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# Isolation and Identification of Bacteria from Food Vendors

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**Abstract**
A fundamental need for food quality is food safety. This project aims to study bacteria associated with food vendors in hi-tech city public places street food vendors, Food such as Pani puri, Fried rice, chat, Shawarma waterleaf, spinach collected from street food vendors in a zip storage bag. 10 food samples were collected from food vendors. On the same day, isolation of bacteria was done from different food samples and the isolates from this study were found to be E. coli, Staphylococcus Aureus, Bacillus, Salmonella species, and Shigella species. Foods that contain several bacteria get transmitted due to use of tainted raw food components and particles, dirty water, unhygienic preparation methods, and infected containers all contributed to the contamination and unhygienic conditions, which may result in foodborne infections involving diseases that affect the cardiovascular, musculoskeletal, respiratory, and immune systems. Besides these, some beneficial bacteria stay in the intestine.

**Keywords :** Food,Vitamin,Protein,Carbohydrate.

## Introduction

Food plays an important role in human survival. A vendor is an individual selling something. The globe Vitality Organization (WHO) denoted that foodborne diseases, the vast majority of which, are of microbial origin are possibly the greatest widespread issues in the modern world and this is responsible for about one 3rd of deaths global wide; Moreover, infectious conditions with harmful effects can decrease economic productivity. Deprived sanitary conditions in many of the local markets and the environment being highly polluted and sizzling with spoilage and pathogenic flora is doubtless the origin of the contamination of meal items sold by such vendors. Humans not only obtain nutritional requirements from food but also consume undesirable microorganisms which could be hazardous for the body. Most foods contain sufficient nutrients to support microbial growth. The most important factor is water availability, pH, and temperature. Millions of people get sick from contaminated foods all over the world. One of the major problems in the health sector is food-borne diseases.

## Objectives

- **Protein**

A member of a class of organic molecules containing carbon, hydrogen, oxygen, Nitrogen and oxygen (Sulphur and phosphorus may also be present). The complicated structure of a protein molecule is made up of one or more chains of amino acids connected by peptide bonds. Proteins are vital components of the body; they provide structural support for muscles, tissues, organs, and other bodily structures and hormones. Proteins are created in the body from their amino acids, which are derived via the digestion of protein in food, and are equally important as regulators of function of that diet.

- **Vitamin**

Any set of compounds that the body cannot generate on its own, making them vital components of the diet. They are needed in very small amounts for healthy growth and development. If a vitamin is soluble in water or fat determines which of the two groups, it belongs to. Fat-soluble vitamins and vitamin C are among the water-soluble categories including mins A, D, E, and K. Certain vitamin deficiency diseases occur when the diet is deficient in one or more vitamins.

**Review of Literature**

Foodborne disease is a major cause of health problems. It is caused by eating contaminated food that contains bacteria, viruses, parasites, or chemical substances such as heavy metals. This growing public health problem causes considerable socio economic impact through strains on health care, loss of productivity and harming tourism and trade.

Foodborne diseases are caused by the contamination of food and occur at any stage of the food production, delivery, and consumption chain. Foodborne illness is a major health issue worldwide. Nowadays, irrespective of age, everyone is suffering from food-borne diseases. In developing countries, a major source of ready-to-eat foods is prepared and sold in public places Such as streets, markets, metro stations, schools, offices, malls, exhibitions, etc. Street foods (SFS) are cheaper, especially pain puri. Nowadays everyone loves to eat irrespective of age. Some people eat daily street side foods as evening snacks, especially children, bachelors, and spenders, and some people avoid vigorous efforts of preparing food as time-consuming.

However, many studies have shown that food plays a major role in a healthy life. Food sold by food vendors is the primary factor in causing disease because some foods are prepared with low-quality food items, such as reusing cooking oil without a deep fryer is extremely harmful to your health.

**Factors That Impact Food-Based Illness**

Poor personal hygiene, incorrect food preparation, exploitation of the time-temperature relationship, improper cooling of foods, and cross-contamination of raw and cooked foods are some of them.

**●Personal Hygiene Issues**

Food contamination can occur because of poor personal hygiene, such as when a food worker neglects to thoroughly wash their hands after using the lavatory. Toilets and restrooms provide a significant risk of fecal contamination. Everyone carries bacteria on their hands, lips, skin, and several other regions of their bodies, including their hair. Employees in the food industry have the potential to contaminate food and spread disease. Food workers may transfer pathogens to food by touching a contaminated surface, moving contaminated food from one container to another, or using hands that have been infected with gastrointestinal germs.

**●Using Time and Temperature Relationships Abusively**

A second aspect that might result in food-borne illnesses is the misuse of the link between time and temperature. Food-borne sickness must be avoided if you want to Limit the amount of time food is exposed

to dangerous temperatures. This means that cold foods should be maintained at 410 For lower and hot meals should be kept at 1400 F or above (FDA, 2004). Salads should not be left at room temperature for longer than two hours after being cooked or refrigerated (FDA, 2004). Time-temperature relationship issues arise for the following reasons:

- Food is not cooked or reheated to a temperature high enough to kill hazardous microorganisms; food is not stored, prepared, or retained at the needed temperature.
- Before serving, food is cooked, and proper temperature control is not upheld.

**Food Cross-Contamination Between Raw and Cooked**

When hazardous microorganisms are transferred from a surface to food or from one food to another, it is referred to as cross-contamination of raw and cooked foods.

