

Unified National Strategy for animal feeding operations

by Paul Miller, manure management specialist, Natural Resources Conservation Service

The U.S. Department of Agriculture (USDA) and Environmental Protection Agency (EPA) have developed a Unified National Strategy to address the effects of animal feeding operations on water quality and public health. The Unified National Strategy (often referred to as the AFO/CAFO Strategy) is part of the Clean Water Action Plan.

Animal feeding operations are defined as agricultural enterprises in which animals are raised in confinement. It is estimated that there are more than 350,000 animal feeding operations in the United States. Iowa is home to approximately 40,000 animal feeding operations.

The final animal feeding operation strategy, released by the USDA and EPA on March 9, 1999, reflects comments received during a 120-day public comment period as well as issues raised during 11 national "listening sessions."

The strategy encourages owners and operators of animal feeding operations to develop and implement comprehensive nutrient management plans to minimize water pollution from confinement facilities and land application of manure. The comprehensive nutrient management plans must be technically sound and economically feasible. They also must be site specific to complement the operation's total resource management objectives. The following components should be part of a comprehensive nutrient management plan:

- **Feed Management:** The effect of animal diet and feed rations on nutrients in manure.



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- **Manure Handling and Storage:** Divert clean water; prevent leakage; provide adequate storage, manure treatment, and dead animal management.
- **Land Application of Manure:** Manage manure based on crop nutrient balances and timing and methods of manure application.
- **Land Management:** Conservation practices to control erosion and runoff.
- **Record Keeping:** Soil and manure testing, records of quantity and use of manure.
- **Other Use Options:** Other uses of manure, such as sales and composting, when land application is limited.

For approximately 95 percent of animal feeding operations, the strategy is voluntary. The strategy is administered locally and includes environmental education and financial and technical assistance programs to help producers develop and implement comprehensive nutrient management plans.

The remaining operations, for which the strategy is required, are those designated as concentrated animal feeding operations. Those operations must have National Pollutant Discharge Elimination System permits. Concentrated animal feeding operations are those with the following specifications:

- More than 1,000 animal units (1,000 beef cattle; 700 dairy cattle; 2,500 finishing hogs or sows; or 100,000 chickens). Iowa has 1,650 operations that meet this classification. In the United States, 10,000 operations meet this classification.

- More than 300 animal units **and** pollutants being discharged into navigable waters through a ditch, flushing system, or other artificial device; **or** pollutants being discharged directly into waters that pass through the facility or come into direct contact with the confined animals.
- Operations of any size in which the National Pollutant Discharge Elimination System permit-issuing agency determines, after an on-site inspection, that the facility is a significant contributor of pollution to the waters of the United States.

The strategy addresses seven strategic issues and identifies actions to implement the strategy. Several organizations may implement these actions. They include the USDA and EPA, as well as state and local government entities, producers, integrators, livestock industry, private groups, and research and educational institutions and environmental groups. Electronic copies of the strategy can be downloaded from the “Current News” button on the Iowa Manure Management Action Group Web site at extension.agron.iastate.edu/immag



Commercial manure applicators—initial certification

by Jim Johnson, special projects coordinator, ISU Extension to Agriculture and Natural Resources

A satellite downlink program will be offered on September 20 for commercial manure applicators that require initial certification. There is no registration fee. The program will be held from 9:00 a.m. to 12:30 p.m., with two 15-minute breaks. Registration begins at 8:30 a.m.

This program is for commercial manure applicators who did not attend the certification meetings held in June and who have not taken the certification test. New employees who are not already certified need to become certified before applying manure this fall.

The Department of Natural Resources has informed me that confinement site manure applicators (producers who apply their own manure) can attend this 3-hour downlink and also become certified. However, they would need to attend the full 3 hours (normally, confinement site applicators attend 2-hour programs to become certified).

This program also will qualify as continuing education for those applicators already certified.

