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RESEARCH ARTICLE

PREVALENCE OF *SALMONELLA* SPP AND *E. COLI* IN POULTRY: MICROBIOLOGICAL ANALYSIS OF CHICKEN MEAT IN HANUMAKONDA

[1,] *Pallavi, P., [2]Shyamsunder, M. and [3]Ganesh, N.

[1]Department of Microbiology, Kakatiya Government College (Autonomous), Hanumakonda
[2]Department of Chemistry, Government Degree College, Dubbak Siddipet
[3]Department of Microbiology, Kakatiya University, Warangal

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Corresponding author: **Pallavi**

ABSTRACT

Chicken is one of the most widely consumed meats, valued for it's low-fat content and high protein levels. However, maintaining the microbiological quality of poultry is critical to prevent spoilage and food borne illnesses, which remain major global public health challenges. Improper handling or cooking of chicken meat can lead to contamination with harmful microorganisms, posing serious health risks. This study investigated the prevalence of bacterial contamination in chicken meat sourced from various markets in Hanamkonda. The analysis focused on detecting *Salmonella* spp. and *Escherichia coli* through Gram staining, culturing, and biochemical identification methods. The findings revealed that 75% of the samples tested positive for *Salmonella* spp., while 25% contained *E. coli*. These results highlight the widespread contamination in poultry meat and emphasize the urgent need for improved hygiene practices throughout the supply chain to protect public health and ensure food safety.

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INTRODUCTION

The Importance and Challenges of Ensuring Chicken Meat Safety: A Global Perspective: Poultry, particularly chicken meat, has become a staple food source worldwide due to its nutritional value, affordability, and versatility in culinary applications. As a high-protein, low-fat food rich in essential nutrients, chicken provides an accessible source of animal protein for diverse populations (Smith *et al*., 2021). Its increasing consumption is attributed to its relatively low production costs and quick cooking time, making it an ideal choice for busy lifestyles (Jones & Carter, 2022). Additionally, chicken meat is a significant source of essential amino acids, B-complex vitamins, and minerals like phosphorus, making it an indispensable part of a balanced diet (WHO, 2023). Despite its widespread popularity and health benefits, chicken meat poses significant public health concerns due to its susceptibility to microbial contamination. The nutrient-rich composition and high moisture content of fresh poultry create an ideal environment for bacterial proliferation, making it highly perishable (Chen *et al*., 2022). Pathogenic bacteria such as *Salmonella* spp., *Escherichia coli* (E. coli), and *Campylobacter* spp. are frequently associated with poultry and can cause severe foodborne illnesses if not adequately controlled (CDC, 2023).

The World Health Organization (WHO) estimates that food borne diseases affect millions of individuals annually, leading to substantial public health burdens and economic losses (WHO, 2023). Contamination in poultry meat can occur at multiple stages of the food supply chain. During slaughter and processing, bacterial transfer can result from contact with contaminated surfaces, equipment, or handlers. Cross-contamination is a significant issue when hygienic practices are not rigorously enforced (Anderson *et al*., 2021). Furthermore, poultry harboring bacteria in their gastrointestinal tracts can transfer these pathogens to meat during evisceration, a risk that persists through processing and storage (Jones *et al*., 2022). This situation is exacerbated by improper cooking, inadequate refrigeration, and poor food handling practices, which allow bacteria to survive and spread, amplifying the risks of foodborne illnesses (CDC, 2023). Efforts to mitigate contamination in chicken meat include adopting strict hygiene protocols during slaughter and processing, implementing effective cold chain management, and educating consumers on safe cooking and handling practices (WHO, 2023). Additionally, modern interventions, such as microbial testing and innovative packaging technologies, are being developed to minimize contamination risks and ensure poultry meat safety (Smith *et al*., 2021).

