

ORGANIC WASTE MANAGEMENT IN AGRI-FOOD INDUSTRY IN POLAND

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ABSTRACT

The paper gives an overview of the current state of organic waste management in agri-food industry in Poland. The scope of the paper covers the following issues: the current state of agri-food industry and the obstacles it faces at present; legislation requirements on organic waste management in agri-food companies with special emphasis to animal by-products management; characteristics of organic waste and treatment methods; organic waste management facilities; solutions and recommendations for organic waste management in agri-food companies with reference to the UE legislative framework; financial support programs.

INTRODUCTION

With the EU accession, Polish agri-food industry is obliged to introduce a number of alterations and modifications in order to comply with the EU legislative framework not only in case of food quality and safety standards but also environment protection with particular reference to wastewater and waste management (Seremak-Bulge, 2003).

Currently, developing an effective waste management strategy fulfilling the EU legislation requirements in agri-food industry is an ongoing issue. However, development of organic waste management in agri-food industry needs to take into consideration a number of hindrances identified and described in the national plan for waste management (KPGO, 2002):

- dispersed structure of agri-food industry with numerous medium and small sized companies,
- lack of current and reliable data on organic waste generation as very few companies run quantitative and qualitative registration and control of organic waste generation,
- seasonal production which results in accumulation of large quantities of perishable organic waste over short period of time,
- production costs that previously did not included costs of waste utilization methods other than landfilling,
- profitability of organic waste recovery is rather low as the application of available technologies for organic waste recovery results in an increase of product prices in comparison to the prices of their equivalents.

ORGANIC WASTE GENERATION & TREATMENT IN AGRI-FOOD INDUSTRY IN POLAND

The majority of organic waste from agri-food industry is generated in slaughterhouses, meat processing companies, dairy companies, refrigeration plants, farms, sugar factories, breweries, distilleries, fruit and vegetable processing companies, and catering facilities. In 2000 the quantity of organic waste in agri-food industry was estimated at ca. 12,9 mln tones. The agri-food industry shows high recovery rate reaching ca. 98% of total organic waste, the remaining is sto-

red (4,7%), landfilled (4,2%) or utilized with other methods such as composting (2,1%). Due to rapid development of agri-food industry in Poland, the amount of organic waste will be increased by 10% by the year 2006.

Farm production generates significant quantities of animal manure, plant residues, animal-by products and carcass. Animal manure is mainly used for agricultural purposes, however due to high generation rate it needs to be utilized by means of other methods such as anaerobic digestion (KPGO, 2002). Farm production, meat processing and animal-by products utilization industries are closely related and cooperate in organic waste management. Efficient processing of raw materials, minimization of organic waste generation and application of utilization methods are considerably impaired owing to large dispersal of meat processing companies and animal by-products utilization facilities (Rosik-Dulewska, 1999). Animal by-products generated in slaughterhouses should be treated in animal-by product utilization facilities or incineration plants. Because of high costs of transportation to these facilities illegal waste deposition and burying is likely to occur. This imposes significant threats to human health and the environment (KPGO, 2002). Fruit and vegetable industry generates high amounts of organic waste comprising mainly fruit and vegetable pomace and peeling. Due to seasonal production the amount of organic waste changes during a year. Accumulation of organic waste from fruit and vegetable industry results in high amounts of perishable waste which can not be entirely used as animal feed due to low demand (Makosz, 2000). Therefore other utilization methods such as composting are preferred as the majority of organic waste from fruit and vegetable industry is suitable for composting. Sugar industry generates almost half of the total organic waste from agri-food industry as sugar production technology results in high waste generation rates. At present, no other technologies for sugar production from sugar beets with lower waste generation rates are available. Beet pulp and sewage sludge are chiefly generated in sugar industry. Over 84% of total organic waste from sugar industry is recovered as a fertilizer, and 5% is deposited at landfills. Dairy industry generates mainly whey which is used for animal feed or other purposes including production of pharmaceuticals. The recovery rate of organic waste in dairy industry is reaching almost 99% and only 1% of organic waste is landfilled. In beverage industry, the majority of organic waste comes from distillation and fermentation processes, there are also large amounts of pomace and stillage. The total recovery rate is ca. 96%, excluding sewage sludge from industrial wastewater treatment plant (66,3% of recovery). Organic waste from beverage industry should be used for animal feed or agricultural purposes (KPGO, 2002).

Although the amounts of organic waste generated in agri-food industry, according to the available data enclosed in the national plan for waste management, are considerable, the recovery rates are also high. The organic waste are mainly used for animal feed and agricultural purposes. However, the values of obtained data can be underrated as a large number of agri-food companies do not run a registration of waste generation (KPGO, 2002). Due to ineffective waste management systems, organic waste generated in agri-food companies especially animal-by products may pose significant threats to human health and the environment (Rosik-Dulewska, 1999).

