



MEAT WASTEWATER LOADING



Introduction

Residents, communities, wildlife, and economic sectors (like agriculture) all depend on steady access to clean and safe water. Inadequately managed wastewater and chemical byproducts from production, manufacturing, and other industrial operations can threaten the water quality of lakes and other water bodies downstream. In times of dry spells or droughts, wastewater runoff may also reduce the quantity of clean water available for industrial and residential use.

Benefits of Wastewater Loading Reduction

- Achieving cost savings on wastewater bills and strength charges from biochemical oxygen demand (BOD), total suspended solids (TSS), and/or other pollutants.
- Optimizing manufacturing processes by reducing excess chemical use.
- Protecting human health from antibiotic resistance due to pathogens and chemicals associated with animal processing operations.
- Benefiting neighbors and local communities by ensuring that receiving waters can be used readily for drinking, agriculture, and other necessary processes.

NAICS Code: 3116**
Industry Sector: Animal Slaughter and Processing
 EPA Region 5

About MnTAP

The Minnesota Technical Assistance Program (MnTAP) is a confidential, no-cost, and non-regulatory program at the University of Minnesota that provides technical assistance focused on pollution prevention to organizations in Minnesota.

Background

MnTAP was contacted by a meat processor who operated a grower-owned facility for butchering and packaging meat. The facility was interested in conserving water and minimizing high-strength waste discharges associated with regular facility processes and in preparation for an upcoming wastewater permit renewal. MnTAP staff performed a site assessment to explore new strategies for conserving water, reducing waste and chemical loading to wastewater, and conserving energy use with a focus on compressed air leaks.

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Conduct Dry Cleanup in Processing Area

Dry cleanup means physically removing waste and byproducts from equipment and floor before pre-rinsing, washing with appropriate detergent, and rinsing. When waste and byproducts are collected before being processed by a rendering company, less effluent waste, which is high in BOD and TSS, can be hosed down and discharged as wastewater.



Minnesota Technical Assistance Program

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Pollutant Reduction:

42,000 lbs. of BOD
25,000 lbs. of TSS

Status:

Proposed

If there is enough space, offal can first be collected in carts or drums before being moved to a receptacle marked for the rendering company. Doing so would prevent any fat, protein, viscera, or other organic material from entering wastewater and increasing its BOD and TSS content. MnTAP staff members identified four locations where offal may be able to be collected before it can reach wastewater.

Based on available published research and observations made at the site visit, MnTAP estimates that the above four locations comprise as much as 25% of the total offal weight in the offal line. According to industry estimates provided by a poultry processor, approximately 32% of that facility's BOD and 38% of their TSS came from evisceration carriage water containing offal.¹

Using these estimates, if offal were removed directly from the four locations recommended by MnTAP, 42,000 pounds of BOD and 25,000 pounds of TSS could be removed from wastewater. Removing offal via dry cleanup may also result in savings associated with wastewater strength charges that were incurred due to elevated BOD loading.

Common Methods of Performing Dry Cleanup:

- Sweeping or squeegeeing waste off the floor
- Installing strainers in areas where byproducts routinely collect on the floor or along processing lines
- Scraping grease or fat off conveyor belts

Increase Liquid Storage Capacity for Effluent Waste

Pollutant Reduction:

680 lbs. of TSS

Status:

Proposed

Even though the facility's liquid storage tank for effluent waste (e.g., animal byproducts and blood) is periodically emptied, MnTAP staff members determined that the facility is producing more effluent waste than could be stored and moved out for rendering. This means that excess effluent waste high in BOD and TSS is being discharged directly to the sewer, creating the potential for fines or strength charges.

By replacing the current liquid storage tank with a new tank that is approximately 60% larger, the facility would more adequately meet the amount of effluent produced over the year, including times high demand. Expanding the liquid storage capacity would also prevent 1,000 pounds of BOD and 680 pounds of TSS from being discharged to wastewater and reduce any charges incurred from elevated BOD loading.

Conclusion

Wastewater from meat processing can be a large source of BOD and TSS loading to wastewater, but opportunities exist to reduce pollution at the source by diverting meat and offal wastes. The physical limitations of a facility, including the proper sizing of wastewater and offal receptacles, must be understood to enact the process changes and engineering controls needed to minimize high-strength discharges. Additionally, wastewater source reduction creates less strain on municipal treatment plants, which in turn promotes lower public costs and improves water quality.

1. Woodard, F.E., et al. (1972). *Abatement of pollution from a poultry processing plant*. *Journal of the Water Pollution Control Federation*.