

**A Comparative Study on Food Adulteration in
Bangladesh: Different Sources and Food Categories**

**A Comparative Study on Food Adulteration in Bangladesh:
Different Sources and Food Categories**

**Submitted To
Dr Khandoker Mahmudur Rahman
Professor, School of Business and Economics (SoBE)**

**Submitted By
Golam Moinuddin Rafi, Id: 111202030**



**School of Business and Economics
United International University**

Date of submission: 24th November, 2025

Letter of Transmittal

24 November, 2025

Dr. Khandoker Mahmudur Rahman

Professor, School of Business and Economics

United International University

Subject: Submission of Project Report on “A Comparative Study on Food Adulteration in Bangladesh Across Different Sources and Food Categories”

Dear Sir,

I am pleased to submit my project report titled “**A Comparative Study on Food Adulteration in Bangladesh: Different Sources and Food Categories**” as part of my undergraduate program at the School of Business and Economics, United International University.

This study looks into the various sources of food adulteration in Bangladesh, including farmers, middlemen, wholesalers, street vendors, Kacha Bazar sellers, super shops, and online platforms. It also explores the use of harmful chemicals, preservatives, hormones, and fertilizers, and examines their potential impacts on public health. Through this project, I have tried to provide practical insights and recommendations to help improve food safety and raise awareness among consumers and stakeholders.

I am sincerely grateful for your guidance and support throughout this research. I also thank all the individuals and organizations who provided valuable information and data, without which this study would not have been possible.

Sincerely,

Golam Moinuddun Rafi

ID: 111202030

School of Business and Economics

United International University

Certification of Similarity Index

This is to certify that the project report written by **Golam Moinuddin Rafi** has been examined for similarity and plagiarism. The plagiarism detection software used for evaluation followed the academic integrity guidelines of **United International University (UIU)**.

After detailed analysis, the **similarity index was found to be within the acceptable academic limit**. This indicates that the work is **original**, and all external information, data, and references have been **properly cited** following recognized academic standards.

Declaration of the Student

This is to certify that I, **Golam Moinuddun Rafi**, ID: 111202030, student of the School of Business and Economics at United International University, do hereby declare that this project report titled: “**A Comparative Study on Food Adulteration in Bangladesh: Different Sources and Food Categories**” has been completed and presented by me as part of the requirements for the **Bachelor of Business Administration (BBA)** degree.

This work is the outcome of my own research and has not been submitted, either wholly or partially, for any degree or diploma at this or any other institution. All sources, references, and information used in this project have been properly acknowledged in accordance with academic integrity and citation guidelines.

I further declare that I have conducted this study with honesty and sincerity. All opinions, interpretations, and conclusions presented in this report are my own unless explicitly stated otherwise.

Golam Moinuddun Rafi

111202030

School of Business and Economics

United International University

Acknowledgement

First and foremost, I am deeply grateful to the Almighty for giving me the strength, patience, and determination to complete this project successfully.

I would like to express my sincere gratitude to Dr. Khandoker Mahmudur Rahman, Professor, School of Business and Economics (SoBE), United International University, for his continuous guidance, support, and encouragement throughout this research. His insightful feedback and academic expertise were invaluable in shaping the direction, depth, and quality of this study.

I am also thankful to all the faculty members of the School of Business and Economics for creating an intellectually stimulating environment that nurtured my academic curiosity. My heartfelt appreciation goes to my peers and friends who supported me morally, provided constructive suggestions, and encouraged me throughout this journey.

I am grateful to the organizations, market experts, and data providers who shared valuable information about food safety and adulteration practices in Bangladesh. Their insights and contributions greatly enhanced the practical relevance of this study.

Finally, I would like to express my deepest gratitude to my family for their unwavering support, patience, and encouragement. Their belief in me and sacrifices throughout my academic journey provided the motivation I needed to complete this project.

The completion of this project would not have been possible without the support, guidance, and contributions of all the above-mentioned individuals and organizations. I am sincerely thankful to each of them.

Table of Contents

Letter of Transmittal	iii
Certification of Similarity Index	iv
Declaration of the Student	v
Acknowledgement	vi
Table of Contents	vii
Executive Summary	ix
Chapter 1: Introduction	1
Chapter 2: Objective of the Study	3
2.1 General Objective.....	3
2.2 Specific Objective	3
Chapter 3: Methodology.....	6
3.1 Research Approach	6
3.2 Data Collection Methods.....	7
Chapter 4: Food Adulteration at The Farmer level	9
4.1 Background and Role of Farmers	9
4.2 Factor Affecting Farmers Reputation	9
4.3 Common Adulteration Practices at Farmer Level	11
4.4 Farmer Oriented Findings (Based on Newspaper Reports)	13
4.5 Primary Finding	13
Chapter 5: Food Adulteration at the Middlemen and Wholesaler Level	14
5.1 Background & Role of Middlemen, Wholesalers	14
5.2 Factor Effecting Their Reputation	14

5.3 Common Adulteration Practices by Middlemen & Wholesalers	15
5.4 Data Driven Observation	17
5.5 Primary Findings.....	17
Chapter 6: Food Adulteration in Kacha Bazar and Street level Retailing	18
6.1 Background.....	18
6.2 Factor Influencing Their Reputation	18
6.3 Common Adulteration Method Used by Kacha Bazar & Street Vendor Sellers	19
6.4 Data Driven Observation	21
6.5 Primary Findings.....	21
Chapter 7: Food Safety Practices in Super Shop & Online Grocery	
Platforms	22
7.1 Background of The Study	22
7.2 Reputation Factor	23
7.3 Safety level and common Concern	24
7.4 Data Driven Observation	25
7.5 Primary Finding	25
Chapter 8: Cross Source Analysis of food Adulteration in Bangladesh.....	26
8.1 Overview	26
8.2 Adulteration Across Different Sources.....	27
8.3 Most Adulterated Food Items	28
8.4 Region wise Highest Adulteration	29
8.5 Primary Findings.....	30
Chapter 9: Conclusion & Recommendation	31
9.1 Summary of Key Findings	31
9.2 Strategic Recommendation.....	32
9.3 Conclusion	34
References	35

Executive Summary

This project analyze the sources and consequence of food adulteration in Bangladesh by focusing on different food categories like milk, meat, vegetables, fish, spices, fruits and edible oils. The study shows a clear comparative view of how food adulteration occurs among different channels including farmers, middlemen, wholesaler, street vendors, super shops, and online platform. Also identify the risk combined with harmful chemicals, preservatives, hormones, and fertilizer.

