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# ANTIMICROBIAL RESISTANCE IN FOOD AND AGRICULTURE

Antimicrobial Resistance (AMR) occurs when micro-organisms – bacteria, fungi, viruses, and parasites – evolve resistance to antimicrobial substances, like antibiotics, antifungals and others.

This occurs naturally through adaptation to the environment or through selective pressure when microorga-

nisms come into contact with antimicrobials.

The process is accelerated when there is inappropriate or excessive use of antimicrobials.

As a result, medicines that were once effective treatments for disease in people and animals become less ef-

fective or not effective at all, leading to a reduced ability to successfully treat infections.

This in turn leads to more severe or prolonged illnesses, increased mortality, production losses in agriculture and reduced livelihoods and food security.

## AMR IN THE FOOD AND AGRICULTURE SECTORS

Antimicrobials play a critical role in treatment of terrestrial and aquatic food producing animals and plants, helping to assure food safety and quality, animal health and welfare and farmer livelihoods.

In food animal production, antimicrobials can be used either to treat sick animals, to prevent diseases from spreading or to promote faster animal growth by applying low concentrations of antimicrobials to animal feed. This third use is increasingly discouraged but still practiced in several countries.

While the majority of antimicrobial use in agriculture tends to be for food animal production, antimicrobials such as antibiotics

and fungicides are also applied to agricultural crops and are used in the agro-industries, for instance for the production of biofuels by-products.

A growing world population is resulting in an increased demand for food. This in turn is putting pressure on the food supply chains and systems.

Global antimicrobial use in the agriculture sector is difficult to estimate due to lack of regulations and poor data collection in many countries, but is estimated to be over 60,000 tons annually.

This total volume is expected to rise over time with an increase in demand for food and for products of animal origin.

# KEY FACTS

## ANTIMICROBIAL RESISTANCE

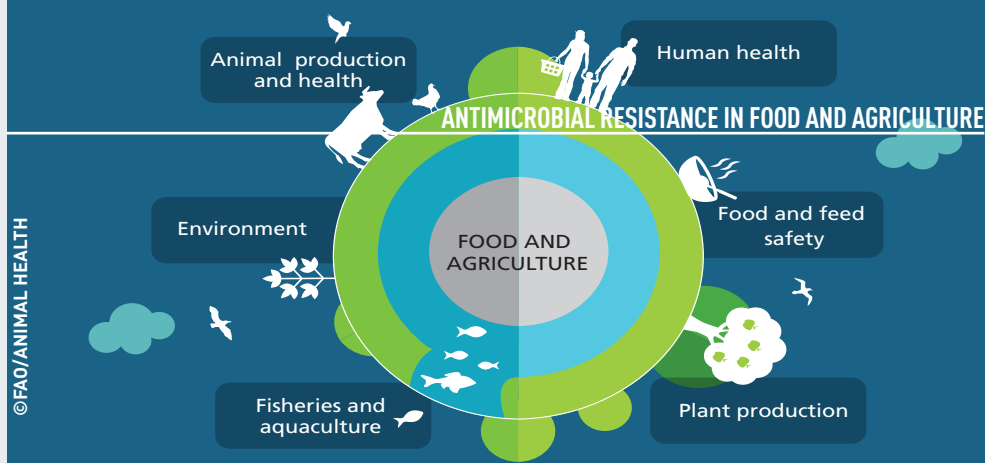
EFFECTIVE ANTIMICROBIALS ARE CRITICAL FOR TREATMENT OF DISEASES IN PEOPLE AND ANIMALS, HELPING TO ENSURE FOOD SAFETY AND SECURITY, AND THUS NEED TO BE PRESERVED

AMR IS A MAJOR GLOBAL THREAT OF INCREASING CONCERN TO HUMAN AND ANIMAL HEALTH, EXACERBATED BY EXCESSIVE USE AND MISUSE OF ANTIMICROBIALS

ANTIMICROBIAL USE IS EXPECTED TO RISE WITH THE INCREASE IN DEMAND FOR FOOD; MINIMIZING THE USE OF ANTIMICROBIALS IS CRITICAL TO REDUCE DEVELOPMENT OF AMR

FAO IS UNIQUELY POSITIONED TO CONTRIBUTE TO INTERNATIONAL EFFORTS TO ADDRESS AMR, HAVING EXPERTISE IN A VARIETY OF DISCIPLINES

FAO ACTION PLAN AND ONGOING PROJECTS FOCUS ON RAISING AWARENESS, DEVELOPING CAPACITIES FOR SURVEILLANCE, STRENGTHENING GOVERNANCE AND PROMOTING GOOD PRACTICES IN FOOD AND AGRICULTURAL SYSTEMS



Following administration, up to 90 percent of antimicrobials may be excreted un-metabolized in water and animal waste with subsequent spread into the environment. This in turn, may increase the development of AMR microorganisms through exposure to antimicrobial residues and further spread of resistance through transfer of resistance genes to other microorganisms.

Various practices can be implemented to reduce use of antimicrobials in agriculture.

Among others, adequate animal vaccination, good hygiene and husbandry practices, higher animal welfare, would lead to healthier animals or crops and a decreased need for antimicrobials as well as use of feed ingredients or additives that enhance gut health and the efficiency of feed conversion.

A legal framework should be in place in each country to ensure the quality and efficacy of antimicrobials being used, and to ensure their prudent use.

### KEY PLAYERS AND PARTNERS

FAO is uniquely positioned to contribute to international efforts to address AMR, having expertise in a variety of disciplines (aquatic and terrestrial animal health and production, animal welfare, food and feed safety, plant production and protection, environment, and legislation) to provide scientific and technical advice, and conduct capacity development projects.

FAO works closely with the World Health Organization (WHO) and World Organisation for Animal Health (OIE) promoting a One Health approach to reducing AMR globally.

Furthermore, FAO supports the work of the Codex Alimentarius, which sets a range of standards related to preventing and minimizing AMR in the food chain; providing scientific advice and support to countries for the implementation of the Codex standards.

### FAO ACTION PLAN AND TOOLS FOR COMBATting AMR

FAO has developed an Action Plan on AMR which focuses on:

- raising awareness on AMR and related threats,
- developing capacity for surveillance and monitoring of AMR and antimicrobial use in food and agriculture,
- strengthening governance related to antimicrobial use and AMR in food and agriculture, and
- promoting good practices in food and agriculture systems and the prudent use of antimicrobials.

FAO is developing tools to assist countries in their efforts to manage the risks associated with AMR.

The Progressive Management Pathway for AMR is a tool which offers a stage-wise progression to guide activities and interventions on AMR for each of the food and agriculture sectors in the four focus areas of the Action Plan.

The Assessment Tool for Laboratory and AMR Surveillance Systems (ATLASS) assesses laboratory capacities for detecting AMR, as well as the structure and operation of the overall surveillance system.

### FAO PROJECTS TO SUPPORT MEMBER COUNTRIES TO PREVENT AND CONTROL AMR

FAO has projects in Southeast Asia, Sub-Saharan Africa, Latin America and the Caribbean (2016), and in Eastern Europe and Central Asia (2017), focused on ensuring that multi-sectoral National Action Plans on AMR are in place, and aligned with global recommendations and standards, enhancing awareness, strengthening regulatory frameworks, building surveillance capacities, and promoting good practices that reduce the need for antimicrobials.

## ANTIMICROBIAL RESISTANCE

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