



## **KEY ELEMENTS FOR IMPLEMENTING ANTIMICROBIAL STEWARDSHIP PLANS IN BOVINE VETERINARY PRACTICES WORKING WITH BEEF AND DAIRY OPERATIONS**

### **INTRODUCTION**

The goal of this document is to provide veterinarians with best practices for designing, implementing, and monitoring antimicrobial stewardship programs with their clients. These best practices are aimed at veterinarians who administer antimicrobials, who are responsible for oversight of drug use or treatment protocols, or who make recommendations for use of antimicrobials, including private practitioners, consultants, extension veterinarians, animal health product sales and technical service personnel, and other veterinarians involved in beef or dairy operations. The focus is on best practices for veterinarians with defined and defensible Veterinarian-Client-Patient Relationships (VCPR) or Veterinarians of Record, but elements may be applicable to veterinarians with other relationships to clients and patients.

### **DEFINITION OF ANTIMICROBIAL STEWARDSHIP**

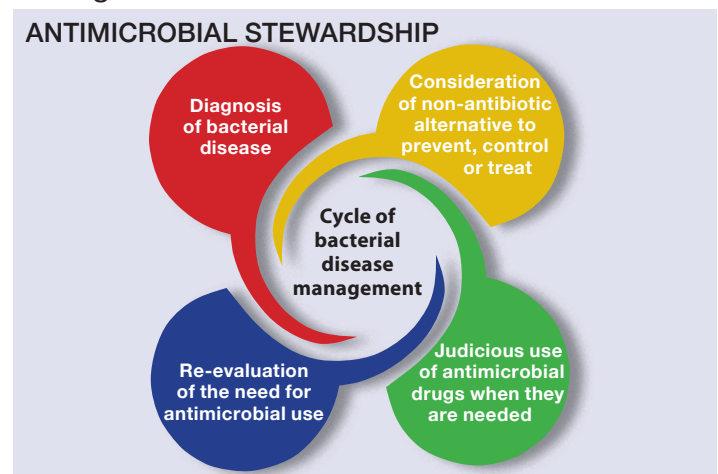
Commitment to reducing the need for antimicrobial drugs by preventing infectious disease in cattle, and when antimicrobial drugs are needed, to using antimicrobial drugs appropriately to optimize health outcomes and minimize selection for antimicrobial resistance as well as prevent violative residues.

### **KEY ELEMENT 1: LEADERSHIP COMMITMENT**

In bovine veterinary practice, individual veterinarians working with animal owners and managers as well as veterinarians within their practice setting, such as with co-workers in a team practice or colleagues providing veterinary services to the same production unit or group of animals (within or across practice leadership) are leaders with responsibility for antimicrobial stewardship. A commitment to leadership in antimicrobial stewardship in bovine veterinary practice includes accepting responsibility and accountability for antimicrobial

prescribing, dispensing, and administration. This commitment also includes the need to identify leaders on farms and ranches to share in antimicrobial stewardship.

Bovine veterinary practice differs from other models of healthcare; therefore, the designation of a single leader within a practice is not necessary. Instead, every practicing veterinarian should shoulder the leadership responsibility as a professional and should lead stewardship activities that involve other stakeholders such as veterinary technicians, cattle operation managers, nutritionists, farm employees, hoof trimmers, pharmacies and drug distributors, and animal health companies in all settings in which antimicrobial drugs are used. Leadership means being responsible for the cycle associated with bacterial disease management:



### **VETERINARIANS CAN BE LEADERS IN ANTIMICROBIAL STEWARDSHIP BY ASKING THE FOLLOWING QUESTIONS WHEN A BACTERIAL DISEASE PROBLEM HAS BEEN IDENTIFIED:**

- Have I done or facilitated the necessary diagnostic work to establish a functional case definition that includes bacterial pathogens?



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Have I provided essential training and education about the need for antimicrobial stewardship and ways to use antimicrobial drugs judiciously for on-farm personnel, if appropriate/necessary?

