

Invitro Evaluation of Microbial Load in Bread and their Antibiotic Susceptible Nature

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Abstract: Bakery products, like bread has become an important staple food in many countries. Cereals and bakery products serve as a valuable source of nutrients in the diet of many people. They provide most of our food calories. Bakery products provide nutrients such as carbohydrates, proteins, lipids, Vitamins and minerals. A variety of bakery products are available in the market. Earlier bakery products were considered as a sick man's diet or poor man's diet. It has now become the essential food item for a vast majority of the whole

Keywords: Bakery products

I. INTRODUCTION

Bakery products, like bread has become an important staple food in many countries. Cereals and bakery products serve as a valuable source of nutrients in the diet of many people. They provide most of our food calories. Bakery products provide nutrients such as carbohydrates, proteins, lipids, Vitamins and minerals. A variety of bakery products are available in the market. Earlier bakery products were considered as a sick man's diet or poor man's diet. It has now become the essential food item for a vast majority of the whole population. Bread is made by mixing flour, Salt, Yeast and other ingredients which is followed by baking.

The basic process involves mixing the above ingredients until the flour is made into dough. The dough is baked into a loaf. The dough is made in such a way that will rise easily and be able to give a bread of good quality to the consumer. Yeast is used the dough which releases CO₂ and the bread becomes spongy. Earlier airborne yeasts were used in making bread. This was done by keeping the dough exposed to air for some time before baking.

Bread loves fresh out of the oven are free of molds or mold spores due to their thermal inactivation during the baking process. Bread becomes contaminated after baking, from the mold spores present in the atmosphere surrounding loaves during cooling, Slicing, packaging and storage. Most common source of microbial spoilage is due to mold growth.

Food safety is crucial in the quest of healthy eating and sustainable food systems because it ensures that food is safe for human consumption. Grains and grain products account for a significant component of the food consumed by many people around the world. Bread is a grain product that is consumed by people of various genders, ages, ethnicities, and faiths around the world. Due to its primitive origin, simple production technology and wide consumption, bread has attracted a significant level of food innovation in terms of recipes diversity and improvement in production technology that have led to complete automation of production system thereby minimizing human contact leading to improvement in food safety, quality and hygiene in developed nations. However, the same cannot be said of most developing countries in which the bread production system is still largely a traditional affair dominated by traditional technology and persons with limited levels of education; lacking knowledge of food safety and hygiene practices.

These have led to bread being produced in an unhygienic environment characterized with high level of hazardous food safety practices. Poor food handling techniques have been linked to food-borne disease in studies. [Clayton DA, et al., 2002.]

According to the previous studies bread molds like Mucor and Rhizopus are found to grow first during bread spoilage. [Banwart, G.J. 2004].

Bread is a stable food prepared by cooking a dough of flour and water and some additional ingredients. Salt, fat and leavening agents such as Yeast (*Saccharomyces cerevisiae*) and baking soda are common ingredients. Bread may contain milk, egg, sugar, spice, fruit, vegetables, nuts or seeds.

Fresh bread is prized for its tastes, aroma, quality, appearance and texture. There are several different types of bread prepared around the world, viz., white bread, brown bread, whole meal bread, wheat germ bread, whole grain bread, Roti or Chapatti, Granary bread, Rye bread, unleavened bread or matzo, sourdough bread, flat bread, hemp bread, crisp bread etc. In breads the amount of flour is always stated as 100% and the amounts of the rest of the ingredients are expressed as a percent of that amount by weight. The grains used in flour making provides starch and proteins needed to form bread. The protein content of the flour is the best indicator of the quality of bread. In addition to starch, the wheat flour contains three water soluble proteins viz., albumin, globulin and proteases, and two water insoluble protein, glutenin and gliadin. When flour is mixed with water, the water soluble proteins dissolve, leaving the glutenin and gliadin to form the structure of the resulting bread. Ascorbic acid, hydrochloride, sodium metabisulphate, ammonium chloride, various phosphates, amylase and protease are commonly used as ingredients to improve the quality of bread. In addition to these, three natural phenolic glucosides viz., secoisolariciresinol, P-coumaric acid glucoside and Ferulic acid glucoside are also found in commercial breads.

