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Section D: Ecological and Public Health Implications of Animal Waste on Our Food and the Environment—Overview and Background

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IAP Environmental Degradation

- IAP (industrial animal production) contributes to the degradation of ...
 - Soil
 - ▶ Nutrient overloading
 - Air
 - ▶ Chemical and biological contaminants
 - ▶ Greenhouse gas emissions
 - Water
 - ▶ Nutrients
 - ▶ Pathogens
 - ▶ Ecosystem alterations
- IAP can create significant negative public health effects



Causes of IAP Environmental Degradation

- Monoculture crop production for animal feed
 - Unsustainable water usage and soil degradation associated with feed production
- Pesticide production and application
- Transportation of feed and animals
- Sub-therapeutic use of antibiotics
- Animal waste
 - Large volumes of animal waste produced in localized areas
 - Lack of appropriate waste management and disposal

U.S. Livestock Farms and AFOs

1. More than 50 percent of U.S. livestock is raised on 5 percent of farms
 - “EPA and the USDA are committed to a comprehensive national approach to ensure that manure and wastewater from AFOs are properly managed”
2. EPA and USDA rely on voluntary programs (e.g., technical assistance, training, funding, and outreach) and on regulatory programs to ensure that AFOs establish appropriate site-specific comprehensive nutrient management plans (CNMPs) that will protect the environment and public health

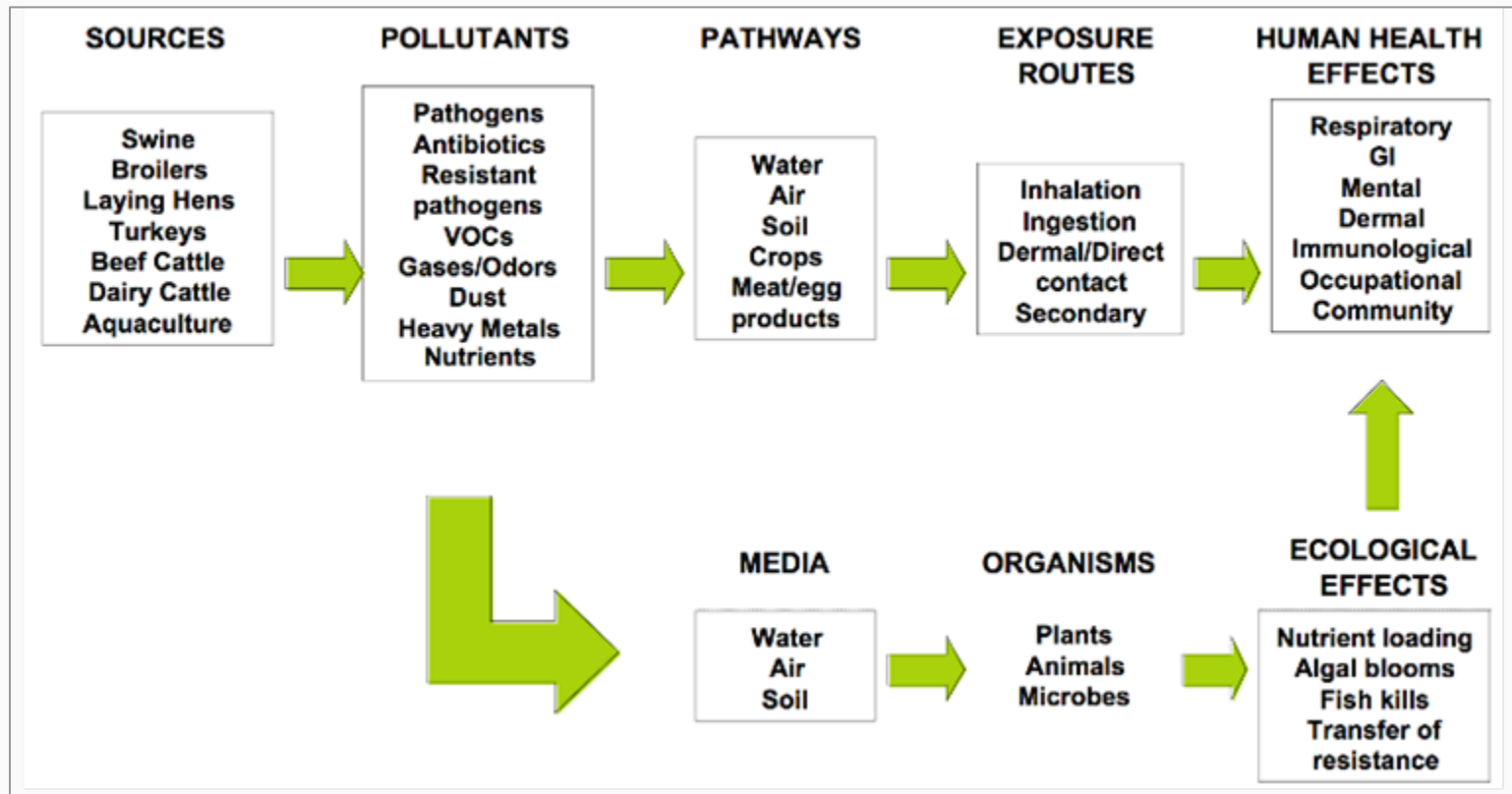
IAP New Business Model Brings New Challenges

- More than 50 percent of soil and sediment erosion
- More than 35 percent of U.S. pesticide usage
- From 70 to 80 percent of antibiotic usage
- Thirty percent of nitrogen and phosphorous loading to drinking water resources



Source/Effect Paradigm

- Source-to-effect diagram illustrating the role of IAP facilities as a source of hazardous agents whose emission impacts environmental quality of air, water, and soil, and creates conditions for biological exposure and adverse health outcomes in affected animal and human populations



Antibiotic Use in Animal Feeds

- Nearly 70 percent of antibiotics sold in the U.S. are used in animals
- Administered at sub-therapeutic levels for growth promotion
- Poorly absorbed by the animal gut, from 25 to 75 percent excreted unaltered in feces
- The hundreds of millions of tons of animal waste produced in the U.S. per year are a large source of antibiotics and antibiotic-resistant bacteria in the environment

Zoonotic Microorganisms

- World Health Organization definition of zoonoses: “those diseases and infections which are naturally transmitted between vertebrate animals and man”

Groups of Microorganisms

- Bacteria
 - *E. coli*, *Campylobacter*, *Salmonella*
- Parasites
 - *Cryptosporidium*, *Giardia*
- Viruses
 - Hepatitis E virus, noroviruses
- Helminths
- Prions

Two Key Concepts to Keep in Mind

1. Size of the microorganism
2. Resistance to environmental degradation and chemical inactivation