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Manure Matters (newsletter)

Biological Systems Engineering

2002

Manure Matters, Volume 8, Number 2

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Henry, Christopher G. and Schulte, Dennis D., "Manure Matters, Volume 8, Number 2" (2002). *Manure Matters (newsletter)*. 14.

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UNL's Livestock
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Issues Committee
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representation from
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Department of
Environmental
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Conservation Service,
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Districts, Center for
Rural Affairs,
Nebraska Cattlemen,
USDA Ag Research
Services, and
Nebraska Pork
Producers
Association.



Assessing Odor Risk

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Odors from animal production operations are a major concern in rural communities. Pressure from the public and the potential impact on the rural economy has caused strong emotional conflicts. Currently livestock producers and urban planning officials have few tools to objectively evaluate scientifically based setbacks between livestock operations and residential areas. Conversely, livestock producers have few tools available to them to demonstrate how odor control technologies can reduce the risk potential of odor incidents.

Recognizing this concern in Minnesota, the Minnesota Legislature provided funds to their University to develop a tool to help predict offsite odor movement from livestock and poultry facilities. This recommendation resulted in an appropriation from the 1997 Minnesota State Legislature. Funds were awarded to the Biosystems and Agricultural Engineering Department to develop the "Odor From Feedlots Setback Estimation Tool" (OFFSET).

OFFSET is a simple tool that estimates the frequency of odor events at various distances from an animal production site.

Development of OFFSET involved the measurement of odor emissions from various animal production sites, assessment of downwind odors using trained field sniffers, comparisons of downwind odor measurements to standard air dispersion model results, measurement of odor reductions using various odor control technologies, and validation of the tool using community residents. Evaluation and resulting modifications of OFFSET continue through June 2002 with a project funded by the University of Minnesota Rapid Response Fund.

Over the past four years, approximately \$830,000 has been spent on research to specifically develop the OFFSET method for animal agriculture in Minnesota. The research has focused on developing methods to quantify odor emissions, measuring odor emissions from different types of livestock and poultry

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operations, developing odor control technologies and monitoring the frequency and intensity of odor events in areas surrounding these farms.

How OFFSET Works

OFFSET is a tool that can be used to estimate the frequency of odor events at distances from animal production sites. Estimation is done in two parts. First the odor emissions from the facility are calculated based on the species, building types, building area, and manure storages. Here the impact of odor control technologies can be applied to the odor emissions estimated from the facility. Next the odor emission number is read from a frequency figure that correlates emission factors with distance and a given level of odor free annoyance risk.

Application to Nebraska and other States

OFFSET is currently being validated and used in Minnesota, but has limited use in other parts of the country. Two distinct limitations exist with OFFSET. It was originally developed with a large data set for swine and dairy operations. However, the open lot cattle component of OFFSET was developed with a small data set representing small concentrated feedlots. Consequently, the open lots used for the development of OFFSET are not representative of feedlots in Great Plains states like Nebraska. Second, anaerobic lagoons, a widely used odor control and treatment technology in Kansas, Nebraska, and Missouri were not used in the development of OFFSET, since it is relatively uncommon in Minnesota. Thus, the use of anaerobic lagoons as a control technology is not

included in OFFSET. Both of these shortfalls represent the majority of livestock facilities in the Great Plains States.

Further development of this much needed and risk based system of predicting odor impacts is needed in Nebraska and many other states. Wide acceptance and use of OFFSET would allow counties to effectively develop land use plans that provide for the continued expansion of animal agriculture while still protecting rural residents from excessive odors.

For more information on OFFSET see the following website:

<http://www.extension.umn.edu/distribution/livestocksystems/DI7680.html>

Source

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