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Research Article

Microbiological evaluation of meat sold in butcheries shop of Cheleleka town in anchar woreda, West Harerge, Oromia, Ethiopia Western Ethiopia

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Abstract

Food borne infections and disease are a main international health problem with consequent economic loss and deaths. Meat is considered the most vital source of proteins consumed by humans, so far, most perishable. For highly consumable foodstuffs such as fresh red meat, the hazard of food poisoning is mainly high since it contains all the nutrients that support bacterial growth. The objective of the study was evaluated bacteriological meat quality sold in shops of Cheleleka town in west harerge zone, Oromia region, Ethiopia. Samples of kitfo and gored-gored were collected from five different meat shops. The microbial quality of raw meat sold in five most popular meat shops in the of Cheleleka Town was determined to ascertain its safety. The meat samples were taken from Genet, Wondu, Ayichuluhum, Alemayehu, and Kamil shops. A total of 10 raw meat samples were collected in two successive visits. Raw samples from Ayichuluhum had the highest mean total aerobic bacterial count of 3.3×10^6 cfu/g for kitfo and 2.8×10^6 cfu/g for gored-gored. The lowest counts were obtained from Genet (7.8×10^5 cfu/g and 7×10^5 cfu/g) for Kitifo and Gored-gored were recorded respectively. The highest mean fecal counts (2.0×10^6 cfu/g for kitfo and 1.7×10^6 cfu/g for gored-gored) were obtained also from Ayichuluhum shop. From Genet shop was seen the lowest fecal coliform bacterial counts of 4.3×10^5 cfu/g for Kitifo and 4×10^5 cfu/g for gored-gored. Bacterial species isolated from the samples were mostly Gram-positive rods and Gram-positive spherical bacteria in clumps. Some Gram-negative rods were also seen some of which may be fecal coliforms. The high bacteria count and diversity of bacterial isolates from the samples tested is an indication of its low bacteriological quality, and this can make it a potential source of food infection.

Abbreviations

CDCP: Centre for Disease Control and Prevention; CFUs: Colony Forming Units; FAO: Food and Agricultural Organization; HACCP: Hazard Analysis Critical Control Point; NIAID: National Institute of Allergy and Infectious Diseases; TPC: Total Plate Count; TVC: Total Viable Count; WHO: World Health Organization

Introduction

Background information

Food security is a complex issue, where animal proteins such as meats, meat products, fish and Food safety is a complicated issue, wherein animal proteins inclusive of meats, meat merchandise, fish and fishery product are commonly appeared as an excessive-hazard good to contamination and toxication [1]. These meals borne infections and the ensuing ailments are a number of the fundamental worldwide demanding situations that cause excessive mortality and financial loss [2]. In the industrialized world, meals borne contamination reason tremendous ailments that closely have an effect on healthcare systems [2]. Food borne illnesses are illnesses because of ingestion of microorganism, pollution and cells produced through microorganisms found in meals [2,3]. The depth of the symptoms and symptoms and signs and symptoms can also additionally range with the quantity of infected meals ingested and susceptibility of the people to the toxin. Meat and meat merchandise are occasionally infected with germs after leaving the manufacture plant and throughout handling [4]. Hygiene situations are negative while ingredients are produced in nonindustrial establishments, especially because of inadequate tracking throughout processing. These infected meals finally

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end up infecting or intoxicating children, aged and immune suppressed people who are surprisingly susceptible [4]. The muscles of wholesome dwelling animals are typically loose from micro-organisms. However, throughout the slaughtering system, this meat receives infection on outside floor, inclusive of hair and skin, the gastrointestinal and breathing tract [5]. Based on research, the gadget used withinside the slaughtering and dressing operations (knives, saws, cleavers, and hooks) make tremendous contributions to the general infection through direct touch with hides and hair in addition to through touch with steels, knife scabbards and the garb of operatives [6].

