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Combination of natural micro-flora with industrial strains in bio refineries

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Novel bio-refinery concepts have been piloted in three European countries in a multination EU Baltic Sea Region, ABOWE project (Advanced Concepts for the Biological Utilization of Waste). In Finland cellulosic waste, in Poland sorted bio-waste and potato industry residues and in Sweden slaughter house waste and chicken manure were used as feed-stocks. The process has been designed by the author and it has been tested by the company Finn flag Oy in Finland. It is based on 15 years of experimentation with the PMEU device (Portable Microbe Enrichment Unit). In these accelerated bio-processes, the application of different cultivation and carrier gases plays an important role in the non-aseptic runs. Selected industrial or laboratory strains, such as *Klebsiella* sp. and *Clostridium* sp. are combined with the background flora existing in the biomass raw materials. This concept is now under development toward industrial processes. The interactions in the mixed cultures and the adjustment parameters are highlighted. Results from the corresponding experiments as well as from the ABOWE experimentation are summed up. The basic idea is to provide a concept with an improved productivity of platform chemicals, biogas and organic fertilizers from the wastes. With an improved productivity the facility size can be reduced, and the required investments consequently lowered. The processes taking place in the bioreactor are compared with the degradation and conversion events in the environment and in the human or ruminant digestive tract. This evaluation has brought some promising aspects also into the probiotic development.

Biography

Elias Hakalehto is currently working as Adjunct Professor in University of Eastern Finland, Kuopio.

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