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Study on microbiological quality of fast food in Nangarhar

Sayed Mohammad Weqar[1], Mohammad Nazer Faisal[2], Samiuddin Rahil[3]
[1, 2] Veterinary Science Faculty, Nangarhar University, Jalalabad, Afghanistan
[3] Agriculture Faculty, Said Jamaluddin Afghan University, Kunar, Afghanistan

Abstract
Microorganisms cause nutritional and sensory deterioration foods, producing loss of quality and limiting shelf life. Food-borne pathogens are the leading cause of illness and death in developing countries costing billions of dollars in medical care and medical and social costs. When the government want make strategy for controlling of food borne illness and the people have to purchase better quality food need to researched about the causing agent of poisoning, contamination of food because Studies made in Nangarhar pointed out that the important aspect of fast foods is their safety and understanding the possible ways of contamination. Microbial contamination of fast foods could occur due to different possible reasons such as storing foods in cheap utensils, holding foods at a temperature that would permit bacterial growth, utilization of water of questionable hygienic quality, using packing materials that were not of food-grade quality, vending site that has no facilities for waste disposal and utilization of unclean utensils. In addition, street foods vendors are unaware of the basic importance of personal cleanliness, thus their products are usually vulnerable to gross contamination by flies, insects, rodents, dust and other dirt. It is also indicated that fast food are often poor and uneducated and lack appreciation for safe food handling. aims of the study were to determine microbiological quality of fast food in Nangarhar Province Afghanistan. According to our result we have seen 12 sample positive of burger, 10 sample of fry chicken and 8 sample of pizza for shigella and only 4 sample of fry chicken sample were positive for Salmonella. So the people must use those fast foods which are purchasing in hygienic conditions and not present as a vender shape.

Keywords: vender food quality, food borne illness, pathogen, quality, hygiene, fast food

Introduction
Life is getting very fast nowadays. People barely have time to have their meals properly. Therefore, they have foods from the streets which are known as street foods. Street foods and fast foods are becoming very popular in the developing countries like Afghanistan. Contamination of food is one of the most serious issues that the food industries of Afghanistan are facing today, which not only causes major economic losses for the processing industry, but also a major health risk for the consumers. Fast food is a good media for microbial growth due to high nutrient value. The microbiological quality of food during retail marking mainly depends upon the post production handling of the product, in addition to the efficiency and sanitary condition during preparing, handling, processing and storage. Contamination of food by pathogenic micro-organisms at some processing steps resulted in several disease outbreaks in numerous countries of Asia, Europe and America. Food-borne pathogens are the leading cause of illness and death in developing countries costing billions of dollars in medical care and medical and social costs [1]. Changes in eating habits, mass catering, complex and lengthy food supply procedures with increased international movement and poor hygiene practices are major contributing factors [2]. Contaminated raw meat is one of the main sources of food-borne illnesses [3, 4]. Foods contaminated with entero pathogenic bacteria are an important factor contributing to the high incidence of diarrhea in developing countries [5]. Pathogenic *E. coli*, nontyphoid *Salmonella* serovars, and *S. aureus* remain a potential threat to human health with beef, broiler chickens, and pork serving as possible sources of these organisms in the environment [6, 7, 8]. The clinical significance of these pathogens cannot be overemphasized. Pathogenic *E. coli* is recognized as an important pathogen in outbreaks of acute diarrhea especially in developing countries [9, 10, 11].

Most of the studies done on street foods in India and other countries had indicated that these foods were not meeting the microbiological standards and were contaminated with various pathogens like *E.coli*, *Vibrio*, *Salmonella*, *Listeria* etc. [12, 13] had reviewed about the food borne illnesses associated with the consumption of street foods. These food borne illnesses were leading cause of morbidity and mortality worldwide [14]. The microbiological status of the food had been reported to be dependent on several factors like quality of raw material [15, 16], handling and processing of food [15], microorganisms that survive the preservation and storage treatment [17], post process contamination [18, 19]. Sometimes, the food was not covered and the foods got infested by flies and other insects. The water used in the food and to wash the materials was of poor quality. Beside direct health consequences, these food borne illnesses can reduce the productivity and economic output, and also impose substantial stress on health care system [20]. For these reasons, identification of these microbes is necessary to stop health problems.

There are different types of restaurants or shops selling these foods. Some are placed on the streets openly, some are mid level shops and some are very high qualified restaurants such as, KFC, BFC, and Pizza etc. These are very well known restaurants for these foods especially fried chicken, Green hot and pizza etc.

