

# Bacterial Fermentation of California Agricultural Waste into Advanced Biofuel

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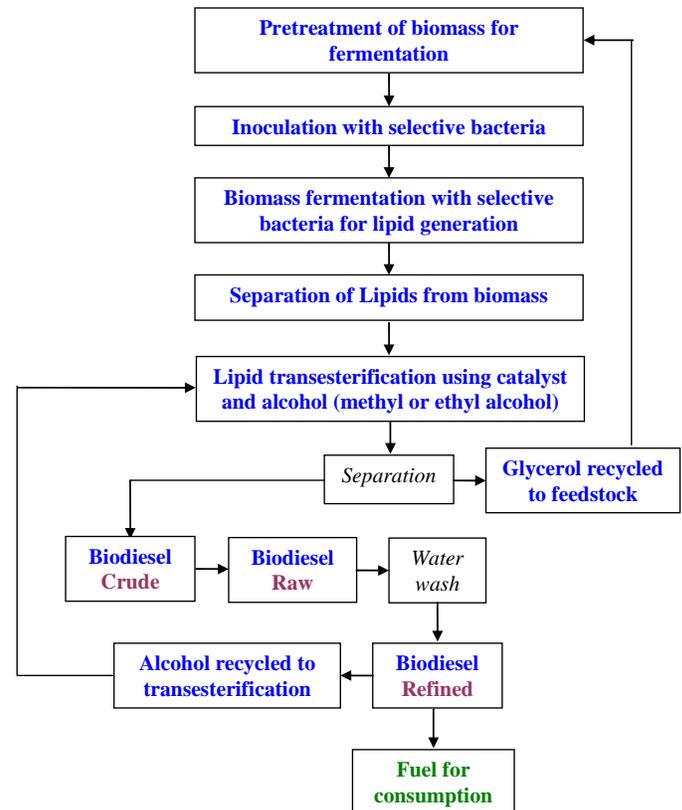
## Fact Sheet

### The Issue

Ethanol and other biofuels from the fermentation and distillation of nonfood cellulosic biomass, such as wood pulp or woody agricultural waste, but the procedure is very expensive. Development of new aerobic fermentation processes that rely on natural bacterial photosynthesis would significantly reduce the cost of in-state biofuel production. These new processes would only require agricultural waste feedstocks that do not compete with food production, thereby increasing the efficiency of food production rather than competing with it.

### Project Description

This research will demonstrate the production of fuel, from non-food sources, in a manner less complex and more efficient than competing processes using only cellulosic (woody) biomass feedstock. This new process first converts cellulosic biomass feedstock into high-energy-density lipids (fatty acids) through bacterial digestion. The process then converts the lipids into biodiesel, enabling rapid and efficient conversion of cellulosic solid waste into biodiesel fuel in a small-scale, low-cost processing facility. Menon and Associates propose to use California agricultural waste as the feedstock, specifically almonds and grapes.



Flow Chart of Menon Process  
Image Credit: Menon and Associates

### Anticipated Benefits for California

The objectives of this agreement are to validate the economic and environmental viability of the proposed processes. Validation will be achieved by operating the processes on a scale sufficient to measure the following parameters given below with their target values:

- Validated conversion of almond husk and grapevine waste feedstock into fuel at >30 gallons of fuel, with a target of 60 gallons of fuel, produced per 2000 pounds of input feedstock.
- Validated production cost of less than \$2.00 per gallon, with a target of less than \$1.00 per gallon, which includes payback of the production plant costs.
- Validated greenhouse gas emissions over 50 percent less than petroleum-based fuel production and consumption, with a target of 100 percent reduction in fossil carbon emission.
- Development of a top-level design for a farm-scale agricultural waste-to-biodiesel production facility consistent with costs determined in bullet point two above.

## Project Specifics

Grant Agreement Number: PIR-08-049

Recipient: Menon & Associates

City/County: San Diego/San Diego County

Application: Statewide

Amount: \$800,000

Contract Term: July 2009 to December 2011

CoFunding: \$650,000 (Menon & Associates)

For more information, please contact:

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