



Current Trends in Antimicrobial Research

ANTIMICROBIAL RESISTANCE IN AGRICULTURE AND ITS CONSEQUENCES

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CRC Press
Taylor & Francis Group

Cover image credit: Shutterstock

First edition published 2024

by CRC Press

2385 NW Executive Center Drive, Suite 320, Boca Raton FL 33431

and by CRC Press

4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

CRC Press is an imprint of Taylor & Francis Group, LLC

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ISBN: 9781032216447 (hbk)

ISBN: 9781032216461 (pbk)

ISBN: 9781003269380 (ebk)

DOI: 10.1201/9781003269380

Typeset in Times

by Apex CoVantage, LLC

8 Recent Trends in Antimicrobial Drug Resistance and Implications for the Needs of Microbial Toxicology Research

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8.1 INTRODUCTION

Microorganisms, often known as microbes, are microscopic organisms that can survive as a single colony of cells. Van Leeuwenhoek was the first to identify microorganisms in the 1670s. Louis Pasteur discovered that bacteria were to blame for food rotting in the 19th century. Robert Koch was founded in the late years of the 19th century. There is a strong link between bacteria and diseases. Microorganisms have the potential to cause diseases and are known as pathogens. Diseases including tuberculosis, cholera, diphtheria, and anthrax are caused by microbes that have grown and invaded an individual or population. These microbes also cause harm to a person's vital systems.

Furthermore, researchers have been interested in answering the challenges of infectious diseases. Researchers are trying to find a chemical that would kill, prevent, or reduce the growth of these disease-causing microbes. Antibiotics are one of our most powerful weapons against potentially lethal infections.

Antibiotics treat infections, and the discovery, widespread use, and commercialization of antimicrobial drugs revolutionized modern medicine. These antimicrobial drugs also altered the therapeutic approach. Bacteria can protect themselves against an antibiotic's effects and are experts at surviving in changing environments. The competence of pathogens to resist antibiotics applied to eradicate them is a unique and significant challenge to the overall communal health of the modern era. However, bacterial resistance to antibiotics is accelerated through inappropriate use and abuse of currently available antibiotics in both community and vet care, besides in agriculture. However, dangerous antibiotic-resistant microorganism strains occurred only within the past 20 decades with alarming regularity (Medina and Pieper, 2016). People worldwide, including Americans, are living in a period when we are dying from untreatable contagions because of the occurrence and spread of antibiotic resistance (Fair and Tor, 2014). Tuberculosis, gonorrhoea, pneumonia, wound infections, septicaemia, and childhood ear infections are some ailments that are hard to treat with antibacterial drugs. Almost 30% of all deaths accounted for drug resistance; this is a frightening prospect. In the 20th century, antibiotic resistance was one of the three most significant threats to public well-being, as per the World Health Organization (Walsh, 2003). According to estimates, an additional \$20 billion in healthcare and 8 million different clinic stays costs per year in the US are due to resistant infections (Fair and Tor, 2014; European Medicine Agency, 2009; Reynolds et al., 2005) and €1.6 billion more and 2.5 million extra hospital stays in the EU (Grundmann et al., 2006). Currently, hospital pharmacies in the US spend 30% more on antibiotics than on other drugs. It was obligatory to examine and assemble the present classification and functions of more or less all antibacterial agents in light of the vast growth in the number and classes of newly added antibacterial medicines. Therefore, these have been discovered as antibiotic resistance phenomena – for example, structurally different agents with a somewhat unlike form of activity. Inhibiting infections in the first place,