

# A Study on Bacteriological Detection of Food-Borne Pathogens

Laraib Nadeem, Hira Batool\*

Department of Microbiology, Jinnah University for Women

## ABSTRACT

This study was conducted to estimate the bacteriological quality of different fast food items. Standard microbiological methods were used for isolation, enumeration and identification of bacteria. A total of 9 samples were collected from different sources like: Fries, Roll paratha, Zinger burger and some bakery products like bread, Rusk, simple cake, and some fresh fruits sample were also used like orange, banana and apple. Bacteria were isolated by serial dilution technique. Then isolation and identification of bacteria perform by cultural characteristics on Blood agar and MacConkey agar. Gram staining, colony morphology and biochemical characteristics also performed for further confirmation. Four strains of pathogenic organisms were identified as *E.coli* 29%, *Staphylococcus epidermidis* 25%, *Pseudomonas* 25%, *Staphylococcus aureus* 42.85% and *Bacillus subtilis* 29%. Recent study concluded that fast food can lead to food poisoning and food borne illnesses. Heftiness is related with an expansion in respiratory issue. Obesity increases the likelihood of heart diseases, kidney disease, joint pains, high blood pressure and diabetes. Your kidney stone, kidney disease and stomach cancer risk may also increase due to the excess amount of sodium, and may also increase your risk of developing osteoporosis (thin, fragile bones). The top risk factor for heart disease and stroke may cause due to the high cholesterol and high blood pressure. Chocolate and greasy foods were possessing high amount of carbohydrates increase blood sugar levels, they may also trigger acne. Fast food was identified as potential health hazards it can be proposed that satisfactory cleanliness rehearses are required in the wake of cooking the nourishments and furthermore before serving.

### Keywords

Food safety, Pathogens, fast food items, food borne illnesses

### Address of Correspondence

hb\_heer@hotmail.com

### Article info.

Received: April 3, 2017

Accepted: May 29, 2017

**Cite this article:** Nadeem L, Batool H, Nadeem GS. A Study on Bacteriological Detection of Food-Borne Pathogens. *RADS J. Biol. Res. Appl. Sci* 8(2):11-14.

**Funding Source:** Nil

**Conflict of Interest:** Nil

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## INTRODUCTION

Fast food is a sort of nourishment which can be cooked and served rapidly and is prepared for prompt utilization. Much of the time it holds such fixings which can supply different basic microorganisms for their ideal development (1). There was a wide variety of snacks foods, including Burger, Pizza, fried stuff with cheese, French fries, all type of food items are called "fast food." This nourishment may appear to be exceptionally tasty however it can hurt your wellbeing over the long haul (2).

If the food is prepared there are so many options for bacteria to contaminate fast foods. Proper hygiene is very important when it comes to food preparation (3). Without washing hands and kitchen tools, diseases may easily spread. In the event that nourishment prepares don't completely wash their hands, kitchen utensils, cutting surface and other kitchen surface that come into contact with crude substances, cross pollution the spread the spread of micro organisms from tainted sustenance to

uncontaminated nourishment may happen and maladies may effortlessly spread (2, 4). It appears that fast food has turned into a normal matter of life. All over the world people are seriously affected every day by diseases that are caused by consuming unhygienic and unsafe food. Fast food is ordinarily high in calories which bring about eating excessively calories. It can prompt an additional weight pick up and eventually corpulence. There are numerous unsafe impacts of fast food on wellbeing, for example, corpulence, diabetes, heart issues or some other ceaseless issue. The pathogenic organisms are capable of causing illness in common peoples (5). Food-borne pathogens are a major threat to food safety. Fast food can lead to food poisoning and food borne illnesses. Most food-borne illness is caused by infection by microbial pathogens (6). Food-borne illness can also be caused by toxins (microbial or chemical) that have contaminated food. Bacteria can contaminate food and make it harmful to eat during growth, harvesting or slaughter, cutting and processing. Food borne infection some time caused "food borne disease" or "food (5, 7). Different types of micro organism that are involved in food borne infection like: *Staphylococcal*, *Salmonella*, *Campylobacter jejuni*, *Shigella bacteria* Shigellosis, *Escherichia coli* O157:H7, *Clostridium botulinum*.