Bread is eaten all over the world by almost peoples of every culture if we traveled to the other side of the planet we would probably find a culture very different from our own, yet with its own version of bread. Therefore; bread is a food that has desirability to all population rich and poor, rural and urban.

Thus, none of any food types compete with bread in line with consumption in the world. In Nigeria, bread has become the second most widely consumed non- indigenous food product after rice, also in Ethiopia, next to Injera the bread is highly consumed and loaves among most people, particularly in urban area daily and on holiday. **(Shittu TA, et.al(2007)**

Bread may be described as a fermented confectionary product produced mainly from wheat flour, water, Yeast and salt by a series of process involving mixing, kneading, proofing, shaping and baking. The consumption of bread and other baked goods such as biscuits, doughnuts and cakes produced from wheat flour is very popular, but the low protein content of wheat flour, which is the most vital ingredient used for the production of different kinds of baked goods has been major concern in its utilization **(Dewettinck K., et al.,2008)**

Bread is prominent food for the world population, it is affected the health of the people in case of contaminated with pathogenic microorganisms. Basically, the surface of a fresh baked bread free of viable microorganisms; however, it is subject to contamination by mould spores and bacteria from the air, improperly sanitized utensils, and handlers, transporting equipments and wrapping materials.

Ehvald and Estonia explained that more than 90% of bread contamination occurs during cooling, transporting, slicing, and wrapping operation. Moreover, it has been reported that mould spores in proofer's clots in bakeries can build up enough heat resistance to survive baking. **(Ehvald H, et al(2009).**

Study on soy flour supplemented wheat flour in making bread was done. Study was done in cookies made of a blend of wheat, yam and soybean. **(Sanful, et al.,2010)**

Food safety is essential for healthy living and overall well-being, because a shortage of safe food leads to food insecurity, which leads to malnutrition and foodborne infections. Food spoiling is a metabolic process that causes changes in sensory characteristics of food, making it unattractive or unsatisfactory for human ingestion. Spoiled food is safe to eat if it does not cause sickness since it contains no germs or poisons, but it is rejected due to changes in texture, smell, taste, or appearance. Freshly baked bread is almost devoid of living microorganisms on the surface, but airborne mold spores contaminate it during cooling and prior wrapping. Microorganisms in the air, on the blades, or on the case can all cause contamination while slicing. Bacterial spores that cause bread to become rosy survive baking.

[Pundir, R.K. et al,2011]

Previous studies done by Oluwajoba et al (2012) have shown bread as a good source of nutrients namely macronutrients (carbohydrate-52%, protein-9% and fat- 1%) and micronutrients that are important for health. **(oluwajoba, et al.,2012).**

The microorganisms associated with the storage of biscuit produced from composite flour of 60% maize and pigeon pea have been studied **(Olunlade et al., 2013).**

Bread is a meal that is typically consumed unprocessed, making it a potential cause of food-borne disease if handled incorrectly. Open and unsealed loaves of bread are frequently exposed to hot and humid conditions, which raises the risk of new microbial contamination and the spread of previously infected organisms. As a result of the disparity between developed and developing countries in terms of advanced food processing and enhanced food safety practices, all bakery operators must be well-trained and prepared to deal with such issues. Knowledge of the chemical, physical, and biological processes involved in bakery technology flow, as well as the impact of new operations and devices on the entire production, are critical in managing the major issues. This is required because consumers desire bread that has the same flavor, look and aroma as traditional goods, but is created in a safer environment and has longer shelf life comparable to innovative technology. [Olusegun T Afolabi, et al 2015].

Baked foods and cereals offer enough nutrients and calories to meet daily requirements.