The finding reveals that food adulteration occurs in various stages of supply chain. For fish preservation formalin is commonly used, fruits are treated with calcium carbide to quick ripen them. Chemical dyes is used to make vegetable more shiny, milk is added with water to increase quantity and sometimes use detergent to make milk thicker. Hormones are used in cattle, fish and chicken to accelerate the growth. These elements can pose serious health risk such as diabetics, kidney diseases, infertility, cancer and heart disease.

The study also compares the differences between traditional market with modern market in terms of food safety. Super shops and online platforms generally maintain higher safety standard but although they are not fully protected from adulteration. Traditional shops like Kacha Bazar and street vendors are occurring more adulteration due to weak monitoring, lack of cold storage facilities and profit driven practices.

Based on these data, the project indicates realistic evaluation to improve food safety, strict regulatory improvement, awareness campaign for consumers, better food handling practices and promote chemical free organic farming.

In conclusion, the study shows that food adulteration in Bangladesh is a complex problem that needs combined action from consumers, authorities, and businesses. Detecting these issue and addressing steps to make food safer for public health and build trust in nations food supply chain.

Chapter 1: Introduction

In Bangladesh people are facing many health issues and behind them a major cause is food adulteration. Back then time it was just an infrequent practice but nowadays it has become an distress matter affecting millions of consumers. In current situation we can see that adulteration occurs in every stages of food supply chain. Starting from farmer, then moving through middlemen and wholesaler, then lastly ended with the kacha Bazar seller, street vendors, supermarkets and even online platforms seek opportunities for harmful and unethical practice whenever they get the chances. As a result it has become one of the challenging task for people to ensuring safer food in this nation. We often consume adulterated food and don't even know about anything.

The major causes behind food adulteration is mostly involved with several factors such as higher profit margin, complexity of supply chain process, limitation of cold storage, week monitoring, improper enforcement of regulation and the lastly limited consumers awareness. Some farmer often use chemical fertilizer and poisonous insecticide to maximize their production quickly. In the aquaculture and livestock society growth hormone, antibiotic and chemical feeds are often use to boost the size and yield of cattle, fishes, poultry. Middlemen and wholesaler often use preservative or add formalin to preserve the items for long time due to long distance of transportation and slower supply chain process. At the retail level Vendor often use inferior and expired ingredient, add artificial color, diminish product to maximize profit. Even the super shops and online seller despite being the most trustworthy souses have occasionally been found to sell adulterate food. Restaurant often found to add artificial nonfood grade color or substance to add extra flavor and looks.

Food adulteration mainly occurs in several levels of supply chain, so it become very difficult to identify which sources are genuine and safer. However not all the food categories have same type of risk. Perishable items like fishes, vegetable, fruit and meats

are often adulterated by harmful chemical to preserve long time. On the other hand items like dairy, edible oil, spices are contaminated by adding or subtracting low grade, poisonous and chemical elements to get extra profit. Often we hear that some fake companies are duplicating the prestigious brand product. These variation of adulteration contain the need to compare the different sources of food supply chain and different categories to see who contributes the most, where it begins and which channel is more safer and which one to avoid.

While the study aim to gather a comprehensive analysis on food adulteration and investigate on the parties involve in food supply chain including the farmers, middlemen, wholesaler, Street vendors, Kacha Bazar seller, super shops and online platform. By studying different food categories such as processed items, edible oils, spices, fishes, meats and grocery items the study aims to identify the most adulterated point in supply chain and highlight the types of adulteration used in each area. The research also include journal report, government articles, newspaper report, TV channel report and laboratory test reports to format a well round understanding of this issue.

Food adulteration is not just an economic problem, nowadays it has become a public health crisis. Harmful chemicals like formalin, carbide, textile dyes, artificial preservatives, growth hormone, and industrial grade elements can be led to serious health concern including cancer, kidney damage, infertility. liver failure, hearth disease, diabetics, stroke, bone disease and long term developmental disease in children. On the other side it also effects customer trust, brand value, promote unfair competition and undermine the overall food systems of the whole nation.

This introduction part of the study describes the seriousness of food adulteration in Bangladesh by explaining why food adulteration occurs and identify the stages where it occurs the most. Also explains why we should compare the different categories and different sources to identify the vulnerable points across the food supply chain. The following chapters will outline the objective of the study, research questions, methodology, findings and recommendation of the study and also aims to contribute towards safer, healthier and more transparent food practice.

Chapter 2: Objective of the Study

In Bangladesh food adulteration is not limited to a single point in food chain rather, it's an extensive problem influenced by extra profit, less monitoring, long supply chain gaps. To carefully identify where the problem begins from and how it spreads across the different sources to different food categories and adjust objective according to them. Moreover these objectives aims to guide the whole project and contributes to determine where the vulnerable areas within the entire system.

2.1 General Objective

The general objective of the study is to **explore and differentiate the scope of food adulteration across different food sources in Bangladesh**. Therefore, the study aims to get clear view of how adulteration differ from farmers to retailers and covering different good categories.

2.2 Specific Objective

To gain a widespread goal, the study focus on several specific objective:

A) To determine the types of seller who contribute most on adulteration

In food chain process the foods we get are processed through many hand such as farmers, middlemen, wholesaler, Kacha Bazar seller, street vendors, super shops and even online platforms. Each parties plays a different role and some even engaged higher in food adulteration process then other. The study direct to compare these sources and identify who contribute highest towards the problem.

B) To identify the most adulterate food items

All foods are not equally adulterated some food like milk, fish, vegetables, meats, fruits are often treated with harmful chemical, while the others like edible oil, spices and package food are adulterated by adding cheap elements or substitute elements to increase quantity. This study aim to investigate which food item are mostly adulterated and why.

