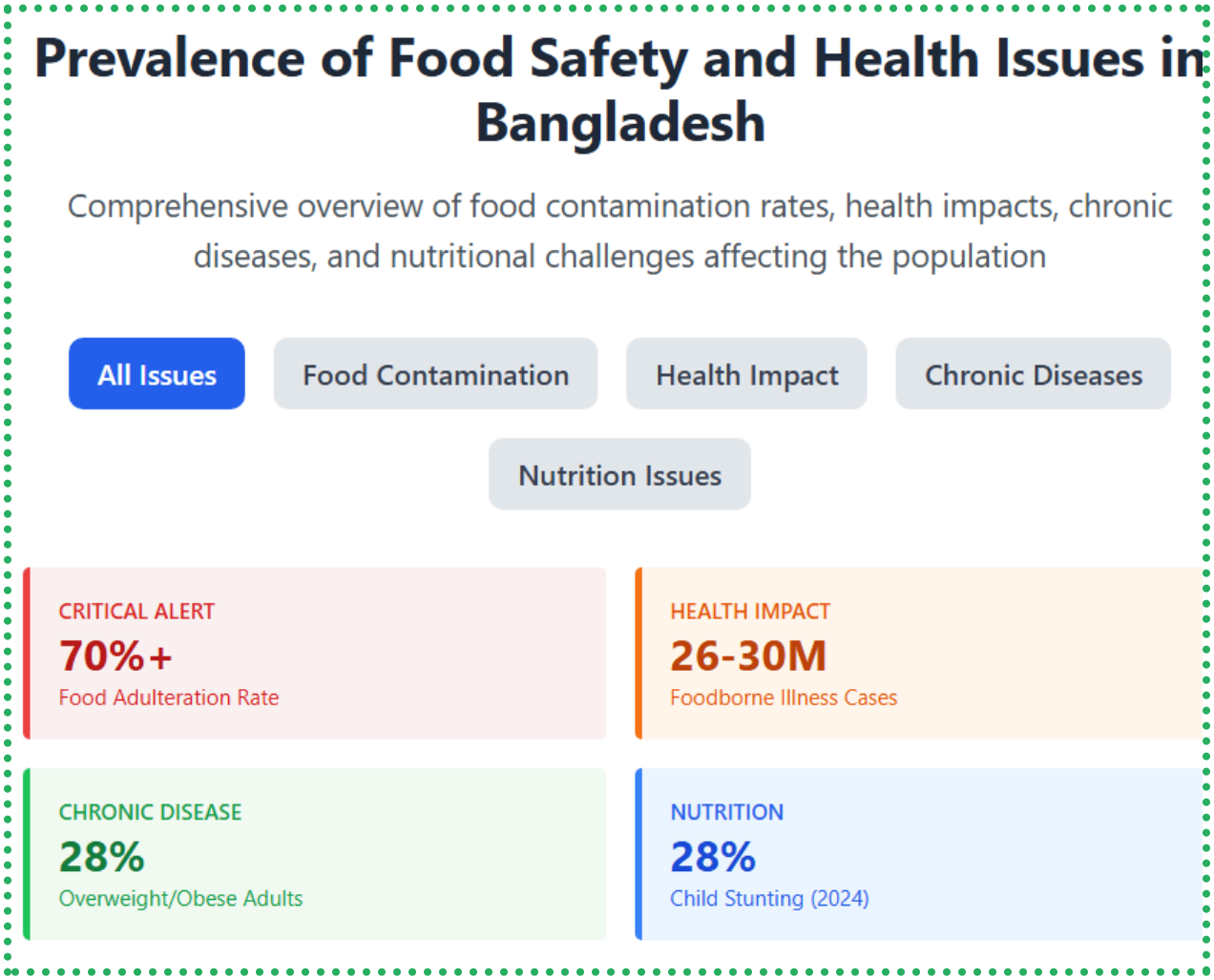
this extremely hazardous chemical.[32]

Another deeply concerning practice is the artificial ripening of fruits, including mangoes, bananas, and pineapples, through the use of calcium carbide. While calcium carbide does release acetylene gas, which can accelerate the ripening process, it is also known to contain dangerous contaminants such as arsenic and phosphine, both of which pose serious and well-documented health risks to consumers who unknowingly ingest them.[32]

Beyond these widely reported examples, a multitude of other adulterants have been identified in various Bangladeshi food products. These include the use of textile dyes to artificially enhance the color and visual appeal of sweetmeats, the addition of brick dust to spices to deceptively increase their volume and weight, the mixing of urea with rice and puffed rice to improve their whiteness and perceived quality, and even the use of burnt engine oil in the preparation of popular fried snacks sold by street vendors.[32]

primarily driven by strong economic incentives and a perceived lack of effective

deterrence. The financial gains from practices such as diluting milk, adding starch to spices, or incorporating toxic substances to increase bulk, reduce cost, or enhance perceived quality often outweigh the risks of detection and punishment.[21] This situation has created a deeply ingrained "adulterated-food culture" [1] that systematically erodes consumer trust and contributes to severe long-term public health consequences, including a rise in cases of cancer, diabetes, paralysis, heart attack, kidney failure, and other organ damage.[1]



2.2.2. Systemic Issues and Practices

Beyond intentional adulteration, several systemic issues contribute to the precarious state of food safety. A significant challenge is the widespread lack of public awareness regarding food safety risks and the prevalence of unhygienic practices in food handling and preparation.[21]

While approximately 60% of food handlers possess good knowledge about food safety, only about a quarter consistently demonstrate good attitudes and practices.[22] This disparity between knowledge and practice suggests that education alone is insufficient; it points to underlying economic pressures, limited access to proper facilities (such as clean water and adequate cold storage), and inadequate enforcement as critical barriers to adopting safe practices.

Another critical concern is the excessive use of agrochemicals. Vegetable cultivators in Bangladesh, for instance, apply an average of 3.4 kg of pesticides per hectare per growing season, a rate nearly double the world average of 2.0 kg/ha.[22] This poses significant health and environmental risks, not only for those in direct contact with these chemicals but also for consumers through dietary exposure.

Farmers often fail to observe the necessary waiting periods after chemical application, leading to harmful pesticide residues and heavy metals contaminating food supplies.[21]

Additionally, the current agriculture landscape puts farmers in a credit trap by the corporations, making it difficult for them to switch to natural farming despite the fact that many of them want to. The end to end agri-supply chain is not natural farming friendly. Issues like syndicate, lack of availability of logistics support further complicate the challenge.