Contact your local county extension office for details and registration information.



Manure management plans due September 1

by Karen Grimes, Iowa Department of Natural Resources

Starting September 1, animal producers must have a manure management plan filed with the Department of Natural Resources (DNR) prior to applying manure from a confinement operation. Even if manure will not be applied until after mid-November, all producers who are required to have a plan must submit it to the DNR by November 15, 1999.

The following confinement operations must have plans:

- any operation with an animal weight capacity of more than 400,000 pounds of cattle or 200,000 pounds of all other species (i.e., 1,333 finishing hogs) that was built or expanded after May 31, 1985;
- any permitted operation or any new operation that is required to have a permit; or
- any out-of-state operations that apply manure in Iowa unless the operation has a capacity equal to or less than 400,000 pounds of cattle or 200,000 pounds of all other species.

Open-lot livestock are not included when calculating the animal weight capacity to determine if a plan is needed.

All manure management plans must be filed on forms prepared by the DNR. The form can be picked up at your local Extension or Natural Resource Conservation Service office. Additional copies are available at the six DNR field offices and on the DNR Web site at www.state.ia.us/government/dnr/organiza/epd/wastewtr/feedlot/feedlt.htm

Frequently Asked Questions About Manure Management Plan Requirements

Q. I've been trying to use the manure management plan form on the DNR Web site, but I can't open the files.

How can I open the form so that I can type my information directly into it?

A. Actually, it is easy, just save the files to a disk. Then you can open the form and add the numbers you want. Save your information under a file name of your choice.

Q. I own 800 hogs (120,000 pounds) at one place and another 800 hogs at another location. Because the facilities at each place are under the 200,000-pound capacity limit for hogs, I don't think I need a plan. Do I?

A. You need to determine if you have one operation. If the facilities are "adjacent" (Test 1) or if they have a common area or system for manure disposal (Test 2), they are considered one operation and need a plan.

Test 1 Adjacency: To decide if the facilities are adjacent, measure the shortest distance between the two facilities. If the distance is less than 1,250 feet, then the facilities are adjacent. This is one operation because the facilities are under your ownership **and** they are adjacent. Therefore, you will need to include the total animal weight capacity of the operation, including both facilities. Because it is more than 200,000 pounds (400,000 pounds for cattle) you will need to submit a manure management plan.

Test 2 Common manure disposal: If the two facilities are more than 1,250 feet apart (not adjacent) and do not use a common area or system for manure disposal, they can be considered as separate operations for the requirements for a manure management plan. Because each facility is less than 200,000 pounds, you are not required to have a plan.

Test 3 Common manure disposal: If the two facilities use a common area or system for manure disposal, they are considered one operation, regardless of the distance between the facilities. However, if the facilities are more than 1,250 feet apart, the operator can keep these two facilities separate by making sure that the disposal areas are distinctly separate and that the same system is not being used for disposal.

Note that this question was answered based on smaller confinement facilities. As the combined animal weight capacity of the facilities increases to more than 625,000 pounds, greater distances between the facilities may be required.

The plans were due on July 1, 1999. However, because the DNR was late in making the forms available, they recognized that producers would have difficulty meeting that deadline. Although the DNR could not change this statutory deadline, the department adopted an enforcement policy that allows producers to land apply manure until September 1, 1999, without a plan.

Producers should be aware that they must follow state rules regarding manure application, including the new separation distances and application of manure so that it does not pollute waters of the state. Producers who have already filed a plan may need to update it to comply with the law (House File 2494) passed in the spring of 1998.

For more information, contact me at 515-281-5135 or Kevin Baskins at 515-281-8395.

Calculating animal weight capacity

For one species, multiply the maximum number of animals that you will confine at any one time (animal capacity) by the average weight during the production cycle. For more than one species, add the animal weight capacities for all species.

