

# Federal Water Quality Policy and Animal Confinement Operations

Patricia E. Norris, Michigan State University  
Andrew F. Seidl, Colorado State University

---

---

## Background

---

---

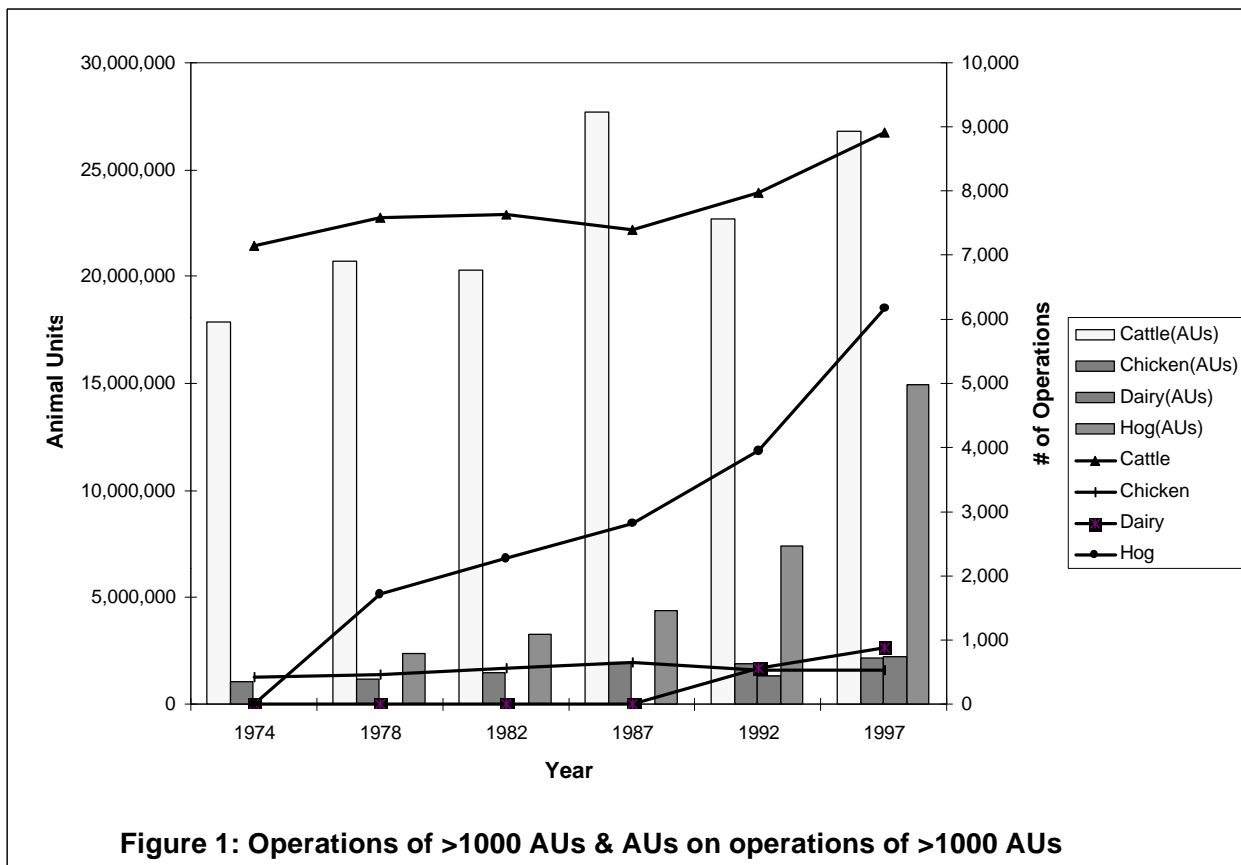
The National Census of Agriculture indicates that U.S. livestock and poultry production has been relatively stable in terms of animal units (AU) for the past quarter century. The number of livestock operations has decreased markedly across all species, indicating a general increase in operation size over the period (NASS, 1999). Of the 1.3 million livestock operations in the U.S., the U.S. Environmental Protection Agency (EPA) estimates that 376,000 livestock operations confine animals, generating approximately 128 billion pounds of manure each year (USEPA, 2000). Nutrients and bacteria in manure find their way into rivers, lakes, and streams when manures flow out of improperly designed or maintained manure storage structures, or when excessive rainfall washes manure from storage units or from cropland where manures are applied as fertilizer. Algal blooms, fish kills, and public health concerns related to polluted waters continue to focus public interest on the regulation of animal agriculture, in general, and manure management, in particular.

