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A REVIEW ON BACTERIAL ATTACK IN THE MEAT BEFORE AND AFTER COOKING

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Abstract: *: The study aimed to review the bacterial attack in the meat before and after cooking. To complete this review, 78 articles have been collected from google scholar, PubMed, and other online websites, and the data has been analyzed using Microsoft excel 2019. This study determined the presence of bacteria in meat both before and after being cooked. Reviewing around 78 articles confirmed bacteria could live in crude and cooking meat. Raw meat may commonly contain Salmonella, E. coli, and S. enteric bacteria. The 10.0% E. Coli in raw beef and 19.70% have S. enterica, the other 26.20% contain Salmonella, and some bacteria are sensitive to water phase salt. Normal salt decreases the quantity of certain lactic corrosive microorganisms in the gut of mice and people. Based on the review, Staphylococcus aureus is sensitive to 10.0% water phase salt, and Yersinia enterocolitis-ca is susceptible to 7.0% water phase salt. In summary, Salmonella and other group bacteria can spread with cook meat and may produce multidrug resistance such as antibiotic resistance. Since it is a public health threat globally. So, to reduce the microbial attack, raw meat should be properly stored, processed, and public awareness should be increased.*

Keywords: *: Foodborne Disease, Raw Meat, Cook Meat, Antibiotic Resistance*

Introduction

The word meat refers to the skin, muscle fibers, and any associated soft tissue or fatty omitting skeleton and bone marrow[1]. High nutrient containing Foods such as meat are wonderful sources of protein and crucial fatty acids[2-3]. Meat and poultry constitute rich in proteins[4-5], essential for a healthy diet[6-7], and Contain many additional minerals, such as iodine[8], iron[9], vitamins (particularly B12)[10], and crucial fatty acids[11], have been found in these foods as well. Fresh meat has a significant concentration of water[12], making it an ideal environment for developing bacteria[12]. Besides, the animals' intestines typically hold bacterial species such as Salmonella and E. coli[13], and raw meat should be contaminated during the slaughter process. Still, they are perishable since they furnish an ideal environment for developing a wide variety of bacteria and other microbes[1]. However, meat can become affected during the butchering and shipping of healthy animals because of the presence of different pathogenic and nonpathogenic microbes in the tissues of healthy animals[14]. The External sources may contaminate the raw meat readily, and it has been arising during cutting, holding, and preparation through blades, equipment, clothing, hands, and the environment[15]. A wide range of biological, chemical, physical, and especially microbiological sources are easily generated by contaminating meat and meat-related food[16-17].

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The enhancement of meat's biological organisms is influenced by many endogenous and environmental factors[18]. Besides, a higher amount of water in raw meat makes it an effective source of nutrients for microbes[20], and all kinds of meat generally contain a high amount of water.

In the last couple of years, infections are among the most common causes of death and disease in developing nations. In most cases, they are transmitted via food consumption such as meat or contaminated food[19-20]. Many different types of bacteria, pathogens, and parasites are responsible for the majority of foodborne illnesses[21], such as norovirus[22], Salmonella[23], Campylobacter[24], and Escherichia coli[25].

E. coli is a bacterium that may be found in the stomachs of several animals, especially mammals and cattle, and is responsible for food poisoning[26]. The majority of E. coli strains are not hazardous to humans. Nevertheless, Certain strains may have catastrophic health consequences if consumed by humans[27-28]. For example, uncooked meat minced beef is a common source of E. coli 0157:H7 infection, but it may also be spread via consumption of raw meat and raw dairy products and raw fruit juice, water contamination, raw vegetables, and even direct human contact[29].

Bacteria that cause salmonellosis are often prevalent in animals, reptiles, and avians. However, they are mainly transmitted to people via the intake of animal-based products, such as eggs, poultry meat, and dairy products30. Campylobacter microorganisms are the primary cause of campylobacteriosis. In certain places, it is more prevalent than salmonellosis, and globally, this is the most often recognized bacterial etiology of diarrheal disease[31]. Therefore, the study aimed to review the bacterial attack in the meat before and after cooking.

Material and Method

Data sets utilized for this review to look incorporate PubMed, Scopus, Google Scholar, Web of Science, and IranMedex with data detailed. Around 35 articles has been included.

