The National Cleaner Production Center - Macedonia

CP Assessment Report

Company: **Kokolanski**

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Location: **Berovo**

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Assessment methodology

Cleaner Production (CP) is defined as the continuous application of an integrated preventive environmental strategy to process, products and services to increase the overall efficiency and to reduce risks to humans and environment. A CP project follows a certain methodology and consists of the following elements: data collection, analysis of the collected data, option generation, feasibility analysis, implementation, controlling and continuation. This report follows the UNIDO CP assessment methodology but it is based on one company visit. Therefore the report should be assumed as basic CP assessment report.

Company profile

- Brief history, Ownership, Number of employees

DPTU "KOKOLANSKI" DOOEL Import-Export Berovo was established in 2003 as a private enterprise with a primary activity in consolidation, processing and export of wild harvested Boletus dried mushroom (Porcini) and other wild crafted mushrooms. There are two employees (the father and the son) who are involved in the whole process of processing and exporting the wild mushrooms. The wild mushrooms are purchased from local suppliers.
Company is located at Kokolanski family home in Berovo. Storage/ cooler is located in Kokolanski family house while production process (drying, cleaning and slicing) is in separate building close to the family house on the same site.

- Activities, Main production, Products

Kokolanski processes and dries wild mushrooms. Raw materials are sorted, cleaned by hand or knife but not washed. Lactarius mushrooms are blanched and brined from May through October. Boletus mushrooms are dried. Wastewater is generated during the blanching of Lactarius mushrooms and during equipment clean-up. Floors are cleaned by vacuum and rarely washed. Kokolanski is a clean operation with little need for water and little wastewater generation (basically only from blanching process). The plant is connected to the town's sewer system. Air emissions from use of wood as fuel in blanching process is very small and practically unnoticeable in Berovo area where wood is primary fuel used for domestic heating.

- Plans for production expansion, investments, new equipment

Kokolanski wants to improve and increase the processing capacity for the blanched and brined Lactarius mushrooms by securing preconditions for HACCP certification and increasing processing capacity to 1,500 kg/day. In order to be able to improve the blanching area/room and to be able to extend the HACCP certification to this production line, several investments were done: non porous concrete floor was laid down, service toilet for the employees was built and ample space for installation of stainless steel blanching vats was provided. Stainless steel blanching vats (2*250 liters) will be purchased and installed during the next processing season in order to increase the processing capacity for Lactarius mushroom to 1,500 kg/day or 30,000 kg annually.
Kokolanski in future plans to remove the company away from the family house. However the nature of the production is very dependent on the weather conditions and seasonal harvest so the plans for expansion have to be made very carefully. An example for the uncertainty of the production capacity is the fact that the season 2008 was very dry and as such poor in wild mushrooms.

- Implemented standards, awards, certificates, permissions

Kokolanski implements HACCP standard since October 2006. All of interior materials used are according to HACCP standard. The capacity of blanched mushrooms in Kokolanski is relatively small so IPPC permit has not been needed.
There is no individual packaging of products in Kokolanski so their products are exported as bulk semi-raw materials. As such they are not eligible for award contests.