2.2.3. Regulatory and Enforcement Gaps

Despite legislative efforts, the regulatory and enforcement landscape for food safety in Bangladesh remains fragmented and inefficient. The country operates under a multiplicity of laws with a notable lack of coordination among various regulatory authorities.[21] This overlapping jurisdiction and unclear mandates create confusion among manufacturers, processors, small businesses, and the very authorities tasked with oversight.[21]

The Bangladesh Food Safety Authority (BFSA), established under the Food Safety Act of 2013 [7], serves as the apex body responsible for coordination, regulation, standard development, and enforcement.[25]

However, the existence of this legal and institutional framework alongside persistent challenges indicates that while the framework is in place, its operational effectiveness is severely hampered by fragmentation and enforcement deficits.[21] This leads to inconsistent oversight and a lack of accountability, perpetuating unsafe practices.

Bureaucratic complexities, inadequate infrastructure, and a shortage of skilled human resources further impede effective food safety monitoring.[21] Penalties for food adulteration offenses are often insufficient to deter widespread malpractices.[21]

Furthermore, the enforcement powers of appointed food safety inspectors are limited, frequently requiring the involvement of executive magistrates who are often preoccupied with other duties, leading to inconsistent and ineffective oversight.[2]

2.2.4. Supply Chain Vulnerabilities

The food supply chain in Bangladesh is plagued by significant vulnerabilities, particularly concerning post-harvest management and cold chain infrastructure. A substantial portion, estimated between 20% and 45%, of fresh fruits, vegetables, dairy, meat, and fish spoils before reaching consumers.[8] This translates to an estimated annual economic loss of $2.4 billion for the country.[8]

While Bangladesh possesses approximately 2.7 million metric tons of cold storage capacity across over 300 sites, this capacity is insufficient to meet demand, especially in rural areas.[12] Consequently, most perishable foods are handled through traditional wet markets with minimal or no mechanical refrigeration support.[12] The problem extends beyond a mere lack of refrigeration units; it encompasses the absence of proper

infrastructure at or near the farms, a scarcity of temperature-controlled trucks for safe transport, and a lack of real-time monitoring using modern digital technologies.[8] This highlights that improving supply chain efficiency is intrinsically linked to enhancing food safety and economic prosperity.

The severe post-harvest losses and inadequate cold chain infrastructure represent a *dual challenge*: they directly contribute to food insecurity and unsafe food by increasing spoilage, and they also constitute a substantial economic drain.

Additionally, significant gaps exist in food supply chain traceability systems, from farm to distribution, due to limited technology adoption and a lack of transparency.[21] This absence of robust traceability hinders public health efforts, compromises supply chain efficiency, and limits export opportunities.[37]

The reliance on numerous intermediaries in the supply chain can further lead to inefficiencies and a lack of control over product quality.[38]

Economic Impacts of Food Safety Issues in Bangladesh

Annual economic losses from food safety challenges demonstrate the significant financial burden on Bangladesh's economy, highlighting the urgent need for improved food safety systems.

FOODBORNE ILLNESSES
$3.5B
2% of GDP annually

SUPPLY CHAIN LOSSES
$2.4B
Post-harvest vulnerabilities

DHAKA CITY ONLY
$1.65B
Six common illnesses

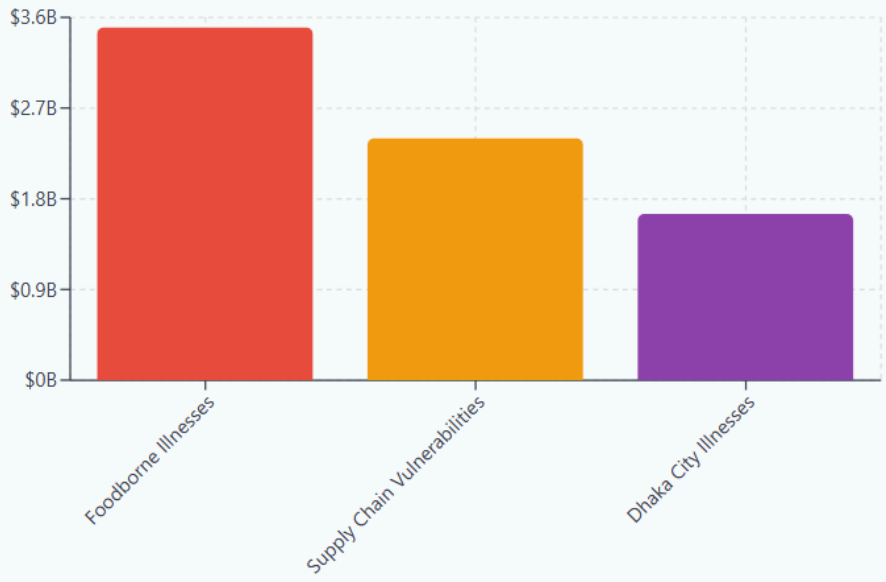
2.2.5. Economic and Social Impacts of Food Safety Issues

The issue of food safety extends far beyond individual health, resulting in substantial economic losses at both micro and macro levels. Foodborne illnesses lead to significant financial burdens due to a combination of factors, including direct healthcare costs associated with medical treatment, indirect costs from lost productivity due to illness-related absenteeism, expenses related to product recalls and market losses for affected food businesses, and negative impacts on the tourism and trade sectors.[34]

The World Bank has estimated that low- and middle-income countries experience substantial economic losses annually due to lost productivity resulting from the consumption of unsafe food.[34] Furthermore, poor food quality and the lack of food safety have a significant negative impact on individuals' overall quality of life.

These issues can affect physical health through increased susceptibility to illness and chronic diseases, mental health through stress and anxiety related to food choices and potential health risks, social interactions by limiting participation in food-related social events, and the general ability to engage in daily activities and enjoy life to its fullest.[34]

For example, individuals with food allergies face a constant need for vigilance and may experience significant stress and social isolation due to concerns about accidental exposure to allergens.[34] The pervasive worry about food safety and the potential for adverse health reactions can substantially diminish an individual's sense of well-being and overall quality of life.[34]



Combined Economic Impact

$5.9B+ USD

Minimum annual economic loss from food safety issues

Note: Dhaka city losses are included within the national foodborne illness figure

2.3. Market Overview and Size

Bangladesh's food market is characterized by substantial size and dynamic growth, driven by evolving consumer preferences and increasing industrial capacity.

