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## Fecal Bacteria and Gender Regulating Hormones in Soil and Runoff from Cropped Watersheds Amended with Poultry Litter

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**Why Does it matter?**

Because poultry litter is a source of fecal bacteria and the sex hormones estradiol and testosterone, its application to agricultural fields can pose environmental health hazards. Understanding the fate and transport of these components of poultry litter will lead to more effective and scientifically based waste management practices.

**What was done?**

To four cropped watersheds poultry litter was applied to meet the N requirement of pearl millet one year and grain sorghum the next year. The load of fecal bacteria and hormones from the litter was determined. Several times after the litter application soil samples from each watershed were taken to determine the fate of the fecal bacteria and hormones. Runoff from rain events was measured and sampled for fecal bacteria, estradiol and testosterone.



**What was found?**

At the rates of litter application commensurate with the nitrogen nutrition of the crop concentrations of estradiol and testosterone did not appear to impact background levels in soil and runoff. For only one rain event that occurred three weeks after litter application (all other rain events occurred several months after litter application) were the concentrations of fecal bacteria greater than background levels. It must be noted that the hormone levels of the litter we applied were ten times less than that found in other sources of poultry litter.

**What is the impact?**

If the tons of poultry litter produced annually have low to moderate concentrations of estradiol and testosterone, then litter applications based on a crop's nutrient requirements would not contribute to the environment's hormone load. Knowing that the load of fecal bacteria can be increased when runoff events occur soon after application must be considered as important aspects in managing poultry litter. This information can be used by the poultry industry and environmental agencies to ensure safe application of the 14 million tons of poultry litter generated annually in the USA.

**Research Team and Contact information**

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