

Antimicrobial Resistance in India's Veterinary Sector: A Silent Threat That Needs Everyone's Attention

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A sick calf with diarrhoea, a cow with mastitis, a poultry flock with respiratory disease, a dog with a skin infection, or fish dying in a pond—these situations naturally cause alarm. Antibiotics can be lifesaving when a bacterial infection is correctly diagnosed and treated. But when they are used unnecessarily, in the wrong dose, or without veterinary guidance, they can create a larger and more lasting problem: antimicrobial resistance, commonly called AMR.

AMR occurs when bacteria and other microorganisms change over time and no longer respond to medicines that once killed or controlled them. As a result, infections become more difficult, expensive, and sometimes impossible to treat. The World Health Organization identifies misuse and overuse of antimicrobials in humans, animals, and agriculture as important drivers of this threat. [1]

In India, AMR is not only a hospital problem. It concerns dairy farms, poultry units, goat and sheep flocks, pig farms, aquaculture, pet clinics, livestock markets, food chains, households, and the environment. It is therefore a shared responsibility—but veterinarians have a particularly important leadership role.

Why AMR matters in the veterinary field

India has one of the world's largest livestock populations and a growing demand for milk, meat, eggs, fish, and companion-animal care. Animals are central to nutrition, rural livelihoods, employment, and the national economy. When animal diseases are not prevented or treated properly, families and farmers suffer immediate losses.

Antibiotics are essential medicines for certain bacterial infections. However, they cannot cure every illness. They do not treat viral infections, heat stress, poor nutrition, parasitic disease, poisoning, or many metabolic disorders. Treating every fever, cough,

diarrhoea, or drop in milk yield with an antibiotic is therefore neither scientific nor safe.

Unnecessary treatment exposes bacteria to a medicine without eliminating them. Some bacteria may survive and multiply. Over time, these resistant bacteria can spread between animals, people, food products, water, soil, and the farm environment. India's current National Action Plan on AMR recognises that effective control requires a One Health approach linking human, animal, food, and environmental health. [2]

How AMR develops on farms and in animal care

AMR can emerge when antibiotics are used inappropriately. Common risk situations include:

- treating animals without a veterinary diagnosis;
- using antibiotics for viral or non-infectious conditions;
- choosing medicines based only on prior experience or advice from non-professionals;
- using the wrong dose or stopping treatment too early;
- sharing leftover medicines between animals or across species;



- using poor-quality, expired, or improperly stored products;
- repeated blanket treatment of an entire flock or herd when only selected animals need treatment;
- poor hygiene, overcrowding, inadequate vaccination, and weak biosecurity; and
- disposing of unused medicines or animal waste carelessly into soil or water.

Underdosing is especially dangerous. A dose too low to eliminate bacteria may allow the hardiest organisms to survive. Similarly, stopping treatment as soon as an animal “looks better” can leave bacteria behind. This does not mean antibiotics should be used for longer than necessary; it means that every course should follow the veterinarian’s exact instructions.

ICAR’s AMR stewardship initiatives have highlighted responsible antibiotic use, proper record-keeping, and surveillance of resistant organisms in livestock as urgent priorities for Indian animal agriculture. [3]

AMR is a One Health problem

One Health means that the health of people, animals, plants, and ecosystems is interconnected. AMR illustrates this connection clearly.

A resistant bacterium can develop in an animal, persist in a farm environment, contaminate water or manure, reach food products, or spread through direct contact. The precise pathway varies, but the central message is simple: the health of animals cannot be separated from the health of people and the environment.

This does not mean that all animal products are unsafe or that farmers are responsible for AMR alone. Rather, it shows why disease prevention, prudent antibiotic use, clean production systems, surveillance, and cooperation between sectors are essential. India’s AMR strategy calls for optimising antimicrobial use in human health, animal

health, and food production—not merely in hospitals. [2]

The role of the veterinarian

Veterinarians are the first line of defence against AMR in animals. Their role is much wider than prescribing a medicine.

