

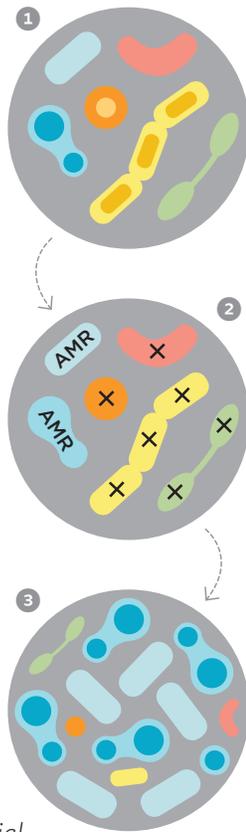


# NIFA Supports Federal Initiative to Combat Antimicrobial Resistance

Society uses antimicrobial drugs to prevent, control, and treat diseases caused by harmful microorganisms in humans, animals, and plants. However, development and spread of antimicrobial resistance (AMR) has emerged as a serious societal problem. USDA's National Institute of Food and Agriculture (NIFA) supports extramural research, education, and extension activities and complements other USDA efforts to understand and mitigate AMR along the food chain, from production to consumption.

## HOW DOES AMR HAPPEN?

- 1 Microbes have existed in nature for billions of years. Changes that can naturally occur in the DNA of microbes may make them harmful to plants and animals or resistant to antimicrobials.
- 2 Antimicrobials are able to kill some microbes but are ineffective against the resistant microbes.
- 3 Repeated exposure of microbes to the same types of antimicrobials—in natural or human-managed environments—may eventually select for the resistant microbes to outnumber the susceptible microbes.



As a result, certain types of antimicrobial drugs may no longer be able to treat harmful, highly resistant microbes that infect humans, animals, or plants. The extent to which antimicrobial drug use in agriculture contributes to human and animal infection by AMR microbes is unknown.

## AMR ADVERSELY IMPACTS HUMAN HEALTH. EACH YEAR IN THE UNITED STATES:\*

- **2,049,000** human illnesses are caused by bacteria and fungi that are resistant to at least some classes of antimicrobial drugs, and **23,000** of these illnesses result in death.
- AMR-related illnesses and deaths cost **\$20 billion** each year in additional human healthcare spending and an extra **\$35 billion** in lost human productivity.



## NIFA SUPPORTS BASIC AND APPLIED RESEARCH, EDUCATION, AND EXTENSION PROJECTS THAT:

- Determine the attributable risks caused by antimicrobial use in agriculture
- Create new and improved animal disease vaccines and diagnostic tests
- Identify strategies for controlling and mitigating the emergence and spread of AMR
- Explore alternatives to antibiotics

## GLOSSARY



**ANTIMICROBIAL DRUGS:** substances that kill or inhibit the growth of microorganisms. Antibiotics are a specific type of antimicrobial drug that kills bacteria.

**ANTIMICROBIAL RESISTANCE:** the inability of commonly used drugs to treat and prevent illnesses caused by disease-causing microorganisms.

**MICROORGANISMS:** bacteria, fungi, viruses, and some parasites.