C) To find out the substance and chemical used adulteration proceaa

Not all food items are adulterated in the same way or using the same type of chemicals. For example:

- ❖ Fish may contain formalin for long term preservation.
- ❖ Milk may be adulterated by mixing, water, detergent, starch.
- ❖ Vegetable may be treated with chemical dyes to look fresher.
- ❖ Fruits may be ripened using carbide or ethephon.

This study aims to identify the substance which are applied to adulterate different food items and also clearly explain the harmfulness behind it.

D) To explore the reason behind food adulteration

In every stage of food chain adulteration do not happens for same reason. Farmers adulterate their crops with chemical to **increase production**, middlemen uses preservative to **preserve the food item for long time** and also to **avoid spoilage** during long transportation, retailers may adulterated product to cut **extra profit** margin. This study will explore the economic, social and structural causes behind adulteration.

E) To investigate the use of hormones, fertilizer and preservatives

This study will investigate the growing use of :

- ❖ **Growth hormones** are use to boost the growth of fish, cattle and poultry chicken.
- ❖ **Harmful fertilizers** are used in crops to get better production
- ❖ **Chemical preservatives** are used in perishable goods for long term preservation.

These parties directly effect consumer health and food safety. So we need to deeply examine these parties practices.

F) To identify the highest food adulterated regions in Bangladesh

The level of food adulteration varies from region to region. Urban areas like **Dhaka Chattogram** and **Sylhet** often shows higher level of food adulteration due to excessive population growth and slower supply chain. Rural areas have comparatively lower record of adulteration cases but has lack of monitoring. This study aims to identify the regions where food adulterated occurs the most.

G) To propose effective prevention strategies

Lastly one of the major objective is to provide realistic, effective and practical solution for:

- ❖ Tips and technique for **consumers** to detect adulterated food.
- ❖ Safer and organic farming practices for **farmers**.
- ❖ Making ethical and sustainable practices for **businessmen**.
- ❖ Policy improvement and enforcement by **government** to reduce the practice of food adulteration.

Chapter 3: Methodology

In Bangladesh understanding food adulteration needs a method that can capture the depth, complexity and variations of the issue. We can see that adulteration occurs in different stages in food supply chain and also involves different parties. It also involves various sellers, many harmful chemicals, and practices. This study mainly focused on qualitative method and aim to gather trustable, detailed and reliable information from sources to draw a clear picture of the whole situation.

3.1 Research Approach

The research follows a **qualitative descriptive research approach**, which is preferable because the main purpose is to identify, compare, and understand how and why adulteration happens across different stages and food categories. Also detect the gaps all over the food supply chain process. The study examine secondary data by collecting information from different trusted sources rather than collecting primary data directly from field. This approach combine scientific, journalistic and regulatory data to create a overall understanding of the issue. The qualitative approach enables the study to explore:

- ❖ Different types of adulteration practices
- ❖ The reasons behind adulteration
- ❖ Health impacts behind adulteration
- ❖ Different seller comparison
- ❖ Regional variation of adulteration

Topics like food adulteration are generally helpful for using qualitative approach. Because this method uses secondary data and there large amount of data already exists and can be analyze meaningfully.

3.2 Data Collection Methods

The topic we have is sensitive and widespread, this study collects data from multiple secondary sources such as **Journal articles, Newspaper writings, Research articles and government/NGO reports**. Collecting data from different sources ensures the analysis is balanced, trustworthy, and reliable.

A) Journal Articles and Research Paper

Journal articles and research paper are the core and main sources of data collection. Because the journal reports are the combinations of survey reports and collection of secondary data also they contains interviews with the parties involved and also contained lab base data report. These are the trustworthy secondary data sources for the report and contains a large volume of data, also reduce the need for primary data collection.

B) News Articles.

Articles published by newspaper, magazines, or online news platforms often provides reliable data. Newspaper like **The Daily Star, Prothom Alo, Dhaka Tribune** provide detail news about formalin use, mobile court and food safety violations, Kacha Bazar, street vendors, Super shops, wholesalers and supply chain frauds. Also many TV shows like **Investigaion 360 degree, Onushondhan, Crime scene** publish many report and TV show on food adulteration. These investigations helps to identify how adulteration happens in real life.

C) Government & NGO Reports

To examine the regulatory site the study also varies on report and publication of nation and international bodies. Organization like **BSTI(Bangladesh Standard and Testing Institution)** where we can find approved food standard test report on adulterated products. **DNCRP (Directorate of National Consumer Rights Protection)** provides data on raids, fines, and types of violations. **WHO (World Health Organization)** and **FAO (Food and Agriculture Organization)** provide global guidelines, chemical risk assessments, and food safety recommendations. These reports assist to find out whether Bangladesh's current laws, monitoring, and enforcement systems are effective for preventing adulteration.

Chapter4: Food Adulteration at The Farmer level

4.1 Background and Role of Farmers

In food supply chain the farmers always comes first, because whatever goes wrong in this segment influences the whole system. Most of them generally dependent on the traditional firming system, limitation of resources, uncertain weather, and unpredictable market demand. Their livelihood often depends on market demand, crop yield and selling their product quickly and often faces strong challenges that influence them to practice that causes adulteration.

News report , journal and articles shows that farmer do not adulterate food like traders and seller do. Instead their adulteration occurs during cultivation, growth and production phrases. These occurs especially by using hormones, chemical fertilizer, and pesticide to increase productivity, prevent crops loss and to survive in the market competitions. Most of them don't know anything about the threats of these elements they use.

4.2 Factor Affecting Farmers Reputation

Based on the data collected from journal article, newspaper interviews and some research paper there are many factors influencing farmers to directly or indirectly involve in the vulnerable production practices. These are given bellow:

❖ Too much dependence on traditional firming practices

Most of the farmers do not know anything about scientific farming. They mostly relay on traditional firming method. They just follow their neighbors and do what they just do. These practices influence them to adulterate their productivity without even knowing anything about the harmfulness behind it.