They are important food sources in our diet, supplying the majority of our dietary calories and about half of our protein requirements. Carbohydrates, proteins, fats, vitamins and minerals are all found in baked foods. They are crucial for customers, particularly those in the low and middle income stratum whose basic diets rely on street food. Bread is the second most popular non-native food in Nigeria after rice. Despite the fact that bread is a staple diet for the world's population, it has been shown to be hazardous to human health when contaminated with pathogenic microbes. [Demissie, S, et al, 2018.]

Microorganisms play a crucial function in the baking process in terms of constancy and formation of aroma, but they can also cause damage or spoilage. Despite attempts by food regulators to enhance hygienic and sanitary conditions and eliminate risky food safety practices in the bread-making industry in Nigeria, the sector remains mired in poor food safety standards due to poverty, illiteracy, corruption, and tax regulation. While a few significant bakery enterprises have been able to build their bakery brands on a national scale, they remain insufficient and unavailable to the poor. As a result, the growing demand is satisfied on a smaller scale from unlawful and semi-authorized local producers that is rarely checked by current food regulatory agencies. Consequently, so many individuals are at danger of foodborne diseases and adulteration. [Md. Shovon Al-Fuad et al, 2018]

Food borne illness is a major health problem associated with foods and results from ingestion of bacteria and / or their toxins present in foods. Food borne illnesses have a consequential impact on global economic in addition, increased multidrug resistance trends of foodborne microorganisms make the global economy more vulnerable in tackling issues of food safety as it relates to public health. Food borne continue to be of significant interest in Nigeria and other countries. Unfamiliar problems have been created due to development in food countries. Unfamiliar problems have been created due to development in food products. The processing and handling of foods, change of food habits and availability of convenience foods available for sale in stores has created general impression that shelf life of a food is closely related to its acceptability. The question of dating and labeling of retail packages has been considered essential features of dating and labelling of retail packages has been considered essential features of acceptable quality assurance and quality control programs. However, in Nigeria such programs are still underdeveloped. Consumers are aware of the potential for large scale food borne outbreaks because of mishandling of improper processing of foods such as breads and other pastries and demand a safer supply.

Many industrially produced baked goods emerge from the baking process with a surface that is essentially sterile, but post bake handling can quickly lead to contamination.

Microbiological spillage is often the major factor limiting the shelf life of baked products. It has been estimated that in the United States alone, losses due to microbiological spoilage are over 90 million kilograms of products each year. The most principal factor influencing the microbiological spoilage of bakery products is the water activity (a_w). For low-moisture bakery products ($a_w < 0.6$), microbiological spoilage is not usually a problem.

In intermediate moisture products ($a_w = 0.65-0.85$), osmophilic yeasts and mould are the predominant spoilage microorganisms, and a_w of Pita bread exceeds the intermediate range. Yeasts which cause bread surface spoilage are mainly *Pichia burtonii* ('chalk mold'), while osmophilic yeast contaminations occur from unclean utensils and equipment. Post baking germination of surviving Bacterial spores may also initiate bread spoilage. Therefore, maintaining good manufacturing practices will minimize contamination by osmophilic yeast and other spoilage microbes. Losses due to mould spoilage vary between 1-5% of products depending on season, type of product, and method of processing. Although fresh bread and other baked products are free of viable vegetative mould spores,

products soon become Cereals played an important role in human diet and were consumed long before bread making process was developed. The consumption of bread and other bakery products has increased within the past decades. Next to bread, biscuit is one of the most commonly consumed baked snacks. In India, breads and biscuits constitute over 80 percent of total bakery products produced in the country. The urbanization has resulted in increasing demand for ready to eat food items at reasonable price. Although bakery products were considered as poor man's diet earlier, they have now become essential food items in the day-to-day life of a large majority of human population Bread is a food produced by baking leavened dough mixed with yeast that weights onehalf pound or more after cooling. This dough might be prepared by mixing one or more ingredients such as flour, Water, Yeast, shortening (fatty acids), milk and/or other dairy products, egg, nutritive carbohydrate sweeteners, enzymes, lactic- acid-producing bacteria, non wheat flours, yeast nutrients, and calcium iodate and/or calcium peroxide, azodicarbonamide, dough strengtheners, spices, colouring reagent and other ingredients. [Defraeye, et al., 2016].