Research have proven that after carcasses and cuts are sooner or later dealt with complete the meal's distribution channels, they more and more get extra infected [5,7]. In growing countries, illnesses due to infected meals represent one of the maximum tremendous fitness troubles in addition to a prime reason of decreased financial activity [3]. Meat isn't always most effective surprisingly prone to spoilage, however additionally often implicated to the unfold of meals-borne illness, numerous biochemical adjustments and microorganisms are related to meat, throughout the system of slaughter, processing and preservation (Olaoye, 2010). Approximately 69% of gram-bad microorganism are recognized to reason bacterial meals borne disease (Onkoko, 2010). Several researchers have pronounced that the meats pattern had been infected with excessive degree of Klebsiella pneumonia, Enterobacter sp, Pseudomonas aeruginosa, E. coli, Salmonella sp, Serratia marcescens and Proteus vulgaris, Staphylococcus aureus and Bacillus sp (Onkoko, 2010). On the opposite hand, meals-borne pathogens can disseminate from infected meat to the surfaces and might unfold infections within side the community (Gorman, 2002). Meat offered in stores incorporate better microbial load due to the huge amount of uncovered floor area, extra with ease to be had water, nutrient, and extra oxygen penetration [Forest]. Meat is spoiled while it's miles not worthy for human intake. Meat is subjected to adjustments through its very own enzyme, through microbial movement and its fats can be oxidized chemically through microorganisms which can be grown on the beef inflicting visual, textural, and organoleptic extrade once they launch metabolites [8]. According to the International Meat Secretariat Newsletter, (November 30, 2005) its miles pronounced that as the same old of dwelling improves, meat intake additionally will increase. These will increase in meat needs are stated to be because of improved urbanization, better disposable income, and the human preference for a greater diversity of their diets (Sofa, 2008). Therefore, the protection of meat has been withinside the vanguard society worries in latest years and proof exists that the demanding situations of meat protection will maintain withinside the future [Sofa]. Consequently, very crucial to put into effect right hygiene and protection tactics throughout slaughter, handling, and processing meat.

Meat is the ones elements of a slaughtered animal that are in most cases meant for human and animal intake, and that have now no longer gone through any processing apart from de-boning, reducing up, mincing, cooling, or freezing. The number one unit of meat is known as carcass. It represents the perfect meat after elimination of head; hide, gut and blood [9]. The fit to be eaten elements of a carcass consist of lean flesh, fats flesh and fit to be eaten glands or organs which includes heart, liver, kidney, tongue, and brain. Meat is spoiled whilst it's miles undeserving for human intake. Meat is subjected to alternate via way of means of its personal enzymes, via way of means of microbial movement and its fats can be oxidized chemically. Microorganisms develop on meat inflicting visual, textural, and organoleptic alternate once they launch metabolites [8]. Most meat for human intake comes from home animals, along with cattle, pigs, sheep, chickens, turkeys, ducks, and rabbits. Meat is a nutritious meal because the protein presents all vital amino acids withinside the proportionate quantities required via way of means of guy and is likewise an exceptional supply of iron, thiamine and niacin, phosphorus, potassium, and sodium 8 [9]. Butcher meat is a treasured a part of the human weight-reduction plan because:

a) it's miles the maximum focused and is a great supply of nice protein, that is, it includes the ones amino acids that are vital for human life.

b) it's miles stimulating to metabolism because of its excessive protein content material it assists the frame withinside the manufacturing of warmth and energy.

c) it's miles satisfying, for the presence of fats withinside the weight-reduction plan delays emptying of the stomach [10].

It is expected that greater than 2 billion humans withinside the international are poor in key nutrients and minerals specially diet A, iodine, iron, and zinc [11]. Deficiencies arise whilst humans have confined get admission to to micronutrient-wealthy ingredients such meat, fish, fruits, and vegetables [11]. Most humans with micronutrient deficiencies stay-in low-profits nations and are commonly poor in a couple of micronutrients. Highly nutritious ingredients which includes meat are specially required for HIV AIDS inflamed groups and youngsters and women [12].

