Pelletized manure reduces toxic runoff

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There is considerable amount of uncertainty concerning the environmental impacts that animal hormones have on surface water. Higher concentrations of hormones in waterways have been found to cause physiological and sexual impairment in fish and other aquatic species. However, a study from the University of Delaware that examined estrogen concentrations runoff from agricultural fields fertilized with chicken manure found that it is as much about the application of the manure as it is about the measurement of the types of estrogen.

The study was conducted on the experimental plots on the Coastal Plain agricultural soils in Middletown, DE. It measured and compared the amounts of both toxic, free forms of estrogen hormones and less toxic species found in runoff. Corn was planted as a cover crop and chicken manure was applied in either a pelletized form or a raw litter form. Reduced tillage and no tillage treatments were also employed. Samples of surface runoff were collected after 10 rain storms during the 2008 summer growing season from April through July.

Sudarshan Dutta, the author of the study, found that the amounts of estrogen were lower in plots fertilized with pelletized manure and plots that received no-tillage treatments.

Additionally, Dutta discovered the entire range of estrogen concentrations in the samples was significantly lower than those observed in other previous agricultural studies. Nevertheless, concentrations of the less toxic conjugate forms of estrogen were higher

than the toxic, free forms.

According to Dutta, prior studies did not usually measure the conjugate forms of estrogen, saying it is necessary to measure these forms.

"The higher concentration of conjugate forms of estrogens underscores the need for reporting all forms of the hormones. This is especially critical considering that conjugate species can be converted to the toxic free forms under certain environmental conditions," he says.

More information: The study was partly funded through a grant by the United States Department of Agriculture and the results are published in the September-October 2010 issue of the *Journal of Environmental Quality*. View the abstract at www.agronomy.org/publications/ … /abstracts/39/5/1688

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