When food contact surfaces are not cleansed or sterilized as required for food safety, cross-contamination may occur (FDA, 2004). Before beginning to prepare food, before handling a different meal (for example, if you have touched raw chicken, wash your hands before preparing a salad), and after using the loo, it is vital to wash your hands with soap and warm water to prevent cross-contamination. Never cough or sneeze on food.

Never allow raw food to touch cooked food because organisms can "travel" from raw to cooked food.

**●Those who are more Prone to Food-Borne Illness**

**Include:** Infants and young children are at high risk for food-borne illnesses,

Older people, expecting mothers, people with immune system-impaired conditions including HIV, AIDS, liver illness, or cancer.

**Materials And Method**

**Hardware:** The following hardware materials were used for this research. i Electric thermostatic incubator (DNP.9022-1A) ii Autoclave (Yx-280A) iii

Microscope (XSZ-107BN) iv Refrigerator (FR-330) v electronic scale.

**Software :** The following software materials were used for this research. i Nutrient Agar ii. MacConkey Agar iii. Salmonella, shigella Agar (SSA) and

Kovac's reagent vi Acetone vii Safranin viii Hydrogen peroxide.

**Sample Collection**

A bacteriological survey was conducted in different vending sites at hi-tech city in Hyderabad.

Five fried rice plates, 5 Pani puri plates, and five vegetables were purchased from various vendors in the hi-tech main market and studied to determine their level of bacterial contamination and safety for human consumption.

**Methods:** All media used were weighed appropriately and prepared according to the

Manufactures' instructions

. They were autoclaved at 1210C for 15 minutes. The cooled were poured into Petri dishes and then allowed to cool and solidify (see Appendix 1)

- clean sterile covered plates were used to dish the foods.
- Sterile polythene bags were used to collect and transport the purchased samples on ice to prevent bacteria multiplication during sample transportation to the department's laboratory where the analysis was done.

- a 10g portion of each food sample was macerated. iv. 9 ml of sterile distilled water was poured into a test tube.
- 1 ml of each macerated sample was added into the test tube containing 9 ml of sterile distilled water.
- Fourthly, fold serial dilutions made from 10 -1 to 1040 were examined using the pour plate method.

**Culture of Sample (Pour Plate)**

- Briefly, each plate was carefully labeled on top, and one military (1ml) of each dilution from 10 -1 – 1040 was pipetted into nutrient agar plates.
- Shaking of these plates was done as soon as the agar was poured, to have the microorganisms separated during growth.
- The medium was allowed to be set on a flat top bench after which plates were incubated aerobically and anaerobically at 370 c for 24 hours.

**Result**

In this investigation, a total of 25 street food samples were examined for bacterial contamination.

**Discussion**

Gastroenteritis has remained a major health care problem in Nigeria both in terms of human suffering and food-borne illness. The isolation of bacteria in all the food samples (n-25). Fried rice, Pani puri, and vegetables from different vendors in the hi-tech city main market indicated that the frequency of Salmonella species was more significant in water Leaf (2.9 X 107 CFU/ML) and not significant in jollof rice (2.5 X 103 CFU/ML). The unacceptable total bacterial count of >104 CFU/ML of screened food samples implies extreme contamination and potential health risk of these street food samples. The high incidence of bacterial contamination encountered in this study was mainly due to the largely unhygienic nature of the food preparations and services areas of foods are good indicators of the state of the environment in which they are prepared or served. The majority of the street food centers are located beside waste disposal points and dusty roads. Furthermore, the lack of running water, sewage disposal infrastructure, inappropriate storage conditions, and the presentation of this food in the open encouraged multiple contaminations. Results showed that isolates obtained from Jollof rice gave the lowest colony forming unit/ml. The significant or unacceptable colony forming unit was from salmonella species, isolated in water leaf, a major cause of food-borne gastroenteritis and typhoid fever, Bacillus cereus was isolated in jollof rice, Vibrio species were also isolated from soup samples, this may be a result of cross-contamination either from the raw vegetable or water used in the soup preparation. The Shigella species was isolated from green (Spinach) this may be a result of fecal contamination from the manure used. Escherichia coli. Being isolated in us is responsible for the high prevalence of diarrhea, fever, nausea, and cramps in children and adults exposed to contaminated food. Staphylococcus aureus isolated from Jollof rice and water leaf is a pointer to largely poor personal hygiene, improper storage facilities, use of low-quality raw materials, and an unhygienic environment. The use of the so-called food thermos flask to store food before sales contributed to the proliferation of the bacteria and consequently the high level of microbial count recorded in the study as these devices hold foods at bacterial growth temperatures.

**Conclusion**

The street food business has remained largely unregulated in Nigeria, notwithstanding the sector's contribution to the nation's food security. Wholesome and nutritious street foods have a positive impact on food security, while consumption of street foods of low and below minimum safety standards is injurious to health on an acute or chronic basis. The findings of this study illustrate that bacterial contamination is present in fried rice, Pani puri, and vegetables sold in the hi-tech main market.

And that the CFU/ML of Salmonella species is high, since it is more significant (2.9 X 107 Cfu/ml) and can cause food poisoning. Other organisms isolated such as coli, Shigella, and Staphylococcus. Aureus, Bacillus cereus, and Vibrio species which were also isolated in insignificant numbers could still cause food-borne illness depending on the consumer's health status. Staphylococcus aureus was less significant in jollof rice. Therefore, it is very important and necessary for food vendors to always clean and sanitize food contact surfaces, and cook and store food properly, to reduce the level of food contamination and also to reduce bacterial load to the lowest level, thereby preventing cases of foodborne infections. Results also indicated that factors such as the vendors themselves (e.g., personal cleanliness etc.), and the type of food affect the bacterial contamination present in foods

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