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Antibiotics Feeding in Food Animals and its Consequences on the Environment

Since their discovery, antibiotics have been instrumental in treating infectious diseases that were previously known to kill humans and animals. However, it has now become clear that widespread use of antibiotics is not without problems. The major concern is the development of antibiotic-resistant microorganisms, which are difficult to treat with existing antibiotics. It is claimed that a significant portion of the antibiotic produced (as high as 78%) is used as feed supplement in food animals. The use of antibiotics in animal feed helps increase the animal's ability to absorb feed and thus reach market weight quicker. In addition, supplementing antibiotics in animal feed counteracts the effects of crowded living conditions and poor hygiene in intensive animal agriculture. Although antibiotic dose is small (1 to 200 g per ton of feed), as much as 80% the antibiotic may pass through the animal in urine and manure unaltered. Since much of the manure is land applied, there is a concern not only on the spread of antibiotic resistant bacteria to the environment but also on the potential of antibiotics appearing in Nation's water and food supplies. This presentation briefly highlights Minnesota research on (1) antibiotic losses in surface runoff and through leaching from manure-applied lands, (2) antibiotics feeding of food animals and development of antibiotic resistance on the farm, (3) antibiotic uptake by vegetable crops from manure applied soils, and (4) effects of aeration on antibiotic degradation in manure. Field characterization of antibiotic losses was done at three different sites representing soils developed in glacial till, glacial outwash, and loess.

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