



Fats Into Jet Fuel

New biofuels technology has the potential to turn virtually any fat (including oils from animal fat or from algae) into fuel to power jet airplanes. The technology is said to be 100 percent green as no petroleum-derived products are added to the process. The technology can also be used to make additives for cold-weather biodiesel.

Scientists say that the new technology has some key advantages over other biofuel projects. “We can take virtually any lipid-based feedstock, or raw material with a fat source, including what is perceived as low-quality feedstock like cooking grease and turn it into virtually any fuel,” said a scientist. “Using low-quality feedstock is typically 30 percent less costly than using corn or canola oils to make fuel. And we're not competing directly with the food supply, like ethanol-based fuels that are made from corn,” he added.

The fuel created by the new process burns cleaner, say scientists, so it's better for the environment, as there is no soot or particulate matter associated with it. The new process also puts to use what other biodiesel processes throw away. The new process of converting feedstock into fuel produces a low-value commodity (glycerol) as a by-product. Rather than discarding glycerol as waste like most plants do, the process burns glycerol cleanly and efficiently to provide some of the process' energy requirements.

The physical and chemical properties of traditional biodiesel fuels don't match the current requirements required for jet fuels, making biodiesel unacceptable for the task. Jet fuel travels at 25,000 to 35,000 feet where temperatures can reach 70 degrees below zero, so it needs to flow better in cold temperatures.



The process comprises four steps. First, engineers use high temperatures and high water pressure to strip off the so-called free fatty acids from the accumulated feedstock of oils and fats, or triglycerides. Next, they place the free fatty acids in a reactor and then carbon dioxide is removed. “After these first two steps, we can make any fuel we want to make,” said a scientist.

In the last two steps, engineers break up the straight chains into molecules with branches, making them more compact and changing their chemical and physical characteristics. Finally, the engineers make some other chemical changes to create a desired fuel. The glycerol by-product is burned off to provide heat for the various processes involved.

We currently produce one-and-a-half billion gallons of animal fats annually - about half of the amount of vegetable oil produced. “Animal fats are harder to work with, but cheaper, said a scientist. “We think the aviation industry will be keen to find an alternative to petroleum-based jet fuel.”

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