The eastern zone of Afghanistan has long border with Pakistan. According to the long chain border various kind of fast foods are imports here from various legal and illegal ways, which has low quality. Imports low quality fast food and vending fast food are the causing Agents of food borne illness. For this purpose we have to be examining the quality of fast food which are purchasing here in Jalalabad city.

2. Objectives

2.1. Hypothesis

2.1.1. Street vending food is causing agent of food borne illness.

2.1.2. Hot, humid climate, flies, insects, dust and unhygienic condition of street vending food is highly favorable for contamination.

2.2. Aims of the study are to determine microbiological quality of fast food in Nangarhar.

2.3. Parameters

2.3.1. Determination of pathogen microbes (Salmonella, shigella, staphylococci, streptocooci) in fast food

3. Materials and Methods

3.1. Study area and sample collection

A total of 72 samples of burgers, potato chop, Chicken fry from 4 different shops were purchased from my work place, Jalalabad city Afghanistan. Shops were mainly one street, one lower mid-level, one higher mid-level and one higher level. The food samplebs has been taken in sterile plastic bags and kept here till analysis.

3.2 Media

Different types of media were used. These were Nutrient broth agar, MacConkey agar, manitol salt agar and SS agar. MacConkey agar was used as a selective and differential culture medium for bacteria. It was designed to selectively isolate Gram-negative and enteric (normally found in the intestinal tract) bacilli and differentiate them based on lactose fermentation. It contained crystal violet and bile salts, those inhibit the growth of gram-positive organisms and allowed for the selection and isolation of gram-negative bacteria. Nutrient agar was used as a general purpose medium which supported the growth of a wide range of non-fastidious organisms. Manitol salt Agar: it is selective Media for the growth of staphylococci. SS agar is selective Media for Salmonella and Shigella.

3.3. Sample collection

Sample was collected and immediately put into sterile tip bag to avoid any type of outer contamination. If it could not be done immediately, sample should have been kept in the refrigerator until sampling was done.

3.3.1 Sampling

The sample was serially diluting up to six times in saline solution and each of the test tubes were labeled properly. All the agar plates is also label properly and only the dilution from 10-3-10-6 are spread in all of the media, which is Nutrient agar, MacConkey agar, then we have been used SS Agar for salmonella and Shigella. Then we have introduced it to plate for culturing. After plating, all the plates were kept in incubator for 24-48 hours for growth.

3.7. Place of Work: Nangarhar University, Veterinary Science faculty.4. Result of the research

Many fast foods are perishable by nature and require protection from spoilage during their preparation, storage and distribution in order to provide them with the desired shelf life. The exact results have been showed in below table.

Table 1

Result of the Shigella Samples					
Fast food	**Total sample**	**Positive sample**	**%**	**Negative sample**	**%**
Potato and beef burger	24	12	50%	12	50%
Fry Chicken	24	10	41.66%	14	58.33%
Pizza	24	8	33.33%	16	66.6%
Result of the Salmonella Samples					
Fast food	Total sample	positive sample	%	negative sample	%
Potato and beef burger	24	0	0%	24	100%
Fry Chicken	24	4	16.66%	20	83.33.33%
Pizza	24	0	0%	24	100%

5. Discussion and Summary

A study which has done by Akbar Islami in Iran in 2017, he has diagnosed 270 samples for fast food microbial contamination. From these 270 samples, 13.3 % were positive for Shigella and 14.44 % for Salmonella (Eslami *et al* 2017). Also a study which is completed by mahboob Husain and their colleagues in Bangladesh for microbial contamination of fast food at 2014, they have find 10.18 sample positive for Salmonella spp and 2.7% for Shigella. In 2010 a study done by Sadia and Husnain Essa in Saudi Arabia, they have diagnosed 60 samples from 15 hotels in different areas of the mentioned country, they have seen 5.53% positive samples of burger and 5.76% samples of fry chickens for Shigella but do not find positive sample for Salmonella. but the study which is present completed we have seen 12 sample positive (50%) of burger, 10 sample positive (41.66%) of fry chicken and 8 sample positive (33.33%) of pizza for shigella and only 4 sample (16.66%) of fry chicken were positive for Salmonella.

Many fast foods are perishable by nature and require protection from spoilage during their preparation, storage and distribution in order to provide them with the desired shelf life.

We are resulted that which fast food are purchasing in vender shape those are infected by salmonella, shigella and other type of Pathogenic bacteria.

Finally, people should become more aware in having foods from outside. People selling and preparing the foods should also become more alert. Food safety rules and implementation of food regulatory laws in food preparation, serving and preservation should be strongly maintained to avoid contamination problems and food-borne diseases.

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