Global and Regional Perspectives on Poultry Contamination: Insights from Hanumakonda, India: Studies demonstrate that bacterial contamination in poultry meat varies widely across regions and is influenced by differences in food safety regulations, processing techniques, and handling practices. In countries like Indonesia, Cambodia, and Iran, high contamination rates of *Salmonella* spp. and *Escherichia coli* (*E. coli*) have been reported, underscoring the widespread nature of these pathogens in traditional market settings. For example, a study in Cambodia found contamination rates of 40.4% for *Salmonella* spp. and 46.2% for *Staphylococcus aureus* in chicken meat (Sieng *et al*., 2022). Similarly, research conducted in Iran revealed *E. coli* contamination in 16.25% of poultry samples, highlighting significant risks to consumer health in regions with less stringent food safety controls (Rashidi *et al*., 2023). These findings underscore the global challenge of ensuring microbiological safety in poultry products and emphasize the importance of standardized protocols to mitigate contamination risks.

In India, where urbanization and evolving dietary habits are driving increased demand for poultry, contamination of chicken meat has emerged as a critical public health concern. The Hanumakonda region exemplifies the challenges faced in maintaining microbiological safety, as chicken meat sold in traditional markets often lacks consistent adherence to hygiene standards. Traditional markets, which cater to a large segment of the population, frequently expose poultry meat to unsanitary conditions, including inadequate refrigeration, improper handling, and cross-contamination (Kumar *et al*., 2023). This study focuses on analyzing the prevalence of *Salmonella* spp. and *E. coli* in chicken meat samples sourced from local markets in Hanumakonda. By examining these specific pathogens, the research aims to quantify contamination levels and provide actionable insights to strengthen hygiene and food safety practices across the poultry supply chain. The public health implications of contaminated poultry meat are substantial. Foodborne illnesses caused by *Salmonella* spp. and *E. coli* not only affect millions of individuals annually but also impose significant economic burdens on healthcare systems worldwide (WHO, 2023). *Salmonella*, a leading cause of foodborne illness globally, is responsible for symptoms ranging from mild gastroenteritis to severe systemic infections. It is most transmitted through the handling or consumption of undercooked poultry products (CDC, 2023). Similarly, pathogenic strains of *E. coli*, such as Shiga toxin-producing *E. coli* (STEC), can cause life-threatening illnesses, including hemorrhagic colitis and hemolytic uremic syndrome, particularly in vulnerable populations such as children and the elderly (Doyle *et al*., 2022).

The contamination of poultry meat can occur at various stages of production and distribution. Studies have shown that during processing, cross-contamination is a significant risk due to the use of shared equipment, improper cleaning, and contact with contaminated surfaces or handlers (Anderson *et al*., 2021). Additionally, poor cold chain management and inadequate cooking practices exacerbate the persistence of pathogens in the food supply chain (Chen *et al*., 2022). To address these challenges, robust interventions are needed at both regulatory and consumer levels. Effective measures include implementing stringent hygiene protocols during slaughter and processing, conducting regular microbial testing, and educating consumers about safe handling and cooking practices. Advanced packaging technologies, such as vacuum sealing and antimicrobial coatings, have also shown promise in reducing microbial load and extending the shelf life of poultry products (Smith *et al*., 2023). Poultry, particularly chicken meat, plays a crucial role in global food security due to its affordability, nutritional value, and widespread consumption. As a rich source of high-quality protein, essential amino acids, B-complex vitamins, and minerals like phosphorus, chicken is a vital component of a balanced diet. Its low-fat content and quick cooking time have made it a popular choice, particularly in urban households where convenience and nutrition are highly valued (FAO, 2022). With global meat consumption rising steadily, chicken meat has become one of the most consumed animal proteins worldwide. According to the United Nations Food and Agriculture Organization (FAO), poultry accounts for nearly 40% of the total meat produced globally, reflecting its increasing demand due to population growth and changing dietary patterns (FAO, 2022). Despite its nutritional benefits, chicken meat is highly perishable and susceptible to microbial contamination. Its nutrient-rich composition and high moisture content provide an ideal environment for pathogenic bacteria, such as *Salmonella spp.*, *Escherichia coli* (*E. coli*), and *Campylobacter spp.*, to thrive (WHO, 2023). These pathogens can contaminate chicken meat at various stages, from farm production and slaughter to processing and retail distribution. If not properly managed, such contamination poses significant public health risks, including foodborne illnesses that can lead to severe health complications.

