

## Using Diet to Change Air Emissions from Animal Feeding Operations

By: [Wendy Powers](#)

*This article was written for publication in the March / April, 2007 Biosystems and Agricultural Engineering Newsletter, Michigan State University, East Lansing, MI*



Animal feeding operations (AFOs) and their emissions have come under increasing scrutiny. As part of a U.S. EPA and livestock industry joint study, efforts are underway to collect baseline emission data from AFOs around the country. With new air quality regulations for AFOs likely in the near future, in addition to baseline data, there is a need to identify ways to reduce or mitigate air emissions. Identified strategies must be able to effectively control air emissions in a manner that is affordable and does not compromise animal performance, such as the amount of feed need to produce a unit of milk, meat, or eggs. Livestock receipts are an important part of Michigan's economy so providing solutions is a critical need to ensuring that this

sector of the economy remains viable and that it does so in an environmentally-friendly way.

The departments of Biosystems and Agricultural Engineering and Animal Science are exploring ways to change animal diets as one option for livestock producers. Dietary strategies offer the opportunity to prevent the formation of undesirable emissions (source control) as opposed to treating or capturing emissions after they have formed. This is part of a research program lead by Wendy Powers, who joined the faculty of both departments in November 2006. While at Iowa State University, Wendy conducted work, funded by USDA, with swine, broiler chickens, and laying hens.



The approaches used include reducing nutrient excesses in the diet by changing diet ingredients, re-formulation of diets to better meet the needs of animals as they grow, and using dietary additives to prevent the formation of emissions from excreta. Results have been promising, particularly for ammonia emissions. Observed reductions have been as high as 50 percent for swine, 40 percent for laying hens, and 30 percent broiler chickens without any negative impacts on animal performance. In addition to ammonia emissions some strategies have demonstrated positive impacts on emissions of other gases as well, including some that may eventually lead

to opportunities for producers to receive payments for carbon credits. This aspect of the work is in the early stages and programs for carbon payments as a result of diet strategies

do not yet exist. But with promising results, there is merit to pursue this as an income opportunity for producers.

Studies using growing cattle, lactating cattle, and turkeys are planned at Michigan State University. This work will be funded by USDA as well. This work is expected to begin in September 2007 following the completion of construction of a laboratory specifically designed to address this prominent issue facing the livestock industry.