The bacteriological situation of carcass meat is relatively depending on the manner, wherein meat animals are reared, slaughtered, and processed [13]. The presence of excessive suggest values of microbial load of scrapings from meat stalls become suggested in Ibadan metropolis, Nigeria [14]. A Microbiological popularity of sparkling pork cuts, environmental reassess, in a beef and Fecal coli-shape Contamination of Beef Carcasses at some point of the Slaughtering Process suggested 1.2×one hundred and one - 6.3×100 and 1 cfu/g and three.16x101 - 8.9x 101cfu/g for faecal coliform depend in sparkling pork samples respectively [15,16]. It is essential that simplest fantastically easy animals be provided for slaughtering, considering its miles extraordinarily hard to reap easy meat from grimy animals. The presence of fecal coliforms is indicative of fecal infection and of the capability presence of enteric pathogens in particular bacterial pathogens [17]. Therefore, the cleanliness of farm animals relies upon on husbandry, climate and climate, techniques of shipping and maintaining situations on the

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abattoir. Cattle from feedlots may also convey greater fecal microorganism and much less soil organisms [5]. Although the muscle mass of animals is freed from micro-organisms; it is able to effortlessly contaminate with each pathogenic and non-pathogenic microorganisms on the time of slaughter below terrible processing situations. In addition, the excessive nutritive fee of meat makes it a super medium for bacterial boom [18]. Some seemingly healthful animals may also harbor diverse micro-organisms withinside the liver, kidneys, lymph nodes and spleen. These microorganisms and people from infection through slaughtering can migrate to the skeletal muscle groups through the circulatory system [19]. In general, the micro-flowers of meat may be that of the feedlot that are at the outside surfaces of the animal contaminating the beef via way of means of direct touch through air, water, soil, manure and the arms and gear of the workers [20]. The healthful internal a part of meats has been suggested to comprise few or no micro-organisms, despite the fact that they had been observed in lymph nodes, bone marrow, or even flesh [21]. Staphylococci, Streptococci, Clostridia and Salmonella, had been remoted from the lymph nodes of red-meat animals. The essential infection, however, comes from outside reassess at some point of bleeding, handling, and processing. During bleeding, skinning, and reducing, the primary reassess of micro-organisms are the outside of the animal (hide, hooves and hair) and the intestinal tract [22]. Comminuted meats which include floor pork continuously have better numbers of microorganisms than non-comminuted meats which includes steaks [23]. Commercial floor meats usually encompass trimmings from diverse cuts. These portions had been dealt with excessively and therefore commonly comprise greater micro-organisms than meat cuts which includes steaks. Ground meat additionally presents a more floor vicinity, which itself money owed in element for the improved flowers. This more floor vicinity of floor meat favors the boom of cardio microorganism, the standard low-temperature spoilage flowers. One closely infected piece of meat is enough to infect others, in addition to the whole lot, as they by skip through the grinder. This closely infected element is regularly withinside the shape of lymph nodes, that are usually embedded in fats. These organs had been proven to comprise excessive numbers of micro-organisms and account in element for hamburger meats having a usually better general depend than floor pork [23].

Meat carcasses are relatively infected via way of means of touch with unhygienic surfaces, via way of means of employees and airborne organisms, will continue to be a opportunity in all operations at some point of the following records of the beef [7]. These will consist of chilling, freezing, processing, reducing, packaging, shipping, sale, and home handling, despite the fact that a few reassets of infection are glaringly eliminated whilst the carcasses go away the slaughter floor [5].

Bacteriological high-satisfactory of uncooked meat product is strongly stimulated via way of means of the triumphing hygiene situation at some point of their manufacturing and handling [13]. The carcass of a healthful animal slaughtered for meat and held in a refrigerated room is probably to have simplest minimum floor bacteriological infection whilst the internal tissues are sterile. After chilling, similarly processing of carcasses can bring about uncooked meat product infection. When carcasses and cuts are sooner or later dealt with through the meal's distribution channels, they're subjected to more and more micro-organisms from the reduce surfaces [21]. Contamination sooner or later happens via way of means of the creation of micro-organisms on the beef surfaces in operations carried out at some point of reducing, processing, storage, and distribution of meat [3]. However, if the beef is saved easy via way of means of stopping infection through grimy arms, clothing, gadget and centers and the beef is saved bloodless and covered, there may be very little infection via way of means of micro-organisms whether or not microorganism, yeasts, moulds, viruses, or protozoa [13]. A worker who does now no longer comply with sanitary practices are the biggest infection supply of uncooked meat that they meet spoilage and pathogenic micro-organisms through paintings and different elements of the surroundings whilst their arms, hair, nostril and mouth, harbor microorganisms that may be transferred to uncooked meat at some point of reducing, processing, packaging, and promoting via way of means of touching, breathing, coughing, or sneezing [5]. Therefore, withinside the prevention of meat infection, private hygiene performs an essential position as there are as many as two hundred one-of-a-kind species of microorganisms on a healthful human frame (Featherstone, 2003).