Food borne disease are the infection of GIT that occurred by foods, beverages, harmful microorganism, viruses, or some kind of chemicals (8). The treatment for most food borne illnesses is replacing lost fluids and electrolytes to prevent dehydrations (8). Food-borne microbes are usually killed or controlled by cooking or chilling. Most food-borne illness can be prevented by avoiding cross-contamination. This is achieved by storing cooked and raw food separately, cooking food thoroughly and washing hands before and after touching raw food (9). Food borne illnesses can be prevented by properly storing, cooking, cleaning, and handling foods (10).

## MATERIALS AND METHODS

### Source of sample:

The fast food samples were collected from local markets, JUW and home sample.

### Sample collection Preparation:

A total of 9 sample of fast food items were collected from different sources like: Fries, Roll paratha, Zinger burger and also collected some bakery products like bread, Rusk, simple cake, and some fresh fruits sample were also used like orange, banana and apple. A total of nine (9) samples of fast food items were aseptically blended serial dilution were made up to ten-fold dilutions for each prepared sample by weighing 1g of the food sample and dissolve in 9ml of sterile distilled water for the serial dilution and then plating on different agars plates incubated for 24 hours at 37°C. The isolated were identified by conventional methods. Next day performed gram staining and biochemical test and observed colony. After that performed biochemical test:

## RESULT

The 9 samples are subjected to culture; all the food sample was obtained from various sources were contaminated with bacteria. Five different species were isolated. The frequency of bacteria isolated from the (9) sample and the percentage of occurrence of bacterial isolated, were the highest are *Staphylococcus aureus* (42.85%), *Escherichia coli* (29%), *Staphylococcus epidermidis* (25%), *Pseudomonas aeruginosa* (25%), and *Bacillus* (29%). The morphological appearance of bacteria isolated from the food sample that were observed and recorded on blood and MacConkey agar respectively, which may be due to the poor sanitary practices by food processing and handling. The cultural identification of *E. coli* on MacConkey was done by observing pink fermenting colonies. The Blood agar show beta hemolysis indicated the presence of *Bacillus subtilis* and MSA indicated the presence of *S. aureus*. For the further confirmation perform the biochemical test to the gram negative perform TSI and citrate and for *S. aureus* perform catalase and coagulase. The *E. coli* is TSI butt and slant (acidic) and give gas production and citrate negative. *P. aeruginosa* in TSI give butt (alkaline), slant (acidic) and give no gas production and citrate positive. The *S. aureus* is coagulase and catalase positive. The gram reaction shows the *Bacillus subtilis* are gram positive rods in purple and *S. aureus* are gram positive cocci in bunches. For the further confirmation of *S. epidermidis* perform the antibiotic susceptibility test in this we use Novobiocin and its give 20mm and 22mm zone of inhibition its indicated

that the presences of *S. epidermidis* because it was sensitive to Novobiocin.

