

Environmental impact of sunflower oil production enterprises

Samadova Xadichabegim

Bukhara State Medical Institute

samadova.xatichabegim@bsmi.uz

Annotation. The environmental impacts of edible sunflower oil production are evaluated by life cycle assessment (LCA), with a particular focus on the processing and packaging phases. The assessment is performed using both a resource oriented method (cumulative energy demand, CED method) and an impacts oriented method (ReCiPe method). Both methods show similar results in the evaluation of two alternatives for energy management in an edible oil refinery. However, the CED method gives misleading results in the identification of hot spots in the life cycle because it does not consider environmental impacts not correlated with the energy consumption. The hot spots of the refining phase are the bleaching step, the production of steam from natural gas and the wastewater treatment plant.

Introduction

In the last years, the process industries began to decrease their material and energy consumption and to improve the global performance of their products under the pressure of several factors, such as the introduction of policies on a worldwide scale for the reduction of greenhouse gases, the consequent commitments of several countries, and the need of a cost compression to survive in a highly competitive global market. The awareness of food product consumers to buy products using the environmental performance as a choice criterion has contributed to the acceleration of this improvement process. In order to face the changes in consumer requirements and the international policies for the reduction of the environmental impacts, the food industry is engaged in the production of high quality goods with low energy and material consumption.

In this context, every firm needs to reduce its consumption and, consequently, check its environmental impacts in order to reduce the impact associated with its products. In addition, the distribution sector increasingly demands producing industries to evaluate, quantify and reduce their environmental impacts. Sometimes, this request can influence the choice for one supplier instead of another. These factors drive the food industry to consider the specific contribution of production processes to the impacts of products, though the environmental burden of the processing phase may be considerably lower than that of other phases of the life cycle. In particular, the agricultural production phase, rather than the processing phase, determines the life cycle impact of many food products (Roy et al., 2009). However, better than a general analysis on the whole life cycle, a focus on the processing phases may address technological actions towards environmental improvements in production processes and plants.

References:

- 1.G.A. Blengini et al.The life cycle of rice: LCA of alternative agri-food chain management systems in Vercelli (Italy). *J. Environ. Manage.*(2009)
- 2.C. Brink et al.Cost-effective emission abatement in agriculture in the presence of interrelations: cases for the Netherlands and Europe. *Ecol. Econ.*(2005)
- 3.B. Grau et al.Environmental life cycle assessment of rapeseed straight vegetable oil as self-supply agricultural biofuel. *Renew. Energ.*(2013)
- 4.G. Landucci et al.Analysis and simulation of an industrial vegetable oil refining process. *J. Food Eng.*(2013)
- 5.S.C. De Vries et al.Resource use efficiency and environmental performance of nine major biofuel crops, processed by first-generation conversion techniques. *Biomass Bioenerg.*(2010)