❖ **Higher cost of firming raw materials**

Nowadays fertilizer, quality seeds, pesticides, feeds, and instruments are become very expensive. These factors influences farmer to use low quality chemicals and excessive use of them to ensure higher outcome.

❖ **Lack of knowledge about food safety**

Most of the farmers did not know anything about food safety. They don't know the perfect measurement of using chemical limits regulated by BSTI, WHO or agriculture extension office.

❖ **Pressure from wholesaler**

Report collected from farmer often shows that middlemen and wholesaler demand for visually attractive crops. So they force to use chemical fertilizer to growth enhance and often use chemical pesticides to make their crop look fresher and attractive. They also use chemicals to early ripen their crops.

These factors shows that farmers are often a victim in the adulteration process, they do not intentionally adulterated food rather that they are forced by these types of factors.

4.3 Common Adulteration Practices at Farmer Level

Based on the data collected from various reports and journals, it shows that food adulteration in the firming stage often linked with the production phrase. Some of the major practices are:

A) Growth hormone used in livestock

- ❖ Farmers often inject cows with **Oxytocin** to quickly increase milk production.
- ❖ **Growth hormones** are injected to cattle for quick increase in meat production
- ❖ **Hormone reach feed** are often feed to boiler chicken to increase their growth. As a result they grow within 28 to 35 days to be marketed.
- ❖ Fish farmers often uses hormone rich feed to increase the grow of pangas, tilapia and koi fishes.

Studies have shown that the long time consumption of these type of hormone treated food causes major health issues.

B) Frequent use of chemical fertilizer

In Bangladesh farmers uses **TSP, Urea, Potash and DAP** without any expert recommendation. The excessive use of chemical fertilizer creates problems like:

- ❖ Reduce nutritional values of food.
- ❖ These harmful chemicals remain in crops and increase health risk.
- ❖ Decrease the productivity of the soils in long term.
- ❖ Create long term risk for human health.

Agricultural Journals often shows that farmers do not maintain the proper dose for using chemical fertilizers.

C) Dependency on heavy chemical pesticide

Studies shows that many farmer violate the farming practices by:

- ❖ Using Chemicals which are banned or hazardous by WHO.
- ❖ To prevent crop loss they spray pesticide close to harvest time.
- ❖ Store vegetable without proper hygiene maintenance.

Some newspaper reports shows that some region use pesticide more than 2 to 3 times beyond recommendation.

D) Ripening food artificially

Farmers need to sell their product according to market demand so they use:

- ❖ **Calcium carbide** ripe their product early so that they can meet market demand.
Fruits like banana, papaya, mangoes are often treated with these type of chemicals.
- ❖ **Ethephon** is used to coloring and softening fruits.

These elements are dangerous for human health when treated incorrectly.

4.4 Farmer Oriented Findings (Based on Newspaper Reports)

Newspaper and TV channel report often shows the difficulties in reality the farmer faces. One farmer in Rangpur revealed his difficulties with **Prothom Alo** that:

“If we don’t spray, the vegetables will rot before reaching Dhaka. Transport takes too long, and we have no cold storage.”

This report shows that the **supply chain pressure** which led them to involve in unsafe practices. Poor road condition, excessive heat, tong transportation time and lack of cold storage influence farmer to get in a situation where they forced to use chemical substance for their survival.

The reports from DNCRP shows that farmer do not intentionally use these chemicals to adulterate food rather they only know these practices to protect and not spoiled their crops.

4.5 Primary Finding

Food adulteration often occurs indirectly in the farmer level they do not use or mix additional substance in their crops rather than it occurs in the production phase by unsafe agricultural practices such as uses of excessive pesticide, hormone usage, artificial ripening practices. Most farmers use these chemicals not out of greed but for:

- ❖ Financial pressure
- ❖ Lack of awareness
- ❖ Poor farming practices
- ❖ And weak government monitoring

These issues can be prevent in the early stages of the food supply chain by increasing farming knowledge, Promote organic farming process, Strengthening supply chain process.

Chapter 5: Food Adulteration at the Middlemen and Wholesaler Level

5.1 Background & Role of Middlemen, Wholesalers

In Bangladesh farmers do not directly sell their product to consumers rather they sell their product to the middlemen & wholesaler and they provide them to the retail sellers. They act as a link between Rural farmers and busy city markets. Almost all the food items such as milk, vegetable, fruits, fishes, chickens, spices these product are passes through this stage before reached to retailers. They deals with large volume and have a robust control over supply chain. Most of the adulteration cases occurs in this stage. Their ultimate goal is to **maximize profit** and having **minimum level of waste**. As a result many harmful practices occurs before the food comes into our kitchen.

5.2 Factor Effecting Their Reputation

In our country middlemen and wholesaler reputations are often questioned or affected by various practical and formatting reasons. Because the markets in Bangladesh do not maintain any kind of formal operation and strict monitoring. Here are some key factors which are effecting these parties reputation:

- ❖ **Higher profit margin**

Middlemen and wholesaler usually handles tons of food everyday. So, even a small amount of adulteration can bring huge profit margin.

- ❖ **Absence of authorized monitoring**

In Bangladesh the major wholesaler hubs like, **Jatrabari**, **Kawran Bazar**, **Shymbazar** and **Khatunganj** has minimum level of monitoring from the

authority. So, Wholesalers can easily adulterate food. Most of the adulteration cases occurs at night.

❖ **Lack of traceability**

Another major problem is that once the food enters to whole seller hub it is impossible to track the product where it is came from and what is added to it.

❖ **Absence of proper storage and preservation**

In Bangladesh the wholesalers points usually don't have any large scale cold storage. So they add chemical substance to keep food fresh.

Therefore all these lack ness creates a system where adulteration is unnoticed and became a common practices.

5.3 Common Adulteration Practices by Middlemen & Wholesalers

In food supply chain the most adulterated sectors are the middlemen and the wholesalers, where the most of adulteration occurs. Several harmful practices are used in these sector to preserve food, increase weight, and mixes low quality product with high quality product. Here are practices which are commonly used:

A) Usage of Formalin

- ❖ In our country formalin is often used in fish, vegetable and fruits to make them look fresh for long time.
- ❖ Newspaper report, TV channels report, and studies have shown that formalin usage are high on big wholesale markets like Kawran Bazar, Jatrabari, and Chottogram fishery ghat.