These ingredients need to be strictly controlled and regulated, and bread can be enriched bread, milk bread, raisin bread, and whole wheat bread. Bread, particularly white bread, was claimed to be the highest quantity consumed since the other group of bread such as whole wheat, cracked wheat, rye, and raisin were more associated with the higher income groups. [Gebiski, et al., 2019].

Bread is a historic dietary item that dates back to the Neolithic era, prepared by baking inside the oven. The history has been traced back to around 10,000 years BC or over 12000 Years ago where bread might have been developed by experimental mixing of water and grain flour. It is believed that Egyptians were the pioneers by making the Art of bread making popular throughout the world. [Bredariol, P., et al., 2021].

Food has long been acknowledged as one of life's essential requirements, because of its potential to bring sustenance, health, and vitality to the consumer. Despite the importance of food, it is now well accepted that both risky food preparation and risky eating behaviour contribute to a rise in foodborne disease outbreaks. Microorganisms in the ecosystem are always looking for nourishment in order to survive. Their dining habits unavoidably have a negative impact on our food system, which is bad for human health. [Eke M.O. et al., 2021].

Even though, the bread is highly consumed as daily meal in home, cafeteria and tea shops. The microbial safety of this delicious food is still not documented on the other hand the bread is eaten by nearly all of the world population but some groups of the consumers are criticized about the microbial safety of the bread because of unhygienic of transporting material handling and storage place of bread, which is presently appeared. Hence, having this scenario insight the present study was carried out to evaluate the microbial load in bread sold in different areas and to evaluate their antibiotic susceptible nature

II. MATERIALS AND METHODOLOGY

SAMPLE COLLECTION

A 10 leaves of fresh bread sample were collected from different local supermarket. Each of sample was collected in sterile polythene bags and sealed and labeled, stored in refrigerator before processing.

NUTRITIONAL ANALYSIS

The Nutritional composition of the bread was studied according to the methods of AOAC (2005).

SAMPLE PROCESSING

10g of each sample was homogenized with 99ml of saline to prepare stock solution. Serial dilution were made nutrient agar, mannitol salt agar, sabouroud dextrose agar, macconkey agar, EMB agar, were prepared inoculated and incubated.

CHARACTERIZATION OF ISOLATED ORGANISM

The bacterial isolated were identified by Gram staining, motility, cultural characteristics and biochemical tests were carried out.

GRAM STRAINING:

A thin smear was made from the colonies of agar plate and heat fixed . The smear was covered with the 2-3 drop of crystal violet for minute.

The slide was washed with the water and then covered with the gram's iodine for minute.

Again the smear was washed to decolourised slide gently adding acetone alcohol till it destain the gram's iodine.

Then the slide was counter strained with saffarin for 30 sec.

Once again the slide was washed with the water blot to dries with tissue paper and viewed under the oil immersion microscope.

Purple - Gram positive.

Pink – Gram negative.

MOTILITY TEST:

A drop of cell suspension is placed on to a centr of coverslip with the help of an inoculation loop.

Vaseline placed on four corners of cover slip.

A clean cavity slide is carefully placed over the frof of coverslip. The slide is inverted quickly. Then it observed the low power objective.

BIOCHEMICAL TEST INDOLE TEST:

Tryptophan broth is prepared, sterilized and dispensed into sterile test tube.

Inoculate the test tube of tryptophan broth with the test organism and incubation at 37 °C for 24 hours.

After incubation, add 0.2ml of Kovac's reagents and shake. Allow to stand for minute and read the results.

Red ring formation - positive result.

No red ring formation – negative result.

METHYL RED TEST

MR - VP both was prepared sterilized to dispensed into sterile test tube. Inoculate the tubers with the test organism and incubation at 37 °C for 24 hours.