Federal regulation of animal manure started with the Federal Water Pollution Control Act of 1972 (known as the Clean Water Act (CWA) since 1977),

which defined concentrated animal feeding operations (CAFOs) as point sources of discharge and mandated that all CAFOs maintain National Pollutant Discharge Elimination System (NPDES) permits (Section 402). Current regulations automatically consider as a CAFO any facility that confines 1,000 AU or more. EPA currently estimates that there are approximately 12,660 operations in this category (USEPA, 2000).

Although census data do not precisely convert to 1,000 AUs across livestock species and not all livestock operations of that size are considered CAFOs, Figure 1 illustrates the estimated number of operations and animal units potentially affected by the 1,000 AU standard. Approximately 60 percent of all hogs produced in the United States would appear to be subject to this regulation but, until quite recently, very few dairies were large enough to be considered concentrated. Smaller operations may be designated as CAFOs depending upon how they manage manure and storm water. However, most smaller operations are defined as nonpoint sources, and are subject to no regulation of manure management.

An NPDES permit requires that the CAFO build and maintain sufficient wastewater storage capacity to accommodate a 25-year, 24-hour rainfall event. The permit stipulates a performance standard (called an effluent limitation guideline): No discharges to waters of the U.S. except when chronic or



catastrophic rainfall events cause an overflow from a facility designed, constructed, and operated to hold process-generated wastewater plus runoff from a 25-year, 24-hour storm event. These discharges are what the NPDES program permits. Federal NPDES permit guidelines also specify design criteria for anaerobic lagoons to hold wastewater and runoff – the impermeability of clay liners, the recommended capacity of the lagoon – as well as criteria for best management practices for applying manure from CAFOs to cropland.

In 36 states, the authority to issue NPDES permits to CAFOs has been granted by EPA to state regulatory agencies; seven states do not have authority to issue NPDES permits to CAFOs, and programs in those states are administered by EPA (USEPA, 1999). However, inconsistent interpretation and enforcement of current regulations by state and federal regulators continues to raise questions about whether existing programs are sufficient to protect water quality.

While nonpoint sources are not regulated, manure management on these smaller operations is addressed indirectly in the CWA's Section 319 that describes how states should control nonpoint sources, and more directly in the Coastal Zone Management Act that provides for more careful control of nonpoint sources in designated states. In addition, the USDA-USEPA Unified National Strategy for Animal Feeding Operations (AFOs) provides for the development and implementation of comprehensive nutrient management plans (CNMP) by smaller operations. While nonpoint source control programs are voluntary, a federal district court has recently found that nonpoint sources of pollution are not exempt from Total Maximum Daily Load (TMDL) limitations (established under CWA section 303d) on nutrients entering targeted water bodies (Terrene Institute 2000). Both EPA and USDA have provided cost sharing to assist these smaller operations with adopting manure management technologies.

---

---

## Issues

---

---

- Critics of current programs question basing the stringency of regulation on the size of an operation. Difficulties arise when policies are based on the assumption that a 499 animal unit operation is less risky environmentally than a 500 animal unit operation, or that a 999 animal unit operation poses less risk to water quality than a 1,000 animal unit operation. As the number of operations in excess of 1,000 animal units continues to grow and the number of smaller operations continues to decline, a larger proportion of operations will become subject to regulation under the CWA. Smaller operations are not immune from scrutiny – questions have been raised about whether small livestock farms with older technology potentially present significant environmental risks, while newer, larger farms often have the resources to adopt modern, more environmentally protective technology.

The evolution of federal water quality policy is characterized by efforts to address, first, the largest sources of pollution that can be reduced at least cost and, later, to address smaller discharges that are more costly to control. This history lends little to risk management discussions that focus on chronic sources of discharge found in older, smaller operations and acute risks associated with spills from larger operations.
- The size issue complicates discussions about who should bear the costs of preventing water pollution from animal manure. Economies of size in manure management have been cited as reasons why smaller, and often older, operations cannot afford the costs of meeting the same regulatory requirements as larger operations. Public support, in the form of cost share payments, has been made available to smaller (nonpoint source) operations through the U.S. Department of Agriculture's Environmental Quality Incentive Program (EQIP) and EPA's Section 319 Nonpoint Source Program. Industry

representatives question the fairness of limiting financial assistance for compliance to small facilities, while environmental and sustainable agriculture advocates raise concerns about using public funds to help regulated entities comply with environmental laws.

