



## What Can You Do on Your Beef Operation to Protect Water Quality?

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Those of us who live in Minnesota know how lucky we are to live in the “Land of 10,000 Lakes.” It seems that clean, fresh water surrounds us. A favorite fishing hole or good spot for water-skiing are just a few miles away. But, what would happen if the water you rely on for drinking and recreation was contaminated and considered unfit for human and animal use? The mere mention of contamination in our water supply is enough to make most of us uncomfortable. Yet, we often take our water supply for granted.

Large confinement feedlots have often been viewed as the primary threat to local water supplies. It is true that a feedlot with 2,000 cattle will produce more manure than a cow-calf operation with 50 cows. However, it is important to note that ALL livestock operations, regardless of size, have the potential to pollute water and therefore have a vital role in protecting this valuable resource. Most beef producers are good environmental stewards and practice due diligence when it comes to protecting waters of the state. But, it doesn't hurt to be reminded once in a while that water quality is important to everyone, and beef producers have a responsibility to help protect our waters.

Manure contains nutrients essential to plant growth and increases the organic matter of the soil when applied to cropland. It aids in water retention, lessens the impact of wind and water erosion, and promotes growth of beneficial organisms in the soil. However, if not handled properly, manure can harm the quality of surrounding water. Over

application of manure to cropland, leaching from stockpiled manure and silage, and open lot runoff can all result in contamination of our water supply.

The primary pollutants in beef manure are nitrogen, phosphorus, and pathogens. Nitrate-nitrogen can leach into ground water from stockpiled manure or silage and open lots. Concentrations higher than 10 mg/L in drinking water can harm infants and concentrations higher than 100 mg/L can harm cattle. Phosphorus from manure can attach to soil particles and runoff into surface water during rain events. Excess phosphorus in aquatic environments results in eutrophication or “algae blooms.” When the algae die and decompose, dissolved oxygen in the water is depleted, which can cause fish kills. Disease-causing bacteria such as *E. coli*, *Cryptosporidium*, and *Giardia* can threaten public health and reduce livestock performance if runoff containing these pollutants reaches human or livestock water supplies. What can you do on your beef operation to reduce potential contamination of surrounding surface and ground water?

**Control runoff and leaching from stockpiled manure.** Many cattle operations need to temporarily stockpile manure at some point during the year. If manure must be stockpiled, producers should be sure to follow all regulations set by state regulatory agencies. In Minnesota, the stockpiles must be located, constructed, and operated so that manure-contaminated runoff from the site does not discharge into waters of the state. To prevent groundwater contamination, have a concrete pad under

the stockpile and make sure to locate the stockpile in an area where there is at least a two foot separation distance between the base of the stockpile and the seasonal high-water table. Catch basins can be used to prevent runoff from stockpiled manure from reaching surface water.

**Control runoff and leaching from open lots.** Catch basins can be used to contain manure-contaminated water from an open lot. Filter strips are another treatment that can be used to prevent nutrient pollution in surface waters.

**Properly manage silage storage.** Like manure, silage leachate can be a source of excess nutrients that pollute waters. Beef producers should be sure to locate their silage storage in an area that will prevent leachate runoff into wells, streams, or nearby water. If high moisture silage is used, it should be stored on asphalt or concrete to prevent leaching. Rain water should drain away from storage to a field or pasture and no leachate should reach surface water.

**Eliminate or reduce cattle access to streams, rivers, lakes, or ponds.** Fencing cattle away from open water is an effective method of improving water quality. Reducing

access to stream banks will protect the vegetation, which in turn reduces erosion and improves water quality. Keeping cattle away from open water will prevent urination and defecation in the stream which can lead to bacterial pollution. Animal health may also be improved through reduced exposure to water-transmitted diseases and foot rot.

**Install clean-water diversion.** Berms and ditches can be used to divert up-slope runoff and rain water from buildings away from open lots or other areas where manure may accumulate. Preventing this excess water from entering the lot or manure stockpile area not only will reduce pollution potential, it will help keep these areas drier.

**Apply manure at correct rate to fields.** When it comes time to land apply manure from the feedlot, be sure to calibrate application equipment and apply at recommended rates based on crop nutrient needs. If applying manure on high phosphorus soils, follow state regulatory guidelines for phosphorus management. Whenever possible, do not apply manure to frozen ground.