After incubation, add 5-6 drop of methyl red solution and shake. Allow to stand for minute and read result.

Red colour – positive result. Yellow colour – negative result.

VOGES PROSKAVER'S TEST:

MR – VP both was prepared sterilized to dispensed into sterile test tube.

Inoculate the tubers with the test organism and incubation at 37 °C for 24 hours. After incubation, add 0.2 ml of VP reagents B and shake.

Allow to stand for minute and read result. Red colour – positive result

Yellow colour – negative result.

CITRATE UTILIZATION TEST:

Simmon citrate agar is prepared, sterilized dispensed into sterile test tube.

The slant were made and inoculate with the organism. The test tube were incubation for 37 °C for 24 hours.

Prussian blue colour – positive result. Green colour – negative result

CATALASE TEST:

The test was performed to detect the enzyme catalase.

The enzyme is responsible for protecting bacteria from hydrogen peroxide accumulates it becomes toxic to the organism that break hydrogen peroxide into water and oxygen.

To perform this test a small amount of test organism is placed on lid of the petriplate or glass slide.

Then a drop of hydrogen peroxide is added, formation of bubble indicate the presence of catalase.

Lack of bubble indicate that absence of catalase.

Buddle formation- positive result.
No buddle formation – negative result.

OXIDASE TEST:

Some bacteria poses the enzyme of oxidase that form the part of electron transport system. The enzyme oxidase the reagents N-N tetra methyl parapheylene diamine dihydrochloride to a colour product indolephenol. When the growth of orgaism is rubbed over the filter aper contamination this reagentspurple developed. Dark purple – positive result.No colour – negative result.

UREASE TEST:

The Christensen's agar medium was prepared, sterilized and dispnd into sterile test tube. The slant were made and incubated with the organism. The test tube is inoculated at 37⁰c for 24 hours.

Pink colour – positive result

Red colour – negative result.

OXIDASE FERMENTATION (O/ F) TEST

Peptone	-2g
Yeast extract	-1g
Nacl	-5g
K2hpo	-0.2g
Glucose	-10g
Bromothymolbce	-0.08ml
Agar	-2.5g
Distilled water	-1000ml

15ml of freshly prepared oxidation fermentation medium (O/F) test were autoclaves and immediately cooled to avoid dissolution of oxygen in the medium. The both culture were inoculated and incubated. A oxidative metabolism displayed yellow in the upper half of the tube and green in the lower half. Fermentative metabolism displayed as yellow in both halves of test tube. Acid formation and growth region were interpreted after 2 to 5 days of incubation at 32 degree Celsius

DETERMINATION OF TOTAL BACTERIAL COUNT

Nutrient agar prepared and used for the determination of the total bacterial count. Nutrient agar plates were dried and labeled with appropriate dilutions. Plates were inoculated and incubated at 37°C for 24 hours.

DETERMINATION OF STAPHYLOCOCCUS COUNT

Mannitol salt agar was used to determine the Staphylococcus count in bread. The mannitol salt agar inoculated and incubated for 24 hours at 37^o₃. The yellow colour colonies were noted, coagulase test and catalase test were carried out for

DETERMINATION OF COLIFORM BACTERIA

EMB agar prepared was used to detect the coliform bacteria. The plates were inoculated and incubated 37^o₃ for 24 hours. The metallic sheen colonies were observed.

SELECTIVE MEDIUM FOR E.COLI:

The EMB agar is prepared and poured in petriplate and allowed to get solidify. The sample were streaked on the agar plate and inoculated at 37°C for 24 hours.

After incubation, the plate were observed for bacterial growth and formation of metallic sheet colonies.

SELECTIVE MEDIUM FOR STAPHYLOCOCCUS:

The manitol salt agar were prepared and poured in petriplate and allowed to get solidify. The sample were streaked on the agar plate and inoculated at 37 °C for 24 hours.

After incubation, the plate were observed for bacterial growth and formation of golden yellow colonies.