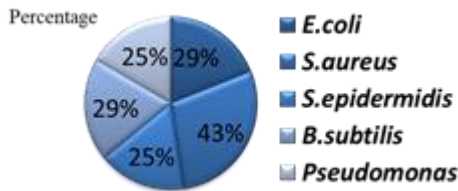


Fig 1: Percentage of Microbes Isolated From Fast Food

Table I: Novobiocin Susceptibility Test for Confirmation

Organisms	Zone of inhibition	Results
<i>S. epidermidis</i>	22mm	Sensitive

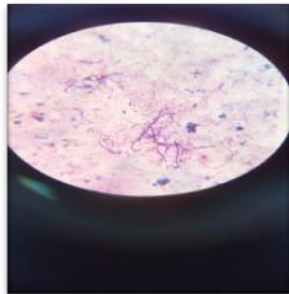


Fig 1: Gram staining of Bacillus

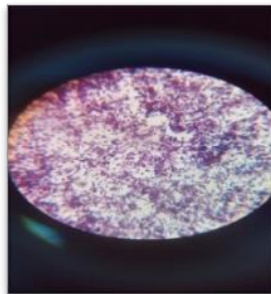


Fig 2: Gram staining of *S. aureus*



Fig 3: Confirmation of *S. epidermidis*



Fig 4: TSI results of *P. aeruginosa*



Fig 5: *E. coli* on MacConkey



Fig 6: *S. aureus* on MSA

## Discussion

This study was conducted to mainly identify presence or absence of microbial pathogens. In this research we analyzed that all the fast food samples were heavily contaminated with different kinds of bacteria. In our nation , a large portion of the fast food things were arranged and prepared physically and showed with inadequate insurance from tidy and flies , which can be some important way for bacteria to get entry in to these foods (1). The present study showed that often people eating at "fast food" which is associated with higher weight and less healthy eating habits (11). Tragically most sustenance handlers don't think about keeping up appropriate cleanliness and great assembling rehearses, which at least prompt microbial pollution in nourishments. Utilization or consumption of these foods containing heavy loads of pathogenic bacteria causes food poisoning and food borne illness and provides the evidence for the presence of pathogenic bacteria in the fast food which are associated with potential infection. Pathogens can cause different types of food borne illness. Most food borne infections were intense they are happen suddenly, and most common people recover on their own without medication (3). The occurrence of pathogen in grilled chicken is an important public health risk because of the great demand of routinely consumption of this product for consumers. To prevent occurrence of food borne illness it is therefore, important to ensure that food sold are safe and hygienic (9). It can be prevented by proper cooking , cleaning , and handling food.

## CONCLUSION

Foods may also be contaminated with micro organism during food preparation in a home kitchen or restaurant and lead to food poisoning and food borne illnesses. Hence, it is concluded that fast food might seem very delicious but it can harm your health. A total of 9 samples run and isolated and identified the pathogenic bacteria. This research indicates that utilization (or consumption) of fast foods may pose a risk of food borne illnesses and that good hygienic practices should be required to ensure public health.

**REFERENCES**

1. Ahmed S, Tasnim UT, Pervin S, Islam MT. An assessment of bacteriological quality of some fast food items available in Jessore City and antibiotic susceptibility of isolated *Klebsiella* spp. *Int J BioSci*. 2014;5:125-30.
2. Clarke Nancy. *Negative Effects of Fast Foods*, 2015. Available: <http://www.livestrong.com/article/283394-negative-effects-of-fast-foods/> Apr 14, 2015.
3. Ahmed J, Hossain ML, Malek MA, Begum F. Assessment of bacteriological quality of fast foods and soft drinks in relation to safety and hygiene. *Bangla J Mic*. 2008;25(1):73-5.
4. Global Food Safety. *Pathogenic Organisms*. Global Food Safety Resource 2006. Available from: <http://globalfoodsafetyresource.com/pathogenic-organisms/>
5. Nedorostova L, Kloucek P, Kokoska L, Stolcova M, Pulkrabek J. Antimicrobial properties of selected essential oils in vapour phase against foodborne bacteria. *Food control*. 2009 Feb 28;20(2):157-60.
6. Taulo S, Wetlesen A, Abrahamsen R, Mkakosya R, Kululanga G. Microbiological quality of water, associated management practices and risks at source, transport and storage points in a rural community of Lungwena, Malawi. *Afr. J. Microbiol. Res*. 2008 May 1;7(2):131-7.
7. Oranusi SU, Oguoma OI, Agusi E. Microbiological quality assessment of foods sold in student's cafeterias. *Global Research Journal of Microbiology*. 2013;3(1):1-7.
8. Stsedrova J. *Fast Food Fatal Fight Slide Share*, Estonian University Of Life Sciences Food Stuff Technology, 2012. Available from: <https://www.slideshare.net/Fatafight/fast-food-11059834>.
9. Bukar AM, Isa YA, Garba AA, Muhammad I, Sulaiman MM. *Bacteriological Quality Assessment Of Some Snacks Sold In Fast Food Shop Within Maiduguri Metropolitan Council*. 2015.
10. Rodgers G. *Food borne Illnesses*, National Digestive Diseases Information Clearinghouse U.S, Department of Health and Human Service 2014. Available from: <https://www.niddk.nih.gov/health-information/digestive-diseases/foodborne-illnesses>
11. Jeffery RW, Baxter J, McGuire M, Linde J. Are fast food restaurants an environmental risk factor for obesity?. *International Journal of Behavioral Nutrition and Physical Activity*. 2006;3(1):2.