Material Flow Analysis

- Processes, process diagram

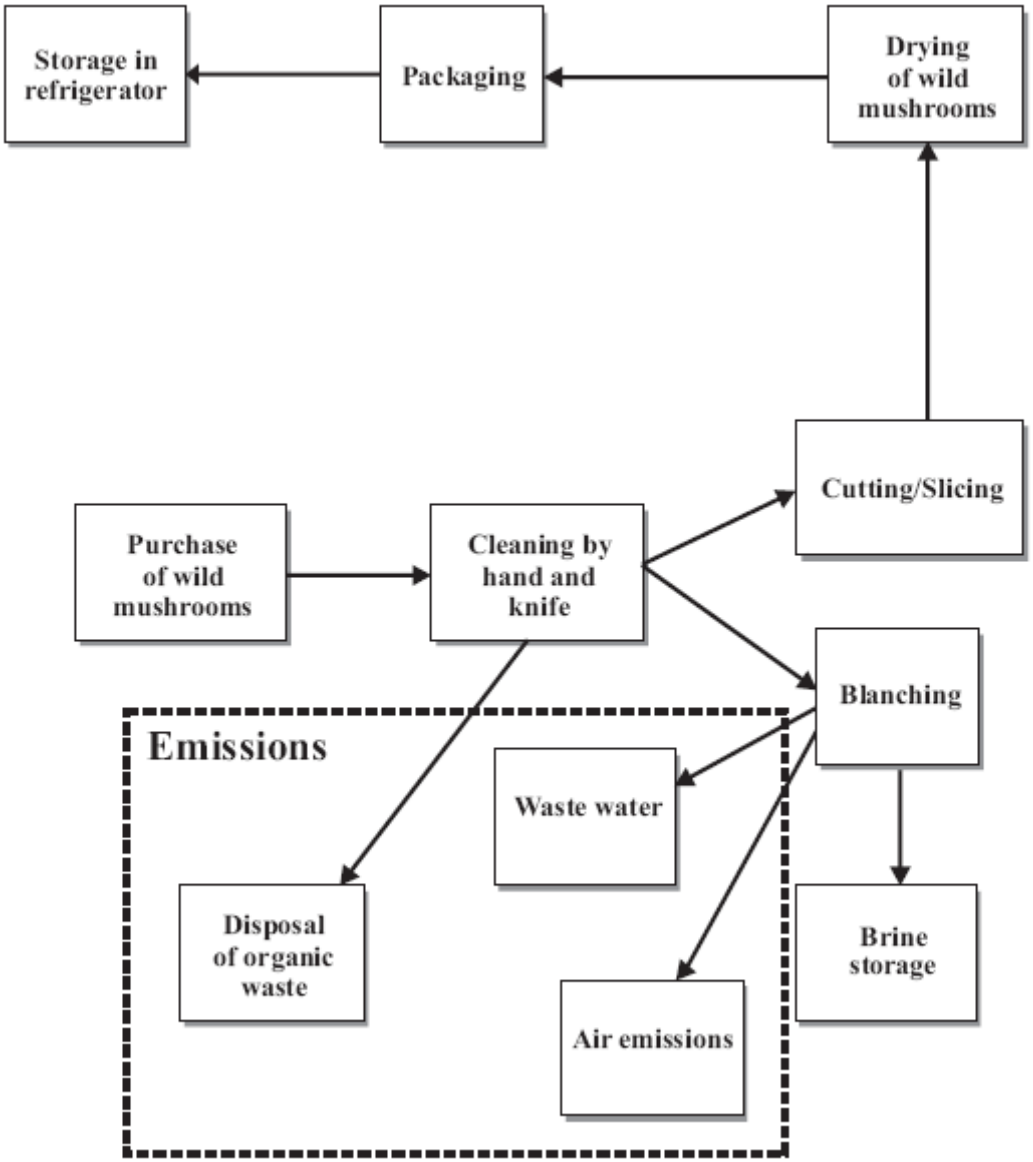

Figure - 1

Kokolanski processes and dries wild mushrooms as shown in Fig. 1. Raw materials are visually sorted, cleaned by hand or knife but not washed. Lactarius mushrooms are blanched and brined from May through October. Boletus mushrooms are dried, packed and refrigerated (if needed). Wastewater is generated during the blanching of Lactarius mushrooms and during equipment clean-up. Floors are cleaned by vacuum and rarely washed.

- Materials handling

All raw materials (wild mushrooms) are visually tested for quality before being accepted from

suppliers. Practically there is no raw material with expired date since the supply of raw materials is on daily basis.

- Raw and waste materials, management of waste materials

There is a storage area for raw materials. According to the owner there are no hazardous raw materials according the requirements of HACCP and ISO standards. Wild mushrooms are not washed. There is a storage area for final products. Part of the final products (dried boletus) is refrigerated. Lactarius mushrooms are stored in plastic containers and exported together with them.

Practically there are no waste materials except some small quantities of organic waste from the process of mushroom cleaning. As the quantities are very small and at the same time there isn't demand for organic waste from the local farmers, the solid waste is disposed to the public waste system or simply drained in the water sewer.