For example, Bill wants to construct a confinement feeding operation with two confinement buildings and an earthen manure storage basin. The capacity of each building will be 900 market hogs. The hogs enter the building at 40 pounds and leave at 250 pounds. Thus, the average weight during the production cycle is 145 pounds for this operation. The animal weight capacity is 145 pounds multiplied by 1,800 for a total of 261,000 pounds.

Confinement site manure applicator training workshops continue

by Angela Rieck-Hinz, extension program specialist, Department of Agronomy

Iowa State University Extension is offering 2-hour certification workshops throughout the state for confinement site manure applicators. Confinement site manure applicators are producers who apply their own manure. The workshops started in June and will continue in August and September. The law requires confinement site manure applicators to become certified by October 1, 1999, to handle manure. Confinement site applicators may become certified either by attending a workshop or by passing a written exam. For more information about the training workshops, please call the numbers listed.

Meeting Date	Base County	Phone
September 14	Adair	515-743-8412
August 25	Allamakee	319-568-6345
August 26	Appanoose	515-856-3885
September 1	Black Hawk	319-234-6811
August 27	Bremer	319-882-4275
September 2	Buchanan	319-334-7161
August 19	Buena Vista	712-732-5056
September 1	Butler	319-267-2707
August 30	Calhoun	712-297-8611
August 18	Carroll	712-792-2364
September 20	Cass	712-243-1132
August 25	Cerro Gordo	515-423-0844
September 1	Cerro Gordo	515-423-0844
August 26	Chickasaw	515-394-2174
September 13	Clarke	515-342-3316
August 30	Clayton	319-245-1451
September 21	Crawford	712-263-4697

Meeting Date	Base County	Phone
September 1	Davis	515-664-2730
Call for meeting date	Decatur	515-446-4723
September 3	Delaware	319-927-4201
September 16	Delaware	319-927-4201
September 22	Des Moines	319-754-7556
August 27	Dickinson	712-336-3488
September 13	Dubuque	319-583-6496
August 23	Fayette	319-425-3331
September 22	Fayette	319-425-3331
August 17	Floyd	515-228-1453
August 18	Fremont	712-374-2351
August 27	Grundy	319-824-6979
August 25	Hardin	515-648-4850
September 7	Hardin	515-648-4850
September 23	Harrison	712-644-2105
September 23	Henry	319-385-8126
August 26	Howard	319-547-3001
August 30	Humboldt	515-332-2201
August 30	Jasper	515-792-6433
September 21	Johnson	319-337-2145
September 22	Lee	319-835-5116
September 16	Lucas	515-774-2016
August 26	Lyon	712-472-2576
August 31	Madison	515-462-1001
September 13	Mahaska	515-673-5841
September 14	Mahaska	515-673-5841
August 30	Marion	515-842-2014
August 30	Marshall	515-752-1551
August 18	Mills	712-624-8616
August 17	Mitchell	515-732-5574
August 20	Monona	712-423-2175
September 14	Monroe	515-932-5612
September 9	Montgomery	712-623-2592
September 9	Page	712-542-5171
Call for meeting date	Polk	515-261-4219
September 21	Pottawattamie (east)	712-482-6449
Call for meeting date	Pottawattamie (west)	712-366-7070
September 13	Ringgold	515-464-3333
September 22	Sioux	712-737-4230
Call for meeting date	Taylor	712-523-2137
September 15	Van Buren	319-293-3039
August 31	Wapello	515-682-5491
Call for meeting date	Warren	515-961-6237
September 23	Washington	319-653-4811
September 16	Wayne	515-872-1755
August 30	Webster	515-576-2119
August 24	Winnebago	515-584-2261
August 31	Winneshiek	319-382-2949
September 23	Woodbury	712-276-2157
August 27	Worth	515-324-1531



Principles of diet manipulation

by Wendy Powers, assistant professor, Department of Animal Science

Manure malodor results from the anaerobic decomposition of organic material. During anaerobic degradation, odorous compounds (more than 200 identified) are formed that can ultimately be degraded to less odorous and nonodorous endproducts such as methane, carbon dioxide, water, ammonia, and hydrogen sulfide. Failure to provide a balanced system leads to the accumulation of these intermediate compounds and to malodor (Figure 1). Freshly excreted manure is less odorous than manure that has been stored for 1 or 2 days, indicating that malodorous compounds begin to accumulate immediately following excretion. Changing the composition of manure offers the potential to improve the odor of stored manure. Some dietary management steps a producer can take to minimize odor development are discussed in this article.