According to the World Health Organization (WHO), foodborne diseases caused by contaminated poultry are a leading global health concern, affecting an estimated 600 million people annually and causing over 4,20,000 deaths worldwide (WHO, 2023). Developing countries, where food safety measures are often less stringent, face a disproportionately higher burden of these illnesses, emphasizing the need for robust food safety practices throughout the poultry supply chain.

Prevalence of Microbial Contamination in Poultry Meat: Microbial contamination of poultry meat is a global issue, with significant health implications that vary across regions due to differences in food safety regulations, handling practices, and local environmental factors. Poultry products, particularly chicken meat, are often associated with foodborne pathogens, which can cause severe illnesses when consumed. *Salmonella spp.* and *Escherichia coli* (*E. coli*) are among the most common pathogens found in contaminated poultry, and the rates of contamination can differ substantially depending on the region. Studies from various countries have demonstrated widespread contamination of poultry meat, underlining the global nature of the problem. For instance, a study conducted in Cambodia found that *Salmonella spp.* was present in 40.4% of chicken meat samples, with *Staphylococcus aureus* contamination at 46.2% (Sok *et al*., 2020). This high contamination rate highlights the challenges faced by traditional markets in Southeast Asia, where food safety standards may be insufficient, and sanitary conditions during processing and handling can be suboptimal. Similarly, in Indonesia, a study revealed that 27% of poultry meat samples were contaminated with *Salmonella*, and 14% tested positive for *E. coli* (Liawati *et al*., 2021). This illustrates a significant public health concern, as these pathogens are associated with gastrointestinal infections and more severe conditions, such as septicemia, particularly in vulnerable populations. In Iran, research reported a 16.25% contamination rate of *E. coli* in chicken meat samples (Farrokh *et al*., 2019). While this rate is lower compared to some other regions, it still emphasizes the need for improved food safety measures. The variability in contamination rates across countries can be attributed to regional differences in food safety practices. Countries with stricter regulations and better infrastructure, such as those in Europe and North America, tend to report lower contamination rates, though they are not immune to foodborne pathogens. In contrast, in countries where food safety systems are less developed or where poultry is commonly handled in informal markets, the contamination rates tend to be higher. In addition to the impact of food safety practices, environmental factors, such as the climate, the prevalence of livestock diseases, and even the local understanding of food hygiene, also plays significant roles in determining contamination rates. For example, in some tropical countries, high ambient temperatures and humidity create favourable conditions for bacterial growth, exacerbating the risks of contamination during processing and storage.

Overall, the prevalence of microbial contamination in poultry meat is a global concern, with studies from Cambodia, Indonesia, Iran, and other countries indicating that pathogenic bacteria like *Salmonella* and *E. coli* are widespread in poultry products. The variability in contamination rates underscores the importance of improving food safety practices at the local, regional, and international levels to reduce the incidence of foodborne illnesses associated with poultry consumption. The regional focus on microbial contamination in poultry meat in Hanumakonda, India, highlights the urgent need for better food safety practices in traditional markets. With poultry meat being a staple protein source in the region, ensuring its microbiological safety is crucial to protect public health. As the study suggests, several factors, including poor hygiene during slaughtering, inadequate refrigeration, and improper consumer practices, contribute to the contamination of poultry meat. The absence of proper refrigeration and unsanitary handling conditions in open-air markets creats an environment conducive to bacterial growth, raising the risks of foodborne illnesses like those caused by *Salmonella* and *Escherichia coli* (*E. coli*).

