



# ANTIMICROBIAL USAGE IN INDIAN ANIMAL HEALTHCARE

DURING 2022-23

A REPORT



**Compiled and Prepared by  
INFAH Therapeutic Sub-committee:**

**Chairman:**

Dr Arun Atrey, Past President INFAH,  
MD & CEO- Zenex Animal Health

**Members:**

Dr D J Kalita, Zenex Animal Health; Dr Nitin Bhatia, Intas;  
Dr Sanjay Awaghate, Virbac; Dr Smita Mahajan, MSD; Dr A Srivastava,  
Zoetis; Mr Jeetish Joshi, Hester; Mr Mubeen Patel, Vetoquinol



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## Preface

Indian animal husbandry sector is one of the largest in the world and contributing significantly to the national economy as well as socio-economic development of the country. The sector is playing a pivotal role as a source of income generation and employment avenues besides providing nutrition through animal produce like milk, eggs, and meat. Considering the growing demand for animal produce along with the huge untapped production potential, the animal husbandry sector will continue to flourish. The sector has been growing at an impressive pace (CAGR of 13.36% from 2014-15 to 2021-22). The contribution of livestock in total agriculture and allied sector GVA has increased from 24.38 % (2014-15) to 30.19% (2021-22). The sector contributed 5.73% of total GVA in 2021-22.

Holistic healthcare is a pre-requisite to ensure efficient animal production. The animal healthcare industry has been playing a very important role in disease mitigation, health & nutrition of animals and improving productivity of animals. However, given the vast spread of India's rural population, and the fact that modern animal husbandry concepts are not uniformly present, the industry still has long strides to make. Treatment & testing facilities for veterinary diseases are one of the biggest challenges in India. Inadequate animal health infrastructure and coverage severely affect immunization & disease control programs in many parts of the country.



## Antibiotics in Animal Healthcare practices

Antibiotics are an essential part of therapeutic management of infectious diseases in both farm and companion animals and ensures safe supply of food from healthy animals. Although treatment of individual animal is preferred, however, for animals like poultry and fish, mass medication is the most feasible means of treatment. Furthermore, certain mass-medication is essential to treat the sick animals while medicating others in the group that may not be sick but exposed to the infection or suffering from sub-clinical infection. Other prophylactic antimicrobial treatments are typically used during high-risk periods for infectious diseases.

It is worth noting that many antibiotics are being used in livestock since their introduction and are still found reliable to treat infectious bacterial diseases, with little resistance being encountered. For example, tetracycline classes of antibiotics make up to 40% of the total veterinary antibiotic market but have limited use in humans in many countries. Nonetheless, despite their use in animals for a long time, veterinarians have found little evidence of resistant strains causing hard to treat infections.

Besides, new generations antibiotics like Carbapenem, new generation Quinolones & Cephalosporins which are considered for life threatening infections in humans, are not allowed in veterinary use. There may be few overlaps in the use of medically valuable antibiotic classes for humans such as fluoroquinolones, cephalosporins, macrolides etc. However, such drugs are available for use through a veterinarian's prescription only.

The role of antibiotics is immense for a sustainable growth of animal husbandry sector by safeguarding health & life of animals and there is a need to strike a balance between the benefits and risk of using antimicrobials in the food supply chain.



## AMR vis-a vis Antibiotic usage in Indian Animal Healthcare

Microbial resistance to antibiotics is a worldwide problem in human and veterinary medicine. It is generally accepted that the main risk factor for the increase in antibiotic resistance is an extensive use of antibiotics which is applicable to all concerns associated with its use. In both human and animal populations antibiotics are used for therapy and prophylaxis of infectious diseases. There are multiple potential sources of antimicrobials entering the environment. Among the most important contributors to environmental pollution by antimicrobials are waste from pharmaceutical manufacturing plants, hospitals, wastewater treatment plants, untreated human wastes, waste and runoff from aquaculture, livestock, and plant-based food production and processing facilities. However, the attributable fraction of each source and factors governing transfer of AMR organisms, antibiotic resistant genes (ARGs), and residues in the environment from agricultural sources are unclear.

AMR and the use of antibiotics in animal healthcare has received significant attention in recent years. Use or over-use of antibiotics in animal husbandry is presumed to have led to an increase in bacterial resistance to the drugs, which in fact is not true. In general, the effect of antibiotic residues in meat, eggs and milk are insignificant when compared with the issue of selection and amplification of antibiotic resistant strains of bacteria. There has been scientific consensus that the prime driver of AMR emergence in humans lies with human use only. Also, the quantum of antibiotics used in animal healthcare is much lower than that of human pharma (India) which is clearly evident from the comparison on the size of the industry (~ 1/50th of human pharmaceuticals).