Infectious illnesses unfold through meals or liquids are a common, distressing and from time-to-time life-threatening hassle for tens of thousands and thousands of humans across the international (NIAID, 2002). The U.S. Centre for Disease Control and Prevention (CDCP) expected that, seventy-six million humans be afflicted by meals-borne ailments every yrs. withinside the United States (CDCP, 2008). This money owed for the 325,000 hospitalizations and greater than five,000 deaths. Cheleleka recorded one of the maximums ever numbers of meals poisoning instances in 1990 (Kimani, 2001). A general variety of greater than two hundred,000 outpatients had been dealt with at authorities' hospitals. Food-borne illnesses in particular the ones as a result of pathogenic organisms, continue to be a critical hassle in all nations and are extraordinarily expensive to treat (Duff, et al. 2003). Health professionals estimates that every year value of all meals-borne illnesses withinside the United States is $five to $6 billion in direct clinical costs and misplaced productivity (NIAID, 2002). In growing nations, in which the hassle of diarrheal ailment is a long way more, the impact on financial hobby and improvement can simplest be a long way greater severe (Adams et al., 1999). Diarrhea is a function of maximum of the meals-borne illnesses and as much as 70 percentage of all episodes of diarrhea may also end result from ingestion of infected meals and water (Adams, etal. 1999). World Health Organization (WHO) suggested that fifty million youngsters below five years get diarrheal illnesses every yr because of infected water and foodstuff (Tavakoli and Riazipour, 2008). In maximum instances, meals aren't infected intentionally, however alternatively because of carelessness or inadequate schooling or schooling in meals safety. Meat intake without sanitary care may also purpose illnesses which includes

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tuberculosis, salmonellosis and cysticercosis in consumers (Azevedo and Bankuti, 2003).

To allow dangers worried to be expected and suitable measures to be taken, evaluation of the slaughtering technique have to be carried out via way of means of series of abattoirs - unique microbiological tracking data, according with Hazard Analysis Critical Control Point, (HACCP) principles [24]. An ordinary microbiological exam of carcasses lets in dependable conclusions to be drawn approximately long-time period hygienic situations in slaughterhouses and butcheries. The microbiological manipulate consists of checking out of the complete manufacturing chain; with samples taken from manufacturing and intake.

Bacteria are microscopic organism which isn't visible via way of means of bare eyes. However, the variety of bacterial in every pattern are required to recognize in positive factors which includes butcheries, ailment research etc. Because of this, a whole lot of techniques had been evolved for the enumeration of microorganisms (along with microorganism) like direct microscopic counts, membrane filtration and possible plate counts [25]. Among those techniques of enumeration, possible plate counts are getting used maximum frequency to degree bacterial populations. Viable plate counts simplest determine (degree) the variety of possible bacterial observed withinside the samples, in contrast to the microscopic counts which can't distinguish stay from lifeless cells. However, possible plate depend takes from time-to-time colonies to develop [26]. Before doing plate counts, serial dilutions required to triumph over Colony Forming Units (CFU) are too severa to depend. The best of CFU have to be <300 colonies on agar plate. This is because of when primary bacterial sample inoculated without serial dilution. It is hard to number more than 300 colonies on an agar plate [27]. Later on, incubation the colonies were counted to find the colony forming unit per centimeter square cfu/cm2, all the visible colonies are calculated and represented as CFU.

Statement of the problem

Meat is an important source of protein and a valuable commodity in resource-poor communities [28]. However, while meat is a rich nutrient source, it can also be a potential vehicle of human food borne illnesses (FAO/WHO, 2013). Inappropriate slaughtering and retail operation can compromise food safety and more so, in densely populated areas like informal settlements [25]. Slaughtering process is frequently unhygienic, and this makes meat to be easily contaminated. Meat products from such condition often deteriorate rapidly and pose a health hazard [12].

