Delaware's Animal Feeding Operations Strategy: A Critical Analysis of the Goals and Measures of Success

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More than 25 years of research has shown that agricultural nutrients are impacting Delaware's ground and surface waters. Nitrate contamination of ground waters used as drinking-water supplies and eutrophication of fresh and estuarine waters by agricultural nitrogen (N) and phosphorus (P) are the major water-quality problems in Delaware historically, and today. Human-health concerns related to eutrophic waters (for example, *Pfiesteria*) have emerged in recent years and created an additional impetus for improving agricultural nutrient management.

Delaware agriculture is dominated by a large and geographically intense poultry industry. Approximately 260,000,000 broiler chickens are produced each year in a State with about 225,000 hectares (ha) of cropland. Research has shown that the nutrient surpluses and nutrient-management problems associated with concentrated poultry production play a major role in nonpoint-source pollution of Delaware waters by agriculture. Fertilizer N use is another significant factor. In 1997, Delaware entered into a Total Maximum Daily Load (TMDL) agreement with the U.S. Environmental Protection Agency (USEPA) as a result of a lawsuit filed against USEPA by a consortium of environmental groups. In the TMDL agreement, the State of Delaware agreed to reduce N and P loads to surface waters by as much as 60-85%. Close upon the TMDL settlement have come State efforts to develop a coordinated response to the newly developed U.S. Department of Agriculture (USDA)-USEPA Unified Strategy for Animal Feeding Operations. A Governor's Agricultural Industry Advisory Committee on Nutrient Management prepared a series of recommendations in late 1998 and proposed legislation in the spring of 1999 that would establish a Delaware Nutrient Management Commission to "*..regulate those activities involving the generation and application of nutrients in order to help improve and maintain the quality of Delaware's ground and surface waters to meet or exceed federally mandated water quality standards, in the interest of overall public welfare"*. Similar legislation has been passed in Maryland, Pennsylvania, and Virginia.

One of the major needs in the ongoing effort to improve nutrient management for water-quality protection is a systematic process to clearly establish goals and document success. This presentation critically analyzes the establishment of nutrient-management goals that will achieve water-quality improvement and outlines a series of measures that can be used to determine if we are progressing toward these goals. The emphasis will be on the changes needed in nutrient management by animal agriculture, and specific recommendations will be made on the most effective means to implement change, as well as areas where future research should be focused.

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