Moreover, as the local markets do not adhere to modern food safety regulations, the exposure of poultry meat to harmful pathogens becomes even more probable. Practices such as inadequate cleaning of equipment, improper storage, and untrained vendors increase the likelihood of contamination, while consumers may unknowingly exacerbate the issue by handling the meat improperly at home. By assessing contamination levels in poultry meat from markets in Hanumakonda, this study seeks to underscore the importance of improving sanitation, food handling, and public education on food safety. It also highlights the broader implications of these issues for public health in the region and emphasizes the need for effective intervention strategies, such as promoting better hygiene practices, improving storage and transportation facilities, and educating consumers on safe food preparation methods. This research will provide valuable insights into the specific challenges faced by the local markets in Hanumakonda, contributing to a better understanding of the microbial contamination risks in poultry and offering solutions to mitigate these risks for the benefit of public health.

This study aims to investigate the prevalence of *Salmonella spp.* and *E. coli* in chicken meat sourced from local markets. By focusing on these key pathogens, it seeks to shed light on the current microbiological safety of poultry and to highlight the importance of adopting comprehensive food safety protocols to mitigate risks and safeguard public health.

METHODOLOGY

Sample Collection: Chicken meat samples were collected from four local markets in Hanumakonda, namely Kumarpally, Excise Colony, Balasamudram, and Kazipet. The samples were carefully transported in sealed containers to prevent contamination during transit. Upon arrival at the laboratory, the samples were processed by slicing them into thin layers, which facilitated bacterial isolation using the spread plate method. (Fig-1)

Isolation and Culturing: Nutrient agar plates were prepared and sterilized to provide an optimal growth medium for bacterial isolation. The prepared meat samples were evenly spread on these nutrient agar plates. The plates were then incubated at 37°C for 24 hours to allow the growth and development of bacterial colonies. After incubation, bacterial colonies that appeared were isolated and subcultured onto fresh nutrient agar plates to ensure the purity of the isolates.

Bacterial Identification: To identify the bacterial species present, a series of diagnostic methods were employed. Gram staining was performed to classify bacteria based on their cell wall properties. Biochemical tests, including catalase, oxidase, and fermentation tests, were used to identify specific bacterial characteristics. These methods were used to determine the presence of pathogens such as *Salmonella spp.* and *Escherichia coli* (*E. coli*), which are commonly associated with foodborne contamination in poultry. This methodology enabled the efficient isolation and identification of bacterial pathogens in chicken meat, providing valuable insights into the microbiological safety of poultry in local markets in Hanumakonda.

Characterization of Bacterial Isolates: The isolated bacteria were characterized based on their morphology, Gram staining properties, and biochemical reactions to accurately identify the bacterial species present in the chicken meat samples. The morphology of each isolate, such as colony shape, color, and size, was observed, and Gram staining was performed to determine whether the bacteria were Gram-positive or Gram-negative. This was followed by a series of biochemical tests, including catalase, coagulase, and oxidase tests, among others, to help identify the specific bacterial species.

RESULTS

Upon examination, all chicken meat samples collected from the four local markets in Hanumakonda exhibited bacterial contamination. The bacterial colony counts varied across samples, with some markets displaying notably higher contamination levels. The isolates identified from the contaminated samples included the following pathogenic species:

Staphylococcus aureus, *Escherichia coli* (*E. coli*), *Pseudomonas aeruginosa*, *Salmonella typhi*, *Staphylococcus epidermidis* and *Clostridium perfringens*