In developing country, carcasses supplied to informal settlements are normally transported in crowded, unrefrigerated trucks or portioned meat and offal transported at ambient temperatures in non-insulated metal bins on taxis [12]. External contamination of meat constitutes a major problem that leads to death of many children and the resulting diarrheal disease can have a long-term effect on children's growth as well as on their physical and cognitive development [2,3]. in most developing countries. Equipment's (like knife) and butcheries, where there are potential sources of contamination reportedly have significant effect on the meat shelf life [6]. Contamination may include pathogens such as Salmonella, Vibrio cholerae, E. coli,and Listeriaspp, thereby causing severe problems to consumers (Elmossadam, 2003). Since the beef carcasses can even remain on shelves for days before they are sold, it was important to determine the presence of pathogenic bacteria such as fecal coliform (E. coli) and Staphylococcus aures that are indicators of excessive human handling [3]. In addition, bacteriological quality of meat was also evaluated. Despite the recorded risk and diseases such as anthrax, diarrhea could be reported due to raw meat, there is still limited surveillance of presence of pathogens hence an infection by these pathogens ends up undetected (Kelly, et al. 2004). In Ethiopia, there is minimal quantitative data microbes present along the food continuum and risk factors. This study therefore aimed to determine the raw meat quality sold in shops of Cheleleka Town and justify necessary intervention recommended. This butcheries shop is chosen because of there is high contamination level of microbial in the Cheleleka town of butcheries shop.

Significance of the study

The finding of this study may give an insight on microbial loads and the possible source of contamination areas that could be investigated in cases of meat poisoning. Data from this study will also be of use to hygiene officers and meat handlers in improving and strengthening hygienic of meat seller to avoid bacterial food contamination. In addition, the findings will form the basis of recommendations which if implemented will improve sanitation programs and it could also be used as a resource by other researchers and provide base line information for further study.

Objective

General objective: To evaluate bacteriological quality of meat for kitfo and gored gored sold in shops of Cheleleka town.

Specific objective

- To determine the level of bacteriological contamination in the meat sample from shops.
- To determine the types of bacteria, present in the meat sample.

Methods and materials

Study area

Study was conducted in different raw meat sold shops of Cheleleka Town, that far 245km from Addis Ababa, Ethiopia. It has an average altitude of 176m above sea level and its temperature range from maximum 25-30°c and minimum 7-20°c and annual rain fall range from 1200-2000mm.

Study design and period

An experimental laboratory study was carried out to evaluate

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bacterial quality of raw meat sold in shops of Cheleleka Town from 10 to25 May, 2019.

Study variables

Independent variable

- Microbial load
- Sanitary condition of shops

Dependent variable

- Total coli form
- Fecal coli form

Source of samples

Overall, of 5 principal meat stores wherein maximum humans choose to shop for pork have been decided on for this look at. The meat stores decided on have been at Kamil, Genet, Wondu, Ayichuluhum and Alemayehu. A general of 10 uncooked meat samples have been amassed in successive visits. The meat samples for kitfo and gored-gored have been amassed into sterile plastic luggage and transported beneath Neath 4°C in a Cole man field full of ice to save you in addition contamination. The samples have been analyzed at once upon arrival withinside the laboratory.

Sample analysis and presentation

After the sample collected the microbial load was analyzed in Hirna regional veterinary laboratory. In laboratory, 1g of raw meat samples were transferred into 9 ml of water in a test tube for 10^{-1} dilution and shaken vigorously for 1 minute. Autoclaved 1-gram meats in 9 ml water served as negative controls Decimal serial dilutions were made by transferring 1 ml of the above samples into 9 ml distilled water up to 10^{-5}. Then, 0.1 ml of 10^{-4} and 10^{-5} dilution was taken and poured onto sterile petri dish that contain solidified 25 ml of plate count agar (PCA) or MacConkey agar. This was then spread thoroughly by using flamed bent rod and incubated at 37°C for 24-8 hours. After incubation the colonies was counted as (cfu/plate/g). Finally, the data, tables, was used for comparison of the selected raw meat samples with standard recommended guideline of microbial load of raw meat per dish [29-31].

Ethical consideration

Before starting raw meat, collection permission was obtained from Environmental Health Department to Cheleleka Town food service office, then Cheleleka Town raw meat sellers.

