Agricultural use of antibiotics and the evolution and transfer of antibiotic-resistant bacteria.

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Abstract
Microbial Resistance to antibiotics is on the rise, in part because of inappropriate use of antibiotics in human medicine but also because of practices in the agricultural industry. Intensive animal production involves giving livestock animals large quantities of antibiotics to promote growth and prevent infection. These uses promote the selection of antibiotic resistance in bacterial populations. The resistant bacteria from agricultural environments may be transmitted to humans, in whom they cause disease that cannot be treated by conventional antibiotics. The author reviews trends in antibiotic use in animal husbandry and agriculture in general. The development of resistance is described, along with the genetic mechanisms that create resistance and facilitate its spread among bacterial species. Particular aspects of resistance in bacterial species common to both the human population and the agrifood industry are emphasized. Control measures that might reverse the current trends are highlighted.