WASHINGTON STATE UNIVERSITY
VETERINARY MEDICINE EXTENSION

ag animal health *spotlight*
VETERINARY MEDICINE EXTENSION
October 2010

WASHINGTON STATE UNIVERSITY EXTENSION & WSU COLLEGE OF VETERINARY MEDICINE

To Use or Not to Use? The Doctrine of Judicious Antibiotic Use

William M. Sischo and Dale A. Moore

- **What is Judicious Use?**
- **How do we conserve our antibiotics and keep them effective?**
- **What kinds of drugs are of most concern with regards to antibiotic resistance?**
- **What kinds of blanket uses of antibiotics are supported by research?**

We all strive to make judicious decisions, decisions that are well reasoned and show good judgment. This is especially true when it comes to using antibiotics on our dairy farms. The obvious question is: What exactly defines a judicious policy for antibiotic use? Antibiotic use in dairy production has always been driven by two things: to care for the health of the animals and to ensure the safety and quality of the food being produced. Historically safety and quality of the product was defined by the absence of antibiotic residues from the product (milk and meat). Those two outcomes were easy to reconcile: judicious use of antibiotics was defined by ensuring that animal health was addressed (the antibiotic was effective and did not hurt the animal), their use was economically sensible (the treatment was cost effective), and the food product was safe (no residues). On these issues the public (our consumers and regulators) trusted that we made judicious decisions. This opened the door for producers to have access to a number of over-the-counter (OTC) antibiotics that were deemed safe (animal and public health), but did not need veterinary oversight because the directions were clear enough that producers could make judicious decisions for their use. Antibiotics in animal agriculture were like aspirin in human medicine, we all could read the label, “take 2 aspirins and call your doctor in the morning”. The focus on optimizing animal health and preventing residues was easy to balance, the rules were clear and good outcomes easy to measure.

In the past decade, the trust that producers can make judicious decisions on antibiotic use has eroded. This change has substantially occurred because the public (and regulators) are increasingly concerned about the development of bacterial resistance to antibiotics. It isn't that we are not trusted to use the products as directed, but that the treatment decisions and consequences of treatment (bacterial resistance) are not as clear as when the focus was on animal health and residues. The public has asked that antibiotics be administered with more guidance from the veterinary profession. This has changed the dynamics of judicious use. While we still have most of the OTC products from the past, all new antimicrobials are Rx (by prescription from a veterinarian) and their purchase and use require a proper veterinary-client relationship. Judicious use now must consider a more complex set of outcomes.

The principles of judicious use of antibiotics are encompassed in the following: Use an antibiotic only when indicated, choose a cost-effective agent which provides appropriate antimicrobial coverage for the diagnosis that is suspected, and prescribe the optimal dose and duration for the antimicrobial which maximizes clinical therapeutic effect while minimizing both drug-related toxicity and the development of antimicrobial resistance. More simply, we still have the same rules: it must be safe for the animal, it must be effective in treating the disease, it must be cost effective, no antibiotic residues in marketed product, and it should not result in antibiotic resistant bacteria.

These principles are broad and suggest a couple of places that you can start to ensure that you have a farm-based policy for judicious use of antimicrobials. First, establish what antimicrobials are used on your farm and where they are used. The obvious first place to start is the medicine storage for the lactating and dry cows but don't forget to look at what might be used for young stock and calves. While most antibiotics are going to be administered by injection or pill, antibiotics also can be administered in feeds and water. Check with your nutritionist and feed supplier about ALL the ingredients in the feeds you purchase and review the ingredients with your nutritionist and veterinarian. In particular, calf milk replacers and feeds for yearlings often have antibiotics.

Not all the antibiotics that we use on the farm carry the same weight for creating bacterial resistance interfere with effective disease treatment in people and animals. The main products that do not concern public health are the ionophores (monensin aka Rumensin, lasalocid aka Bovatec) and the coccidiostats (decoquinate aka Decoxx). It's not that imprudent use of these antibiotics won't create resistance, it's that any resistance that might occur does not have implications for the treatment of disease in people. Residues are still a consideration so use these products as labeled.