Result

From five different shops of raw meat (Kitifo) sold, the highest bacterial count (3.3 × 10^6 cfu/g) was recorded in Ayichuluhum shop and the lowest (7.8 × 105 cfu/g) in Genet shops (Table 1). Also, the Ayichuluhum shop was with highest bacterial count (2.8 × 10^6 cfu/g) for Gored-gored and the lowest bacterial count (7x105cfu/g) recorded in the Genet shop. The raw data are given in Annex Table 1.

From five different shops of raw meat (Kitifo), the highest fecal bacteria count (2.0 × 10^6 cfu/g) was recorded in Ayichuluhum shop and the lowest (4.3 × 10^5 cfu/g) in Genet meat shops (Table 2). Also, the Ayichuluhum shop was the highest fecal bacterial count (1.725×10^6cfu/g) for Gored-gored, and the lowest (4.0 × 10^5 cfu/g) in Genet shop respectively. The raw data are given in Annex Table 2.

Different bacterial types were seen under the microscope. Gram-positive rods and Gram-positive clumped spherical bacteria, probably *Staphylococcus*, were the most numerous (Table 3). Gram-positive spherical bacteria in pairs and Gram-positive chained spherical bacteria, probably *Streptococcus* were the second in number seen. Less numerous were Gram-negative rods, which may include fecal coliform bacteria that grew on MacConkey agar.

Discussion

The study found out that the full coliform be counted number of bacterial contaminants have been grown in all meat samples of Kitifo and Gored-gored accrued from butchery stores (Genet, Wondu, Ayichuluhum , Alemayehu and Kamil) (desk 1). The maximum suggests values of microbial load (3.325×106cfu/g and 1.825×106cfu/g) have been observed on meat samples from Ayichuluhum and (2.425×106cfu/g and 1.85×106cfu/g) have been determined on meat samples from Alemayehu butchery store withinside the Kitifo and Gored gored respectively.

Table 1: Mean number of aerobic bacterial colonies of Kitfo and Gored-gored samples from different raw meat shops in Cheleleka Town May 2019.

Name of Meat Shop	Mean Number of Bacterial Colony (CFU/g) on Plate Count Agar		
	Kitfo	Gored-gored	Control
Genet	7.8 x 10^5	7 x 10^5	0
Wondu	1.9 x 10^6	1.3 x 10^6	0
Ayichuluhum	3.3 x 10^6	2.8 x 10^6	0
Alemayehu	2.4 x 10^6	1.9 x 10^6	0
Kamil	1.5 x 10^6	9.0 x 10^5	0

Table 2: Mean number of fecal bacterial colonies of Kitfo and Gored gored from different raw meat shops in Cheleleka Town May 2019.

Name of Meat Shop	Mean Number of Fecal Bacterial Colony (CFU/g) on MacConkey Agar		
	Kitfo	Gored-gored	Control
Genet	4.3 x 10^5	4.0 x 10^5	0
Wondu	1.4 x 10^6	9.0 x 10^5	0
Ayichuluhum	2.0 x 10^6	1.7 x 10^6	0
Alemayehu	1.8 x 10^6	1.3 x 10^6	0
Kamil	1.0 x 10^6	8.5 x 10^5	0

Table 3: Types of bacteria isolated from meat from the different raw meat shops.

Name of Meat Shop	Type of Bacteria
Genet	G(+) cocci in chains, G(+) cocci in clumps, G(+) cocci in pairs, G(+) rods.
Wondu	G(+) cocci in chains, G(-) rods
Ayichuluhum	G(+) cocci in chains, G(+) cocci in pairs, G(+) rods
Alemayehu	G(+) cocci in clumps, G(+) cocci in chains, G(+) rods
Kamil	C(+) cocci in clumps, G(+) cocci in chains, G(+) rods, G(-) rods

G(+), Grams-positive; G(-), Gram-negative

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This is probably because of excessive publicity to dusts from the surroundings and negative hygienic circumstance. The decrease suggests values of microbial load (7.75×105cfu/g and 7×105cfu/g) have been observed on meat samples from Genet butchery store analyzed withinside the Kitifo and Gored gored respectively. The contemporary findings have been additionally in settlement with Fasanmi, et al. that mentioned the presence of excessive suggest values of microbial load of scrapings from meat stalls in Ibadan metropolis, Nigeria. Similarly, one-of-a-kind genera of Gram poor and Gram-superb microorganism spp. have been remoted on this observe. The microorganism remoted have been diagnosed as E. coli, different coliform, Staphylococcus spp., Streptococcus spp. and bacillus spp. microorganism.

