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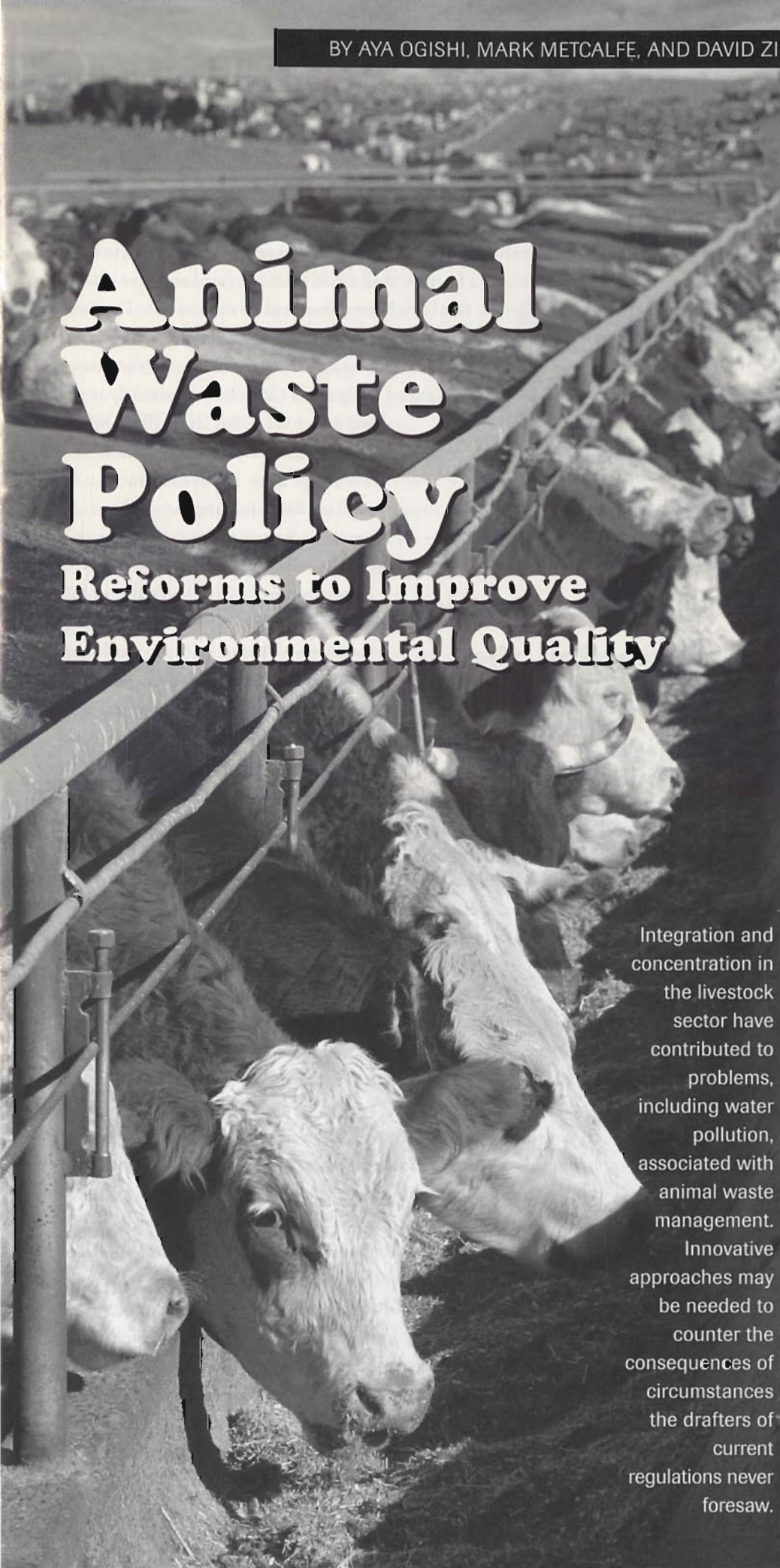
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Animal Waste Policy

Reforms to Improve Environmental Quality



Integration and concentration in the livestock sector have contributed to problems, including water pollution, associated with animal waste management.

Innovative approaches may be needed to counter the consequences of circumstances the drafters of current regulations never foresaw.

Major changes in the U.S. livestock sector have been accompanied by significant adverse environmental effects. Increased efforts to introduce policy solutions to control these effects — which consist mainly of animal waste — are stymied because of the many dimensions of the pollution resulting from animal production. Complex policies are needed to address nutrient runoff, waste spills, air pollution, and odor problems associated with confined animal operations. This article discusses the current regulatory predicament, and shows how structural changes are affecting the environment. New approaches to policymaking and regulation are suggested.

The Environmental Impacts of Animal Waste

Maintaining acceptable levels of water quality is important to human and environmental health. In 1998, the Environmental Protection Agency (EPA) examined (assessed) approximately one-third of all surface waters in the United States. According to this assessment, 35 percent

of the nation's assessed river and stream miles, 45 percent of its assessed lake acres, and 44 percent of its assessed estuarine square miles are considered "impaired" because they do not meet the state water quality standards necessary to support public use and a healthy aquatic environment (U.S. EPA, 2000). The EPA also estimates that 20 percent of all U.S. water quality problems involve agriculture, and that almost one fifth of the water pollution problem can be attributed to animal waste (U.S. EPA, 2000).