Indian Federation of Animal Health Companies (INFAH) that represent ~ 85% of the Animal Health Industry of India has been compiling estimated usage of antibiotics in organized animal healthcare since 2020 and submitted to Department of Animal Husbandry & Dairying (DAHD). The estimated data on antibiotic usage from 2020 to 2023 are tabulated below:



**Table 1: AMU estimation in Indian Animal Healthcare**

(In Tons)

AMU Estimates 2020			AMU Estimates 2021			AMU Estimates 2022			AMU Estimates 2023		
Livestock	Poultry	Total	Livestock	Poultry	Total	Livestock	Poultry	Total	Livestock	Poultry	Total
550	362	912	588	375	963	645	397	1042	584	414	998

In the year 2022 there was a report of surge of antibiotic uses due to epidemic outbreak of lumpy skin disease in cattle & buffaloes across the country.

**Table 2: Category wise bifurcation of Antibiotics Usage**

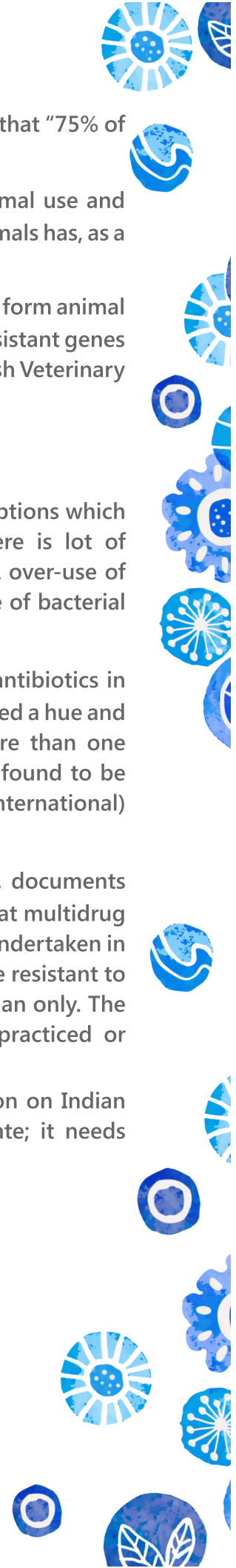
(In Tons)

Antibiotic class	Estimates 2022				Estimates 2023			
	Livestock	Poultry		Total Consumption	Livestock	Poultry		Total Consumption
		Therapeutic	MFA			Therapeutic	MFA	
Aminoglycosides (Streptomycin, Gentamicin, Amikacin, Neomycin)	74	31		105	60	31		91
Penicillin (Natural Penicillin, Amino-penicillin)	93	15		108	77	16		93
Sulfonamides (including Trimethoprim)	150	17		167	139	17		156
Cephalosporins	68	8		76	69	9		78
Fluoroquinolones	135	62		197	129	68		197
Tetracyclines (Tetracycline, Oxytetracycline, CTC)	120	25	50	195	105	30	50	185
Macrolides (Tylosin, Tilmicosin, Erythromycin etc)	5	25	24	54	5	20	24	49
Pleuromutilin (Tiamulin)	31	33	64			30	35	65
Others (Lincosamides, Avilamycin, Streptogramins, Flavophospholipol)	0		76	76	0		84	84
<b>Total Consumption</b>	<b>645</b>	<b>214</b>	<b>183</b>	<b>1042</b>	<b>584</b>	<b>221</b>	<b>193</b>	<b>998</b>

**Contribution of Veterinary use of Antibiotics on emergence of AMR in humans:**

The antimicrobial agents used in animal care are also significant in increasing the resistance in animal pathogen and in some extent such resistant bacteria or resistant genes may get transmitted from animals to humans. However, regarding antimicrobial use in animals, it is not clear to what degree it poses a threat to human health. Numerous research studies conducted on AMR do not provide information on the origin of AMR in pathogens. Also, there is no systematic and comprehensive data on the prevalence of AMR infections in livestock.

- The UK Government in a five-year antimicrobial strategy reported “Increasing scientific evidence suggests that the clinical issues with antimicrobial resistance that we face in human medicine are primarily the result of antibiotic use in people, rather than the use of antibiotics in animals. Nevertheless, use of antibiotics in animals (which includes fish, birds, bees and reptiles) is an important factor contributing to the wider pool of resistance which may have long term consequences.” (UK deptt of Health and DEFRA)
- In 2019, the U.S. CDC published a report on ‘Antibiotic Resistance Threats’ confirmed that out of the 18 species of antibiotic resistant bacteria that pose the greatest threat to human health, only two have their potential source in food animals. (US CDC)

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- In a landmark study, the European Centre for Disease Prevention and Control found that “75% of disease linked to resistant bacteria is due to healthcare-associated infections”.
  - Study from University of Edinburgh (2017) explored the relationship between animal use and human AMR finding that "curtailing the volume of antibiotics consumed by food animals has, as a stand-alone measure, little impact on the level of resistance in humans”.
  - Numerous scientific reports conclude transmission of bacteria and its resistant genes from animal to human is not common. Most of them are host specific and transmission of such resistant genes from animal to human is very limited. (Mather et al.3, in Science Sept 27, 2013; Swedish Veterinary Antimicrobial Resistance Monitoring,” 2013; H.Sharp et al. Sept 2014)



### **Misrepresentation of Animal Healthcare Practice on emergence of AMR**

Many a times, the ensuing media has created firestorm influence on consumer perceptions which are largely based on assumptions rather than scientific facts. Unfortunately, there is lot of misinformation around the use of antibiotics in animal healthcare. Veterinary use & over-use of antibiotics has been projected (in many occasions) as the prime cause of emergence of bacterial resistance to the drugs, which is far from the fact.

