The use of anti-microbials in animal production

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Antimicrobials

Antimicrobial are **essential** drugs used to treat infections caused by microorganisms in animals and humans.
Antimicrobial usage

Antimicrobials

Physicians

Human
Antimicrobial usage

- Antimicrobials
  - Veterinarians
  - Physicians

- Agriculture
- Human
Antimicrobial usage

Human

Veterinarians

Agriculture

Environment

Physicians

Food

Antimicrobials
Antimicrobial use

Overuse / Misuse

Antimicrobials

Veterinarians

Physicians

Human

Agriculture

Environment

Food

drug-resistant pathogens
A Complex Problem

EPIDEMIOLOGY OF ANTIMICROBIAL RESISTANCE

AQUACULTURE
- Sea / Lakes
- Drinking Water

Rivers and Streams
- Drinking Water

SOIL
- Farm Effluents and Manure Spreading
- Sewage

WILDLIFE
- Vegetation, Seed Crops, Fruit

FOOD ANIMALS
- Sheep
- Cattle
- Veal Calves
- Poultry

COMPANION ANIMALS

Animal Feeds
- Rendering
- Dead stock

Commercial Abattoirs / Processing Plants
- Meat
- Handling Preparation Consumption

INDUSTRIAL & HOUSEHOLD ANTIBACTERIAL CHEMICALS

HUMAN
- Hospitalized
- Community - Urban - Rural
- Extended Care Facilities

DIRECT CONTACT

after Linton AH (1977), modified by Irwin RJ
Impact pathways

• Through work with animals and their products (workers) – large, high certainty
• Through animal products (consumers) – probably low on average, large in low and mid income countries
• Through the environment (everyone) – probably large, but very variable
Global map of antimicrobial consumption * in livestock

*Consumption in milligrams per 10 km²

Total consumption in 2010 at 63,151 tons…
… will rise by 67% by 2030

Source: Global trends in antimicrobial use in food animals
Livestock sector growth

• 70 % more animal products by 2050, driven by income growth, population, urbanization
• Recent “peak meat” in developed countries
• Strong growth in emerging countries
• Africa starting its own livestock revolution
• Rapid intensification in pigs, poultry, dairy
Structural Changes

• Highest growth in monogastrics (poultry)
• Up-scaling of operational size in production
• Sector vertical integration
• Geographic concentration (close to consumption, close to feed supply)
Requirements for industrial livestock production

• Surplus feed – nitrogen fertilizer
• Uniform animal genetics
• Reduced disease pressure
Use of anti-microbials in animal production

• Therapeutic – treat disease
• Prophylactic – prevent disease risk
• As growth promoter (sub-therapeutic use)

• Estimates* of the global average annual consumption of antimicrobials per kilogram of animal produced:
  – 45 mg·kg⁻¹ for cattle
  – 148 mg·kg⁻¹ for chicken
  – 172 mg·kg⁻¹ for pigs

• Estimated increase in use by 67%, from 63,151 ± 1,560 tons to 105,596 ± 3,605 tons

* Van Boeckel et al., 2015
Antimicrobial Resistance = Cross-cutting issue and a Global Threat

Public - importance of public understanding of the threat. Raise awareness

Physicians - Misuse of antibiotic prescription by clinicians (prescribing antibiotics for minor illnesses) and in hospitals;

Veterinarians - overuse and misuse of antimicrobials in food animals

Farmers - The use of preventive antibiotic in animal farm as a substitute of a good hygiene and health on factory farms. Antibiotics as a less expensive prevention system.

Policies - Need for national policy to contain antimicrobial resistance

Private sector - Lack of accurate information on the use of antibiotics

Academia – more scientific evidence that antibiotics use in animal feed will eventually harm humans

✓ Coordinated interventions
International/intergovernmental Organizations - joint international effort to control this threat

**FAO:**
Draft Resolution on AMR to be presented to the 39th Conference in June 2015 for adoption

**WHO:**
Draft Global Action Plan on AMR to be presented at International Health Conference in May 2015

**OIE**: Draft resolution on AMR to be presented at the annual General Assembly in May 2015

*intergovernmental organization*
Status Report on AMR to 39th FAO conference (6 to 13 June 2015)

• Recognizes AMR as a cross-sectoral, multi-stakeholder issue that requires multi-agency efforts (FAO, WHO, OIE, others)

• Food security implications (core mandate of FAO) – trade-offs between different objectives

• Problem more pronounced in intensive production systems
Suggested FAO Response

• Develop step-wise, progressive management pathway (PMP) to assist Member Countries to set targets, improved management of AMR risks and antimicrobial use, in line with the GAP on AMR

• FAO has established strong and effective collaboration on AMR within the framework of the FAO/OIE/WHO tripartite agreement and with other public and private sector organizations

• Create a dedicated body of work will support and enhance the contribution of the livestock and fish to sustainable food and agriculture, global food security and health, equity and growth
Issues

- **Scientific evidence Vs precautionary principle** / approach might be applied in cases when the scientific evidence is not conclusive enough to determine a level of protection but there is a necessity to take measures for the purposes of protecting public health, safety, or the environment* - ‘*better safe than sorry*’.

- **Antimicrobials usage** in livestock has been the subject of debate about the appropriateness of using these important drugs in animal feeds - Ethical issues. Or use as **preventive** antibiotic in animal farm as a substitute of a good hygiene and health on factory farms. Antibiotics as a less expensive prevention system.

- **Trade and economic interests.** Lowering or banning sub-therapeutic (or preventative) antimicrobial use in animal production could have serious economic effects on the livestock. *What about developing countries?*

- Developing of **new drugs** Vs limiting the sue those existing

- The importance of **public understanding** of the threat.

*Trans Atlantic Consumer Dialogue TACD*
Need for urgent action

✓ increase awareness amongst all stakeholders involved (political, public)

✓ strengthen national monitoring and surveillance of antimicrobial resistance in agriculture, food and environment

✓ to support the development of sustainable food production systems and promote good animal husbandry management, biosecurity and biosafety

✓ encourage and support research

✓ Support policy making processes that use a “One Health” approach