

Bioethanol Production from Different Food Wastes

Authors: Doğa Çakmak¹ and Mehmet Yekta Göksungur²

Affiliation: ¹Isık Tarım A.S., R&D Department Food Engineer, İzmir, Türkiye; ² Ege University, Department of Food Engineering İzmir, Türkiye
doga.cakmak@isiktarim.com

Ethanol is commonly used as an industrial raw material in various fields such as food, medicine, and pharmacy [1]. Chemically, ethanol and bioethanol are the same molecules. The term bioethanol is used in the literature to indicate ethanol obtained biologically from biomass, as opposed to synthetically from fossil fuels [2]. Ethanol is a colorless, highly flammable liquid fuel that mixes well with water and gasoline [3]. Bioethanol can be used as a pure gasoline substitute or mixed with gasoline. It has been reported that many microorganisms, including bacteria, yeasts, and filamentous fungi, can ferment lignocellulosic hydrolysates to produce ethanol. Among them, *E. coli*, *Zymomonas mobilis*, *S. cerevisiae*, and *Pichia stipitis* are the most relevant ones for lignocellulosic ethanol bioprocesses. These microorganisms have different natural properties that can be considered as advantageous or disadvantageous in ethanol production processes from lignocellulosic biomass [4]. *Saccharomyces cerevisiae* is the most preferred producer of bioethanol, as it can work in a wide pH range and is resistant to mutation. Since agricultural and industrial wastes reduce the cost of raw material in fermentation processes, many studies have focused on using these substrates as potential for bioethanol production. Like in most biotechnological processes, researchers have investigated ethanol production using various regional agricultural products and waste to reduce product costs and also to produce high-value-added products from waste. This presentation will explore research focused on obtaining high-value ethanol from various wastes.

Keywords: Bioethanol; bioethanol production; food waste; *Saccharomyces cerevisiae*.

References

- [1] T. Arı and S. Dönmez (2000). The effect of soy flour on alcohol and cell concentration in alcohol fermentation of molasses, *Turk. J. Biol.* **24**, 573-584.
- [2] A.O. Adıgüzel (2013). General characteristics and necessary feedstock sources for the production of bioethanol, *BEU J. Sci.* **2**,(2), 204-220.
- [3] M. Melikoğlu and A. Albostan (2011). Bioethanol production and potential of Turkey, *J. Fac. Eng. Arch. Gazi Univ.* **26**, (1),151-160 .
- [4] F.M. Girio, C. Fonseca, F. Carvalheiro, L.C. Duarte, S. Marques and R. Bogel-Lukasik (2010). Hemicelluloses for fuel ethanol: A review, *Bioresour. Technol.* **101**, (13), 4775-4800.