

Phosphorus: reducing releases from meat packing operations

Meat packing operation can be significant sources of phosphorus released to wastewater treatment facilities. This fact sheet provides examples of ways to reduce phosphorus releases.

Minnesota's waters must be clean and healthy in order to sustain aquatic life and provide recreational use. Although phosphorus is a nutrient for plant growth, excess phosphorus can speed up the aging process of lakes and streams by stimulating algae growth. This creates high biochemical oxygen demand (BOD) as algae decomposes and uses up available oxygen supplies, sometimes threatening the survival of fish and other aquatic organisms.

The Minnesota Pollution Control Agency (MPCA) has established effluent phosphorus limits and phosphorus monitoring requirements for new or expanding municipal wastewater treatment facilities that have discharges of more than 1,800 lbs of phosphorus per year. These facilities are asking their industrial users to reduce phosphorus in discharges to the treatment plant.

Meat packing operations can be significant sources of phosphorus released to wastewater treatment plants. Cleaning and rinsing of equipment, product lost to the drain and floor, and cleaning chemicals are all ways phosphorus enters the wastewater.

Reducing BOD, TSS, Phosphorus & Water Use

Meat packing operations can be significant sources of wastewater that is high in BOD, total suspended solids (TSS) and phosphorus. A number of steps can be taken to reduce meat packing facility waste, including:

- Recover products and by-products
- Upgrade production equipment
- Improve maintenance
- Use dry cleanup
- Use high-pressure, low volume cleaning systems
- Use low- or non-phosphorus cleaning and sanitizing chemicals
- Monitor water use

- Manage water as a raw material

Recovering Products and By-products

Recovering excess material prior to cleanup can minimize product loss and make your process more efficient. Blood, trimmings and paunch contents naturally contain phosphorus. Recover these by-products and stop them from entering the sewer to lower the amount of phosphorus in your wastewater. Collect as much blood as possible at the slaughter site rather than allowing the blood to enter the packing line. Use troughs and curbs where necessary to direct the flow of blood that makes it to the packing line. Dry clean the paunch and use a screw conveyor or an air-energized system to transfer paunch contents to further reduce the chance of these materials entering your facility's wastewater.

Upgrade old production equipment to help prevent spills and reduce the chance of releasing phosphorus to the sewer. A preventive maintenance program also can help prevent spills at your facility. Both options may have the added benefit of increased process efficiency.

Cleaning

Janitorial operations and process cleaning or sanitizing can be significant sources of phosphorus going to wastewater treatment plants.

Before using wet cleaning methods, dry clean as much as possible to recover excess product and by-products. For example, before washing the production floor with water, use a squeegee and a dust pan to cleanup any product or by-product that ends up on the floor. If products recovered with dry cleanup methods are not suitable to return to your production process, they may be used as animal feed or sent to rendering. For more information about feeding food by-products to livestock see MnTAP's fact sheet, Feeding Food Processing By-products to Livestock [#67], available online at <www.mntap.umn.edu>.

For information on rendering services contact a rendering company that serves your area.

A clean-in-place (CIP) system eliminates the need to dismantle equipment for cleaning and can help you carefully control water and chemical use at your facility. Many production facilities manually run CIP systems, but fully automated CIPs are more consistent than manual operations and are typically more effective. Using final CIP rinses as the pre-rinse for the next cleaning cycle can further cut the amount of wastewater generated.

For wet cleanup, high-pressure, low volume cleaning systems can help cut the amount of wastewater at your facility. Using higher pressure cleaning systems, employees are more likely to use less water during cleanup to achieve specified cleanliness.

Compared to traditional phosphorus cleaners, low and non-phosphorus cleaning and sanitizing chemicals are as effective and are comparable in cost. Ask your chemical supplier for more information about changing chemicals.

For more information about cutting phosphorus from your cleaning operation see MnTAP's fact sheet, Phosphorus: Reducing Releases from Industrial Cleaning and Sanitizing Operations [#11], available online at <www.mntap.umn.edu>.

Water Use

Before you can reduce water use you need to understand how and where it is being used at your facility. Water meters can help measure water use throughout your facility. This tool measures water and wastewater volumes and can help you plan pollution prevention tactics. Some meters on the market use circular chart recorders to measure water use in gallons per minute over a 24-hour period. Fluctuations may indicate leaks, wasteful water use or inefficient equipment. Installing meters in high water use areas will help you identify procedures where excess water use can be cut. Remember, water is a raw material with a real cost to your company.

For More Information

For more information about reducing waste at meat packing plants see the 65-page report [*Reduction in Waste Load from a Meat Processing Plant-Beef*] <www.p2pays.org/ref/01/00466.pdf>.



For More Information

MnTAP has a variety of technical assistance services available to help Minnesota businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution, increase energy efficiency, and reduce costs. Our information resources are available online at <mntap.umn.edu>. Please call MnTAP at 612.624.1300 or 800.247.0015 for personal assistance or more information about MnTAP's services.