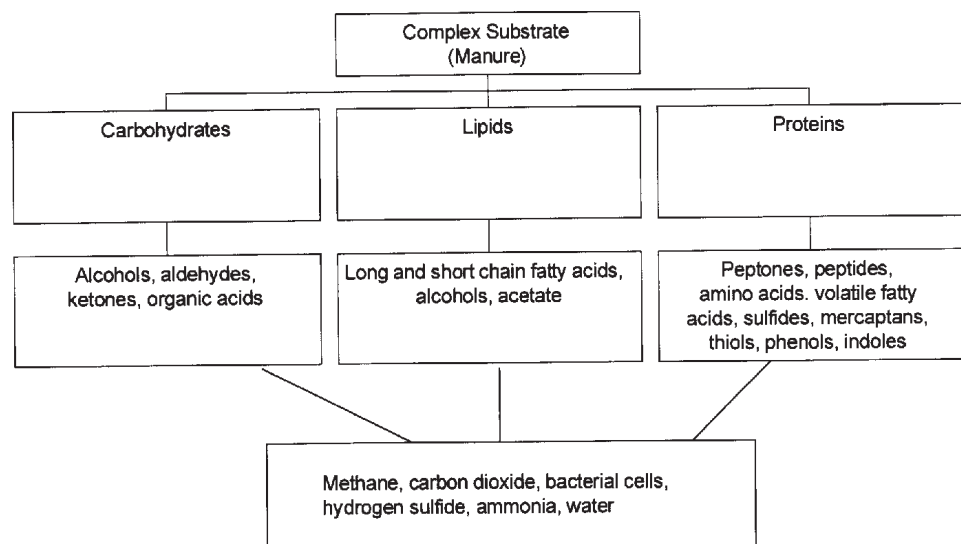
Feed a balanced diet. Most research has shown that protein metabolites appear to be the compounds most highly correlated with manure odor intensity. Several studies illustrate a trend of decreasing odor intensity with decreasing dietary crude protein. Use of crystalline amino acids allows total dietary crude protein to be reduced while still providing adequate amino acids to meet animal needs. Feeding according to the metabolizable protein system guidelines (ruminally degradable versus undegradable intake protein) for ruminants is another method to avoid overfeeding crude protein. By more nearly meeting the animal's exact protein needs, less protein is excreted in the manure and lower concentrations of malodorous metabolites accumulate. Balancing dietary carbohydrate with protein is another strategy. By providing adequate sources of fermentable carbohydrate

protein, use may be improved, resulting in reduced nitrogen excretion.

Group animals according to nutrient requirements. Grouping animals according to production needs reduces the gap between animal nutrient requirements for different groups and allows producers to formulate diets to more closely meet animal requirements. The same principles discussed in "Feed a balanced diet" regarding the impact of overfeeding nutrients then apply.

Feed ingredients. Based on their nutrient profile, digestibility, and inherent odor, specific feeds may predispose manure to malodorous conditions more so than other feeds or dietary regimes. For example, some work demonstrated less malodor when peppermint oil was added to the diet. Peppermint oil has a very strong, but not unpleasant odor. The peppermint oil may have been poorly digested due to its chemical structure, resulting in the pleasant odorants remaining intact and acting as a masking agent to malodorous compounds. Fishmeal is an example of a high-protein byproduct with a strong inherent odor. A study at Iowa State University considered inclusion of bloodmeal in the diets of nursery pigs and observed a trend of increasing manure odor intensity with increasing level of bloodmeal. Others observed that manure from dairy cows fed diets containing bloodmeal smelled distinctly different from that excreted by cows fed diets without bloodmeal. These observations suggest that either

Figure 1. Anaerobic decomposition of manure.



the inherent odor derived from unabsorbed bloodmeal impacts manure odor or amino acids in bloodmeal metabolize to odorous intermediate compounds.

