

**Reduction in Wastes at a Meat Processing Plant**

Estonia

1993

Full scale

**MANUFACTURE OF FOOD PRODUCTS AND BEVERAGES # 17**[http://www.emcentre.com/unepweb/tec\\_case/food\\_15/process/p13.htm](http://www.emcentre.com/unepweb/tec_case/food_15/process/p13.htm)**Background:**

Parnu Meat Processing Plant, constructed in 1897, is a full line red meat plant processing cattle, hogs, and some sheep. The plant is organized into three operating areas:

1. slaughtering,
2. manufacturing of edible by-products, including fresh cut packaging, cooked hams and sausage, and
3. a technical water treatment and wastewater pretreatment plant. Products are sold to distributors.

The annual value of manufactured products is about \$3 million. The plant employs about 250 persons.

The cleaner production measures at the industry were initiated under [World Environment Center's \(WEC's\)](#) Industrial Waste Minimization Program in the Baltic countries.

**Cleaner Production Principle:**

Recovery, reuse and recycle, Housekeeping

**Cleaner Production Application:**

At Parnu, various operations in the slaughter line resulted in uncontrolled discharges to the municipal wastewater treatment plant containing high organic loadings. This practice resulted in high pollution discharge fees and penalties for exceeding biological oxygen demand (BOD) standards.

***A. Reducing the volume of wastewater streams with high BOD***

During the waste minimization project, an evaluation was performed to identify opportunities to reduce the volume of wastewater streams with high BOD. Using a chemical oxygen demand (COD) analyzer, a sampling protocol was developed to identify processes which had the highest COD loadings.

***B. Reducing the volume of water consumed during startup and cleanup procedures***

In the past Parnu performed slaughtering operations two days per week. Separate startup and cleanup procedures were conducted during each day that slaughtering operations were performed.

During the waste minimization project, an evaluation was performed to identify opportunities to reduce the volume of water consumed during startup and cleanup procedures. As a result of the evaluation, several operational changes were identified and implemented.

1. A review of production levels indicated that the entire production schedule could be completed in one day instead of two days. This operational change reduced water use, lowered energy consumption to heat process water, and reduced wastewater treatment and discharge fees.
2. A training program was implemented to emphasize the increasing costs of purchasing water and treating wastewater and the need to make improvements in work habits.
3. Dry cleanup procedures were adopted to minimize the discharge of solids into the drains.
4. Water supply hoses were equipped with nozzles and pistol guns to reduce water losses due to running water when hoses were not in use. Finally installation of high pressure washers improved the efficiency of cleaning process equipment with a combination of hot water, detergent and pressure.

## **Environmental and Economic Benefits:**

### ***A. Reducing the volume of wastewater streams with high BOD***

As a result of the project, the facility reduced BOD loadings by 21 tons/ year and reduced land disposal of solid waste.

The cost of the Spectrophotometer DR2000, supplied by HACH Chemical Company of Loveland, Colorado, United States, was \$3,000 furnished by the United States Agency for International Development (USAID). There was a yearly savings of \$14,100 and the payback period was less than three months.

### ***B. Reducing the volume of water consumed during startup and cleanup procedures***

As a result of the project, the facility reduced water use by 30,000 m<sup>3</sup>/year and reduced wastewater discharges by an almost similar amount. Other benefits included lower energy use and reduced land disposal of solid waste.

High pressure washers were supplied by Tuff Cat, Littleton, Maryland, United States (USA); nozzles by Strahman Valves, Florham Park, New Jersey USA; spray guns by Gunjet spraying Systems Company, Wheaton, Illinois USA; and the squeegees locally. The cost was \$4,700, paid by the United States Agency for International Development. The project resulted in a yearly savings of \$36,400 and a payback period of less than two months.

## **Constraints:**

None reported.

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## **Review Status:**

This case study was taken from the WEC publication "Economic and Environmental Benefits of Industrial Waste Minimization in Estonia, Latvia and Lithuania" (1995). It was edited for the UNEP IE ICPIIC diskette in June 1997.

Subsequently, in September 1998 the case study underwent a technical review by Dr. Prasad Modak, Environmental Management Centre, Mumbai, India.