Arthur Wiebe, B.Sc., M.D., CCFP, FCFP
Diploma, Sport Medicine
Rural Family Physician
Peer Presenter in Environmental Medicine, Ontario College of Family Physicians
ANTIBIOTIC RESISTANCE in FOOD ANIMALS and POSSIBLE HUMAN HEALTH PROBLEMS

• Some basic principles
• Survey of veterinary/farming use of antibiotics
• Human medical use of antibiotics
• Human/food animal disease interactions
• Some suggestions
CHANGES IN BACTERIA

• Natural variation
• Mutation
• “Jumping genes”
NORMAL-NO ANTIBIOTICS

GREEN ARE NORMAL BACTERIA

RED ARE BACTERIA WITH RESISTANT GENES
IMMEDIATELY AFTER ANTIBIOTIC USE
POST ANTIBIOTIC USE

RED ARE ANTIBIOTIC-RESISTANT BACTERIA

GREEN ARE NORMAL BACTERIA
USAGE OF ANTIBIOTICS IN ILO’s (CAFO’s, “Factory farms”)

• Therapeutic-individual and herd
• Sub-therapeutic (some experts call this non-therapeutic)
• Growth promotion
ANTIBIOTIC USE IN NORTH AMERICA

• About 50-60% of antibiotic use is for animals (estimates vary)
• Total use in animals in US is about 18 million pounds-8 million kg annually
• About 10-20% of use is therapeutic (sick animals)
• The greatest proportion of antibiotics are used in recently-weaned animals
Bacteria in the water, soil, our food and AIR
The Human/Food Animal Connection
SUMMING UP

• When animals and/or humans are crowded together, the risk of disease increases
• Swine are almost all raised in intensive operations
• When exposed to antibiotics, bacterial colonies will inevitably develop resistance
• Bacteria, including resistant ones, are passed between species
CONCLUSIONS

• Diseases can be, have been, and will continue to passed between human beings and species we raise for food
• This chance is increased by the way we raise our food animals
• We don’t know exactly how antibiotics are being used in livestock-there are wide variations in practice, and no monitoring, other than sample studies
WARNINGS
SUGGESTIONS

• Better surveillance—we don’t know the scope of the problem—some European countries (Sweden, Denmark, the Netherlands, etc) have been doing this
• Legislation (see above)
• More biosecurity
• Education of those raising and caring for animals
• Changing methods of animal husbandry
THE FOUR LAWS OF ECOLOGY

• Everything is connected
• Everything goes somewhere
• There is no free lunch
• Nature bats last