

4.1.1 Agricultural Business: Food Processing

Case Study #1

BUSINESS: Hillshire Farm & Kahn's (HF&K); New London, Wisconsin
WASTE ORIGIN: Meat Processing
WASTE TYPES: Hazardous Waste and Volatile Organic Compound (VOC) Air Emissions, Freon 113, and Solvent-based Parts Washing Solution

COMPANY BACKGROUND

HF&K processes raw meat into meat products (e.g. sausage, bacon, ham, and lunch meats).

MOTIVATION

Reduce waste disposal costs, long-term disposal liability, and its regulatory burden.

STRATEGIES

Eliminate Freon and solvent-based solutions from operations.

ORIGINAL PROCESS

Freon 113 was used to dissolve the fat in meats in a diagnostic test to determine the fat/lean content of meats. A solvent-based parts washing solution was used in the maintenance area.

NEW PROCESS

HF&K invested in new infrared technology to determine the fat/lean content of meats. The company also purchased parts washing equipment with a filtration system and converted to a non-hazardous (citrene-based) cleaning solution for the equipment.

RESULTS

Waste Reduction

Eliminated Freon 113 from processing operations.

Eliminated use of solvent-based parts washing solutions in operations.

Economics

Savings: Information not available.

Capital Cost: Purchased infrared technology equipment and a parts washer.

Operating/Maintenance Cost:

\$1,000 per year for light bulb replacement in infrared equipment.

\$1,200 per year for non-hazardous cleaning solution and filters.

Payback Period:

Capital costs for the infrared technology were recovered in two years.

Costs for the parts washer were recovered in less than one year.

HEALTH & SAFETY BENEFITS

Worker safety was greatly improved since Freon 113 is mildly toxic by ingestion and inhalation, affects the human central nervous system, is a skin irritant, and is combustible when exposed to heat or flame.

TECHNOLOGY TRANSFER

The technologies applied at HF&K are commercially available and could be applied in similar situations.

PROBLEMS

These waste reduction efforts initially met employee resistance and presented challenges to maintain monitoring test quality and dependability.

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Case Study #2

BUSINESS: Frigo Cheese Corporation; Oconto, Falls, Wisconsin
WASTE ORIGIN: Cheesemaking
WASTE TYPES: Liquid By-products and Liquid Salt Whey

COMPANY BACKGROUND

Cheese manufacturing is a biochemical process converting milk to curd to cheese. Whey is a liquid by-product drained from curd and often sold as a food grade additive. Salt is added to the curd to remove additional whey, but is often too salty for use.

MOTIVATION

Landspreading of liquid salt whey increased levels of chlorides in soils and posed a slight risk of crop damage if applied incorrectly. The landspread also posed a logistical burden.

STRATEGIES

Recover salt from the salt whey and reuse it in the production process.

ORIGINAL PROCESS

Frigo Cheese landspread up to approximately 2,000 gallons/day of salt whey.

NEW PROCESS

A salt recovery process modified an evaporator previously used to recover edible whey. This reduced the salt whey wasted by separating pumpable salt whey from water. Salt whey is reused in cheese production, while the recovered water is used for cleaning and other purposes that don't require potable water.

RESULTS

Waste Reduction

Reduced salt whey production from 2,000 pounds/day to approximately 500 pounds/day.

Reduced salt use from 1,000 pounds/day to 500 to 600 pounds/day.

Recovered 400 to 500 pounds/day of salt whey.

Economics

Capital Costs: \$2,000 for process modification to equipment.

Operating/Maintenance Cost: Approximately 3 cents/pound of salt recovered.

Payback Period: Two months based on capital cost and annual salt savings of \$12,500.

PROBLEMS

Not all salt whey could be recovered because USDA sanitation concerns restricted reuse of salt whey that has contacted wooden containers. Some concerns over use of recovered salt's effect on cheese chemical composition, flavor, and shelf-life were unfounded.