For centuries, animal waste has been used as fertilizer on agricultural fields. However, the geographic concentration of livestock production coupled with the large size of animal feeding operations, particularly in the southeastern region of the United States, has led to excess loadings of nutrient applications on lands near feeding operations. These excess loadings have caused nutrient runoff and leaching and have contaminated surrounding surface and ground waters. Figure 1 shows the estimated regional distribution of excess on-farm manure nitrogen in 1997 (Golleson et al).

Animal waste pollution has caused highly publicized and catastrophic waste spills that contaminated large areas of surface and groundwater and drastically reduced aquatic populations. In 1995, 1.5 million gallons of hog manure from an earthen lagoon in Iowa contaminated the South Fork of the Iowa River. Also in 1995, 25 million gallons of animal waste spilled from a lagoon into North Carolina's New River (Vukina, Roka, and Palmquist). These major environmental accidents have a significant impact on water quality and aquatic life.

The Ineffectiveness of Current Regulations

The federal government has regulated waste discharged from confined animal feeding operations (CAFOs) since 1972 when the Clean Water Act's (CWA) National Pollution Discharge Elimination System (NPDES) permit program designated farms with 1,000 or more animal units (CAFOs) as "point sources" of pollution. The designated CAFOs were forced to meet the requirements of the NPDES program by limiting waste discharge. EPA and NPDES-authorized state governments continue to be responsible for developing NPDES permits that specify "economically achievable" best available technology (BAT) and best management prac-

tices (BMPs) that must be implemented. EPA reviews the establishment, permit, and enforcement processes.

The effectiveness of the NPDES program has been questioned because only a fraction of all CAFOs are regulated and even among those, only a few have been monitored or sanctioned. The ineffectiveness apparently stems from the faulty design of regulations and the political motivation to save family farms. EPA estimates that only 21 percent of designated CAFOs are currently regulated under the CWA (U.S. EPA, 2001).

Limited regulatory resources mean that even fewer have been monitored and penalized for noncompliance. There are two major reasons for policy ineffectiveness and noncompliance:

Regulations are designed without full consideration of the industry's structure. Many livestock and poultry producers operate through contracting. EPA (2001) estimated that 97 percent of broilers produced in the United States and 66 percent of hogs raised by large producers in the southern and mid-Atlantic states are produced on contract farms. An integrator typically provides basic inputs such as genetic materials, feed, and veterinary services, and contracts with farmers who provide production facilities and raise the livestock and poultry. The integrator then processes the livestock and

poultry and sells the consumer-ready meat products. Contracting has been instrumental in the concentration and geographic relocation away from the source of feed and away from lands that can absorb large quantities of manure spread as fertilizer. Water quality regulations were not designed to consider contracting, the relocation of feeding operations, and the concentration of manure-producing CAFOs.

There is political motivation to help protect small family farms. CWA regulations apply only to "point source" CAFO farms, so small farms with only a few animals are not regulated by the CWA. In addition, the "economic achievability" constraint protects financially strained family farms from complying with tough water quality standards. Small, family farms provide amenities to society as a whole, but they can also significantly affect environmental quality despite their low production levels. The "economic achievability" constraint gives producers an incentive to stop with less-than-optimal waste management effort.

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Proposed Reforms

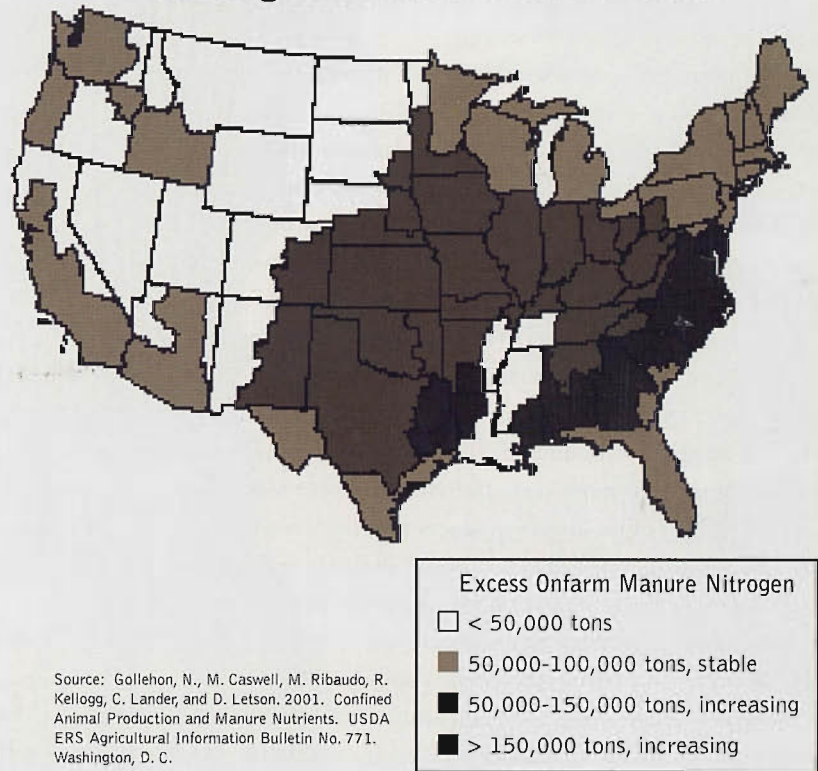
How can the regulatory situation be improved? Below are several key approaches to achieving a successful regulatory reform. One is through a direct effort to create a holistic approach to the problem (achieved through simultaneous regulations of all significant types of farm operations, pollutants, and pollution channels), and the other is based on several individual incentive-based policies.