2.3.1. Overall Food Market and Processing Industry

The domestic food market in Bangladesh was valued at $9 billion in 2022.[2] The food processing sector is a significant contributor to this market, comprising approximately 700 companies.[2]

This sector has demonstrated robust growth, averaging 8% per year between 2005 and 2022, and its output reached $8 billion in 2022.[2] This expansion is largely fueled by the increasing demand for convenience foods from the urban middle-class consumer base.[2]

The market for processed food is highly competitive, with domestic industries actively seeking to expand their global exports.[2] Popular processed food items include snacks, ready-to-eat meals, frozen items, beverages, and dairy products.[2]

Projections indicate that the processed food market is poised for further growth, expected to reach $5.8 billion by 2030.[42]

This significant and consistent growth of the food processing sector, coupled with a large domestic market and increasing exports, indicates a robust industry. This growth creates both opportunities and challenges for food safety, as increased production and complexity necessitate more stringent controls.

In terms of trade, Bangladesh imported $2 billion worth of consumer-oriented products from the world in 2022, while its consumer-oriented food exports amounted to $1 billion in the same year.

2.3.2. Modern Retail and Foodservice Sector Growth

The modern food retail industry in Bangladesh is expanding, albeit from a relatively small base. It consists of approximately 50 companies operating more than 250 outlets.[2] The annual turnover for members of the Bangladesh Supermarket Owners Association grew from around $200 million in 2015 to $300 million in 2022.[2]

This growth is attributed to consumers placing greater importance on the

appearance, ambiance, comfort, and wide range of products available in these outlets.[2]

Modern retail chains differentiates themselves from traditional wet markets by offering a more diverse selection of high-quality products and enhanced convenience.[2]

The modern retail sector currently accounts for about 2% to 3% of total retail sales in major cities like Dhaka, Chattogram, and Sylhet, though industry contacts suggest this figure might be closer to 3-4% of total urban retail market sales.[2]

The rise of e-commerce is also significantly shaping the urban food and non-food retail market, with digital technologies expected to play a crucial role in its future.[2]

The Bangladesh Foodservice Market is experiencing substantial growth, estimated at $4.32 billion in 2025 and projected to reach $8.05 billion by 2030, demonstrating a Compound Annual Growth Rate (CAGR) of 13.25% during this forecast period.[3]

Quick Service Restaurants (QSR) and cloud kitchens are particularly experiencing rapid growth, with cloud kitchen outlets projected to register an 8.45% CAGR in the forecast period.[3]

The frozen food market is also expanding significantly, growing at a CAGR of 7.10% from 2026 to 2032.[4]

The relatively small but rapidly growing modern retail and foodservice sectors, especially frozen foods, signify a shift in consumer preferences towards convenience and perceived quality.

This segment presents a significant opportunity for safe food products, as these channels typically have better quality control and cold chain infrastructure compared to traditional wet markets.

2.3.3. Growing Consumer Demand for Safe and Quality Food

Consumer preferences in Bangladesh are evolving, driven by rapid urbanization, increased disposable incomes, and exposure to global trends. The urban population has grown at 3.6% annually since 2020, with approximately 39% of the population now residing in urban areas.[4]

This urbanization, coupled with a 28% increase in dual-income households, has led to a heightened demand for convenient, high-value, and quality food options.[2]

With 65% of Bangladesh's population under the age of 35, young consumers are

particularly influential, spending approximately 30% more on frozen foods compared to older generations.[4]

There is a discernible increase in health and wellness awareness among consumers, which is driving interest in healthier food options and products with perceived health benefits and natural ingredients.[2]

A preference for international brands is also observed, stemming from a perception of higher quality and safety.[2]

The demand for safe and quality food is not merely a fleeting trend; it represents a structural shift driven by changing demographics and socio-economic factors. This creates a strong market pull for safer products, which can be leveraged by businesses and policymakers to improve overall food safety standards.

However, this demand is currently concentrated among upper-middle and upper-class consumers, indicating an equity challenge in access to safe food.[32]

Table 2: Bangladesh Food Market Snapshot (2022-2030)

Sector	Value (2022)	Projected Value (2025/2030)	Growth Rate/CAGR
Domestic Food Market Size	$9 billion	N/A	N/A
Food Processing Sector Output	$8 billion	$5.8 billion (2030)	8% annual (2005-2022)
Consumer-Oriented Food Imports	$2 billion	N/A	N/A
Consumer-Oriented Food Exports	$1 billion	N/A	N/A
Modern Retail Annual Turnover	$300 million	N/A	From $200M (2015)

Modern Retail Share of Total Sales (urban)	2-3% (3-4% est.)	N/A	N/A
Frozen Food Market CAGR	N/A	N/A	7.10% (2026-2032)
Foodservice Market Size	N/A	$4.32 billion (2025); $8.05 billion (2030)	13.25% (2025-2030)

2.4. Key Players and Emerging Innovators

The safe food ecosystem in Bangladesh is characterized by a diverse range of actors, from established industrial giants to nimble startups and a complex web of governmental and non-governmental organizations.

2.4.1. Established Food Processors and Retailers

Major players in Bangladesh's processed food sector include prominent names such as Kazi Farms, Square Food, Akij Group, Meghna Group, PRAN-RFL Group, and Bengal Meat Industries.[4] These entities represent a significant portion of the country's food processing capacity.

In the retail landscape, top retailers include Shwapno, Lavender Super Stores Ltd., Agora, Khulshi Mart, Meena Bazar, Pick and Pay, Unimart, Almas Super Shop, The Daily Shopping, and Prince Bazar.[2]

While these large, established players signify a mature and competitive food industry, they frequently encounter challenges related to cold chain capacity, food preservation, packaging, and general transportation logistics.[2] Their struggles with fundamental food safety infrastructure highlight that even market leaders face systemic hurdles, which in turn presents opportunities for innovative solutions and strategic partnerships.