B) Injecting water in meats

- ❖ Meats and chicken item often adulterated by injecting water.
- ❖ This process allows the wholesalers to peak extra profit margin.

C) Artificial Shine & Coloring

- ❖ The report shows that some wholesalers apply toxic wax to make apple and orange more glossy.
- ❖ Chemical dyes is used to make vegetable look more fresher for long time.
- ❖ The spice items are adulterated by adding industrial elements and color to increase the quantity, looks, and taste.

D) Mixing & Rebranding

- ❖ Wholesalers used to collect milks from rural areas farmers, they mixes water with milk to increase quantity.
- ❖ Sometime they use detergent to make milk more thicker.
- ❖ Older spoiled goods are mixed with newer one to avoid financial loss.
- ❖ Low grade oil is mixed with soybean and mastered oil to sell them as high quality product.

By examining the wholesalers adulteration practices, it shows that they are on the top of the list.

5.4 Data Driven Observation

Reports collected from newspaper and consumers shows that most of the adulteration cases occurs at night when there is minimum level of observation. Items like fish, fruits and vegetables are often the main target. Studies have shown that:

- ❖ Fruits items are being treated with chemicals to slow down ripening.
- ❖ Old stock are mixed with newer one before the monitoring starts.
- ❖ Fishes are sprayed with formalin before loading into truck for long time refreshment.

These observations are reported from Both Dhaka and Chittogram which are the major trading hubs of Bangladesh.

5.5 Primary Findings

Middlemen and wholesalers are the major parties involved in food supply chain. They handle the food item in bulk amount and play a vital role in distribution process. Adulteration in this process spreads through all the parties involved in the supply chain process from retailer, street vendors and even super shops. Therefore it can be said that they are the largest contributors who directly involve in food adulteration process.

Chapter 6: Food Adulteration in Kacha Bazar and Street level Retailing

6.1 Background

Millions of people in Bangladesh buy their regular food item from Kacha Bazar and street vendors. These sources are popular because of their fresh looking items, lower prices and customer can directly bargain with the sellers. But most of the risks come from these places because most of these markets operate without any kind of regulations and strict monitoring. They don't even maintain any kind of food safety regulation. Therefore customers often buy food items which are already adulterated before it comes to stalls. Also in some cases further adulteration occurs in retail level.

6.2 Factor Influencing Their Reputation

Several factors are influencing Kacha Bazar & Street vendors' reputation. But most of them comes from the informal nature of these marketplace. Here are some causes given below:

- ❖ **Poor hygiene condition**

Water they use to wash products, chopping board and the baskets they use to store foods are often unhygienic, not properly clean, and safe.

- ❖ **Dependency on wholesaler**

These vendors source their product from wholesaler which are already been treated with chemicals.

❖ **Informal selling environment**

Seller usually put their store on temporary spot and road side where hygiene is maintained and monitor in minimum level.

❖ **Absence of licensing**

Most of the Kacha Bazar seller and street vendors don't have any license to sell food item. Without any valid licensing it indicates that there is no monitoring and regulation.

Because of these structural problems even the most honest sellers find it difficult to avoid selling adulterated food because adulteration occurs before the product comes to them.

6.3 Common Adulteration Method Used by Kacha Bazar & Street Vendor Sellers

At this point food adulteration occurs in small scale but frequently. But these type of seller usually attract customer by adding extra shine to their product due to market competitiveness. Here are some method used by Street vendors & Kacha Bazar sellers:

❖ **Selling fish treated with formalin**

In fish market often they can not sell their product regularly. So they add formalin to preserve fishes for long time to prevent loss. Sometimes products are contaminated before it comes to their hand.

❖ **Adding chemical dyes to fruits**

Because of market competitiveness seller try to add extra shine using chemicals for attracting people to buy their product and preserve them for long time.

❖ **Washing vegetable with pollute water**

Many sellers wash vegetables with unhealthy and pollute water which contain harmful germs and bacteria.

❖ **Usages of burned cooking oil**

We often see street food vendors cooks food with burned oil which contained harmful compound that effect health.

❖ **Treating vegetable with artificial shine**

Vegetable items like cucumber, beans, purple, and tomatoes are treated with oil or chemicals to appear more shiny and fresh.

❖ **Selling spices with additional elements**

Powders like chili, turmeric, and coriander may be mixed with industrial color or sawdust to increase quantity. And maximize profit.

Many Kacha Bazar sellers honestly admit that the condition of the goods mainly depends on what they receive from wholesalers. It indicates that adulteration passes through the chain.

6.4 Data Driven Observation

After analyzing many journal article, research paper, TV channel and newspaper interviews it can be said that parties involve in adulteration process are not aware about the food safety regulations. They don't even know the harm ness behind the substance they add to treat foods. One vendor expressed honestly:

“If the fish doesn't look fresh, people won't buy. We have no choice.”

This kind of comment shows the struggle of small vendors who must maintain fresh appearance to confirm sales, even if it pushes them toward unethical practices.

6.5 Primary Findings

In Bangladesh there is a minimum contribution of farmers in the food adulteration process. On the other side Kacha Bazar and streets market seller are not the origin of most adulteration case they slightly modify what have. The main adulteration practices are done by wholesalers and middle men. They provide food to millions of people all over the country. But the point is that a small amount of adulteration can make a large amount of health risk to consumers. They just only think about selling product and making profit without knowing harm ness behind it.

Chapter 7: Food Safety Practices in Super Shop & Online Grocery Platforms

7.1 Background of The Study

Over the past few years, super shops & online platforms have become trusted and modern retail channels of Bangladesh. Unlike Kacha Bazar and street vendors these platform operates their business under a brand name. Their reputation depends on their Product Quality, safety standard, customer trust and commitment. So people can easily trust the foods provided by these channels. These channels state to provide fresh food to consumers.