Search strategy

For the period from January 2005 to 2020, customary course books and data sets, for example, the science Web, Scopus and PubMed, were inspected utilizing the accompanying descriptors: "microbes attarcking in food" or "cooking or raw food," "preserve food" or "conventional food," are included.

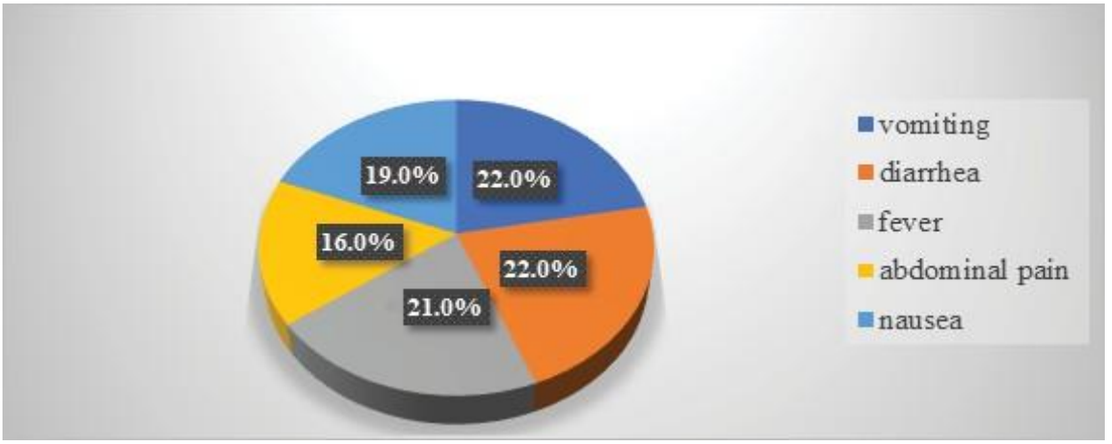
Data analysis

To examine and make the articles, an exploratory comprehension of the bibliographic fixings was shown, assessing the name just as the scholarly idea of the work. Afterward, the paper that appeared to have been checked for the Bacterial Attack in the Meat Before and After Cooking. Following the consummation of the exploratory examination, an all around picked investigation of the paper, which included microbes types of attrack, food types, and checked as proof controlled in the diaries concerned was gotten, along these lines empowering the assortment of insights from the bibliographical audit. Information on the demonstration of against stoutness have been found straightforwardly from the chose articles. Finaaly, microft excel was used to analysis the data and make the graph as well as table.

Result

Symptoms of Salmonella Enteritidis

Salmonella enterica is a post-headed, beat, facultatively anaerobic, Gram-negative bacterium and a kind of Salmonella assortment. Usually, it consists of meat and fish. A portion of its serovars is dead human severe microorganisms. This study has reported that the people are shown some symptoms with percentage, 22.0% are suffering vomiting and diarrhea, other 21.0% are suffering fever, additional 16.0% and 19.0% are suffering abdominal pain and nausea. Among these symptoms, vomiting and diarrhea have been seen in most cases, with almost 22.0%, and fever has been seen in nearly 21.0% of people.



Number of bacteria after cooking in various meat

It has been very much concerned that most bacteria can survive after cooking. In this view, we have analyzed the survival capacity of microbes after being cooked. The chart shows that a more significant number of bacteria can survive in Tongue, tinned Chicken and turkey, tin in the second position beef cooked is good for bacteria to survive, and in cooked fat and corned beef (Table 1).