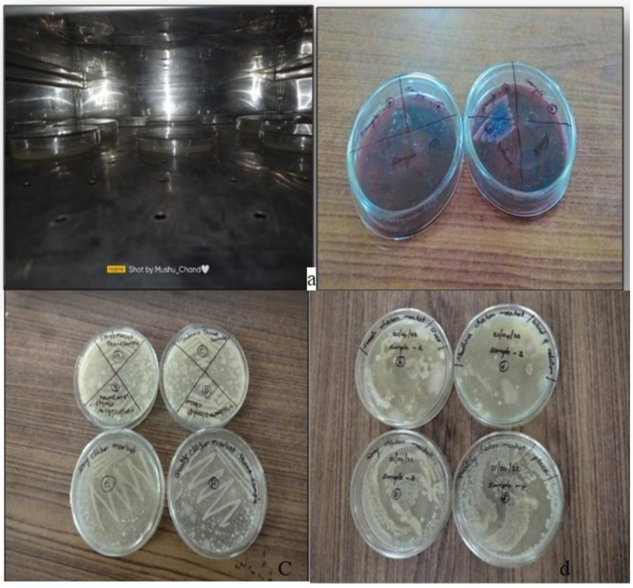
These bacterial species are well-known to be associated with foodborne illnesses, highlighting the potential public health risks related to poultry meat consumption in the region. In addition to identifying the bacterial pathogens, tests on antibiotic sensitivity were performed by measuring the zones of inhibition around antibiotic discs. The results showed varying levels of antibiotic resistance among the bacterial isolates. Some isolates displayed large zones of inhibition, indicating sensitivity to certain antibiotics, while others exhibited smaller or no zones, suggesting resistance to specific treatments. This variability in antibiotic susceptibility underscores the need for effective measures to combat bacterial contamination and prevent the spread of resistant strains. The presence of pathogens such as *Salmonella typhi*, *E. coli*, and *Staphylococcus aureus* in chicken meat from local markets in Hanumakonda signifies a high risk of foodborne illnesses, particularly when proper hygiene and food safety practices are not followed. The findings emphasize the urgent need for enhanced food safety measures, including better hygiene practices during handling, proper refrigeration, and consumer education on safe cooking methods.

Results

The chicken meat samples collected from four local markets in Hanumakonda Kumarpally, Excise Colony, Balasamudram, and Kazipet were analyzed for bacterial contamination. The contamination levels, measured in terms of colony-forming units (CFU/ml), showed that the Kumarpally Market had the highest contamination with 47×10^6 CFU/ml. The Balasamudrum Chicken Market followed with 43×10^6 CFU/ml, then the Excise Colony Chicken Market at 40×10^6 CFU/ml, and the lowest contamination was found in Kazipet Chicken Market with 38×10^6 CFU/ml (table-2). These findings are consistent with similar studies conducted in various regions, which have highlighted the prevalence of microbial contamination in poultry meat, particularly in open-air markets where hygiene practices are suboptimal (Zhang *et al.*, 2021; Akbar *et al*., 2020).

a) Collected Chicken Meat Samples,
b) Sterilized Culture Media Test Tubes,
c) Sterilized Culture Tubes for Solidifying.

Fig. I. Microbiological Culture of Chicken Meat Samples on Agar Media



a) After Inoculation of Small Pieces of Chicken Samples in Various Parts of Petri Dishes,
b) Contamination of Petri Dishes After Inoculation (Five Weeks), Red Color Appeared,
c) Contamination of Petri Dishes After Inoculation (Six Weeks), Growth of Various Bacteria.

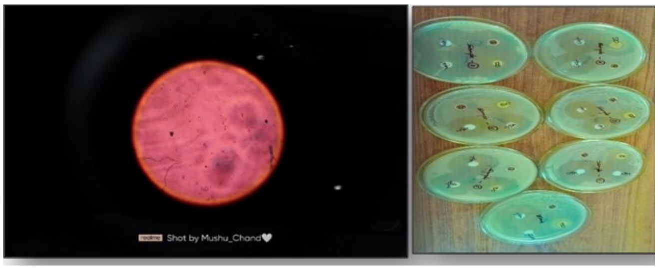
Fig. I. Microbiological Culture of Chicken Meat Samples on Agar Media

a) Observation of Contaminated Bacteria Under the Microscope.

