Feasibility of biofuels production: Combining H\textsubscript{2}-CH\textsubscript{4} and lipid production from food wastes using mixed anaerobic microflora

X. Gómez, C. Fernandez, EJ Martínez, J. Fierro, F. González-Ándres
University of León, Spain

The valorisation of food wastes by means of anaerobic digestion is a widely used management option since it allows the production of biogas. However, when fruit and vegetable wastes are used as substrates, inadequate balance of nutrients may become a problem. Although co-digestion may be an option, this is not always possible due to the logistic associated to waste generation and treatment. In this sense, if an additional benefit can be established for the traditional digestion process, the addition of nutrients may be economically feasible. In the present work, the fermentation of cheese whey and food wastes for H\textsubscript{2} and CH\textsubscript{4} production was studied using mixed microflora and different reactor configurations: Single stage, two-stage, stream recycling and membrane reactors. The fermentation was also performed at low N content to evaluate the feasibility of increasing lipid contents of digested sample and determine the characteristics of these substances. An anaerobic reactor operating with fruit and vegetable wastes obtained from a salad producing industry was operated until ammonium exhaustion was observed. Lipid content in digestates was increased from 0.84 to 2.15% (dry basis) when extracted by standard soxhlet method. Exploring the possibility of lipid accumulation in anaerobic microflora may seem an interesting way of waste valorisation.

Biography

X Gómez has completed his PhD from the University of León in anaerobic digestion of wastes. Her post-doctoral experience has been dedicated to evaluate new alternatives for agro-industrial valorisation of wastes for H\textsubscript{2}-CH\textsubscript{4} production. She has published more than 35 papers in reputed journals dealing with hydrogen production by fermentative processes, anaerobic co-digestion of manures with emphasis in organic matter quality and the application of spectroscopy techniques for evaluating biological degradation of wastes and stabilisation performance.