Holistic Approach. Regulations must include all operations: family farm operations, CAFOs, and all sizes in between. Current policy needs to be expanded so that all operations are required to satisfy regulatory requirements. The policy also must address all pollutants and pollution channels. The implementation of regulations for all operations and pollution types will help re-establish the active management of manure as an agricultural crop fertilizer. This will restore the incentives for recycling, and thereby reduce chemical fertilizer use and overall soil nutrient concentrations. Successful implementation of this approach calls for continuous emphasis on identifying the linkages between animal waste problems, production problems, and the possible alleviation of pollutants.

Incentive-Based Approaches. It is not feasible to observe and monitor all waste management problems. Therefore, it is important to implement incentive-based regulations to make sure that appropriate waste management practices are adopted. Incentive-based regulations can include environmental or “green” subsidies, tradable permits, and the expansion of liability to all parties that influence waste management decisions.

Green Subsidies. The economic achievability constraint limits the ability of regulators to influence contract farmers’ behaviors. When regulators cannot enforce best waste management practices, waste storage lagoons can be designed to be smaller than optimal from an environmental perspective, and waste can be applied to land in close proximity to animal operation areas. The problem can be mitigated by a system of subsidies, or green payments, for waste-controlling environmental services provided by farmers. Small farms that currently receive implicit subsidies through economic achievability could instead be given explicit subsidies that reflect the value of an improved environment. Thus small farms remain financially viable, while they are encouraged to devote greater effort to improving waste management practices.

Figure 1. Regional Potential For Excess Nitrogen From Animal Waste



Marketable Permits. Another possible green policy centers on the development of a system of marketable permits — a policy touted by economists as a cost-effective regulatory tool. An animal production rights system, similar to one used in the Netherlands, could be established to allow trading the rights to produce animals. A more direct approach is to issue pollution permits, or pollution rights, that can be traded among producers. Another possible alternative is to issue tradable waste disposal rights to producers who own disposal areas and also to surrounding landowners. For these marketable permit systems to function properly, a regional authority would have to monitor overall water quality and other environmental conditions and establish limits for these markets.

Extended Liability. Current livestock and waste disposal policies do not fit with the industry’s economic structure. Most poultry and swine production is done through contractual arrangements between the operators who raise the animals and integrators who process and sell the final product. Within a completely integrated framework, one entity makes all decisions about supplies of inputs and sales of output and responsibility for waste management is assigned to the entity. In contemporary contract production, the contract producers are responsible for establishing waste manage-

The “economic achievability” constraint gives producers an incentive to stop with less-than-optimal waste management effort.

ment systems, and they are liable for all damage caused by the waste generated at their facilities.

Sharing the liability for environmental damages will enhance the overall capacity of the livestock system to create a mechanism for improving environmental quality. When integrators have substantial operational controls over the production systems, any decisions by the integrators will likely affect the chemical composition of waste materials, patterns of disposal and land application, and likelihood of waste spills. Shared liability would give integrators an incentive to invest in environmentally friendly specifications and designs for production systems and to conduct research and development of more cost-effective abatement technologies.

The high cost of monitoring reduces the effectiveness of regulators in enforcing policies under current industry arrangements. Under a changed system integrators can easily identify the producers who are responsible for mismanagement and negligence in waste management. Joint responsibility could enhance the role of the integrator as a provider of information and as an enforcer of regulations. To ensure that integrators cannot unfairly exercise power in bargaining contract terms, regulators may need to randomly monitor the integrators' practices. This type of monitoring would not be as costly as the observation of waste management practices on all individual farms.

Conclusions

Animal agriculture contributes significantly to water quality problems in the United States, and current regulations seem inadequate to address this issue. This ineffectiveness is a result of not considering the industry's structure as well as the politics surrounding the financial protection of family farms. A holistic view of regulation along with implementation of incentive-based regulations that encourage operations to improve waste management practices with limited monitoring can help correct the problem. Everyone involved in influencing waste management decisions needs to be held accountable, and the loopholes provided by economic achievability and limited liability must be addressed.

The EPA in January of 2001 put forth proposed revisions to the NPDES program (U.S. GPO). These proposed changes seek to improve regulatory effectiveness by taking a more holistic approach and imposing the requirement of co-permitting, or joint liability, for all parties who enter into a production contract. Implementing such policies would be a step in the direction of more effective regulation.

For More Information

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