In Bangladesh super shops like Shawpno, Unimat, Agora and Minabazar have invested in modern infrastructure, cold Storage, proper packaging, and effective supply chain, and monitoring to ensure product safety. Unlike traditional platform these modern platforms reduces the risk of food adulteration.

Online platform like Chaldal, Daraz Mart, Unimart online, Shwapno online are some prominent online platforms who serve fresh food to peoples home. People just need to order from their website and they deliver food to their door. Some has an express delivery service. These platform makes peoples life easier by providing safe food.

7.2 Reputation Factor

There are several factors which makes stronger reputation for super shop and online platform. Here are some factors given bellow:

- ❖ **Regular inspection**

Frequent inspection is conducted by BSTI and international quality control team. Also their own quality control team always try to ensure safe foods.

- ❖ **Sensitive to public opinion**

Any kind of scandal related to food adulteration can permanently damage their reputation. So they are very concern about what they sell.

- ❖ **Traceability of products**

Branded and packaged product carry batch number, manufacture date, expire date and supplies information which makes easy to track product.

- ❖ **Cold Storage and proper packaging**

Temperature control storage remain food moisture and keep them fresh also prevent mycobacterial contamination.

- ❖ **Maintain Proper hygiene**

Super shops and online plat forms store their food in proper hygienic way. Also they maintain hygienic infrastructure and tools to prevent contamination.

- ❖ **Home delivery service (online platform)**

They used to deliver fresh food in consumers door with proper safety and within the time.

All these points indicates that customer feel more safe and confident while shopping from these platforms.

7.3 Safety level and common Concern

Why super shops and online platforms are safer:

- ❖ The mostly sell branded items with BSTI approval.
- ❖ Their product contains Batch number, production date, expire date and contain supplier information.
- ❖ Perishable items like fish, milk, and meats remain safe with temperature control storage.
- ❖ Staff are well train in food handling and hygiene.
- ❖ Collect product from safe and organic sources.
- ❖ Regularly inspect to detect expire or contaminated product.

Remaining concern

- ❖ High price makes it difficult to accessible for low income people.
- ❖ Imported fruit and vegetables may carry pesticides.
- ❖ Sometime package items fails BSTI test.
- ❖ Also some of them sell non branded packages items.

7.4 Data Driven Observation

Platform like Chaldal, Unimart maintain strict rules of supplier selection, ensuring that all supplier meet safety and hygiene standard. Regular process like packaging, labeling, and delivering are closely monitored. Compare to Kacha Bazar and street vendors these

These platforms are the first choice for urban people who are concern about their health. People don't have to detect or identify safer foods if they shop from these platforms.

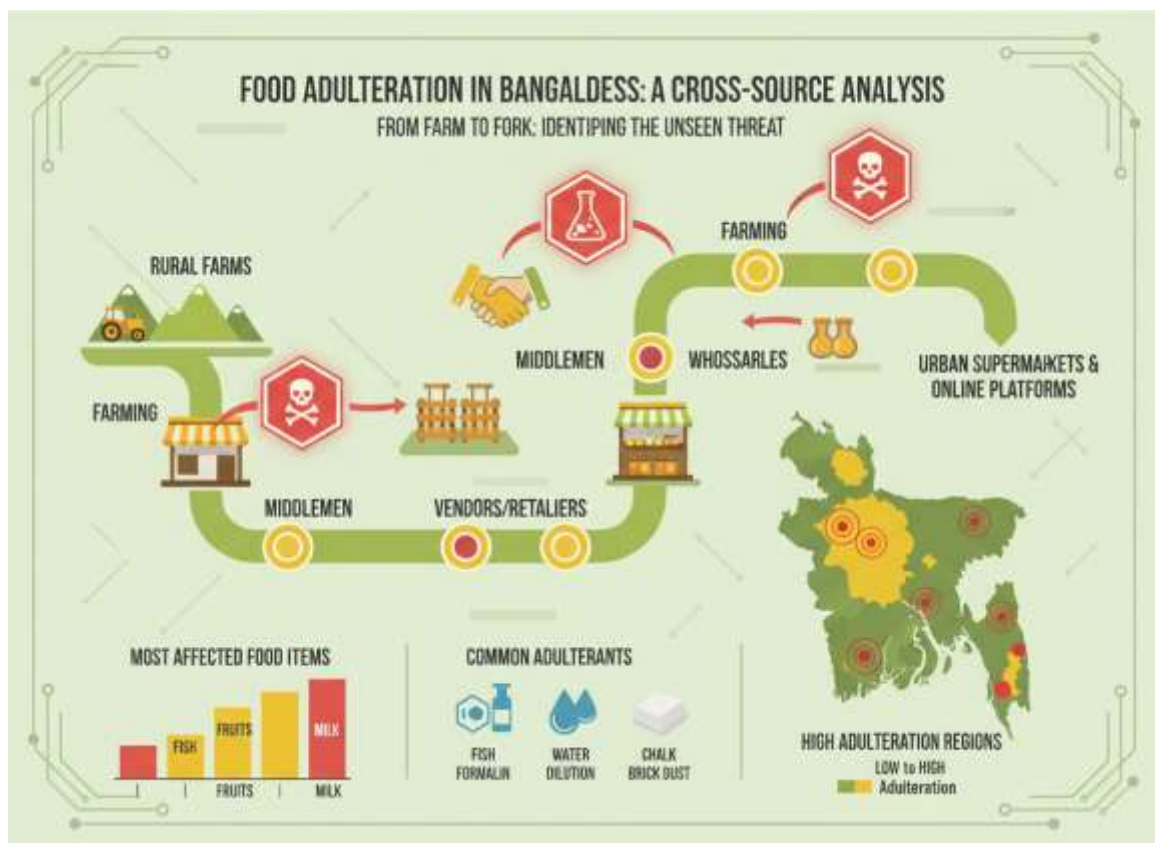
7.5 Primary Finding

Among all the food source analyzed super shops and online platform are the most safest source for food. Because of their strict monitoring, robust supply chain, control, traceability, accountability. Although these sources are not completely risk free but with proper monitoring, supplier standard and brand reputation makes them a reliable food source of Bangladesh.