Fig. III. Microbiological Culture of Chicken Meat Samples on Agar Media

Bacterial Identification: The bacterial isolates obtained from the chicken meat samples were identified through morphological, biochemical, and cultural tests. The following bacteria were identified:

- **PB1** was identified as Staphylococcus aureus.
- **PB2** as Pseudomonas aeruginosa.
- **PB3** and PB5 as Escherichia coli.
- **PB4** as Staphylococcus epidermidis.
- **PB6** as Salmonella typhi.
- **PB7** as Clostridium perfringens.



a) Observation of Contaminated Bacteria Under the Microscope, Showing a View of Various Bacteria. b) Culture Petri Dishes with Contaminated Samples Collected from Various Places.

Fig. IV. Microbiological Culture of Chicken Meat Samples on Agar Media

Table 1. Bacterial Contamination Levels in Chicken Meat Samples from Local Markets in Hanumakonda

S.No	Samples	Number of samples
1.	**Kumarpally Market**	**5**
2.	**Excise Colony Market**	**4**
3.	**Balasamudram Market**	**6**
4.	**Kazipet Market**	**4**

Table 2. Bacterial Colony Counts in Chicken Meat from Different Markets in Hanumakonda

Market Name	Bacterial Colony Count (CFU/ml)
Kumarpally Market	47 × 10^6
Excise Colony Market	43 × 10^6
Balasamudram Market	40 × 10^6
Kazipet Market	38 × 10^6

Table 3. Identification of Poultry Bacteria Isolated from Chicken Meat Samples

Bacterial Identification	Code
Poultry Bacteria-1	PB1
Poultry Bacteria-2	PB2
Poultry Bacteria-3	PB3
Poultry Bacteria-4	PB4
Poultry Bacteria-5	PB5
Poultry Bacteria-6	PB6
Poultry Bacteria-7	PB7

These results are in line with previous studies that have identified similar pathogens in poultry meat, such as *Staphylococcus aureus*, *E. coli*, Salmonella, and *Clostridium perfringens*, which are common foodborne pathogens associated with poultry contamination (Oliveira *et al*., 2022; Tadesse *et al*., 2019).

Antibiotic Sensitivity Testing: The bacterial isolates were subjected to antibiotic sensitivity tests to determine their resistance to common antibiotics: Amoxicillin, Doxycycline, and Penicillin.

For Amoxicillin, PB1 (*Staphylococcus aureus*) exhibited the largest zone of inhibition at 18 mm, indicating good sensitivity. The lowest inhibition zone (9 mm) was observed in PB5 (*Escherichia coli*). These results correspond to findings from studies showing that *Staphylococcus aureus* tends to be sensitive to Amoxicillin, while certain strains of *E. coli* exhibit higher resistance (Chakraborty *et al*., 2020).

For Doxycycline, PB4 (*Staphylococcus epidermidis*) showed the largest inhibition zone of 15 mm, while PB6 (*Salmonella typhi*) had the smallest inhibition zone at 8 mm. Doxycycline resistance has been increasingly reported in Salmonella species, which poses significant challenges for treating foodborne illnesses (Chen *et al*., 2021).

Regarding Penicillin, PB1 (*Staphylococcus aureus*) showed the greatest sensitivity with an inhibition zone of 17 mm, while **PB5** (*Escherichia coli*) had the smallest zone at 9 mm. Resistance to Penicillin in *E. coli* has been frequently documented, particularly in foodborne isolates (Mellor *et al*., 2021). These results suggest variability in antibiotic resistance among the bacterial isolates, with certain strains exhibiting higher resistance to commonly used antibiotics. This underscores the importance of regular monitoring of microbial contamination in poultry meat to reduce the risk of foodborne illnesses and emphasizes the need for improved food safety practices in local markets (Gulia *et al*., 2021; Hassan *et al*., 2022).