Table 03: Bangladesh Food Market Snapshot

Market Segment	Current Value (2024-2025)	Projected Value	CAGR (%)	Key Growth Drivers
BANGLADESH MARKET METRICS				
Safe and Organic Food Market	$143 Million (2025)	$225 Million (2031)	9.0%	Health consciousness, urbanization

COMPARATIVE METRICS				
Global Organic Market	$228.38 Billion (2024)	$660.25 Billion (2034)	11.20%	Premium product demand, sustainability
Bangladesh vs Global Organic Share	0.063% (2024-2025)	0.034% (2031-2034)	-2.20%	Relative market maturity difference

2.4.2. Emerging Safe Food Brands and Agritech Startups

A notable trend in Dhaka is the emergence of small emerging food companies dedicated to offering "safe food," a movement fueled by heightened consumer concern regarding contamination. [1]

These companies typically offer a limited selection of products, ranging from 40 to 70 categories, but promise superior quality and safety, often by sourcing raw materials directly from farmers or utilizing their own manufacturing facilities. [1] Their lean and experimental approach allows them to quickly test the market, ensure superior quality, and build a loyal consumer base through quality, design, and direct communication. [1]

Leading the charge in this new space are companies like Khaas Food, which began as a small Facebook commerce company in 2016 and now boasts a strong presence both online and offline. [1] Other significant players include NeoFarmer and Rowza Foods [9], alongside Green Grocery and Protein Market,[4] Fresh Organic Foods, Farm Fresh Organics, Organic Nutrition Limited, Shuddho Krishi, Prakritik Krishi, Sashya Prabartana (UBINIG), Freshie Farm, Halal Organic Shop, Organic Bangladesh Limited, Grammo foods, Organic Online, Naturals, Fowzia Healthy Food Products, Farmers Best, FruitRoots, Premium Fruits, Krishi Swapno, Farmzila, Parmeeda Agribusiness Limited, etc.

These products are generally more expensive, with prices ranging from 15% to 45% higher than mass-produced alternatives.[9] Consequently, their customer base is primarily concentrated among upper-middle and upper-class consumers in Dhaka.[9]

The rise of these emerging safe food brands and agritech startups represents a direct market-driven response to the demand for trust and quality, effectively filling a gap left by larger players. This signifies a growing, albeit niche, premium segment within the food market.

However, their limited scale and high price points underscore the challenge of making safe food accessible to the broader population, leading to a two-tiered market where safe options are a luxury rather than a standard.

2.4.3. Role of International and Local Development Partners

The safe food ecosystem in Bangladesh is further shaped by a complex network of governmental, international, and local development partners.

Government Bodies: The Bangladesh Food Safety Authority (BFSA), established under the Food Safety Act 2013 [7], stands as the apex body responsible for coordinating food safety management, formulating science-based regulations, monitoring the food supply chain, and enforcing standards.[25] It operates under the Ministry of Health and Family Welfare and is mandated to coordinate with various ministries, including Food, Agriculture, Fisheries and Livestock, and Commerce.[35] The Bangladesh Standards & Testing Institution (BSTI) also plays a crucial role in certification.[24]

Testing Laboratories: A network of accredited laboratories supports food safety efforts. These include the National Food Safety Laboratory (NFSL) under the Institute of Public Health (IPH), various BSTI laboratories, the Institute of National Analytical Research and Service (INARS), the Pesticide Analytical Laboratory under the Bangladesh Agricultural Research Institute (BARI), and Quality Control Laboratories operating under the Department of Fisheries (DoF).[35]

International Development Partners:

- **Food and Agriculture Organization (FAO):** The FAO actively supports Bangladesh in strengthening export and food safety regulations, particularly through initiatives like the Pesticide Risk Reduction project. This involves pesticide management, implementing the National Residue Control Plan (NRCP), and the Pesticide Residue Monitoring Plan (PRMP).[14] FAO also collaborates with the Government of

Bangladesh to optimize public spending in agriculture through its Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme.[15]

- **World Food Programme (WFP):** The WFP provides life-saving relief and food assistance, offers technical assistance for social safety net programs, and strengthens capacity for fortified rice uptake and school meal initiatives.[16]
- **Global Alliance for Improved Nutrition (GAIN):** GAIN is involved in the Large-Scale Food Fortification (LSFF) project, which focuses on digitizing the food fortification process and developing Digital Fortification Quality Traceability (DFQT+) systems, along with capacity building for industry and government stakeholders.[13]

Local Non-Governmental Organizations (NGOs): The Bangladesh Food Safety Network (BFSN), established in 2010, comprises organizations such as the Consumer Association of Bangladesh (CAB) and UBINIG. These groups focus on advocacy, public awareness creation, and community-level initiatives, exemplified by the "Delduar Safe Food Upazila" program.[20]

The sheer number of government bodies, international organizations, and local NGOs involved underscores the complexity of the safe food ecosystem.

While this indicates significant resources and intent, the recurring challenge of "multiplicity of laws and lack of coordination" [21] suggests that the fragmentation of efforts and unclear mandates among these diverse stakeholders remain a critical barrier to achieving holistic food safety across the nation.

Table 4: Key Stakeholders in Bangladesh's Safe Food Ecosystem

Category	Key Players/Organizations
Established Food Processors	Kazi Farms, Asiatic Cold Storage, Square Food, Akij Group, Meghna Group, PRAN-RFL Group, Bengal Meat Industries [4]
Major Modern Retailers	Shwapno, Lavender Super Stores Ltd., Agora, Khulshi Mart, Meena Bazar, Pick and Pay, Unimart, Almas Super Shop, The Daily

	Shopping, Prince Bazar [2]
Emerging Safe Food Brands/Agritech Startups	Khaas Food, NeoFarmer, Rowza Foods, Green Grocery, Protein Market, [9] Fresh Organic Foods, Farm Fresh Organics, Organic Nutrition Limited, Shuddho Krishi, Prakritik Krishi, Sashya Prabartana (UBINIG), Halal Organic Shop, Organic Bangladesh Limited, Grammo foods, Organic Online, Naturals, Fowzia Healthy Food Products, Farmers Best, FruitRoots, Premium Fruits, Krishi Swapno, Farmzila, Parmeeda Agribusiness Limited, etc.
Government Regulatory Bodies	Bangladesh Food Safety Authority (BFSA), Ministry of Food, Ministry of Agriculture, Ministry of Fisheries and Livestock, Ministry of Health and Family Welfare, Bangladesh Standards & Testing Institution (BSTI) [7]
Key National Laboratories	National Food Safety Laboratory (NFSL) - IPH, BSTI labs, Institute of National Analytical Research and Service (INARS), Pesticide Analytical Laboratory - BARI, Quality Control Laboratories - DoF [35]
International Development Partners	Food and Agriculture Organization (FAO), World Food Programme (WFP), United States Agency for International Development (USAID), U.S. Trade and Development Agency (USTDA), Global Alliance for Improved Nutrition (GAIN) [12]
Local NGOs/Networks	Bangladesh Food Safety Network (BFSN), UBINIG, Consumer Association of

	Bangladesh (CAB) [20]

2.5. Major Trends Shaping the Safe Food Sector

Several significant trends are influencing the trajectory of the safe food sector in Bangladesh, reflecting both growing consumer awareness and technological advancements.