ANTIBIOTIC SUSCEPTIBILITY TEST:

The antibiotic susceptibility test for pathogens isolated from the bread samples were tested using the disc diffusion method. The MHA plates were prepared and swabbed with the pathogenic microbes. The standard antibiotic disc chloramphenicol, Amoxicilin, Gentomycin, Streptomycin, Erythromycin, Vancomycin, were used for testing. The plates were incubated and the zone of incubation was measure.

III. RESULT

Bread is eaten all over the world by almost peoples of every culture. If we travelled to the other side of the planet we would probably find the culture very different from our own, yet with its own version of bread. Therefore; bread is a food product that is universally accepted as a very common and convenient form of food that has desirability to all population rich and poor, rural and urban. Thus, none of any food types compete with bread in line with consumption in the world. In Nigeria, bread has become the second most widely consumed non-indigenous food product after rice.

Bread is prominent food for the world population it is affected the health of the people in case of contaminated with pathogenic microorganisms. Basically, the surface of a fresh baked bread free of variable Microorganisms. However it is subjected to contaminated by mould spores and bacteria from the air, improperly sanitized utensils, and handlers, transporting equipments and wrapping materials.

The present investigation carried out to evaluate the microbial load in bread sold in different areas to execution their antibiotic susceptibility test.

The bread purchased from 3 different bakeries and the nutritive content were analysed sample A has the high content of protein and B has low content of protein when compare to C. The fat content ranged between 2.0 ± 0.04 to 5.0 ± 0.12 . The crude fibre range between 0.10 ± 0.02 to 0.5 to 0.01 . The results were shown in Table 1.

Microbial load in bread samples tested in this study. The organisms average counts was found to be higher 1.22×10^7 cfu/g, 2.08×10^3 cfu/g, 4.84×10^8 cfu/g. The results were shown in Table 2.

The organism shows small, round, convex golden yellow colonies on the plates of MSA and the small, mucoid, round shiny, convex metallic sheen colonies on the EMB plates. The results were shown in Figure 2 The organisms were confirmed by the Biochemical test and the results were shown in Table 3 and Figure 3.

The bacterial isolates were tested for their percentage of sensitivity and are mostly sensitive to Gentamycin and Streptomycin. The organism shows resistant to Chloramphenicol. This may result in drug abuse. The results were shown in Table 4.

Table 1 shows the Nutritional composition of bread

S.No	Sample	MC%	Protein(%)	Fat(%)	Fibre(%)
1	A	27.22±0.3	9.79±0.11	20±0.09	0.10±0.02
2	B	28.45±0.3	9.29±0.06	4.0±0.08	0.20±0.02
3	C	29.05±0.21	9.23±0.09	5.0±0.12	0.50±0.01

Table 2 shows the Microbial load in Bread samples

SA(CFU/g)	S.No	Sample	THB	TC(CFU/g)
8.0×10^8	1	A	1.22×10^7	0
1.84×10^7	2	B	2.08×10^3	0
1.0×10^3	3	C	4.84×10^4	2.0×10^6

Table 3

S.No	Indole	MR	VP	Cit	Cat	Oxi	Starch	Urease	O/F	Organism
1	-	+	+	+	+	-	-	+	+	Staphylococcus aureus
2	+	+	-	-	+	-	+	-	+	E.coli

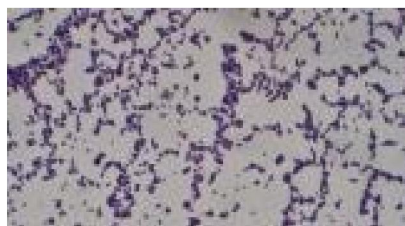
Table 4 shows the Antibiotic susceptibility test

S.No	Antibiotics	Zone of inhibition in mm	
		E. coli	Staphylococcus aureus
1	Chloramphenicol	10 mm	10 mm
2	Amoxicillin	13 mm	15 mm
3	Gentamycin	19 mm	22 mm
4	Sterotortcin	15 mm	18 mm
5	Erttgromycin	12 mm	14 mm
6	Vancomycin	14 mm	17 mm