Chapter 8: Cross Source Analysis of food Adulteration in Bangladesh

8.1 Overview

In our country food adulteration occur in multiple stages of food supply chain starts from farmer in rural areas and then goes to middlemen and wholesaler after that carries by Kacha Bazar seller to street vendors and finally super shop to online platform. By comparing all those sources we can identify **who contributes the most in adulteration, which food item are mostly affected and which region has the most adulteration cases.** This comparison contributes valuable information for policymakers, consumers and businessmen to take effective preventive steps.



8.2 Adulteration Across Different Sources

The table shows that the level of food adulteration varies depending on the different stages or sources of supply chain:

Adulteration Ranking	Sources	Adulteration Level	Reason
1st	Wholesalers	Very High	Higher profit margin, bulk amount storage, long supply chains, weak monitoring
2nd	Middlemen	High	Usage preservative, water injection, increase product freshness
3rd	Kacha Bazar Seller	High	Depends on readily adulterate wholesale food, unhygienic handling
4th	Street Vendors	High	Use cheap material, burned oil, chemical color.
5th	Farmers	Medium	Use chemical fertilizer, growth hormone, harmful pesticide.
6th	Online platforms	Low	Controlled supply chain, brand reputation, product traceability
7th	Super shops	Low	Strong brand image, regular inspection, strong regulations, Controlled supply chain

Farmers have a very little contribution on food adulteration. The highest level of adulteration occurs in the wholesaler level. Where large quantity of food are handled and they prioritize profit over safety. Street level sellers contribute slightly. On the other side super shops and online platform have strict monitoring over adulteration.

8.3 Most Adulterated Food Items

There are some certain food item which are mostly adulterated because of their perishability and higher market demand. The table shows the highest to lowest adulterate food items:

Adulteration Rank	Food Items	Reason
1st	Vegetables	chemical pesticide, chemical base shine, improper washing
2nd	Fish	Use formalin, chemical preservative, hormone mixed feed
3rd	Milk	Added water to increase quantity, detergent
4th	Meat	Water injection, using hormone to increase meat production
5th	Fruits	Calcium carbide for ripening, ethylene, Chemical used to shining
6th	Edible Oils	Mixing low quality palm oil with soybean, adding starch
7th	Broiler Chicken	Hormone treated food to have rapid growth
8th	Street Foods	Uses of burned oil, chemical color, low grade ingredient

High demand items are often targeted to adulterate in most cases. Consumers can not easily verify the adulteration and that makes these products on the top list of health concern.

8.4 Region wise Highest Adulteration

In our country some region contains the highest level of food adulteration because of increasing population density, Huge wholesale hubs and weak inspection. The region given below have the highest adulteration cases among all other region of Bangladesh:

- ❖ **Dhaka:** It places first among the all in case of food adulteration. Kawran Bazar, Jatrabari, and other wholesale market have the highest adulteration cases especially in fish vegetable and spices.
- ❖ **Chattogram:** Reazuddin Bazar and other wholesale hubs have the highest cases of using formalin usage.
- ❖ **Rajshahi:** Has the highest case of fruit adulteration by using chemicals on fruits.
- ❖ **Sylhet:** Also has significant cases of using formalin in fishes.

Most of the adulteration occurs in the urban center of the country because of large wholesale hubs and also creates the highest risk. On the other side rural areas have the moderate risk of adulteration.

8.5 Primary Findings

After conducting the cross source analysis the study finds out that food adulteration is a systematic problem of our country. It begins at the farmer level and becomes most severe at the wholesaler level. Street vendors and Kacha Bazar sellers often extend this to the consumer. On the other hand, super shops contain the lowest level of food adulteration due to reputation concerns and strict monitoring.

The most demandable food items like vegetables, milk, fish, and fruit have the most adulterated cases. The major wholesale markets of urban centers require strict monitoring to prevent adulteration.

Chapter 9: Conclusion & Recommendation

9.1 Summary of Key Findings

This study on food adulteration in Bangladesh Highlight several critical perception:

- ❖ The **first move of adulteration** begin at the **farmer stages** where high price of fertilizer, seed price increase, lack of firming knowledge, pressure from supplier ,and lock of preservation encourage unsafe practice.
- ❖ **Most** of the adulteration occurs in to the **Wholesaler** level because of extra profit margin, lack of monitoring, shortage of cold storage, and supply chain delay.
- ❖ Farmers and seller use chemicals and preservative due to supply chain delay, transportation issue, lack of authority, and the need to maintain freshness.
- ❖ Super shops and Online Platform are comparatively safer because of proper monitoring, selected suppliers, organization reputation, and temperature control storage.
- ❖ Hormones and growth simulants are extensively uses in livestock, poultry, and fish to boost their growth which contain long term health risk.
- ❖ Vegetable and fishes are the most adulterate food item and then comes Milk, meat, fruits, edible oil, boiler chicken and street food.
- ❖ Regionally urban wholesale hubs like Dhaka and Chattrogram have the highest adulteration cases.

9.2 Strategic Recommendation

For Farmers

- ❖ Convert from traditional farming to scientific farming practices.
- ❖ Replace toxic pesticides with natural alternatives like neem oil or mahogany seed oil.
- ❖ Instead of using chemical fertilizer use organic fertilizer and vermicompost.
- ❖ Farmers should use high quality seeds to prevent pesticide and crop loss.
- ❖ Instead of using chemical preservative add cold storage solutions.

For middlemen & wholesaler

- ❖ They should maintain proper hygiene.
- ❖ Obey the law and regulation.
- ❖ Add cold storage to preserve vegetable instead of using chemical.
- ❖ Use ice to store fishes instead of using formalin.
- ❖ Learn about food safety.

For Government

- ❖ BSTI should strengthen their enforcement and increase supply chain monitoring.
- ❖ Government authorities should conduct regular inspection to wholesale markets to prevent adulteration.
- ❖ For selling fish, meat, vegetable, fruits and other perishable item implement mandatory licensing.
- ❖ Organize more training programs for farmers on safe firming method.
- ❖ Government should arrange food safety program to make awareness.
- ❖ Implement heavy penalty for using chemical adulteration.
- ❖ Government should introduce kits to detect formalin and other substance from food.