- Water in the technology processes, waste water treatment/management

Wastewater is generated during the blanching of Lactarius mushrooms and during equipment clean-up. Floors are cleaned by vacuum and rarely washed. Kokolanski has small needs for water. The wastewater generation (basically only from blanching process) is rather small. The plant is connected to the town's sewer system and pays double price for water consumption and wastewater discharge. No water return/reuse has been considered. This is mainly due to the fact that there is no extensive use of water in the process.

Energy Management

There is not an extensive energy use in the processes that are taking place in Kokolonaski. Kokolanski uses wood as fuel in blanching process. In Berovo area wood is primary fuel used for domestic heating. Electrical energy is used for the drying process (few days per year), refrigeration (few days per year) and for lightning.

The dryer uses 5 non controlled resistance heaters of 250 kW each. One batch takes 4-5 hours to dry. The refrigerator is new and modern and is energy efficient. The refrigerator is used only few days during the summer season to preserve the dried boletus mushrooms. In normally warm days there is no need for cooling as the house is well insulated and also Berovo has cool and pleasant summers compared to many parts in Macedonia.

Environmental Performance of the Company

There are no significant environmental concerns because of the relatively small amounts of wastewater and other emissions. Wastewater is discharged to the Berovo public sewage system. The plant is connected to the town's sewer system and pays double price for water consumption and wastewater discharge. Air emissions from use of wood as fuel in blanching process is very small and practically unnoticeable in Berovo area where wood is primary fuel used for domestic heating. Environmental concerns are partly reduced because the wastewater discharge level is only about 2 cubic meters per day during the 20 day blanching season.

Kokolanski was several times inspected by the Environmental Inspector and there were no violation of current Legal Requirements and there are no fines or penalties given to the company.

Current Operating Practices

- Good operating practices

At Kokolanski company material balances are performed routinely. The waste is collected by Communal Public Utility. The operators are provided with detailed operating manuals and/or instructions sets. The company schedules the production to minimize cleaning frequency. The new blanching vats will be equipped with alarms for malfunctions.

- Good housekeeping

The work environment is almost clean. Spillage is moved periodically in process of hand cleaning of the mushrooms. The floors are cleaned by brooms. The walkways are free of containers as much as it could be done in the available space. The employee interest in good housekeeping is stimulated since the company is run only by the family.

- Partnership with other stakeholders

All of the supply of raw material (wild mushrooms) and production is planned ahead according to signed agreements with suppliers which are scheduled by type of mushrooms, day and hours of delivery.

Identification of CP Opportunities

- Technology processes improvement

With new blanching equipment and increased mushroom production options should be found to improve the technology process. The work of the drier should be optimized.

- Water

With new blanching equipment and increased mushroom production, an assessment should be conducted during the blanching season to identify possible cleaner production solutions for reduction of water consumption.

- Energy saving and energy efficiency measures

The overall condition of the energy equipment and installations in the company is quite well. However, there are possibilities for certain improvement, by implementation of some measures for energy saving and better energy efficiency.

With new blanching equipment and increased mushroom production options should be found to increase the efficiency of the technology process. The work of the drier furnace should be optimized. Possible options for energy saving and energy efficiency measures could include:

- control of the heating process
- improved heat transfer in the drier
- dividing the drier area into several units to reduce the zone under temperature field (when the drier works with reduced batch).

Concluding Remarks and Recommendations

The owners of Kokolanski (the father and the son) participated in all the phases of the company assessment. The national experts from the National Cleaner Production Center (NCPC-MK) explained the goals and the aims of the cleaner production. During the audit the owners showed big interest to learn more and to cooperate in the future. At this stage the Kokolanski company is very small, with very short processing season. However, the company makes big efforts to implement high healthy and safety standards in their work.

A detailed CP analysis, with comprehensive materials and energy flow was recommended when the company will increase the processing capacity to the projected 30,000 kg annually.

Skopje, 07.11.2008

Director of the NCPC-MK

Atanas Kocov

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Annex

Photo documentation

Fig. 2. Sorting of wild mushrooms

Fig. 3. Drying furnace

Fig. 4. Packaging of processed wild mushrooms

Fig. 5. Drying furnace