Alteration of rumen or hindgut fermentation may prove to be a plausible mechanism of odor control. By shifting the fermentation, more desirable products—from an odor intensity or offensiveness perspective—may result. Some work has shown that manure from feedlot cattle fed barley-based diets was lower in odor intensity than manure from cattle fed sorghum-based diets, probably due to fermentation differences of each feed. Additives or feeding strategies that improve feed efficiencies or alter rumen or hindgut fermentation and function offer a great deal of potential to affect manure odor as well as reduce nutrient excretions for nutrient management purposes. Although recommendations on specific feeds or additives are not currently available, research is continuing and recommendations are likely in the future.

Consider mineral and water sources. Often, mineral sources contain sulfur, a component of odorous mercaptans and thiols. It is important that producers consider mineral inputs and their impact on total dietary sulfur content. Research that considers the benefits of chelated mineral sources is underway. Water supplies may contain a fair amount of sulfur, depending on geographical location and water source. The contribution of dietary intake of sulfur from the water supply should be considered, if possible.



Keep feed fresh. Offering a supply of fresh feed and disposing of waste feed is another means of controlling odors. When wet, feed ferments anaerobically and produces malodorous products in the same manner as stored manure. Proper cleaning of feeding areas and removal of the feed to a disposal area helps reduce odors from feeding areas as well as improve feed intake.

Future possibilities. Based on current research efforts, producers can expect to have recommendations available in the future for feed and mineral selection that will reduce odor potential. The possibility also exists for alteration of byproduct processing techniques to produce animal feeds with less potential for odor development. Although these strategies are still in their infancy the importance of byproduct feeds coupled with pressure to reduce odor from animal operations supports efforts to pursue this area of study.



DNR clarifies certification—not just for applicators

by Karen Grimes, Iowa Department of Natural Resources

Who requires certification? “If you’re involved in removing or land applying manure from a confinement animal feeding operation, you may need to be certified,” says Wayne Gieselman, Department of Natural Resources (DNR) animal feeding operation program coordinator. “Whether it’s hauling, applying, agitating, pumping, or just plain control-

ling the hose valve, certification is required unless the manure is from an operation that qualifies as a small operation.” A small operation is defined as a confinement operation with an animal weight capacity of 400,000 pounds or less of cattle or 200,000 pounds or less of other animal species.

The certification requirements became part of Iowa law in 1998. Certification is required to

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make sure that people handling or applying manure have the training and knowledge needed to do so correctly, including knowing what to do if an accident or equipment failure causes a spill or other release of manure to the environment.

There are two types of certification: commercial and confinement site. Gieselman says commercial applicators are people who haul or apply manure for a fee, and include all employees of a commercial applicator who are directly involved in handling or applying manure. The deadline for commercial applicators to become certified was July 1, 1999. Commercial manure applicators can become certified by annually attending 3 hours of training or by passing an exam. See article on

page 2 for information on an upcoming commercial applicator satellite program.

Confinement site applicators include the owners or employees of confinement feeding operations who apply manure from these operations, as well as other persons who may receive or buy manure from these operations. Confinement site applicators must be certified by October 1, 1999. Confinement site manure applicators can become certified by attending 2 hours of annual training or by passing an exam. Individuals who are not directly involved in the handling or application of manure are not required to be certified. See article on pages 4 and 5 for a list of ongoing confinement site applicator training workshops.

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... and justice for all

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