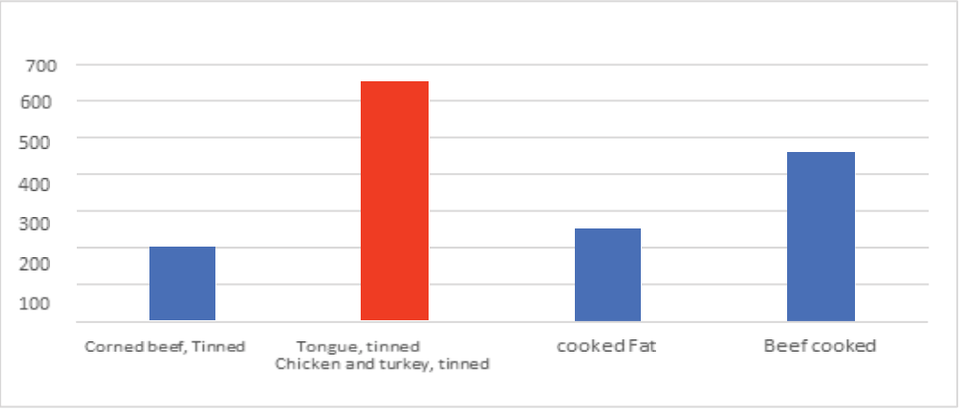


Fig 2: Number of bacteria after cooking in various meat

Bacterial Sensitivity on temperature

Generally, an expansion in temperature will build enzyme movement. Yet, compound action will reduce if temperatures get excessively high, and the protein (the enzyme) will denature. According to this chart, Bacillus cereus is destroyed at a minimum of 39.2 and a maximum of 171, and Campylobacter jejuni can destroy at a minimum of 86°F & maximum of 113°F; other Clostridium perfringens is gone to death by minimum 50°F & maximum of 125.6°F. Salmonella spp is gone to ruin at a minimum of 41.4°F & maximum of 115.2°F; the other one, Staphylococcus aureus, is destroyed at a minimum of 50 and a maximum of 109.4°F[32] (figure 3).

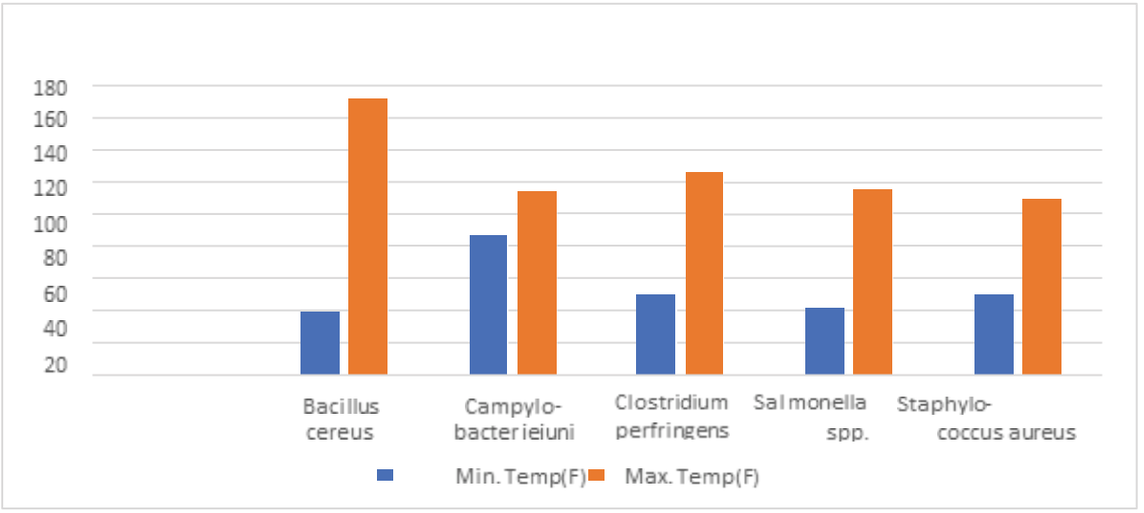


Fig 3: Bacterial Sensitivity on temperature.

Bacterial Sensitivity on salt

Ordinary salt decreases the quantity of certain lactic corrosive microorganisms in the gut of mice and people. For example, based on this chart, Staphylococcus aureus is sensitive to 10% water phase salt, and Yersinia enterocolitis-ca is susceptible to 7% water phase salt (figure 4).