FIGURE : 1
SHOWING THE IDENTIFICATION FOR STAPHYLOCOCCUS STAPHYLOCOCCUS ON MSA PLATE



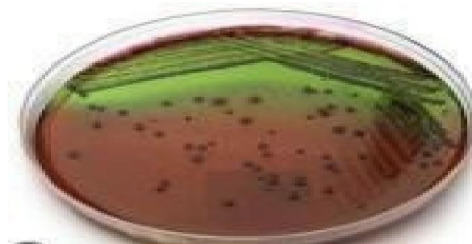
GRAM STAINING



BIOCHEMICAL TEST



FIGURE: II
SHOWING THE IDENTIFICATION FOR *E.COILE.COIL* ON EMB PLATE



GRAM STAINING



BIOCHEMICAL TEST



IV. DISCUSSION

Bread and bakery products are most widely consumed food all over the world. Even in Bangladesh bread and flour consumption is increasing due to health consciousness and to some extent for higher price of rice. They are good sources of nutrient and protein and provide high biological value in our diet. Variety of breads and other bakery products have gained popularity among consumers in the last decade and their sales have been increased notably.

The determination of Microflora carried out in this study is necessary to safeguard the health of public. This study provides the basic information about the microbes in bread likely to cause food-borne disease when present in bread which is ready to eat type of food.

The organism load is due to the improper handling (ie) storage & packing. It found after the 3 days of storage similar to our study Saranraj and Geetha(2012). On the 4th day of storage the texture of the bread became hard. This may be

due to the ropiness caused by bacteria. The bacterial load in the bread samples was relatively high on the 4th day and afterwards. It showed that there were some microorganisms which were eat-resistant may have been associated bread dough and subsequently found in the bread. This was confirmed to be the *Bacillus Sp*. It has the ability of forming endospores which are known to be heat resistant.

The *Staphylococcus & E.coli* prevalence in the bread samples, similar to our study Demissie et al 2018. The overall 68.9% bread samples were positive for *S.aureus*. However, the frequency distribution varied among the bread suppliers. Accordingly it was a prevalent as 93.3% of *S.aureus* in tea shop and 70% in cafeteria bread whereas the lowest prevalence.

The antibiotic sensitivity test shows that Gentamycin and Streptomycin shows highest level of inhibition. Similar to our study Ojo ss. et al 2021. The mostly sensitivity towards gentamycin, Streptomycin, Ampicillin, Crythromycin and amoxicillin, while fungal isolates were most sensitiveto mistatin. The organisms resisted griseofulvin, micoten, augmentin, septrin and chlorompheenicol completely. This maybe as a result ofdrug abuse or misuse.

To assure the food safety for a specific public health concern, his study investigated the microbiological safety of the bred production process. According to the findings the microbial counts are present on the various phases of bread production. However, with the expection of coliforms, the microbial counts for the bread making process were within international norms/rules for food safety.

During the mixing, kneading and rising of the dough, Staphylococcus aureus & E.coli were more prevalent. E.coli is a source if worry since they increase susstantial health risks for consumers and they can lead to food poisoning outbreaks. It is therefore, recommended that throughout the manufacturing and packing of bread, handlers must maintain stringent cleanliness; dough mixing kneading and rising should be done in sanitary settings, bread processors should wear suitable protective clothes to prevent human flora from getting into the bread and utensils and materials should also take proactive measures to monitor and address problems on a regular basis.

This study is step towards evaluating the microbial safety of bread production. Further more research is needed, however to assure food safety and improve public health.

V. CONCLUSION

Bread is known as safe food commodity due to their low water activity. But isolation and enumeration of microbes in this study revealed that prevalence of microbes includes pathogenic organisms. As bread is most commonly consumed food products, their microbiological quality is important to consumer's health. Further more research is needed to assure the food safety and improvement in public health.

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