LEGISLATION ON ORGANIC WASTE MANAGEMENT IN AGRIFOOD COMPANIES

In Poland, the waste management in general has to fulfill the requirements laid down by the act on the waste (Dz.U. 2001.62.628) and the act on environment protection law (Dz.U. 2001.62.627). According to the aforementioned regulations on waste management all agri-food

companies are obliged to apply for:

- the permission for generation of hazardous or other waste exceeding the quantity of one thousand (excluding municipal waste),
- the permission for waste disposal, including transportation, waste recovery and utilization,
- the permission given by local authorities for temporary storage of waste designated for recovery or utilization (excluding landfilling) on the agri-food company premises,
- regulatory procedure specifying the range and methods applied by agri-food companies aimed at eliminating their detrimental impact on the environment as well as reverting the environment to the previous state (Deja, 2001).

SOLUTIONS AND RECOMMENDATIONS

In order to comply with the UE legislative requirements on organic waste management in agri-food industry in Poland, the following actions need to be undertaken:

- registration and control of organic waste generation on the basis of the established catalogue of waste and the list of hazardous waste specified in the decree (Dz.U.2001.112.1206). To conduct qualitative and quantitative registration of organic waste generation in agri-food companies, introducing the ecological balance system is of great benefit. The ecological balance system comprises four subsystems, i.e. a total Input-Output Analysis, Input-Output Analysis of a production process, Life Cycle Assessment (LCA), and a company localization and environment analysis. The application of this system enables not only to register the total waste generation but also allows for drawing up the environment impact assessment of an agri-food company (Korze?, 2001),
- prevention and minimization of generated organic waste by controlling technological process, e.g. storage and handling of raw materials and waste (Deja, 2001);
- increasing the recovery rates of waste generated in food production with major applications in animal feeding and agriculture,
- development of collection system for waste from agri-food companies including waste from catering facilities,
- development of organic waste utilization facilities comprising adjustment of utilization system for slaughter house waste, modernization of operating facilities, building new utilization facilities, and adapting existent incineration facilities for feed meal and fats to the EU standards (KPGO, 2002),
- development of sanitary inspection strategy for animal-by products management (KPGO, 2002) including the ban on feed meal used as a protein supplement in animal feeding (with the exception of milk protein); compulsory segregation of waste from farm and meat production into three categories covering specified risk materials (SRM), high risk materials (HRM) and low risk materials (LRM); obligation of excluding the feed obtained from processing SRM and HRM from animal food chain; obligation of SRM and HRM utilization in the approved utilization facilities (Urban, 2002).

IMPLEMENTATION OF THE EU REGULATIONS ON ORGANIC WASTE MANAGEMENT IN AGRI-FOOD COMPANIES

The implementation of the EU regulations in the scope of organic waste management in agri-food industry requires actions including investments, modernizations and organizational and

structural changes. The agri-food companies in Poland are encouraged to perform actions in aid of the environment protection by the existent system of payments for economic exploitation and alterations of the environment, and also penalties for violating the legislation. The payments and penalties support the National and/or Regional Foundations for Environment Protection and can be allocated for low-interest loans and subsidies for realization of projects aimed at protection of the environment (Deja, 2001). Further, the realization of projects in the scope of waste management can be financed by investor own resources; loans, subventions and subsidized preferential credits given by the National and Regional Foundations for Environment Protection and Water Management; preferential credits provided by e.g. Polish Bank of Environmental Protection; international aid provided by various foundations (EKOFUNDUSZ), or other international programs; credits given by international financial institutions (European Bank of Reconstruction and Development, the World Bank); credits and loans given by commercial banks (KPGO, 2002).

In order to fulfill the EU requirements on organic waste management in agri-food industry, the educational and training programs, providing accurate, complete and updated information, should be available to all entities involved in food production, processing and distribution. Furthermore, the agri-food industry representatives should also participate in establishing governmental policies and procedures on organic waste management.

CONCLUSIONS

Fulfilling the EU legislation requirements on organic waste management in agri-food industry can be achieved by (1) carrying out registration and control of organic waste generation in all agri-food companies with application of the ecological balance system, (2) implementation of collection systems for organic waste from agri-food companies including catering facilities, (3) preventing and minimizing the amount of generated organic waste by application of low waste generating technologies, (4) increasing organic waste recovery, (5) applying organic waste treatment methods other than landfilling (composting, anaerobic digestion), (6) developing a strategy for sanitary inspection of generation and utilization of animal by-products (7) providing accurate, complete and updated information on waste management policies and procedures issued by the governmental agencies.

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