- Have I considered the corresponding management and environmental factors that may have contributed to this disease state and have I made the commitment to work toward improving or eliminating those factors in this husbandry system so that disease and treatment rates can be reduced?
- Have I considered and suggested all the feasible non-antimicrobial alternatives for disease prevention and treatment?
- Have I made the commitment to teach what I learn from each of these therapeutic events and investigations to the veterinarians, producers, and farm employees that I encounter in my practice life?
- Have I made the commitment to apply what I learn from research, participation in scientific organizations, and consultation with subject-matter experts and to relay what I learn to my clients and colleagues?
- Have I considered whether my personal economic gain has influenced my decisions to treat, dispense, or prescribe?

#### ONCE A NEED FOR ANTIMICROBIAL DRUGS HAS BEEN IDENTIFIED, JUDICIOUS USE INCLUDES CONSIDERATION OF THE FOLLOWING:

- Have I identified the organ system affected and specifically identified or determined the most likely agent such that this information aids the selection of an appropriate antibiotic, dose, and route of administration that is likely to be effective along with appropriate withdrawal times?
- Is this regimen likely to be safe?

■ Am I committed to complete the cycle of bacterial disease management by following the judicious use of antimicrobial drugs with re-evaluation of the need to improve the therapeutic benefit of antimicrobial drugs while reducing the potential selection for antimicrobial resistance?

■ Am I committed to using antimicrobial drugs in a manner that does not increase short-term benefits at the expense of long-term loss of drug availability or antimicrobial susceptibility and effectiveness?

■ Have I followed the legal requirements for using antimicrobial drugs, selecting approved products when available, or choosing an extra-label use if it is legally acceptable? Do I have a veterinary-client-patient relationship (see the AABP VCPR guidelines)? Have I avoided causing a residue that would threaten human health or be violative?

#### KEY ELEMENT 2: DRUG EXPERTISE

■ Most bovine practitioners do not practice in settings in which there is an infectious disease specialist on call. Therefore, it is the responsibility of the veterinarian to continuously seek new information about the use of antimicrobial drugs. This might take the form of professional continuing education, searching for and reading peer-reviewed published research, or reviewing rigorously performed knowledge summaries. Knowledge summaries may include online decision-support tools, systematic reviews and meta-analyses, or critically appraised summaries of published data. Veterinary educators are also called to include education about all aspects of antimicrobial stewardship so that new veterinary graduates have the knowledge and skills necessary to be stewards. At a minimum, practitioners are



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encouraged to read and familiarize themselves with the respective antimicrobial package inserts as from time to time they are changed for a variety of reasons.

■ Bovine practitioners should provide antimicrobial use protocols and treatment guidelines specific for each farm, ranch or operation, as described in the AABP Guidelines “Establishing and Maintaining the Veterinarian-Client-Patient Relationship in Bovine Practice” and “Drug Use Guidelines for Bovine Practice.” Well-designed guidance makes all the steps in antimicrobial decision-making transparent, and it provides an educational tool as well as a management tool for accountability and tracking.

#### KEY ELEMENT 3: TRACKING ANTIMICROBIAL DRUG USE

Bovine practitioners should periodically review treatment records, antimicrobial purchase, inventory, and use records present on the farm in relation to treatment protocols, and antimicrobial drug dispensing and usage. This requires appropriate record systems.

When appropriate, tracking may include monitoring the pathogens associated with clinical disease and their antimicrobial susceptibility patterns or evaluating treatment efficacy through the use of treatment and health records for outcomes such as retreatment rates. Knowledge of these parameters on a herd basis can help guide changes in treatment protocols.

#### KEY ELEMENT 4: REPORTING

Recognizing the issues in case definition consistency and record systems, bovine practitioners where practical and possible should support efforts to report antimicrobial drug use across farms in order to benchmark and compare usage, while maintaining client confidentiality.

#### KEY ELEMENT 5: EDUCATION

Stewardship programs require action in addition to monitoring and tracking. Stewardship leader(s) should review activities and recommend appropriate actions on a regular basis. Below are some examples of ways to take action.