2.5.1. Increasing Consumer Awareness and Willingness to Pay

Public concern regarding contaminated and adulterated food has reached an unprecedented level, largely driven by a continuous stream of news reports highlighting the presence of harmful chemicals in various food products.[9]

Consumers widely perceive food adulteration as a significant public health threat, associating it with severe long-term negative health impacts such as cancer, diabetes, and organ damage.[32]

This heightened awareness is accompanied by a strong desire for access to credible information about adulteration and a clear demand for decisive government action against those responsible.[32]

Crucially, this growing awareness is translating into a demonstrable willingness to pay a significant premium for safer food products.

For instance, consumers were willing to pay 29% more for safer Tilapia, 10% more for Pangasius, and 21% more for Rohu fish, even without specific safety information about their production. This willingness increased substantially to 52% for Tilapia, 39% for Pangasius, and 34% for Rohu after consumers received detailed information regarding aquaculture practices, bacterial pathogens, antibiotic levels, and heavy metal content.[6]

Similarly, for GLOBALG.A.P. certified chicken, consumers were willing to pay a premium of 36.69% for broiler and 25.99% for Sonali chicken.[5]

This willingness to pay is notably influenced by socio-economic factors. Higher education levels and increased monthly family income positively correlate with a greater willingness to invest in safe food.[32]

Supermarket customers, who generally represent more educated and affluent demographics, tend to express greater concern about adulterated foods and show a higher propensity to pay for safer options.[32]

The strong and increasing willingness to pay

a premium for safe food, especially when consumers are adequately informed, sends a powerful market signal. It indicates that the demand for safe food is robust and growing, creating a viable economic incentive for producers and suppliers to invest in safety measures.

However, the correlation with higher income and education reveals a critical socio-economic equity gap, where safe food largely remains inaccessible or unaffordable for lower-income populations.

Table 5: Consumer Willingness to Pay for Safer Food Products

Product Category	WTP Premium (without specific info)	WTP Premium (with specific info)	Key Factors Influencing WTP
Fish (Tilapia)	29% more	52% more	Health risks, information on aquaculture practices, pathogens, antibiotics, heavy metal content
Fish (Pangasius)	10% more	39% more	Health risks, information on aquaculture practices, pathogens, antibiotics, heavy metal content
Fish (Rohu)	21% more	34% more	Health risks, information on aquaculture practices, pathogens, antibiotics, heavy metal content
Chicken (Broiler)	N/A	36.69% premium (BDT 45.87/kg)	Education, monthly family income, chicken consumption, meat safety risk perception, taste
Chicken (Sonali)	N/A	25.99% premium (BDT 51.98/kg)	Education, monthly family income, chicken consumption, meat safety risk perception

2.6. Future Direction and Recommendations

Advancing food safety in Bangladesh requires a concerted, multi-pronged approach that addresses systemic challenges, leverages technological opportunities, and builds broad stakeholder collaboration.

2.6.1. Strengthening Regulatory Frameworks and Enforcement

A fundamental step towards a safer food environment involves unifying the existing multiplicity of laws and streamlining bureaucratic processes. Establishing a single, comprehensive legal framework with clearly defined roles for all regulatory bodies is essential to overcome the current lack of coordination.[21] The Bangladesh Food Safety Authority (BFSA)'s mandate to coordinate food safety activities across various government agencies needs to be fully realized and empowered.[35]

Furthermore, it is imperative to depoliticize regulatory bodies like the BFSA and the National Food Safety Management Advisory Council (NFSMAC) by incorporating independent experts and consumer representatives. This measure would enhance their autonomy, transparency, and overall efficiency, ensuring decisions are based on scientific evidence and public interest rather than political influence.[21]

To improve enforcement, a dedicated authority with specialized, empowered inspectors should be established. Legal procedures for penalization must be streamlined to ensure swift and consistent action against violators.[21] Crucially, penalties for food adulteration offenses must be significantly increased to act as a genuine deterrent, coupled with a zero-tolerance stance for repeat offenders.[21] The current situation, where existing laws and enforcement are often deemed insufficient [1], necessitates such fundamental governance reforms, moving from fragmented oversight to a unified, transparent, and empowered regulatory system that can deter malpractices effectively.

Finally, expanding and upgrading food testing facilities at local levels, such as upazila and union, is critical. Quick access to testing facilities is vital for identifying and mitigating food hazards promptly, especially in rural areas where such access is currently limited.[21]

2.6.2. Investing in Infrastructure and Technology

Strategic investment in infrastructure and technology forms the physical and digital backbone of a modern safe food system. Prioritizing the expansion of cold chain infrastructure is paramount to reduce the substantial post-harvest losses, which currently range from 20% to 45% of fresh produce.[8] This can be achieved through government subsidies for cold storage units, offering low-interest loans to incentivize private sector investment, and developing mobile cold trucks and rural cold hubs to ensure product integrity from farm to table.[8] These investments will not only reduce waste and economic losses but also enhance market access and competitiveness, particularly for exports.

Developing robust traceability systems is another critical technological investment. Adopting technologies like Radio Frequency Identification (RFID) and blockchain can enhance real-time monitoring and data exchange across the supply chain, directly combating the current lack of effective food source identification and traceability.[21] Implementing a Rapid Alert System for Food and Feed (RASFF) would further enable swift communication and product recalls during safety incidents.[21]

Commercializing smart sensor technologies holds immense potential. This requires fostering collaboration between sensor developers, regulatory authorities, and stakeholders to navigate complex approval processes.[21] Leveraging advancements in materials science, nanotechnology, and artificial intelligence (AI) can lead to the development of rapid, robust, and eco-friendly on-site testing solutions for multiple hazards, thereby transforming food safety monitoring

2.6.3. Promoting Public-Private Partnerships and Farmer Capacity Building

Food safety is a shared responsibility, necessitating strong public-private partnerships. Collaborative efforts are

essential to enhance community awareness and ensure sustainable improvements in food safety practices.[21] Successful models, such as the partnership between USAID and Golden Harvest in developing cold chain infrastructure, demonstrate the catalytic role such collaborations can play in driving significant improvements.[17]

Empowering farmers through comprehensive training is also crucial. This includes providing education on Good Agricultural Practices (GAP), proper post-harvest handling techniques, and the safe and judicious use of agrochemicals.[21] This will help bridge the gap between knowledge and practice observed among food handlers.[22]

Furthermore, recognizing and supporting the growth of emerging safe food brands and agritech startups is vital. These innovators are developing new supply chains and market linkages that prioritize safety and quality.[9] Their success can serve as a model and drive broader adoption of safe food practices. Engaging the private sector, empowering farmers through training, and supporting innovative startups are crucial for creating a self-sustaining ecosystem of safe food production and distribution, rather than relying solely on top-down regulation.