For Consumers

- ❖ Avoid foods that looks unhealthy, more shiny which may indicate adulteration.
- ❖ In fish market flies always avoid formalin treated fishes try to detect first.
- ❖ Always prefer branded item which contain batch number and expire date.
- ❖ Purchase food from trusted and reliable sources.
- ❖ If possible try to buy from online platform and super shops.
- ❖ After buying fruits and vegetable at first put them in water for an hour.
- ❖ Educate friends and family member about food adulteration.

9.3 Conclusion

In conclusion, food adulteration remains a major issue in Bangladesh by impacting consumers health and trust. To solve the issue both combination of government, consumers, businessmen, and farmers need to cooperate together. Strengthening regulatory frame work, encourage sustainable farming practices, and rising public awareness can reduce food adulteration. Also government can monitor the wholesalers point to control most of the adulteration. By ensuring food safety in every step of supply chain Bangladesh can remove food adulteration, protecting both the population and the agricultural sector for the upcoming generation. Food is the fuel of our body, so we need to ensure safe food for our self and the beloved ones.

References

- Ahmed, M. S., Prodhan, M. D. H., Begum, A., Afroze, M., & Dutta, N. K. (2024). *Pesticide residue contamination in eggplant and hyacinth bean at eight different regions of Bangladesh*. **Asian-Australasian Journal of Food Safety and Security**, 8(2), 67–74. <https://doi.org/10.3329/aajfss.v8i2.77605> [Bangladesh Journals Online](#)
- Ahmmed, K., Islam, S., Noor, N. A. M., Rahman, K. M., & Ahmed, F. (2019). Toward a theoretical framework of relationship marketing in the business context. *Trziste= Market*, 31(2), 209-226.
- Alam, M. M., Hasan, R., Rahman, S. M. M., Choudhury, M. A. R., & Prodhan, M. D. H. (2022). *Analysis of pesticide residues in vegetables purchased from local markets of Mymensingh district of Bangladesh based on QuEChERS extraction and gas chromatography*. **Asian-Australasian Journal of Food Safety and Security**, 6(1), 10–17. <https://doi.org/10.3329/aajfss.v6i1.59746> [Bangladesh Journals Online](#)
- Bangladesh Standards and Testing Institution (BSTI). (2023). *Annual performance report*. BSTI. https://bsti.portal.gov.bd/sites/default/files/files/bsti.portal.gov.bd/page/7b097c56_b6a5_46f4_9644_f2be0b870917/2023-10-10-07-05-85025e1a053a43ba85e4219a0b9dc38d.pdf [BSTI](#)
- Bangladesh Standards and Testing Institution (BSTI). (2025). *Standards for agricultural and food products*. https://bsti.gov.bd/sites/default/files/files/bsti.portal.gov.bd/page/ca7af256_f571_4ec9_ad0c_3b55a0a91a8a/2025-03-09-10-33-e97000cc68d634b2af62fdb3c0daeab8.pdf [bsti.gov.bd](#)
- Dholakia, R. R., & Anwar, S. F. (2009). *Marketing Practices in Developing Economy: Cases from South Asia*. PHI Learning Private Limited. <https://books.google.com.bd/books?id=MjxMDKRyfPoC>
- Noor, N. A. M., & Mahmud, K. (2016). Exploring The Impact Of Use And Non-Use Value On Behavioral Intention To Purchase Organic Foods: Evidence From A Developing Country's Context. *Sains Humanika*, 8(4-2).

- Rahman, M. A., Sultan, M. Z., Rahman, M. S., & Rashid, M. A. (2015). *Food adulteration: a serious public health concern in Bangladesh*. **Bangladesh Pharmaceutical Journal**, 18(1), 1–7. <https://doi.org/10.3329/bpj.v18i1.23503> [Bangladesh Journals Online](#)
- Rahman, K. M. (2016). Packaging. In *Strategic Marketing Management in Asia* (pp. 261-293). Emerald Group Publishing Limited.
- Rahman, K. M. (2016). Strategic Planning and Marketing Models. In *Strategic Marketing Management in Asia* (pp. 59-110). Emerald Group Publishing Limited.
- Rummana, R., Rahman, K. M., Aziz, S., & Nishat, B. (2008). Urban pollution in Dhaka city: A tri-partite qualitative model for alleviation and prevention. In *Proceedings: International Conference on Sustainable Urban Environmental Practices* (p. 297).
- Rahman, K. M., & Mohd Noor, N. A. (2016). Evaluating gaps in consumer behavior research on organic foods: a critical literature review under Bangladesh context. *Journal of Marketing and Consumer Behaviour in Emerging Markets*, 2016(1), 42-50.
- Tasnim, N., Millat, M. N., Sultana, S., Rahman, S. M. M., & Prodhan, M. D. H. (2022). *Multiple pesticide residue determination in major vegetables purchased from Gazipur district of Bangladesh*. **Asian-Australasian Journal of Food Safety and Security**, 6(2), 57–64. <https://doi.org/10.3329/aajfss.v6i2.62865> [Bangladesh Journals Online](#)
- Ahmed, S., Begum, A., & Prodhan, M. D. H. (2021). *Organophosphorus pesticide residues detected in eggplant and tomato samples collected from different regions of Bangladesh*. **Asian-Australasian Journal of Food Safety and Security**, 5(1). <https://doi.org/10.3329/aajfss.v5i1.55015> [Bangladesh Journals Online](#)
- Institute of Food Science and Technology, BCSIR (Bangladesh). (2025). *Homepage*. IFST-BCSIR. <https://ifst.bcsir.gov.bd/>
- Yeasmin, D., Baker, M., & Kamal, A. H. M. (2023). *Exploring customers' perceptions of food adulteration at bazaars and supermarkets in Dhaka, Bangladesh: a qualitative exploration*. **BMC Public Health**, 23, 206. <https://doi.org/10.1186/s12889-022-14933-9> [BioMed Central](#)