

Anaerobic Digestion of Biodiesel and Biodiesel Waste Products

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Anaerobic Digestion

- Anaerobic Digestion is the microbial process by which organic matter is broken down and digested to produce Biogas
- Biogas is a energy resource usually composed of 60% methane, 40% Carbon Dioxide and trace amounts of Hydrogen Sulfide

Biology of Anaerobic Digestion

- Microbial conversion occurs in a community of microbes found in nature, typically in soils and in the guts of organisms
- Conversion occurs in the following steps hydrolysis, acidogenesis, acetogenesis, and methanogenesis
- All the conversion steps occur in a dynamic equilibrium between facultative organisms and methanogens

Microbial Steps to Biogas

- Hydrolysis breaks down organic matter to increase its bioavailability
- Acetic, propionic, and other organic acids are produced during Acidogenesis
- Acetate is produced from the organic acids during Acetogenesis
- Methanogenesis is the process by which methane and CO_2 is produced from acetate or H_2 and CO_2



Biodiesel and Biodiesel Waste Products

- Biodiesel is produced from the transesterification or esterification of oils
- Waste products include glycerol, oil dregs, and wash water
- Waste products and the biodiesel itself are very attractive feedstocks for anaerobic digestion because of the high organic content



Project Proposal

- To characterize the Biodiesel and biodiesel waste products
- Feed the byproducts into fixed film pilot reactors at UF's Dairy Research Unit to measure gas production from waste products

