

Antimicrobial resistance - can we manage it?

Dr. Otto Radostits, from the Western College of Veterinary Medicine at the University of Saskatchewan, wrote the following summary of the recent "Managing Antimicrobial Resistance" Conference, held in Toronto.

Conference objectives

The conference was held to increase the awareness and understanding of:

- ◆ The scope of the issue
- ◆ Global legislation and antimicrobial resistance
- ◆ The impact of antimicrobial resistance on health management
- ◆ Educational initiatives or strategies to manage antimicrobial resistance
- ◆ Trade issues related to antimicrobial resistance
- ◆ Agricultural practices to reduce antimicrobial resistance in food production
- ◆ Surveillance and data collection systems
- ◆ The role of regulatory policy in managing antimicrobial resistance.

Antimicrobial resistance is an issue that affects both human and animal health.

The conference explored the role of agriculture in managing antimicrobial resistance by addressing these questions:

- ◆ How does agriculture contribute to antimicrobial resistance?
- ◆ What impact does this have on human and animal health?
- ◆ What strategies do we need to develop to address these concerns?

Conference summary and recommendations

Antimicrobial resistance is a significant problem in human medicine because of the extensive use of antimicrobials. The concern is hospitalized patients with comorbid illnesses and patients in post-surgical intensive care units who are highly susceptible to infection with antimicrobial resistant bacteria.

Community-based antimicrobial resistant infections are also on the increase because of over-prescription of antimicrobials. The human medical profession recognizes the problem and is making progress towards reducing the number of unnecessary prescriptions.

In contrast, with the exception of a few enteric bacterial species, antimicrobial resistance is not a

problem in food animal veterinary medicine. The standards used to determine susceptibility and resistance of human and animal bacterial pathogens vary widely from country to country and confound interpretation of the problem.

The use of antimicrobials at subtherapeutic levels in the feed of food producing animals is thought to contribute to antimicrobial resistance in human medicine by the emergence of resistant bacteria in food animals. The resistant bacteria may be transferred to humans, causing clinical illness which may be difficult to treat because of antimicrobial resistance. Studies by scientists in the past 30 years have examined the postulated link and have concluded that the cause and effect relationship cannot be proven or disproved.

While there is a connection between human and animal ecosystems, and while it is biologically possible and even plausible for the transfer of bacteria to occur and to cause disease in humans, the incidence is considered to be extremely insignificant.

Over time, the media has created considerable anxiety in the minds of consumers about the safety of meat and poultry products. However, there is overwhelming evidence that food-borne illness is a major problem because of unhygienic handling and inadequate cooking of meat and poultry.

Each stakeholder has a role to play in raising the level of awareness of antimicrobial resistance, and to engage in meaningful dialogue so that everyone understands the problem.

Because antimicrobial resistance is inevitable with the use of antimicrobials, the prudent use of antimicrobials must be given high priority. Physicians and veterinarians must be fully informed about the issue and strive to practice rational therapy. Producer groups also must be fully informed about the prudent use of antimicrobials in their livestock. Furthermore, the process must ensure that science-based decisions are made. Also, the current approval process must be reviewed to ensure that unnecessary delays and barriers don't occur, as they increase the cost of new product development.

A major thrust should be to answer the questions:

- ◆ Does the use of antimicrobials as growth promoters enhance food animal production

economically under modern methods of production?

- ◆ Does the subtherapeutic use of antimicrobials in food animal production cause the emergence of antimicrobial resistant bacteria which are then transferred to humans where they cause clinical illness which is difficult to treat?

Some countries have banned the use of antimicrobials as growth promoters in food animal production. Scientists in those countries claim there is sufficient evidence that antimicrobial resistance in human and animal pathogens is related to the subtherapeutic use of antimicrobials in food animal agriculture. However, the cause and effect relationship has not been substantiated, and the precautionary principle was used to rationalize the banning. It is possible that political decisions are made because of the uncertainty of the science of this topic. Risk identification and analysis are necessary for policy decision-makers.

The subtherapeutic use of antimicrobials in the feed and water of food animals should be monitored nationally, and antimicrobial resistance in selected bacterial species of food animals exposed to antimicrobials should be monitored in sentinel herds.

Governments must give and be seen to give adequate priority to monitoring antimicrobial resistance in food animals in order to evaluate the contribution which agriculture may make to the problem of antimicrobial resistance in human medicine.

A Food Safety Agency under Health Canada is necessary to provide leadership in this sphere of activity which includes food-borne illness.

Governments must be encouraged to invest in animal health research because of the importance of food; a basic necessity of humans.

There is a need for a surveillance system that will monitor the results of routine bacterial cultures and sensitivities from sick and normal animals across the country.

Diagnostic laboratory services must be available to producers so that rational decisions about the use of antimicrobials can be made, including animal identification and record keeping. Consumers are becoming more aware of the potential health risks associated with food, and expect high standards of food safety. Perception is reality.

A major challenge is to educate society about food safety issues for which much practical and effective information is available. In the very near future, the irradiation of fresh beef, pork and poultry at the processing plant will be introduced. This technology can provide bacteria-free products which are safe and wholesome, and could reduce the incidence of food-borne illnesses caused by bacteria such as *E. coli* 0157H:7, *Salmonella* and *Campylobacter*. However, meat products (like ground beef) prepared at the retailer could still be contaminated.

Animal agriculture will continue to change as long as it is part of a free market system and a cheap food policy prevails. The food animal industries are exploring methods of production which will reduce the dependence on antimicrobials for the control of bacterial diseases and the enhancement of growth. The control of infectious diseases in food-producing animals is the essence of the problem and more emphasis will be placed on effective health and production management.

The relationship between antimicrobial resistance in human medicine and the use of antimicrobials in food animal agriculture is a complex problem which requires a coordinated effort by all concerned to make progress in generating effective and economical solutions.

A poster session occurred at the conference dealing with the relationship between the use of antimicrobials in food producing animals and the emergence of antimicrobial resistance. For more information about this, contact the [CAHI office](#).

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