2.6.4. Policy Optimization for Sustainable Food Systems

The future of safe food in Bangladesh demands an adaptive and data-informed policy environment that balances traditional food security concerns with modern imperatives of safety, nutrition, sustainability, and climate resilience. Tools like the FAO's Policy Optimization Modelling Tool (PolOpT) can be leveraged to optimize public spending in agriculture, ensuring that every taka is spent effectively to boost agrifood GDP, create jobs, reduce poverty, and make healthy diets more affordable.[15] This signifies a move beyond reactive measures to proactive, evidence-based strategic planning.

Scaling up climate-smart agricultural practices is essential to mitigate the adverse effects of climate change on food production. This includes promoting drought-resistant and flood-tolerant crop varieties, adopting agroforestry methods, and implementing sustainable land management techniques.[39] Concurrently, diversifying crop production beyond the dominant rice crop to include pulses, maize, and oilseeds will help stabilize food supply, reduce reliance on imports, and enhance

dietary diversity.[40]

2.6.5. Addressing Nutritional Security and Dietary Diversification

While food safety is paramount, the future direction must also encompass nutritional security and dietary diversification, which means safe food must also be nutritious and accessible, particularly for vulnerable populations. Efforts should include exploring unconventional food items, such as water hyacinth and algae, and optimizing protein extraction techniques from agricultural and aquatic sources to address limited dietary variety and nutritional challenges, especially in the face of rising prices for traditional protein sources.[37]

Furthermore, developing effective methods for preserving and processing abundant fruits like jackfruit into year-round products can significantly reduce post-harvest waste and create new export opportunities.[37]

Continuing and expanding large-scale food fortification programs, leveraging digital traceability systems and capacity building for industry and government stakeholders, will also be critical for enhancing nutritional outcomes across the population.[13]

These initiatives can unlock new economic opportunities through value-added processing while simultaneously improving public health.

Table 6: Strategic Recommendations for Enhancing Food Safety in Bangladesh

Recommendation Area	Specific Actions	Responsible Stakeholders	Expected Outcomes
Regulatory & Enforcement	Unify food safety laws; Streamline bureaucracy; Depoliticize regulatory bodies; Increase penalties for adulteration; Expand	BFSA, Ministry of Food, Ministry of Health, Judiciary, Local Government	Reduced adulteration; Clearer mandates; Enhanced accountability; Improved deterrence; Faster hazard

	local testing facilities.		identification.
Infrastructure & Technology	Subsidize cold storage & offer low-interest loans; Invest in mobile cold trucks & rural cold hubs; Adopt RFID & blockchain for traceability; Commercialize smart sensor technologies.	Ministry of Agriculture, Private Sector (e.g., Golden Harvest, Bonton Foods), International Partners (e.g., USAID, USTDA)	Lower post-harvest losses; Enhanced product integrity; Improved market access; Real-time monitoring; Faster recalls.
Public-Private Partnerships & Farmer Capacity Building	Foster public-private collaborations for awareness; Provide comprehensive farmer training on GAP & post-harvest handling; Support emerging safe food brands & agritech startups.	Government (various ministries), Private Sector, Farmers, NGOs (e.g., BFSN, UBINIG), International Partners (e.g., FAO, USAID)	Increased community awareness; Improved on-farm safety practices; Reduced agrochemical misuse; Market innovation; Sustainable food production.
Policy Optimization and Sustainable Food Systems	Utilize data-driven tools (e.g., PolOpT) for public spending optimization; Scale climate-smart agriculture; Promote crop diversification beyond rice.	Ministry of Agriculture, FAO, IFDC, BARC	Optimized resource allocation; Increased agrifood GDP; Enhanced climate resilience; Reduced reliance on imports; Improved dietary diversity.
Nutritional Security & Dietary	Explore unconventional food items; Optimize protein extraction	Ministry of Food, Ministry of Health, Private	Improved nutritional outcomes; Reduced dietary monotony; Minimized food waste;

Diversification	techniques; Develop value-added fruit products; Continue food fortification programs.	Sector, GAIN	New export opportunities.

2.7. Conclusion

The state of safe food in Bangladesh presents a complex yet evolving landscape, characterized by significant challenges but also by burgeoning opportunities. Pervasive issues such as widespread food adulteration, unhygienic practices, and an underdeveloped cold chain infrastructure continue to pose substantial public health risks and economic impediments. The existing regulatory framework, while established, struggles with fragmentation, bureaucratic inefficiencies, and inadequate enforcement, leading to inconsistent oversight and a perpetuation of unsafe practices.

However, the analysis reveals a dynamic market responding to these challenges. A growing urban population, increasing disposable incomes, and heightened consumer awareness are driving a strong demand for safe and quality food products.

The emergence of safe food brands and innovative agritech startups demonstrates a market-driven response to the need for trust and quality, even as these nascent segments primarily serve a premium consumer base.

International and local development partners are actively engaged, providing crucial support in policy, infrastructure, and capacity building.

Achieving a truly safe and sustainable food ecosystem in Bangladesh hinges on a multi-pronged, collaborative approach. This necessitates fundamental governance reforms to unify fragmented laws and empower regulatory bodies with consistent enforcement capabilities.

Simultaneously, targeted investments in critical infrastructure, such as cold chain logistics, and the adoption of technologies like smart sensors and digital traceability systems, are essential to enhance food safety from farm to fork. Furthermore, building public-private partnerships and investing in comprehensive farmer training programs can help cultivate a self-sustaining culture of food safety.

While significant challenges persist, the growing consumer demand for safe food, coupled with technological advancements and strategic partnerships, presents a unique opportunity for Bangladesh to

transform its food sector. Success in this endeavor will not only mitigate public health risks but also unlock substantial economic potential, ultimately ensuring safe, nutritious, and affordable food for all its citizens.