- A Delhi based organization released its findings in July, 2014 on test residues of antibiotics in chicken meat after testing 70 samples collected from Delhi and NCR region and created a hue and cry situation. The samples were found to contain residues of either one or more than one antibiotic. However, the antibiotic residues (mcg/kg) found in chicken meat were found to be much lower than the permissible Maximum Residue Limits (MRLs) as per CODEX (International) standards.
- Another report ‘Antibiotics Resistance in Poultry Environment’ published in 2017, documents highest resistance of E coli followed by K pneumoniae and S.lentus and suggests that multidrug resistance is moving from farm to agricultural fields in case of E coli. The study was undertaken in the farm surroundings not from animal body, that documents 62 E coli isolates were resistant to Meropenem. Meropenem belongs to carbapenems class of antibiotics used in human only. The study also documents similar resistance to Linezolid, again an antibiotic not practiced or advocated in poultry farms.

In view of the major discrepancies in both the studies and its subsequent conclusion on Indian poultry farming practice as major source of resistant bugs may not be appropriate; it needs thorough analysis with proper surveillance to draw any such conclusion.



## Conclusion & Way Forward:

Antibiotics are vital to preserve animal health & welfare and to stop using them considering the human health priority, is not an option. However, misuse and overuse of antibiotics lead to emergence of drug resistance. Responsible use of these drugs 'only when necessary' can reduce the chances of developing resistance; thereby making these precious drugs remain effective in the future.

Though there is widespread and increasing concern of AMR, limited focus has been given on the role of environmental factors in propagating resistance. When antibiotics spill into the soil and waterways, resistant strains of bacteria can emerge in the environment. They in turn can infect animals and humans that encounter them. Proper disposal and treatment of wastes from relevant industries is therefore essential to reduce environmental contamination and the risk of development of resistant bacteria.

'One Health' approach appears to be the most appropriate. There is a need to bridge the gap of collaboration of different sections- biomedical, animal health, aquaculture, agriculture, environmental and social science. For effective implementation of 'One Health' require frequent interaction between the human and veterinary medical associations at regional level and to catalyze the concept to trickle down to clinicians at the local levels.

Continuous effort is required from all stakeholders to encourage rational use of Antibiotics. There is ample scope of improvement in reduction of misuse of antibiotics through awareness, training and stringent regulation.

Disclaimer: The information in the document has been based on internal data, publicly available information and other sources believed to be true and are for general information only. While every effort is made to ensure the accuracy and completeness of information contained, however, takes no responsibility and assumes no liability for any error/ omission or accuracy of the information.



## Acknowledgement:

INFAH therapeutic sub-committee acknowledges the contribution of INFAH Managing Committee members:

- Dr Shirish Nigam, President INFAH and Regional Director, EW Nutrition
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- Mr Vijay Teng, Past President INFAH and President, Intas Animal Health
- Mr Satish Pasrija, Past President INFAH and Advisor, Indian Herbs
- Mr Gautam Chatterjee, MC member and Managing Director, Vetoquinol
- Dr P G Phalke, MC member and Director, Innovet Consultant
- Dr Ram Prakash, General Secretary, INFAH and COO, Hester Bioscience
- Dr Manoj Sood, Treasurer, INFAH and Director Market Access & Reg Affairs, Elanco
- Ms Ashwini Deshpande, MC Member and GM, Zoetis India
- Dr Anup Kalra, MC member and Director, Ayurved Research Foundation
- Dr Aman Sayed, MC member and Managing Director - South Asia, Alltech
- Dr Sushanta Dey, MC Member and Marketing Director, Kemin Industries South Asia Pvt Ltd
- Dr Vinayak Surve, MC Member and Sr Manager, Virbac

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### VISION:

Towards creating trust among the Veterinary Professionals and Livestock, Poultry, Aqua & Companion animal stakeholders and Animal Health Industry's value and contribution to society, by setting high standards of competitiveness, ethical business practices, innovation and leadership among its members for sustainable Animal Health Industry in India and also ensuring significant presence across the Globe.



### MISSION:

- Contribute towards the development of regulatory framework for the new and existing animal health products.
- Contribute towards drafting National Health Policy of India with all stakeholders.
- Formulate a fair marketing environment through ethical business practices.
- Partnering with Global Animal Health Trade Bodies for establishing identity of Indian Animal Health Industry.
- Create a database on various segments of Animal Health Industry for business decisions.

