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Livestock and Water Quality

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Past and Current Research

Sulfates in drinking water and effects on piglets
Predicting manure characteristics and constituents based on diet (chemicals in urine and feces)
Phytase to increase availability of plant-based phosphorus and reduce excreted phosphorus
Soil surface sealing and hydraulic properties (soil pore plugging) due to manure application
Ammonia volatilization following manure application on fields
Sealing of concrete and earthen manure storages to protect groundwater
Liquid manure storage risks and designs in the Karst region
Manure collection, handling, and liquid-solids separation systems
Holistic approach to phosphorus balance at the watershed and county level
Alternative techniques (fungus, electrophoresis) for removing phosphorus from manure
On-site treatment systems for milkhouse wastewater
Vegetative treatment systems for feedlot runoff
Carcass disposal methods
Pathogen survival in manure
Algae growth for treating and cleaning wastewater from milkhouse and dairy manure storages
Aquaculture systems for wastewater treatment and nutrient recycling
Geothermal wells for cooling and heating livestock facilities

Possible research topics

Nutrient availability after land application of manure—placement, timing, distance from source
Maximizing manure nutrient uptake by plants
Proper width of surface water buffers near manure-applied lands or grazing areas to remove sediment, nutrients, and pathogens
Improved methods, techniques, and designs for preventing groundwater contamination
Livestock genetics and nutrition (dietary additives) for more efficient use of inputs and nutrients to reduce amounts excreted
Clustering of animals (facility density) for air quality, health, nutrient recycling
Alternative uses or markets for livestock-generated nutrients (e.g., plant pots, bricks, growing media)

Livestock sector commitment

Reduced water use 41% per pound of pork produced in last 50 years

Reduced water use by 35% per gallon of milk since 1944

Educational opportunities (producers and public)

Nutrient credit for manure

Land application techniques that enhance nutrient use and minimize environmental impact

By-product recovery (food processing and industry) and increased use in diet formulation

Siting, setbacks, nuisances: Being good community citizens and neighbors

Current concerns

Regulations—federal and state compliance, economic viability (proper balance: “carrot & stick”)

Agency personnel being knowledgeable about current data, state-of-the-art techniques and equipment

Sustainability—environmental issues, economic viability and quality of life

Water availability (quantity and quality for animal drinking and farmstead use)

Disease transfer via manure hauling and application techniques and equipment

Manure and other wastewater treatment before land application for soil-plant treatment

Increased cooperation and recognition working across state lines