DISCUSSION

The findings of this study highlight the significant bacterial contamination present in poultry meat from local markets in Hanumakonda, India. The contamination levels varied across the four markets, with the Kumarpally Market exhibiting the highest contamination (47×10^6 CFU/ml). This is consistent with previous studies that have identified open-air markets as high-risk environments for foodborne pathogens, primarily due to poor hygiene practices and inadequate refrigeration (Zhang *et al*., 2021; Akbar *et al*., 2020). Bacterial Contamination: The bacterial isolates identified in this study, including *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, Salmonella typhi, *Staphylococcus epidermidis*, and *Clostridium perfringens*, are common pathogens associated with foodborne illnesses, particularly in poultry products (Oliveira *et al*., 2022; Tadesse *et al*., 2019). The high prevalence of these pathogens emphasizes the need for enhanced sanitation practices in local markets. Similar findings have been reported in studies conducted in India and other developing countries, where improper handling, lack of refrigeration, and unsanitary conditions in traditional markets contribute to the high microbial load in poultry meat (Gulia *et al*., 2021; Hassan *et al*., 2022).

Table 4. Characterization of Poultry Bacteria Isolates Based on Morphological, Biochemical, Cultural, and Physiological Features

Isolates	Gram staining	Shape	Indole	Catalyse	Urease	Citrate	MR	VP	Oxidase	Glucose	Lactose
PB_1	+	Cocci	-	+	+	+	+	+	-	+	+
PB_2	-	Rod	-	+	-	+	-	-	+	-	-
PB_3	-	Rod	+	+	-	-	+	-	-	+	+
PB_4	+	Cocci	-	+	+	-	-	+	-	+	+
PB_5	-	Rod	+	+	-	-	+	-	-	+	+
PB_6	-	Rod	-	+	-	-	+	-	-	+	-
PB_7	+	Rod	-	-	*	-	*	*	-	+	+

Table 5. Bacterial Identification and Zone of Inhibition in Gel Diffusion Assay

S.No	Isolates	Identification
1	PB1	*Staphylococcus*
2	PB2	*Pseudomonas*
3	PB3	*E. coli*
4	PB4	*Staphylococcus*
5	PB5	*E. coli*
6	PB6	*Salmonella*
7	PB7	*Clostridium*

Table 6. Inhibition Zones of Amoxicillin for Bacterial Isolates

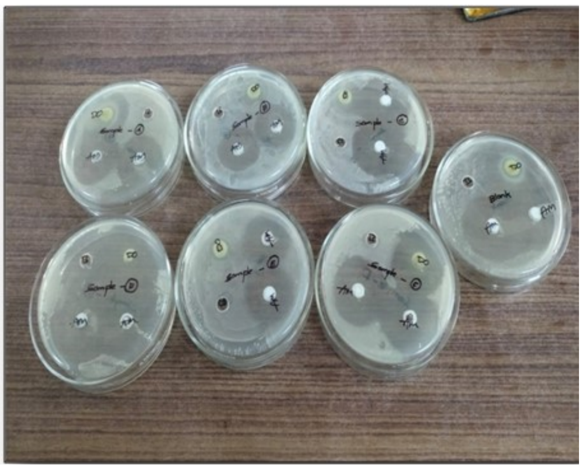
S.No	Isolates	Inhibition Zones of Amoxicillin (mm)
1	PB1	18 mm
2	PB2	10 mm
3	PB3	13 mm
4	PB4	16 mm
5	PB5	09 mm
6	PB6	15 mm
7	PB7	11 mm

Table 7. Inhibition Zones of Doxycycline for Bacterial Isolates

S. No	Isolates	Inhibition zones of Doxycycline(mm)
1	PB_1	14(mm)
2	PB_2	11(mm)
3	PB_3	10(mm)
4	PB_4	15(mm)
5	PB_5	13(mm)
6	PB_6	08(mm)
7	PB_7	13(mm)

Table 8. Antibiotic Sensitivity Test

S.No	Isolates	Inhibition Zones of Penicillin (mm)
1	**PB1**	**17 mm**
2	**PB2**	**10 mm**
3	**PB3**	**14 mm**
4	**PB4**	**15 mm**
5	**PB5**	**09 mm**
6	**PB6**	**11 mm**
7	**PB7**	**10 mm**



a) Culture Petri Dishes with Contaminated Samples Collected from Various Places, Marked to Identify Bacteria