The presence of those organisms in uncooked meats is probably the end result of negative hygienic and sanitary practices hired withinside the slaughtering, processing, packaging, transporting storing of clean meats. Although the muscles of animals are freed from micro-organisms; it could without problems contaminate with each pathogenic and non-pathogenic microorganisms on the time of slaughter below negative processing conditions. In addition, the excessive nutritive fee of meat makes it a really perfect medium for bacterial increase [18].

From the consequences received, clean meats pattern has been infected with excessive stage of E. coli, different coli-shape microorganism, Staphylococcus spp., Streptococcus spp. that consents with Fasanmi, et al. and Clarence, et al. document which said that those organisms are the principle reassets of infection. Therefore, excessive overall coliform received on this observe is probably attributed to negative hygienic circumstance and product coping with practices main to infection.

The presence of fecal coliform is a trademark of negative sanitary circumstance withinside the butcher stores given that those microorganisms originate from fecal microbiota. The end result found out the very best suggest values for fecal coli-shape on meat samples from Ayichuluhum accompanied with Alemayehu, Wondu, Kamil, wall and Genet butchery Shops. The suggest fecal coli-shape be counted number in uncooked meat (Kitifo) have been 1.975×106cfu/g, 1.775×106cfu/g, 1.375×106cfu/g, 1×106cfu/g and 4.25×105cfu/g withinside the Ayichuluhum, Alemayehu, Wondu, Kamil and Genet butchery Shops respectively. This locating parent is a lot better than Eisel, et al. and Stopforth, et al. that mentioned 2.5×101 - 1.58×103cfu/g and 1.2×101 - 6.3×101cfu/g for fecal coli-shape be counted number in clean red meat samples, respectively. The reassess of infection right here may also come from the intestinal contents, slaughter process, via meat coping with and transportation to the market, Cross infection from tables, knives and weighing scale to different beefs is likewise possible. And additionally, the superiority of fecal coli-shape be counted number withinside the uncooked meat (Gore-gored) has been 1.725×106cfu/g, 1.275×106cfu/g, 9×105cfu/g, 8.5×105cfu/g and 4×105cfu/g withinside the Ayichuluhum, Alemayehu, Wondu, Kamil and Genet butchery Shops respectively. This end result indicates that microbial infection of Gored-gored is decrease than that of Kitifo. This might be because of the decrease floor location of Gored-gored, which isn't snug for increase and multiplication of microorganism as on Kitifo. Even aleven though the microbial load in Gored-gored is decrease than Kitifo; it turns out to be better than the studies that mentioned the suggest fecal coli-shape counts of the one-of-a-kind web sites of the carcasses have been 3.16×101 - 8.9×101cfu/cm [16].

This is possibly because of the store is positioned subsequent to a busy road with motors blowing dirt with all styles of contaminants on the beef, knives, timber slicing blocks, weighing balances and on meat reducing tables the butchers themselves pay little subject on their non-public hygiene serve the meats with grimy hands, and clothing. And there have been no garage centers positioned in the vicinity. The presence of fecal coli-paperwork is indicative of fecal infection and of the capability presence of enteric pathogens especially bacterial pathogens [17]. Thus, the above microbial load desk 2 shows the presence of fitness risk complete microbe on the beef produced in Cheleleka town. To keep away from such risk meat merchandise ought to be fried with most appropriate cooking temperature.

Conclusion and recommendation

Conclusion

From the study, high level of bacterial contamination from the different meat sources due to poor personal hygiene and environmental contamination. The place where raw meats are kept, use of open housing during selling might be the likely source for the occurrence of contamination of gram positive and gram-negative bacteria. If measures are not put in place, there may be a possible outbreak of food poisoning and or food borne infections due to consumption of the contaminated meat. This may lead to serious economic and public health problem.

Recommendation

Based on findings the following points are recommended:

1. Awareness creation to butcher shop workers regarding meat hygiene is essential.
2. Meat inspections should be strengthened by veterinary professionals in the town before and after slaughtering and before the meat is distributed to the public.
3. Good personal hygiene and meat handling practices should be followed strictly by butchers and personnel selling the meat.

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