Historical Review of Prior Symposia
Setting the Stage

Thomas R. Shryock, Ph.D.
Antimicrobial Consultants, LLC
Greenfield, IN
Antibiotic Use in Food Animals: 
A Dialogue for a Common Purpose 
Oct. 26-27, 2011, Chicago, IL

[AGP legislation / Media Messages / Company pressures]

• The end goal of the symposium was for animal health and human health experts to share science-based information so an honest dialogue can ensue.

• Three questions need to be addressed in order for that to occur:
  • What are the key components of agreement/disagreement about the science of antibiotic resistance?
  • What role does agreement/disagreement about values regarding food production play into the discussion?
  • Where do we find aspects of consensus across science and values?
Figure 1

EPIDEMIOLOGY OF ANTIMICROBIAL RESISTANCE

AQUACULTURE

Sea / Lakes

Drinking Water

Rivers and Streams

Drinking Water

Industrial & Household Antibacterial Chemicals

SOG

Vegetation, Seed Crops, Fruit

WILDLIFE

Rendering

Dead stock

Animal Feeds

COMPANION ANIMALS

Direct Contact

Commercial Abattoirs / Processing Plants

Meat

Handling Preparation Consumption

HUMAN

COMMUNITY - URBAN - RURAL

EXTENDED CARE FACILITIES

after Linton AH (1977), modified by Irwin RJ
Antibiotic Use in Food Animals:  
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An overview of key discussion points…

• Human Health Implications Relative to Antibiotic Use
  “There is no known connection between several drug-resistant human pathogens and 
  food-producing and/or companion animals. Some drug-resistant infections in humans 
  are a result of extensive use in humans since the antibiotics in question have never 
  been approved for use in food-producing animals.”

• Regulatory Oversight and Risk Mitigation
  • US FDA CVM Guidances: 152 for new products; 209 for Judicious Use
  “Risk…represents a threat to humans only if there is a causal pathway from the AMR 
  bacteria in food-producing animals such that resistance is transferable to humans”.

• Livestock MRSA: Understanding and Communicating the Risks
  • Not foodborne. Direct contact. Colonization vs. Infection. Unique clone.
Antibiotic Use in Food Animals: A Dialogue for a Common Purpose
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An overview of key discussion points and Conclusions…

• Connecting with Consumers
  • “The animal agriculture industry together with various regulatory agencies must consistently and effectively communicate and demonstrate its food safety commitment to the food chain and consumers in order to build long-term trust”.

• Additional Points/ Need for Dialogue Going Forward
  • Antibiotic sales data is not reflective of actual use practices
  • Need for more understanding of farm and production practices
  • Detection sensitivity and surveillance of food safety hazards and outbreaks
  • Need for more understanding of antibiotic dose and duration on resistance selection
  • Oversimplification of complex systems and issues in conversation and media
The end goal of the symposium was:

1. to obtain the scientific facts regarding antibiotic use within animal health, human health and environmental health
2. to better understand the “how” and “why” antimicrobial resistance occurs
3. to look at alternatives to antibiotics in agriculture
4. lead and engage participants in open conversations
5. to build relationships with other sectors and gain better understanding of other perspectives
6. to begin to find common ground and formulate a path forward
7. focus on continuous improvement and commitment to long-term health.
A One Health Approach to Antimicrobial Use & Resistance: A Dialogue for a Common Purpose
Nov. 13-15, 2012, Columbus, OH

An overview of key discussion points…

• Antibiotics and Food Animals
  • Pipeline, “alternatives”, judicious use, legislation
• Human Medicine
  • Measures of usage, AMR pathogens, stewardship
• Environment
  • Sources and routes of antibiotic contamination of water
• Antimicrobial Resistance
  • Genetic origin, definitions of Resistance, surveillance programs
Key discussion points and Path forward…

The Top 4 most important issues identified by attendees in Interactive Sessions were:

1. Effective communication – between consumers and producers; between animal health and human health professionals; messages delivered through mass media
2. Research needed to define the antimicrobial use and resistance problem
3. Stakeholder consensus
4. Education on judicious use of antimicrobials

Four vision themes emerged from Interactive Session #1:

1. Consensus and collaboration building
2. Improved communication and education
3. Redirect how we approach medicine
4. Science-driven decision process
RESOLUTION:

“Finding resolution to antimicrobial resistance must begin with the end in mind: improving human and animal health. Individuals within animal agriculture, human medicine and the environmental field will be best served to think in bigger and broader dimensions and to focus on collective interests and not positions. Common ground should be defined, with mutual satisfaction a priority. Based on scientific bodies of information, the facts should be separated from perceived facts. Reactions, emotions and distrust should be suspended. Reaching resolution also requires acceptance that the issues of antimicrobial use and resistance are not personal.

- The scale and complexity of animal and human medical problems embedded in a changing environment demand that scientists move beyond the confines of their own disciplines and explore new organizational models for team science. One solution is to use a One Health mindset and perspective.

- One Health is a collaborative effort of multiple disciplines—working locally, nationally and globally—to attain optimal health of humans, animals and the environment.”
• The goals of the 2013 symposium were the same as the 2012 symposium:
  • To lead and engage participants in an open conversation.
  • To build relationship within animal, human, and environmental health and gain a better understanding of other perspectives.
  • To find common ground and formulate a path forward.
  • To focus on continuous improvement and commitment to long-term health.