A responsible veterinarian should:

- examine the animal or flock and identify the likely cause of disease;
- decide whether an antibiotic is actually required;
- collect samples for laboratory testing when needed;
- select the right antibiotic, dose, route, and duration for the specific animal and condition;
- consider species differences, age, pregnancy, lactation, kidney and liver health, and concurrent medicines;
- advise on withdrawal periods for milk, meat, eggs, honey, and fish;
- educate farmers and pet owners about completing treatment correctly;
- promote vaccination, hygiene, nutrition, biosecurity, and parasite control;
- record treatment details and encourage farm-level medicine registers;
- report suspected adverse drug reactions or treatment failures; and
- participate in AMR surveillance and farmer awareness programmes.

Veterinary pharmacologists have an especially important role. They study how medicines act in different species, establish safe doses, identify adverse effects and interactions, assess drug residues, guide withdrawal periods, evaluate new medicines, and help design antibiotic-stewardship programmes. Their expertise helps ensure that a medicine is not

only effective for the animal, but also safe for consumers, wildlife, and the environment.

India's regulatory actions also show why veterinary advice matters. In 2025, the Government prohibited several antimicrobial classes for animal use because safer alternatives were available and their use could pose a risk to human health. [4]

The farmer's role: prevention before prescription

Farmers should not have to face disease outbreaks alone. Easy access to veterinary support, quality medicines, diagnostics, and reliable information is essential. At the same time, everyday farm practices can greatly reduce the need for antibiotics.

Practical measures include:

- maintaining clean sheds, feeders, water sources, and milking areas;
- providing adequate space, ventilation, shade, and clean bedding;
- ensuring balanced nutrition and continuous access to clean water;
- following vaccination schedules;
- isolating sick animals and quarantining new purchases;
- avoiding unnecessary mixing of animals from different sources;
- practising hygienic milking and proper udder-health management;
- maintaining accurate records of illness, treatment, vaccination, and production;
- using strategic, veterinarian-guided deworming instead of indiscriminate repeated treatment; and
- contacting a veterinarian early, before disease spreads through a herd or flock.

In aquaculture, water quality, appropriate stocking density, healthy seed, feed quality, and biosecurity are equally important. In poultry, strong farm biosecurity and vaccination are

often more effective than repeated medicine use. In companion animals, routine vaccination, parasite prevention, wound care, and timely veterinary consultation prevent many infections from becoming serious.

Withdrawal periods: protecting the food chain

When a food-producing animal receives a medicine, a specific withdrawal period may apply before its milk, meat, eggs, honey, or fish can be used for human consumption. This allows time for the medicine to be eliminated from the animal's body.

The withdrawal period differs according to the medicine, formulation, dose, route, species, and food product. There is no universal waiting period that can safely be applied to every antibiotic or animal. Farmers must follow the veterinarian's instructions and the approved product label.

A simple treatment register should include the animal identification, diagnosis, medicine name, dose, date of the last treatment, and date when milk, eggs, meat, or other products may safely re-enter the food chain. This protects consumers and helps farmers demonstrate responsible production.

What normal people can do

The public has a meaningful role in slowing AMR. Every family can contribute through simple, responsible choices.

Pet owners should never give human antibiotics to dogs, cats, birds, or other animals without veterinary advice. They should not reuse an old prescription for a new illness, and should complete treatment exactly as prescribed.

Consumers can support responsible food systems by buying from reliable producers and retailers, avoiding pressure on farmers to sell food before a veterinarian-recommended withdrawal period has ended, and recognising that safe animal production requires time and proper care.

Community members can also avoid spreading misinformation. A medicine that helped one animal may be harmful or useless for another. Social-media advice, unlabelled products, and informal recommendations should never replace a veterinary examination.

Most importantly, people should understand that “more medicine” does not mean “better treatment.” The right medicine, given only when needed and under professional guidance, is the safer choice.

The way forward for India

India has recognised AMR as a national priority and has updated its National Action Plan on AMR for 2025–2029. The plan calls for One Health coordination, better surveillance, infection prevention, prudent antimicrobial use, research, innovation, and public awareness. [2]

The solution will require coordinated action by veterinarians, veterinary pharmacologists, farmers, laboratories, regulators, pharmaceutical companies, food businesses, public-health professionals, environmental agencies, pet owners, and consumers.

Antibiotics are precious medicines. They must remain available for animals that genuinely need them—and for people who depend on them to survive serious infections. Protecting them starts with a basic principle:

Use antibiotics only when necessary, only under veterinary guidance, and always exactly as prescribed.

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