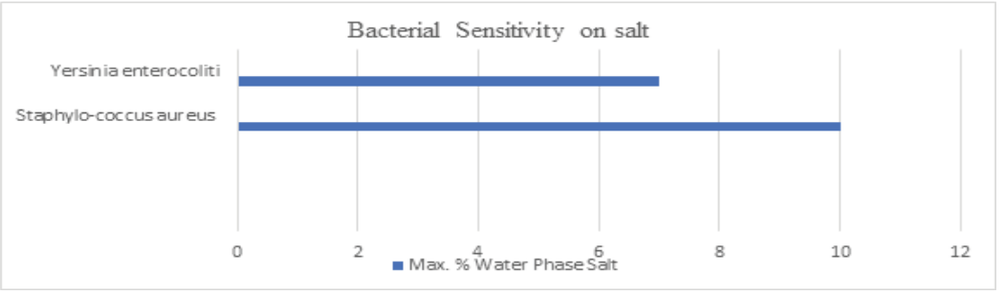


Fig 4: Bacterial Sensitivity on salt

Consists of Common Bacteria in raw meat

The Bacteria. Raw meat may contain most commonly Salmonella, E. coli, and S. enterica. This is because raw meat has a high quantity of water. So, the bacteria can quickly develop and grow in raw meat. Our finding reported that 10% of E. coli are present in raw beef while 19.70% have S. enterica. On the other hand, the additional 26.20% contain Salmonella (figure 5).

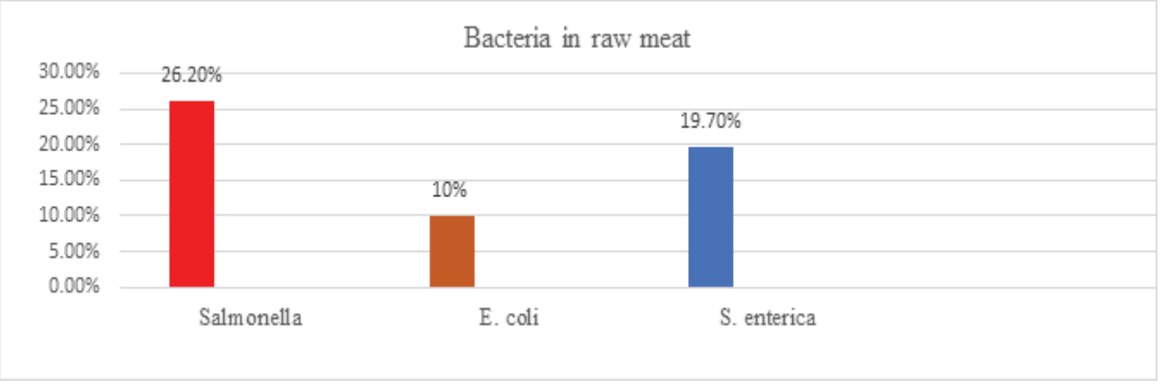


Fig 5: Common Bacteria in raw meat

Discussion

Meat

Meat is the consumable parts of domesticated animals such as cows, sheep, goats, and pigs, as well as chickens, farmed animals, and wild animals[2]. Meat is one of the most fundamental, healthy, and popular foods accessible to the wider populace since it helps supply most of the nutritional needs[33]. It is an essential component of a very well diet and has contributed to human development. Proteins, zinc, iron, selenium, and phosphorus are all important sources, as are vitamin A and B-complex vitamins. Although, few investigations have also suggested that probable correlation involving the consumption of meat and increased cardiovascular disease, cancer, and metabolic disorder risk, its function in the human biological evolution, especially its brain and intellectual growth, cannot be ignored[34].

Pathogen correlation with Foodborne illness

Bacteria are the most prevalent causative agent of illness and come in a wide range of forms, kinds, and characteristics. Some harmful bacteria may produce spores, making them very heat tolerant such as Clostridium botulinum, C. perfringens, Bacillus subtilus, and Bacillus cereus[35]. Some of them can construct poisons that are stable at high temperatures. Most infections are mesophilic, with optimum development temperatures ranging from 20 degrees Celsius to 45 degrees Celsius[36]. Getting sick from eating food may happen when a pathogen enters the body and multiplies, or it can happen when a pathogens bacterium enters the food supply and generates a toxin that is subsequently consumed by the human[37].

Conclusions

Antibiotic resistance is a global and public threat worldwide. Every year, many people die due to microbial infection, which results in antimicrobial resistance. This antimicrobial resistance occurs in numerous ways; among them, meat and Chicken are carriers. In this paper, it has been seen that meat consists of numerous pathogenic microbes that enter the human physiological system through meat consumption. so it is high time the policy maker should take proper steps to reduce this public threat and provide a healthy life.

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