Case Study: MSA
Waste Minimisation Clubs of the City of Cape Town: Meat Processing Industry

Background
Malmesbury Sterilisasie Aanleg (MSA) is an independent rendering plant based in Atlantis that receives and processes blood, fish and animal offal. MSA was formed in 1999 as a part of Roelcor (a large meat processing group in the Western Cape).

Process
The main processes of MSA are receiving (of blood or offal), mincing, cooking, decanting and then finally cooking and bagging. The end products include meat and bone meal, fishmeal, tallow and ostrich fat.

Identification of Waste Minimisation Options
Various options were possible where modifications in the process upstream could result in both a reduction in resource consumption as well as improved process yield. A total of 13 waste minimisation opportunities were identified for the site. These are listed in Table 1.

Implementation of Waste Minimisation
Of the waste minimisation options identified, four have already been implemented. These include reduced COD, water and improved product yield.

Reduced COD values
MSA had been negotiating with the local municipality about the high COD load that was being released to effluent. If the municipality had followed through with threats to penalize MSA due to the high COD readings the MSA would have had to close down and approximately 4 500 tons of waste would need to be disposed of at the local hazardous waste site.

The MSA drew up an action plan with defined objectives in order to comply with the municipal requirements. These objectives were met as the MSA managed to reduce the COD value of the effluent by 60%. The COD reduction was a result of optimized decanter centrifuge operation and a change in the process.

Reduced water consumption
The MSA were also able to recycle 30% of their process water by installing a recirculating cooling system. Fortunately, this equipment could be obtained at no cost from within the Roelcor Group.

Re-use of fat / grease
The process modifications also affected an increase in the fat / grease yield in the fat traps. This recovered material is used for making animal feed and tallow.

Table 1. Summary of Identified Waste Minimisation Options

	Waste Minimisation Opportunities	Status
1	Optimise decanter centrifuge to reduce product losses and reduce COD	Implemented
2	Install a blood collection plate to reduce wastage from spills	Implemented
3	Optimise process to reduce product losses and reduce COD	Implemented
4	Recover grease / fat from fat traps	Implemented
5	Possible re-use of decanter cooling water	Implemented
6	Install a electro-coil to increase temperature of hot-well	Investigating
7	Repair steam leaks and insulate valves and fittings	Investigating
8	Re-use heat from decanter to pre-heat incoming raw material or boiler feed	Investigating
9	Implement energy management programme for lighting, cooling and electrical systems	Investigating
10	Install restriction nozzles on hoses	Investigating
11	Use high calorific waste stream as potential animal feed	Investigating
12	Refrigeration of incoming raw material	Investigating
13	Usage of chemicals to prevent waiting raw material from putrifying and improve smell	Investigating
14	Look at infra-red technology as a more efficient way of drying	Investigating

Economic Benefits
Significant financial benefits were incurred through using waste minimisation techniques.

Recommendation	Savings- Rand / year	Payback
Optimise Decanter Centrifuge	~ R320 000*	Months
Optimise Process – reduced energy	~ R80 000	Immediate
Recycle water (30%)	~ R130 000 water and effluent*	Immediate
Improved fat / grease yield	~ R100 000	Immediate

* Based on theoretical (and not actual) effluent charges. In addition, improved product yield has not calculated.

Environmental Benefits
As a result of the waste minimisation programme, benefits to the environment have also been realized. These include:

- Reduced water consumption.
- Reduced effluent volume and load.
- Reduced energy consumption and therefore emissions
- Avoidance of product being sent to landfill.

Contact Details

Darrin McComb
Case Study Consultant
Beco- Institute for Sustainable Business
PO Box 12485
Mill Street
8010 Cape Town
Tel: +27 21 689-7117 Fax: +27 21 689 7117
E-mail: info@beco.co.za

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