References

1. Adulterated-food culture in Bangladesh: A new form of epidemic - Dhaka Tribune, accessed May 20, 2025, https://www.dhakatribune.com/bangladesh/284997/adulterated-food-culture-in-bangladesh-a-new-form
2. Report Name: Exporter Guide Annual - USDA Foreign Agricultural Service, accessed May 20, 2025, https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Exporter%20Guide%20Annual_Dhaka_Bangladesh_BG2023-0025.pdf
3. Bangladesh Foodservice Market Size & Share Analysis - Industry Research Report - Growth Trends - Mordor Intelligence, accessed May 20, 2025, https://www.mordorintelligence.com/industry-reports/bangladesh-foodservice-market
4. Bangladesh Frozen Food Market Size, Share, Growth & Forecast - Verified Market Research, accessed May 20, 2025, https://www.verifiedmarketresearch.com/product/bangladesh-frozen-food-market/
5. Consumers' willingness to pay for GLOBALG.A.P. certified chicken: Empirical evidence from a consumer survey in Bangladesh | Request PDF - ResearchGate, accessed May 20, 2025, https://www.researchgate.net/publication/352966008_Consumers'_willingness_to_pay_for_GLOBALGAP_certified_chicken_Empirical_evidence_from_a_consumer_survey_in_Bangladesh
6. Consumers' willingness to pay for safer fish: Evidence from experimental auctions in Bangladesh - Purdue Agriculture, accessed May 20, 2025, https://ag.purdue.edu/food-safety-innovation-lab/wp-content/uploads/2024/06/Consumers_WTP_safer_fish-_508_remediated_Final.pdf
7. Bangladesh Food Safety Authority, accessed May 20, 2025, https://bangladeshbiosafety.org/website/bangladesh-food-safety-authority/
8. Lack of adequate cold chain facilities

is failing Bangladesh's farmers ..., accessed May 20, 2025, https://www.tbsnews.net/features/panorama/lack-adequate-cold-chain-facilities-failing-bangladeshs-farmers-1146531

9. A New Emerging Safe Food Trend Sees Traction In Dhaka - Future Startup, accessed May 20, 2025, https://futurestartup.com/2020/02/09/a-new-emerging-safe-food-trend-sees-traction-in-dhaka/

10. Agritech in Bangladesh: Assessing the Current Landscape - LightCastle Partners, accessed May 20, 2025, https://lightcastlepartners.com/insights/2024/12/assessing-the-agritech-landscape-by-lightcastle/

11. Top 10 Most Inspiring Agritech Companies in Southeast Asia, accessed May 20, 2025, https://www.top10asia.org/rankings/top-10-most-inspiring-agritech-companies-in-southeast-asia/

12. USTDA Supports Food Security in Bangladesh - U.S. Embassy Dhaka, accessed May 20, 2025, https://bd.usembassy.gov/ustda-supports-food-security-in-bangladesh/

13. A Taste of Progress: UNILAG and Bangladesh Forge Ahead with Food Fortification Partnership, accessed May 20, 2025, https://foodhq.world/issue-sections/nutrition/food-fortification/a-taste-of-progress-unilag-and-bangladesh-forge-ahead-with-food-fortification-partnership/

14. FAO supports Bangladesh in strengthening export and food safety regulations for fisheries and livestock sector, accessed May 20, 2025, https://bangladesh.un.org/en/290115-fao-supports-bangladesh-strengthening-export-and-food-safety-regulations-fisheries-and

15. MAFAP and Government of Bangladesh join forces to make public ..., accessed May 20, 2025, https://www.fao.org/in-action/mafap/news-details/mafap-and-government-of-bangladesh-join-forces-to-make-public-spending-a-key-driver-of-agricultural-productivity-and-prosperity/en

16. Bangladesh | World Food Programme, accessed May 20, 2025, https://www.wfp.org/countries/bangladesh

17. LOCAL PRIVATE SECTOR PARTNERSHIP - USAID, accessed May 20, 2025, https://www.usaid.gov/sites/default/files/2022-05/ccba-draft_edited.pdf

18. Feed the Future Bangladesh Climate Smart Agriculture Project - IFDC, accessed May 20, 2025, https://ifdc.org/projects/feed-the-future-bangladesh-climate-smart-agriculture-project/

19. USTDA Supports Food Security in

Bangladesh, accessed May 20, 2025, https://www.ustda.gov/ustda-supports-food-security-in-bangladesh/

20. UBINIG || Tuesday 29 August 2017 || READ BY SUBJECT: Bangladesh Food Safety Network (BFSN), accessed May 20, 2025, https://ubinig.org/index.php/networkdetails/index/23/english

21. Advancing Food Safety in Bangladesh: Challenges and the Promise of Smart Sensor Technology - ResearchGate, accessed May 20, 2025, https://www.researchgate.net/publication/390969223_Advancing_Food_Safety_in_Bangladesh_Challenges_and_the_Promise_of_Smart_Sensor_Technology

22. Food Safety Knowledge, Attitudes, and Practices among Vegetable Handlers in Bangladesh, accessed May 20, 2025, https://pmc.ncbi.nlm.nih.gov/articles/PMC11718158/

23. apps.who.int, accessed May 20, 2025, https://apps.who.int/iris/bitstream/handle/10665/332225/ban-profile-eng.pdf?sequence=49&isAllowed=y#:~:text=Bangladesh%20Food%20Safety%20Authority%20(BFSA,enforcement%20job%20under%20various%20Acts.

24. (PDF) "Encountering Food Safety Challenges in Bangladesh-A Regulatory Analysis", the Chittagong University Journal of Law, 2011. - ResearchGate, accessed May 20, 2025, https://www.researchgate.net/publication/258029210_Encountering_Food_Safety_Challenges_in_Bangladesh-A_Regulatory_Analysis_the_Chittagong_University_Journal_of_Law_2011

25. Bangladesh Food Safety Authority (BFSA) - SGS Digicomply, accessed May 20, 2025, https://www.digicomply.com/food-regulatory-bodies-standards-and-authorities/bangladesh-food-safety-authority-bfsa

26. Hindu Dietary Practices: Feeding the Body, Mind and Soul - Minority Nurse, accessed May 21, 2025, https://minoritynurse.com/hindu-dietary-practices-feeding-the-body-mind-and-soul/

27. Diet in Hinduism - Wikipedia, accessed May 21, 2025, https://en.wikipedia.org/wiki/Diet_in_Hinduism

28. Buddhism | Faith in Food - WordPress.com, accessed May 21, 2025, https://faithinfood.wordpress.com/spirituality-food/buddhism/

29. Buddhist Diet: How It Works and What to Eat - Healthline, accessed May 21, 2025, https://www.healthline.com/nutrition/buddhist-diet

30. Traditional and Kosher Rules - RMIG, accessed May 21, 2025, https://rmig.eatrightpro.org/rmig/religionsandfaith/jewish/jewish-resources/traditional-kosher-rules