• Antibiotics
  • The great majority of antibiotic classes used in human and animal health have very little or no overlap. The two classes with a higher level of overlap are the sulfas and macrolides.
  • Definitions of antimicrobial agent, antibiotic, etc.
Bridging the Gap between Animal Health and Human Health
Nov. 12-14, 2013, Kansas City, MO

Key discussion points…
- Consumer Concerns and Perceptions
  - Avoidance approach (no antibiotic, no X…) for labeling. Animal welfare matters. Agribusiness is not trustworthy. Advocacy groups support restrictions on uses and better accountability. Perceptions, interpretations, lack of agricultural practice familiarity, poor communication with ag sector complicates dialog.

- Antibiotic Resistance
  - A one-size-fits-all model for antimicrobial resistance doesn’t encompass the complexity of the issue, and simple models fail to capture the entirety of the issue. Emergence, amplification, persistence and the transfer of antibiotic resistance is highly complex.

- Human Health
  - Prescribing practices to be modified by education.
  - CDC’s Top 20 list of AMR pathogens, categorized by “threat level”
Bridging the Gap between Animal Health and Human Health
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Key discussion points…

• Animal Health
  • Judicious antibiotic use “to do list” includes: education, research on appropriate use, alternative practices or products, disease prevention efforts

• Regulation of Antibiotic Use in Food-Animal Production
  • Residue testing programs, food plant inspections
  • Guidances 152, 209, 213 and sales reporting

• Solutions to Antibiotic Use and Resistance
  • Appropriate prescribing reduces use; resistance prevalence decreases
  • CDC’s Four Core approaches - Infection control; stewardship; surveillance, new diagnostics and antibacterial agents
  • Public policy and Private policy approaches - pros and cons of each
Conclusions / Next steps

- Decisions and policy should be grounded in science, and policy should be based on science. The question, however, is who decides what should be considered when making those decisions and policies. For effective interventions to complex problems, the solutions should be developed by a broad representation of relevant stakeholders and their sometimes-competing perspectives and values.

- Solving antibiotic resistance requires collaboration and raises the question, “How does human health, environmental health and animal health work together to address antibiotic use and resistance?”
End goals similar to previous symposia

Key discussion points:
- Identifying and Prioritizing Key Resistance Issues at the Human and Animal Interface
  - Salmonella and campylobacter considered main food borne pathogens. AMR concern is for subset that are resistant to important antibiotics such as FQs, 3rd Gen cephalosporins and macrolides
  - Food animal disease due to animal pathogens require treatment with same agents
Key discussion points...

- Stewardship Programs to Minimize Resistance
- Human Health (e.g. hospitals, pediatrics) - education, formulary, infection control
- Companion Animal Health - education, diagnostics, guidelines
- Food Animal Health - QA programs to ensure best practices, including antibiotic use
Antibiotic Use and Resistance: Moving Forward Through Shared Stewardship
Nov. 12-14, 2014, Atlanta, GA

Key discussion points…

- Metrics of Success in Minimizing Resistance (Clinical Outcomes vs. Process Goals)
  - Animal Agriculture
    - (PCAST recommendations)
  - FDA CVM Antibiotic Sales data and NARMS data analysis (NIMBioS); VFD
  - Canadian CIPARS Farm Program for AMR and antibiotic use
- Human Medicine
  - Optimal prescribing
Antibiotic Use and Resistance: Moving Forward Through Shared Stewardship
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• Strategies to Move Forward: Real-World Solutions

• US National Strategy and Action Plan for Combating Antibiotic-Resistance Bacteria led by Secretaries of HHS, DoD and USDA - Five year plan with Five Goals:
  • GOAL 1: Slow the development of resistant bacteria and prevent the spread of resistant infections
  • GOAL 2: Strengthen national One Health surveillance efforts to combat resistance
  • GOAL 3: Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria
  • GOAL 4: Accelerate basic and applied research and development for new antibiotics, other therapeutics and vaccines
  • GOAL 5: Improve international collaboration and capacities for antibiotic resistance
Antibiotic Use and Resistance: Moving Forward Through Shared Stewardship
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Recommendations for the 2015 meeting -
• Outcome measures (i.e. clinical) and Process measures
• Metrics of success in the effort to minimize the development of antibiotic resistance include:
  • assessing the effectiveness of antibiotic stewardship programs
  • increasing veterinarian oversight in animal agriculture
  • more careful monitoring of antibiotic usage and resistance in human and animal health
  • ongoing evaluation of individual and aggregate case outcomes
  • population health indicators
  • measuring the economic impact of resistance on health costs and society
Summary of Key Learnings

- Risk assessment - each link from farm to meat to clinical failure must be causally connected in order for interventions to be effective.
  - Campylobacter example
- Standardized methods for metrics must be used in order to ensure valid comparisons
  - Susceptibility Testing - Pertains to NARMS, research, hospitals, clinics, etc.
  - Interpretation of MIC data - clinical vs. epidemiological cut-off value
- Standardized methods for data collection on sales or use must be consistently applied
- Communication Caution - Catchy phrases may not be supported by science
  - 80% of all antibiotics…right drug, right dose, right duration….antibiotics in meat
- “Sloppy language” leads to misunderstandings
  - Regulatory language vs. science vs. common usage
    - e.g. subtherapeutic, medically important classes, resistance,
RESOLUTION:

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