■ Review the infection prevention program for the operation for specific disease conditions to assure that optimum husbandry is being employed as well as appropriate management such as vaccination and nutrition. Specific examples include:

- In the feedlot, examine closeout data for incidence of preventable conditions.
- Review pre-weaned dairy calf feeding and management to reduce scours and respiratory disease and the need for treatment.
- Examine treatment records of one or more farms to estimate the percentage of entries for a single disease challenge (e.g., mastitis on a dairy, bovine respiratory disease complex on a feedlot). Make a plan with the owner or manager to reduce the incidence of disease and review records in 6 months.

■ Review treatment protocols developed for different disease syndromes.

- Are the clinical syndromes described adequately for farm personnel to act on?
- Are written protocols up to date for the specific syndrome with regard to indication for use, dosage, route, duration, animal or group identification? Is there another class of antimicrobial that could be used effectively that is not of high importance in human medicine?
- Examine treatment records of one or more farms to estimate the percentage of entries that include all the necessary recorded items such as: antimicrobial drugs used, indication for use, and regimen (dose, route, duration, and frequency as well as withdrawal times). Make a



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plan with the owner or manager to increase this percentage of complete records by a particular percent and review in 6 months.

- Compare the operation's drug inventory and purchasing as a measure of protocol compliance.
- Evaluate pathogens or environmental bacteria for resistance profiles.
- Review the published evidence for efficacy of specific antimicrobials for pathogens seen in the practice.
- Establish a baseline resistance profile against which to measure future progress. Pick one or more clients that are significant and influential in your producer community and assess herd-level resistance in these operations.
- Pick one or more high prevalence diseases in a production class and create a progress plan for:
  - Herd management changes that have the potential to reduce disease pressure and prevalence over the subsequent period.
  - A review of current treatment protocols for that disease and suggestion of refinements in terms of decision tree for when to treat and what to treat with.
  - Providing for reliable treatment and outcome records for later review.
- Establish a schedule (annual, semiannual, quarterly) to review resistance prevalence patterns, disease rates, treatment frequency, and changes in treatment outcome quality parameters.

- Commit to seeking and creating a learning system around this selected disease such that repetition of the status quo is an unlikely long-term outcome (disease, diagnosis, and drug expertise throughout the production team).
- Be or become prepared to measure, identify, and call out the economic benefits of improvements garnered from these efforts.
- Employee turnover on livestock operations is a very real and increasing issue. Ensure that employees are authorized to complete treatments of animals and are properly trained and mentored to certify antimicrobial stewardship.

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#### RESOURCES

- AABP Drug Use Guidelines for Bovine Practice [http://aabp.org/resources/aabp\\_guidelines/druguseguidelines\\_2015-4-8-1.pdf](http://aabp.org/resources/aabp_guidelines/druguseguidelines_2015-4-8-1.pdf)
- AABP Establishing and Maintaining the Veterinarian-Client-Patient Relationship in Bovine Practice [http://aabp.org/resources/aabp\\_guidelines/VCPRGuideline\\_032020.pdf](http://aabp.org/resources/aabp_guidelines/VCPRGuideline_032020.pdf)
- Best BETs for Vets <https://bestbetsforvets.org/>
- Evidence-Based Veterinary Medicine Association <https://www.ebvma.org/>
- FDA Guidance 152 Evaluating the Safety of Antimicrobial New Animal Drugs with Regard to Their Microbiological Effects on Bacteria of Human Health Concern
- FDA Guidance 209 The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals <https://www.fda.gov/media/79140/download>
- FDA Guidance 213 New Animal Drugs and New Animal Drug Combination Products Administered in or on Medicated Feed or Drinking Water of Food-Producing Animals: Recommendations for Drug Sponsors for Voluntarily Aligning Product Use Conditions with GFI #209 <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/cvm-gfi-213-new-animal-drugs-and-new-animal-drug-combination-products-administered-or-medicated-feed>
- Food Armor® <https://www.foodarmor.org/>