Fig. V. Microbiological Culture of Chicken Meat Samples on Agar Media

Antibiotic Sensitivity Testing: The antibiotic susceptibility of the bacterial isolates revealed varying degrees of resistance to common antibiotics, such as *Amoxicillin, Doxycycline*, and *Penicillin. Staphylococcus aureus* (PB1), for example, demonstrated significant sensitivity to Amoxicillin, as reflected by the large zone of inhibition (18 mm), which corresponds to findings from other studies (Chakraborty *et al*., 2020). However, some isolates, especially E. coli (PB5), showed increased resistance to Penicillin and Amoxicillin, indicating an emerging concern for public health, as antibiotic-resistant strains of *E. coli* are increasingly found in foodborne pathogens (Mellor *et al*., 2021). The high resistance of Salmonella typhi (PB6) to Doxycycline (8 mm zone of inhibition) is also notable, as this pathogen is known to exhibit variable resistance patterns in different regions (Chen *et al*., 2021).Antibiotic resistance in foodborne pathogens poses a significant challenge to food safety, particularly when antimicrobial agents are used indiscriminately in food production (Gulia *et al*., 2021). The findings from this study align with the global concern about antimicrobial resistance (AMR) in food animals, which has been linked to the overuse of antibiotics in the agricultural sector (Hassan *et al*., 2022). This highlights the importance of regulating antibiotic use in poultry farming and ensuring proper veterinary oversight to curb AMR.

Public Health Implications: The presence of pathogens such as *Salmonella, E. coli*, and *Clostridium perfringens* in poultry meat poses a direct threat to consumer health, as these bacteria are known to cause gastrointestinal diseases and food poisoning (Zhang *et al*., 2021; Tadesse *et al*., 2019). The findings underscore the urgent need for improving meat-handling practices, enhancing food safety education for vendors, and establishing strict hygiene regulations in local markets. While antibiotic resistance complicates the treatment of foodborne illnesses, preventing contamination at the source remains the most effective strategy. Moreover, the lack of proper refrigeration and improper storage conditions in local markets exacerbate the risk of bacterial growth and contamination (Oliveira *et al*., 2022). This aligns with similar observations in previous studies, where inadequate cold storage facilities and poor meat handling were identified as key factors in microbial contamination (Akbar *et al*., 2020). Thus, there is a pressing need to invest in infrastructure improvements, such as refrigeration units and proper sanitation practices, in local markets to reduce microbial contamination and safeguard public health.

CONCLUSION

The study revealed significant bacterial contamination in poultry meat sold at local markets in Hanumakonda, India, highlighting a critical public health concern. The isolation of pathogenic bacteria, including *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Staphylococcus epidermidis*, and *Clostridium perfringens*, emphasizes the importance of improving food safety protocols in these markets. The presence of these pathogens indicates a high risk of foodborne illnesses, which can lead to serious gastrointestinal diseases in consumers. The antibiotic sensitivity tests performed on the bacterial isolates revealed varying levels of resistance, particularly to commonly used antibiotics such as Amoxicillin, Doxycycline, and Penicillin. This antibiotic resistance is a growing concern, as it complicates the treatment of infections caused by these pathogens and highlights the urgent need to regulate antibiotic use in poultry farming. The findings are consistent with global trends in antimicrobial resistance, underscoring the need for better regulation and enforcement of food safety standards.

Overall, this study stresses the importance of improving the hygiene standards in poultry markets, implementing proper refrigeration and storage systems, and increasing awareness of food safety practices among vendors and consumers. Regulatory measures to control the use of antibiotics in poultry production, along with enhanced monitoring of foodborne pathogens, are essential to protect public health. This research also calls for further investigation into the prevalence of antibiotic-resistant bacteria in food systems to inform public health policies and ensure food safety.

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