- Economists continue to search for more efficient approaches to environmental management, and flexible incentives, or “smart policy,” is receiving considerable attention from policy analysts. Flexible incentives specify objectives but allow choices as to response (Batie and Ervin). “Smart policy” requires clear performance standards, affords flexibility to the regulated entity in how performance standards are met, invests in management proficiency, targets changes to areas where benefits of reducing pollution most outweigh costs, and devolves programs to state and local areas that have the greatest knowledge of pollution and control processes (CFARE).

A move toward more flexibility for animal agriculture is limited by current policies that enforce technology-based performance standards (regulations specify what manure management technologies should be used to meet performance standards), and that provide financial assistance for the adoption of specific manure management technologies. Smart policy prescriptions that devolve pollution control authority pose additional challenges for the effective monitoring and enforcement of regulatory compliance.

Enforcement of local and state programs may require greater skill among local personnel. More localized control may create economic and political power disparities between those charged with enforcing policies and those who are meant to comply with them. State and local authorities must be willing and able to guide policy compliance in order for smart policies to work with greater local autonomy.
- In policy debates, issues associated with environmental quality and the industrialization of animal agriculture are inextricably linked. To date, environmental regulation of animal agriculture has focused, at federal and state

levels, on proper manure management to protect water quality. However, not all complaints against animal agriculture are quelled with assurances of reliable water pollution prevention.

Opponents of the size and structural changes in animal agriculture express concern about the loss of a traditional farming structure, competition for resources, and competition for markets. Other objections related to size and locational changes in animal agriculture relate to concerns about odor, public health, and property value impacts. Where disputes between animal operations and their neighbors have progressed to lawsuits, water quality regulations offer the only legal instruments that give complainants standing in court. Thus, the lawsuit is about the adequacy of the livestock facility's management of manure to avert water pollution, even if the actual problem is odor, flies, or, more abstractly, the disruption of a way of life. The problem for the design of effective policy is that these cases do not send signals that motivate changes in behavior or technology to address the root problems causing resistance to large-scale agriculture. Effective water quality policy may not end debates about manure management.

- As fewer independent producers have production volumes sufficient to gain access to marketing channels, smaller operations are turning to contractual relationships with larger firms linked to the end of the marketing chain. Traditionally, environmental policy compliance was the responsibility of the producer or farm manager. With contracting corporations increasingly providing all of the means of production except for labor, including manure management technology, there is increasing sentiment to hold the contractor as well as the contracted farm manager responsible for environmental regulation compliance. Proponents of this approach argue that the contractor has as much, if not more, ability to affect the risk of mismanagement of manure as the actual manager of its handling and dispersal. Co-permitting between contractors and producers would implement this shared compliance responsibility.

- Best Management Practices for the handling and dispersal of agricultural nutrients have traditionally focused on limiting the potential environmental impacts of excess nitrogen (N). Phosphorus (P) is now receiving increased attention due to its role in accelerating eutrophication of surface waters. Among the complicating factors in managing for P rather than N is that relatively small amounts (about 0.02 ppm, or about 1/10 the critical concentration for plant growth) of P can cause water quality impairment (Waskom 2001). P-based manure management policies may imply a three-fold increase in the amount of land required for dispersal of dairy manure with no change in typical feeding practices (Waskom 2001).

---

---

## Policy Alternatives and Consequences

---

---

Water quality policy changes affecting animal confinement operations will focus on alternative responses to two primary questions: 1) Will adoption of manure management technologies by confinement operations be required by law, or will it be encouraged under a voluntary approach? 2) Who will bear the costs associated with adoption of manure management technologies? Responses to these questions will be reflected in decisions made within EPA and USDA, as well as decisions about how authority for policy development and implementation is shared (or divided) between EPA and USDA.

### **What are the rules and who has to comply with them?**

Currently, livestock confinement operations of greater than 1,000 AUs are defined as point sources of pollution, and are subject to the provisions of the Clean Water Act. They must, therefore, obtain an NPDES permit to remain in compliance. Individual operations of between 300 AU and 1,000 AUs can be

considered point sources if they discharge manure through man-made structures or if manure is discharged to waterways that run through the facility or come into contact with the animals. All other livestock operations are considered nonpoint sources of pollution and are not subject to CWA regulations. These operations are encouraged to prepare CNMPs in order to decrease the likelihood that they will contribute to water pollution.

