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Regional Activity Centre for Cleaner Production

MINISTERIO DE MEDIO AMBIENTE

Generalitat de Catalunya
Government of Catalonia
Department of the Environment and Housing

No. 25 Pollution prevention case studies

Pollution prevention in an agro-food industry

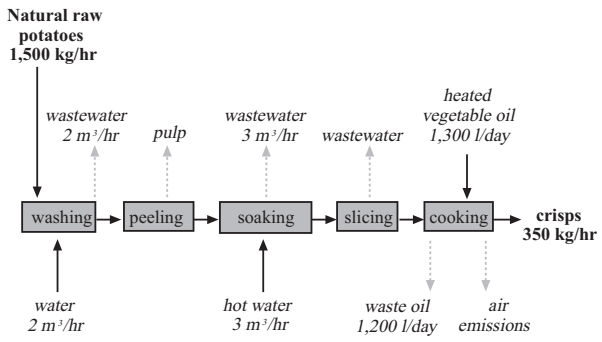
Company background	Bonjus Lebanon Fruit Juice Co. (Mount, Lebanon) is a medium-sized crisp manufacturing factory located in a residential area. It processes about 1,500 kg/hr of natural raw potatoes to produce 350 kg/hr of crisps, and employs 15 permanent technical experts plus 40 temporary employees when needed.
Industrial sector	Agro-Food industry. Crisp production.
Environmental considerations	In the productive process, there was a high consumption of water and generation of wastewater that could be reduced, and some waste products such as oil and starch could be recovered to be sold to other industries. Moreover, organic compounds were emitted to the atmosphere, thus generating odour problems and failing to take advantage of their potential heat power.
Background	The aspects identified to be improved were the following: 1. The non-recycling of water during all the productive process, especially during washing stages, implied a higher consumption of it, as well as higher generation of wastewater. 2. The emissions from the cooking unit carried organic compounds; as they weren't treated but directly evacuated to the atmosphere, not only a problem of odour and air pollution was generated, but also a loss of potential heat energy. 3. Some products generated during the process, such as oils from the cooking unit and starch, were managed as waste products instead of taking advantage of their potential use in other industries. 4. The refrigerators used contained ozone-depleting agents.
Summary of actions	The pollution prevention actions that were implemented were the following: 1. Recycling of water from washing and peeling stages by means of the installation a treatment unit consisting of a filter. 2. Recovery of the oil used in the cooking unit and sell to soap companies. 3. Replacement of fuel oil with propane as a fuel source for heating purposes. 4. Recovery of heat from the incinerator by treating the air emissions generated in the cooking unit. 5. Use of freon refrigerators instead of ozone-depleting agents.

There are still some actions that will be carried out in the future:

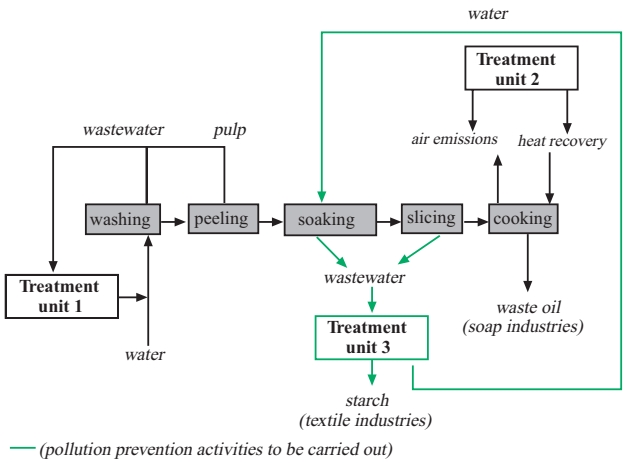
1. Recycling of water from the soaking and slicing processes following prior treatment of their wastewater.
2. Recovery of starch from the soaking and slicing stages to be sold to textile industries.

Diagrams

OLD PROCESS



NEW PROCESS



Balances

Only a financial overview of the filtering and reuse of wastewater from the washing process is available:

BENEFITS	SAVINGS	COSTS		PAYBACK PERIOD
		Cost of water usage €/y (1 m³/day = 182.50 €/y)	Cost of the filter €	
• Reduction of water consumtion • Reduction of wastewater generated	Up to 2 m³/hr = 18 m³/day	18 x 182.50 = 3,285.04	5,703.20	< 2 years

Conclusions

The environmental benefits obtained by the cleaner production measures undertaken in the manufacturing process, were a considerable decrease in water consumption as well as a reduction in pollutant load and volume of wastewater generated. A reduction of energy consumption was also achieved by the reclamation of heat from the incineration process. And finally, it must be pointed out that a better management of waste products has been carried out, thus implying not only environmental benefits, but also economic benefits for the company.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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