31. Kosher foods - Wikipedia, accessed May 21, 2025, https://en.wikipedia.org/wiki/Kosher_foods

32. Exploring customers' perceptions of food adulteration at bazaars ..., accessed May 20, 2025, https://pmc.ncbi.nlm.nih.gov/articles/PMC9887844/

33. Khaas Food- Best Pure and Safe grocery Store in Bangladesh (BD), accessed May 20, 2025, https://www.khaasfood.com/

34. accessed May 21, 2025, uploaded:Part I: Introduction: You Are What You Eat

35. BANGLADESH - Food Safety Profile, accessed May 20, 2025, https://apps.who.int/iris/bitstream/handle/10665/332225/ban-profile-eng.pdf?sequence=49&isAllowed=y

36. (PDF) Does food safety governance in Bangladesh include the urban poor? An analysis of government strategies and policies for the retail food environment in Bangladesh, 2013–2022 - ResearchGate, accessed May 20, 2025, https://www.researchgate.net/publication/389862995_Does_food_safety_governance_in_Bangladesh_include_the_urban_poor_An_analysis_of_government_strategies_and_policies_for_the_retail_food_environment_in_Bangladesh_2013-2022

37. Ensuring Safety and Integrity in Bangladesh's Food Supply Chain, accessed May 20, 2025, https://ric.gov.bd/ensuring-safety-and-integrity-in-bangladeshs-food-supply-chain/

38. Exploring the challenges to cope with ripple effects in the perishable food supply chain considering recent disruptions: Implications for urban supply chain resilience - ResearchGate, accessed May 20, 2025, https://www.researchgate.net/publication/386566494_Exploring_the_challenges_to_cope_with_ripple_effects_in_the_perishable_food_supply_chain_considering_recent_disruptions_Implications_for_urban_supply_chain_resilience

39. Tackling the impacts of climate change on food security in Bangladesh - LSE, accessed May 20, 2025, https://www.lse.ac.uk/granthaminstitute/publication/tackling-the-impacts-of-climate-change-on-food-security-in-bangladesh/

40. Bangladesh's food security: Current challenges and strategic responses, accessed May 20, 2025,

https://www.tbsnews.net/thoughts/bangladeshs-food-security-current-challenges-and-strategic-responses-1138326

41. Nurturing the sustainable food systems: crafting policies and practices for crop diversification in Bangladesh - Frontiers, accessed May 20, 2025, https://www.frontiersin.org/journals/sustainable-food-systems/articles/10.3389/fsufs.2024.1459526/full

42. Bangladesh eyes foreign investment to unlock agro-processing potential, accessed May 20, 2025, https://www.tbsnews.net/economy/bangladesh-eyes-foreign-investment-unlock-agro-processing-potential-1112196

43. Top 5 Food and Beverage Angel Investors in Bangladesh in April 2025 - Shizune.co, accessed May 20, 2025, https://shizune.co/investors/food-and-beverage-angel-investors-bangladesh

List of Acronyms

- AI: Artificial Intelligence
- BARI: Bangladesh Agricultural Research Institute
- BFSA: Bangladesh Food Safety Authority
- BFSN: Bangladesh Food Safety Network
- BSTI: Bangladesh Standards & Testing Institution
- CAB: Consumer Association of Bangladesh
- CAGR: Compound Annual Growth Rate
- DoF: Department of Fisheries
- FAO: Food and Agriculture Organization
- F-commerce: Commerce conducted via Facebook
- GAIN: Global Alliance for Improved Nutrition
- GAP: Good Agricultural Practices
- GDP: Gross Domestic Product
- icddr,b: International Centre for Diarrhoeal Disease Research, Bangladesh
- IFDC: International Fertilizer Development Center (implied from project name)
- INARS: Institute of National Analytical Research and Service
- IPH: Institute of Public Health
- LSFF: Large-Scale Food Fortification
- MAFAP: Monitoring and Analysing Food and Agricultural Policies
- NCDs: Non-Communicable Diseases
- NFSMAC: National Food Safety Management Advisory Council
- NFSL: National Food Safety Laboratory
- NRCP: National Residue Control Plan
- PBUH: Peace Be Upon Him (used in reference to Prophet Muhammad)
- PolOpT: Policy Optimization Modelling Tool
- PRMP: Pesticide Residue Monitoring Plan
- QSR: Quick Service Restaurants
- RASFF: Rapid Alert System for Food and Feed
- RFID: Radio Frequency Identification
- SKUs: Stock Keeping Units
- UBINIG: (Organization mentioned, full form not explicitly provided)
- USAID: United States Agency for International Development
- USTDA: U.S. Trade and Development Agency
- WFP: World Food Programme
- WTP: Willingness To Pay

Glossary of Terms

- **Food Adulteration:** The act of intentionally debasing the quality of food by adding cheaper or harmful substances
- **Non-Communicable Diseases (NCDs):** Chronic diseases not transmitted from person to person, often linked to diet, such as obesity, type 2 diabetes, and cardiovascular diseases
- **Cold Chain Infrastructure:** A temperature-controlled supply chain that maintains the quality and safety of perishable goods from production to consumption
- **Food Security:** Ensuring that all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food
- **Gut Microbiome:** The community of microorganisms, including bacteria, fungi, and viruses, that live in the digestive tract and play a crucial role in human health
- **Halal:** Food permissible according to Islamic law
- **Tayyib:** Food that is wholesome, of good quality, nutritious, and safe for consumption in Islamic tradition
- **Kashrut (Kosher):** Jewish dietary laws derived from biblical principles governing what foods can be eaten and how they must be prepared
- **Nutrigenomics:** The study of the relationship between human genome, nutrition and health
- **Ahimsa:** The principle of non-violence in Hinduism, encouraging vegetarianism
- **Tamasic, Rajasic, and Sattvic:** Categories of food in Hindu dietary codes based on their effect on the body and temperament
- **Prasada:** The custom in Hinduism of offering food to God before consumption
- **Ultra-processed foods:** Food items highly manufactured with numerous additives, often high in unhealthy fats, added sugars, and sodium, and linked to significant health concerns
- **Traceability Systems:** Systems that allow the tracking of food products through all stages of production, processing, and distribution
- **Climate-Smart Agriculture:** Agricultural practices that increase productivity and resilience, reduce greenhouse gas emissions, and enhance the achievement of national food security and development goals
- **Post-harvest losses:** The amount of food produce lost or wasted after harvesting due to inadequate storage, transportation, and handling

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