On December 15, 2000, the EPA announced new proposed regulations for animal confinement operations. The EPA proposes several measures to clarify the definition of an animal confinement operation and a concentrated operation. It proposes setback requirements, phosphorus-based land applications, a record keeping requirement and the elimination of the 25- year, 24-hour storm exemption, and provides for remediation of closed manure storage facilities. The proposal recommends co-permitting of contractors and producers and creates a number of new CAFO categories, including veal.

One track of the proposal would maintain the same animal unit thresholds, but would place the responsibility to establish exemption from the CWA on operations in the 300-1,000 AU category rather than the permitting agency. An alternative two-tier track would reduce the CAFO threshold to 500 AUs with the permitting authority responsible for any designations for smaller operations. This track is expected to affect approximately 10 times the number of operations currently subject to the policy, or 26-36,000 operations, at a cost of \$850 to \$940 million to bring these operations into compliance (USEPA 2000).

### **Who will pay?**

Possible policy directions are to place the burden of paying for manure management technologies on the operations that adopt the technologies, or to provide financial assistance to those operations. Financial assistance programs may benefit operations that are required to adopt technologies and operations that do so voluntarily, or benefits may be limited to those by whom voluntary adoption is sought. If EPA broadens the definition of a CAFO to include operations with 500 AU or more, then smaller

operations may be burdened financially by additional regulatory requirements. By definition, these smaller operations would no longer be eligible for cost sharing assistance made available by EPA's nonpoint program.

If the USDA restriction on cost sharing to large operations, required with the Environmental Quality Incentives Program (EQIP), is maintained, and if "large" continues to be defined in line with CWA requirements, then fewer operations will be eligible for these funds as well. Whether USDA will be able to provide cost sharing to affected facilities hinges largely on whether the public perceives the smaller operations to be family farms that should be protected (and assisted), or as production facilities that should be subject to the "polluter pays" principle.

---

---

## **References and Suggested Readings**

---

---

- Batie, S. S. and D. E. Ervin. 1999. "Flexible Incentives for Environmental Management in Agriculture: A Typology." Chapter 5 in *Flexible Incentives for the Adoption of Environmental Technologies in Agriculture*, F. Casey, A. Schmitz, S. Swinton and D. Zilberman (eds.), Kluwer Academic Publishers, Norwell, MA.
- CFARE (Council on Food, Agricultural and Resource Economics). 2000. *Smart Environmental Policy for Animal Agriculture: Possibility or Pipe Dream*. CFARE, Ames, IA.
- NASS (National Agricultural Statistics Service), U.S. Department of Agriculture. 1999. 1997 Census of Agriculture, Volume 1, Geographic Area Series. USDA, Washington, D.C.
- National Survey of State Animal Confinement Policies. <http://cherokee.agecon.clemson.edu/confine.htm>.

- Norris, P.E. and S.S. Batie. 2000. "Setting the Animal Waste Management Policy Context."  
Presentation at the Agricultural Outlook Forum 2000, U.S. Department of Agriculture, Washington, D.C. [\\_http://www.usda.gov/oce/waob/oc2000/speeches/norris.txt](http://www.usda.gov/oce/waob/oc2000/speeches/norris.txt)
- Norris, P.E. and A.P. Thurow. 1999. "Environmental Policy and Technology Adoption in Animal Agriculture." Chapter 12 in *Flexible Incentives for the Adoption of Environmental Technologies in Agriculture*, F. Casey, A. Schmitz, S. Swinton and D. Zilberman (eds.), Kluwer Academic Publishers, Norwell, MA.
- Shaping New EPA CAFO Rules: A Guide To the Proposals and Comment Process. <http://agenvpolicy.aers.psu.edu/cafo/>
- Terrene Institute. 2000. Nonpoint Source News-Notes. October 2000, Issue #62. Terrene Institute, Alexandria, VA.
- USEPA, Office of Water. 2000. "Proposed Regulations to Address Water Pollution from Concentrated Animal Feeding Operations." EPA 833-F-00-016. Washington, D.C.
- USEPA, Office of Water. 1999. "State Compendium: Programs and Regulatory Activities Related to Animal Feeding Operations." <http://www.epa.gov/owm/stcfin.pdf>.
- Waskom, R. 2001. Managing Agricultural Phosphorus to Protect Water Quality. Colorado Dairy News. Jan 2001. Vol. 7, Number 1.