

# Microbial Contamination of Chicken Litter Manure and the Threat of Antimicrobial Resistance in an Urban Area Setting in Cameroon

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## Introduction

In many developing regions, including urban areas of Cameroon, the rearing of poultry is not only a significant economic activity but also a critical source of protein for local communities. However, alongside the economic benefits, the management of poultry waste, particularly chicken litter manure, presents considerable environmental and public health challenges. Chicken litter, a mixture of manure, bedding material, feathers and feed residues, serves as a breeding ground for a diverse array of microorganisms, including bacteria, fungi, viruses and parasites. Microbial contamination of chicken litter manure poses a potential threat to human health and the environment due to the presence of pathogens and the emergence of Antimicrobial Resistance (AMR). Improper handling and disposal of chicken litter can lead to the contamination of soil, water and air with pathogenic microorganisms, endangering both agricultural workers and nearby communities. Furthermore, the widespread use of antimicrobial agents in poultry production contributes to the selective pressure for AMR, exacerbating the global crisis of antibiotic resistance [1].

In urban areas of Cameroon, where poultry farming is often practiced in close proximity to residential neighbourhoods, the risks associated with microbial contamination of chicken litter manure and AMR are particularly pronounced. Limited infrastructure, inadequate waste management practices and poor sanitation conditions further exacerbate these risks, highlighting the urgent need for research, awareness and intervention to address this pressing public health issue. This paper aims to investigate the microbial contamination of chicken litter manure and the threat of AMR in an urban area setting in Cameroon. Through a comprehensive review of existing literature and empirical data, this study seeks to elucidate the sources, transmission pathways and health implications of microbial contamination in chicken litter manure, as well as the drivers and consequences of AMR in poultry production systems. By identifying key knowledge gaps and proposing recommendations for mitigation and control, this research endeavours to inform policy-making and promote sustainable practices in poultry waste management and AMR stewardship [2].

## Description

Microbial contamination of chicken litter manure encompasses a wide range of potentially pathogenic microorganisms, including bacteria, fungi, viruses and parasites, which can pose significant risks to human health and the environment. Common bacterial pathogens found in chicken litter include *Salmonella* spp., *Escherichia coli*, *Campylobacter* spp., *Clostridium*

*perfringens* and *Listeria monocytogenes*, all of which can cause foodborne illnesses in humans through the consumption of contaminated food products or exposure to contaminated environments. In addition to bacterial pathogens, chicken litter may also harbour fungal pathogens such as *Aspergillus* spp. and *Fusarium* spp., which can produce mycotoxins that are harmful to both humans and animals. Furthermore, viruses such as avian influenza virus and Newcastle disease virus may persist in chicken litter and pose a risk of transmission to humans and susceptible bird populations. Parasitic pathogens, including helminths (e.g., *Ascaris* spp., *Heterakis* spp.) and protozoa (e.g., *Eimeria* spp., *Cryptosporidium* spp.), are also of concern due to their potential to cause zoonotic infections and environmental contamination [3].

The transmission pathways of microbial contaminants from chicken litter manure to humans and the environment are multifaceted and complex. Direct contact with contaminated poultry or their waste, consumption of undercooked or improperly handled poultry products and inhalation of airborne particles or dust from chicken litter are common routes of exposure for agricultural workers, consumers and residents living near poultry farms. Additionally, runoff and leaching of contaminated water from poultry facilities can contaminate surface water sources, soil and crops, leading to further dissemination of pathogens in the environment. The emergence and spread of Antimicrobial Resistance (AMR) among bacterial pathogens in poultry production systems pose a significant public health threat in urban areas of Cameroon and beyond. The indiscriminate use of antimicrobial agents, including antibiotics, antifungals and antiparasitics, in poultry farming contributes to the selection pressure for AMR genes, leading to the proliferation of resistant bacteria and the loss of effectiveness of antimicrobial treatments in both veterinary and human medicine [4]. The consequences of AMR in poultry production extend beyond the farm gate and have far-reaching implications for human health, food safety and environmental sustainability. Resistant bacteria and resistance genes can be transmitted from poultry to humans through direct contact, consumption of contaminated food products, or environmental exposure, leading to treatment failures, prolonged illness and increased healthcare costs. Moreover, the dissemination of AMR genes in the environment through poultry waste can contribute to the spread of resistance to other microbial populations, further complicating efforts to control AMR on a global scale [5].

## Conclusion

The microbial contamination of chicken litter manure and the threat of Antimicrobial Resistance (AMR) in urban areas of Cameroon represent significant public health challenges that require urgent attention and intervention. The close proximity of poultry farms to residential neighbourhoods, coupled with inadequate waste management practices and poor sanitation conditions, exacerbates the risks associated with microbial contamination and AMR transmission, posing a threat to the health and well-being of local communities. Efforts to address these challenges must be multifaceted and collaborative, involving stakeholders from the public health, agriculture, veterinary, environmental and policy sectors. Priority areas for action include improving hygiene and biosecurity practices on poultry farms, promoting responsible antimicrobial use in poultry production, implementing effective waste management and sanitation measures and enhancing surveillance and monitoring systems for AMR and foodborne pathogens. Furthermore, raising awareness among poultry farmers, consumers, healthcare providers and policymakers about the risks of microbial contamination and AMR is essential

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for fostering behavior change and promoting sustainable practices in poultry production and waste management. Education campaigns, training programs and outreach activities can empower individuals and communities to take proactive steps to mitigate the risks associated with chicken litter manure and AMR, ultimately safeguarding public health and environmental integrity in urban areas of Cameroon and beyond.

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## Conflict of Interest

None.

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