The remainder of the antibiotics that you likely have on the farm is given directly to sick animals or to prevent disease. With few exceptions, the antibiotics on your shelves are commonly used in veterinary medicine and are considered important in human medicine. Start by reviewing all the antibiotics you have on hand with your veterinarian and properly dispose of any that are out-dated, no longer used, or not indicated for the diseases that you are currently treating. As mentioned in a previous article in this series, antibiotic resistance is not an unusual event and is a consequence of exposing bacteria to antibiotics. While there are certain antibiotics that are considered essential to treat life-threatening human infections (some which are used to treat cattle) and thus create a heightened significance for how they are used; the increasing significance of pathogenic bacteria that are resistant to multiple antibiotics suggests that treatment with any antibiotic may select for these multi-resistant bacteria. In the end, nearly all the antibiotics that are in our medicine tool box are important and critical for animal and human health and must be used carefully, that is, judiciously.

What can you do?

1. Do all things preventive. Having to treat a cow or calf is an expensive proposition. It requires extraordinary efforts on the part of yourself and your employees because it is not part of the daily production routines for your dairy. For your calves, routine prevention includes an effective colostrum management and feeding program, feeding for growth, and keeping feeding and housing areas clean. For your cows, routine prevention includes an effective feeding program, a well designed close-up or transition cow program, an effective udder health program, and keeping housing areas clean. Your employees are the lynch pin for successfully developing and implementing a preventive health program. Keep them trained and informed so that they take care of the details.

2. Antibiotics are not the first line of treatment. There are many conditions that do not require antibiotic therapy or are not bacterial. Calf scours may be effectively treated with fluids. Cows with high body temperatures may initially be effectively treated with aspirin or other non-steroidal drugs that might control fever. Lame cows due to laminitis do not need to be treated for an infection. Here again, your employees are the key to making this work. Providing them with high quality training and consistently monitoring the effectiveness of treatment protocols and their implementation will result in judicious use of antibiotics. Work with your veterinarian to develop good approaches to correctly diagnose, treat, and monitor success or failure of a treatment protocol.

3. To repeat the judicious guidelines, when you use an antibiotic--use it only when indicated, choose a cost-effective agent which provides appropriate antimicrobial coverage for the diagnosis that is suspected, and choose the optimal dose and duration for the antimicrobial that maximize clinical therapeutic effect while minimizing both drug-related toxicity and the development of antimicrobial resistance. Many of our decisions to treat are based on a clinical sign (scours, difficulty breathing, fever, a discharge) and not on an actual diagnosis. It is important that you and your employees have worked with your veterinarian to develop good criteria for deciding to treat. The challenge is to develop sound treatment approaches so that antibiotics are targeted and appropriate.

One of the most controversial uses of antibiotics in our industry will be the blanket use (all animals in an age or production group) to treat or prevent disease. Two dairy situations are dry cow therapy and medicated calf replacer. The evidence for using blanket dry cow therapy is strongly supportive and there is little or no evidence that its use results in the development of resistant bacteria. This is not true for the blanket use of medicated calf replacer. There are an increasing number of studies that show no benefit to feeding calves antibiotics. Calves fed antibiotics have very resistant gut bacteria, there is little evidence that the antibiotics have value in preventing diarrhea, and calves that have received adequate colostrum and fed antibiotics are more likely to have diarrhea than similar calves not fed antibiotics. The use of blanket antibiotic therapy needs to be evaluated often and the value of this use weighed against the negative consequences.

We all share in the responsibility to protect the value of antibiotics for treating animal and human disease. Developing judicious use guidelines that can be applied by you and your employees is an obligation that we have as partners in public health. In moments of calm, making judicious decisions is relatively easy. It becomes more difficult in the midst of crisis when we may rely on instincts. When calves are dying, the instinct may to grab for that bottle of antibiotics. At the moment, that may seem to be the best decision, but over time what was a judicious decision becomes a habit and given time and circumstances may no longer be a good decision. We should remain vigilant in adhering to judicious use; our animals and children deserve no less.