



# FOOD WASTE UPCYCLING AND MINIMIZATION



## Overview

Food manufacturers work to package as much of their product as possible to maximize profit and minimize process waste. Depending on the facility, facilities may find that the easiest waste management solution would be to rinse excess ingredients to wastewater drains or sweep up waste and dispose it with general facility trash. However, ingredients and food that would otherwise be wasted may be upcycled into new, high-quality products for human consumption.

To establish a hierarchy for reducing environmental impacts of wasted food, the U.S. EPA developed the Wasted Food Scale in 2023, shown below. Additional information can be found on this [EPA webpage](#).

**NAICS Code:** 3119\*\*  
**Industry Sector:** Other  
Snack Food Manufacturing

### 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.



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## Retail Bakery Example

**NAICS Code:** 3118\*\*  
**Industry Sector:** Bakeries

**Pollution Reduction:**  
220 lbs. of product

**Cost savings:**  
\$1,700

**Status:**  
In Progress

MnTAP visited a retail bakery that operates a bread slicer used for bagging stuffing bread, which is offered seasonally by a grocery store for \$5 for a ten-ounce bag. MnTAP understands that stuffing bread is made for eight weeks each year, on four days per week. At the time of the site visit, the stuffing of bread bagging had just been completed, but the area had not yet been swept.

MnTAP estimates that the equivalent of five loaves of bread, or approximately seven pounds, had fallen to the floor during the slicing process. A guard or pan installed around the slicer could allow bread pieces to be recaptured and bagged as stuffing. Based on the typical throughput of the bread, approximately 220 pounds of bread would be kept from landfill disposal through this process improvement. Additionally, \$1,700 of annual profit could be gained through the sale of bread.

## Snack Food Manufacturing Example

**NAICS Code:** 3119\*\*  
**Industry Sector:** Other Snack  
Food Manufacturing

**Pollutant Reduction:**  
129,000 lbs. of COD  
20,700 lbs. of TSS

**Cost Savings:**  
\$25,000

**Status:**  
In Progress

During a site visit at a vegetable processor, MnTAP studied potato waste from the slicers to evaluate its potential for reuse. Potato pieces that were not captured in the production line, some of which were still acceptable for their intended use, were collected on a mesh screen that was washed into a wastewater trench and then into a pit. Following discussions with facility personnel and measurement of the potato waste generation rate, and based on the facility's operating schedule, MnTAP determined that approximately 880 gallons of potato waste was discharged to wastewater each day from slicers. MnTAP also reviewed the facility's wastewater discharge permit and the strength charges incurred from COD and TSS loading.

Given the facility's current configuration, a tank could be installed in the wastewater line between the screen and the wastewater trench to capture the waste potatoes. The size of the tank would depend on the frequency at which the tank was emptied. Assuming an in-line tank could reduce wastewater loading by 10%, the annual wastewater effluent savings may be as much as 129,000 pounds of COD and 20,700 pounds of TSS. Based on the strength charge structure imposed by the municipality, the COD and TSS savings would be approximately \$25,000.

MnTAP understands that potato waste from this facility is currently being shipped to a farm for use as animal feed. If potatoes are diverted from the waste stream at the slicer, an application may be found that would convert potato management from a cost to an asset. Potatoes diverted from the slicers may be able to be reused in one or more of the following ways:

- Recycling through the slicer to capture potatoes in the production line
- Reprocessing as an ingredient in another potato product (e.g., mashed potatoes, gnocchi, vodka)
- Repurposing as a non-food ingredient (i.e., potato starch)

## Conclusion

Where source reduction in food manufacturers is impractical, upcycling and food reuse are important options to consider. Upcycling a waste byproduct, such as bread scraps or potato trim, is more environmentally beneficial and can earn the organization revenue, provided that a viable market exists for that material. Dehydration and fermentation are currently two viable methods to upcycle byproducts, and the stabilized (i.e., dehydrated) byproduct can be incorporated into new consumer food products.