Managing AMR Risk in Humans with Applied Veterinary Medicine and Science

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Brief Background

• 35 year career working as a board certified poultry veterinarian for two top 10 U.S. broiler companies

• For last 25 years have worked for Mountaire Farms Inc.

• Mountaire Farms is the 6th largest U.S. broiler company operating 4 fully vertically integrated broiler complexes in the mid-Atlantic region

• Mountaire Farms is non-branded

• Conventional production practices were replaced with certified responsible antibiotic use program in December 2016
Antibiotics are a **shared resource with shared risks**

- **All users** of antibiotics must do their part to preserve their effectiveness for use now and for future generations

Source: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3234384/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3234384/)
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Two step process for success:

• **First step:** Admit that veterinary medicine is part of the problem

• **Second step:** Commit to develop animal health programs and strategies using best antibiotic stewardship practices as part of a holistic responsible animal care program
Admitting that veterinary medicine is part of the AMR problem

• AMR is a global societal problem that affects everyone
• **ALL antibiotic use** contributes to this important problem
• **ALL veterinarians** must practice good antibiotic stewardship
• Food animals
• Companion animals
• Zoo and wildlife
• Educators
• Researchers
Admitting that poultry production is part of the AMR problem

• Concern is that an acquired foodborne illness in humans will not respond to antibiotics from a physician because the chickens/turkeys were treated with the same or a related antibiotic sometime during their life
• Risk analysis studies indicate that the odds of this scenario occurring are low
• CDC estimates that 2 million AMR infection occur in the U.S. each year causing 40,000 deaths
• Poultry related foodborne pathogens of Salmonella and Campylobacter cause 400K AMR infections and 120 deaths annually
• ANY human illness or deaths attributed to AMR originating in poultry is TOO MANY
• Environmental release of AMR bacteria from commercial poultry production sites is a significant AMR risk that is difficult to accurately measure
Responsible Animal Care:
Raising Healthy Animals and Minimizing Risk of AMR for Humans

Progress in Antibiotic Stewardship in Poultry:
Poultry Antibiotic Use Report: Dr. Randy Singer
Key Changes Among Turkeys Over the Five-Year Period

Turkeys receiving antimicrobials in the hatchery decreased

Hatchery gentamicin use decreased approximately

Medically important in-feed antimicrobial use in turkeys decreased

Medically important water-soluble antimicrobial use in turkeys decreased substantially

- Hatchery gentamicin use decreased approximately 42%
- Tetracycline use decreased 67%
- Penicillin use decreased 42%
- Tetracycline use decreased 28%
- Lincomycin use decreased 46%
- Neomycin use decreased 49%
- Erythromycin use decreased 65%

Some Progress in Antibiotic Use Reductions in Chickens has Come from Voluntary Marketing Programs: No Antibiotics Ever
No Antibiotics Ever (NAE): Most common animal production meat label claim

• Many consumers (35-75%) mistakenly believe that if antibiotics are used during animal production then harmful antibiotic residues will still be present in the meat when sold*

• Concern about possible exposure to antibiotic resistant bacteria causing foodborne illness is poorly understood by consumers

• Package based certification results in two tiered product stream because animals treated with any antibiotic must be diverted into a different product sales category

• Creates competing priorities: Maintain NAE label or animal health?

*Source: Kynetec 2016, Global survey commissioned by Enough Movement
Voluntary Marketing Program: No Antibiotics Ever (NAE)

• Began in 2013 as voluntary marketing production practice to remove **ALL** antibiotics from chicken production, including ionophores
• Initial NAE market premium was high ($1.00/lb Boneless Breast)
• From 2013 to 2019: NAE production has increased 10X in volume
• Current NAE market premium is low ($0.10-0.20/lb Boneless Breast)
Percent (%) of Birds fed ‘NAE’
No Antibiotics Including Ionophores
January 2013 through September 2019

Tyson Entry
Percent (%) of Birds fed ‘NAE’
vs.
Percent (%) Lbs. sold ‘NAE’
August 2017 through May 2019
NAE Programs: Unintended Consequences

- **Data:** Broiler mortality data trends (National Chicken Council)

- **Research:** Survey of veterinarians responsible for NAE programs (Dr. Randy Singer, U of Minnesota)

- Data from poll of **42 broiler veterinarians managing health of NAE chickens**
Broiler Mortality
Broiler Mortality Trending up for First Time in 90 Years

Historical Mortality

Source: National Chicken Council used with permission
Broiler Mortality Trending up for First Time in 90 Years

Source: National Chicken Council used with permission
Percent (%) Adjusted Mortality*: NAE (6 lb) vs. Traditional (7 lb) Oct 2017 – May 2019

*Mortality adjusted for live wt: 1.0 lb = 0.50%
How does NAE impact broiler health and welfare?

Source: 2018 Singer et al, Potential impacts on animal health and welfare of raising animals without antibiotics
https://www.biorxiv.org/content/10.1101/600965v1
There are times that maintaining an NAE Label has priority over animal health and welfare?

Figure 20 Label Priority. There are times that maintaining an RWA label has priority over animal health and welfare.

Source: 2018 Singer et al, Potential impacts on animal health and welfare of raising animals without antibiotics
https://www.biorxiv.org/content/10.1101/600965v1
If NAE is not a good idea, then what is the solution?

Integrating antibiotic stewardship into responsible animal care programs
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- Goal is for **responsible antibiotic use** vs **antibiotic reductions**
- **Employ strategies to reduce the NEED for antibiotics**
  - Optimize animal husbandry and sanitation practices to reduce disease
  - Optimize biosecurity programs to prevent introduction of disease
  - Optimize veterinary health plans to prevent disease by use of vaccines and other disease prevention strategies including non-antibiotic alternatives
Integrating antibiotic stewardship into responsible animal care programs

• When antibiotic use is necessary follow **good antibiotic stewardship** principles

• Medically important antibiotics:
  1. Should only be used to treat and control disease
  2. Should not be used for prevention purposes or administered in a regular and repeating manner
  3. Should be administered to the fewest number of animals possible when used

• Antibiotics deemed not important to humans may be used in accordance with FDA regulations

• Measure treatment outcomes

• Record and track all antibiotic use

• **Regularly review and update veterinary health plan based on clinical outcomes**
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• **All users** of antibiotics must do their part to preserve their effectiveness for use now and for future generations

**THIS INCLUDES ALL VETERINARIANS**
Thank you
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