



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: AR3621

Title: Occurrence of Animal Feed Additives in Northwest Arkansas Surface Water

Focus Categories: Water Quality, Non Point Pollution

Keywords: feed additive, water quality, animal waste, land application, non-point source pollution, occurrence, concentration

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Congressional District: 3

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Abstract

Animal feeds are commonly formulated with special additives such as antibiotics for animal growth promotion and the control of various intestinal diseases. Up to 90% of the administered antibiotics may be excreted through urine and feces. Land application of animal wastes is a common practice in agricultural regions in the United States to recycle nutrients and organic matter in order to reduce the need for fertilization and maintain the soil quality with respect to organic matter content. Land application of animal wastes and resultant wide spread antibiotics in soil and surface water following runoff seriously deteriorate the quality of soil and water, and result in the emergence and spread of antibiotic-resistant strains of bacteria in the environment.

The occurrence and the environmental behavior of antibiotics from animal wastes need to be defined in order to adequately assess the benefit from land application of animal wastes versus the cost of possible environmental deterioration. Such information has not been available in Northwest Arkansas. In this proposal, we propose to monitor the occurrence of four major antibiotics originating from the animal wastes in Northwest Arkansas surface waters. We hypothesize that antibiotics from animal wastes exist in Northwest Arkansas surface waters due to their runoff following the land application of animal wastes. We further hypothesize that their concentrations vary depending on the physicochemical properties of individual antibiotic, and the environmental conditions. The overall objective of this proposal is to monitor the occurrence, and the variation in the aqueous concentrations, of major animal feed antibiotics in Northwest Arkansas surface waters. We propose six locations in Northwest Arkansas for water sampling and analysis for antibiotics. These locations differ in sources of animal wastes (cattle, turkey, chicken, hog), and environmental conditions (soil properties, land geographical properties, and hydrological features). Water samples will be collected and analyzed for selected antibiotics once every 3 months for a span of one year from year 2001 through 2002 to reflect the influence of climate. The results are expected

to provide the information on the initial hazard identification that will be an essential part of assessing the environmental behavior of feed additives in Northwest Arkansas.