

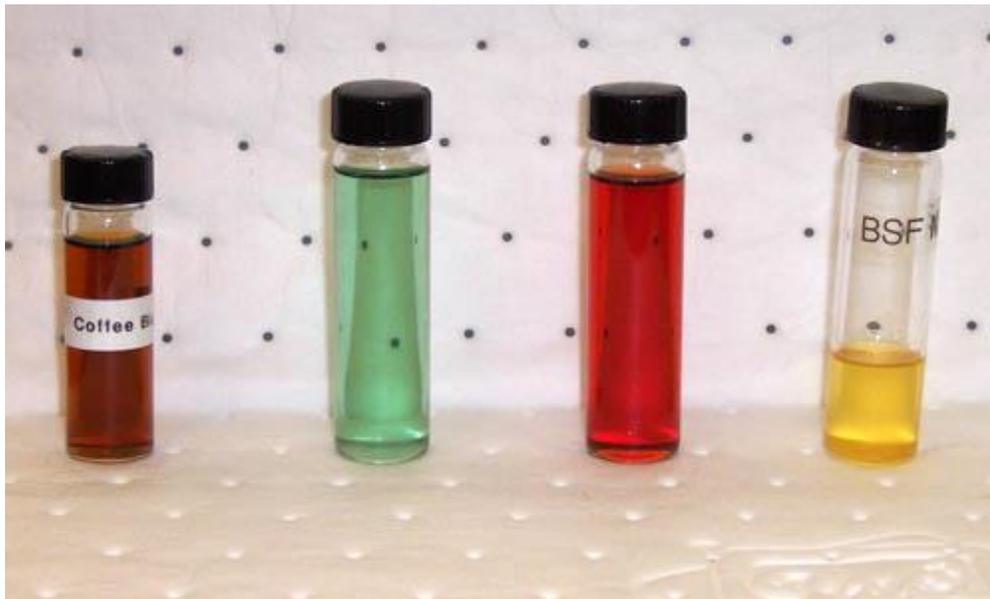
# Other Feedstocks for Biodiesel

Biodiesel is normally made from soybean oil, canola oil, waste oils and greases, or animal fat. However, biodiesel can be made from virtually any oil or fat.

Over the past 24 years, our biodiesel lab has made biodiesel from a variety of unusual feedstocks, including oil from candlenut and croton from Africa, avocado from Mexico, karanja from India, hemp from Canada, algae from California, peanuts from Georgia, and coffee grounds from our local Starbucks.

Probably the strangest feedstock I've ever worked with was the fat from black soldier fly larvae. We received the larvae from a man in Washington State who was researching them as a way to produce both fertilizer and biodiesel feedstock. The larvae feed on manure and transform it into fertilizer. As they grow, they accumulate fat in their bodies. We received several pounds of larvae. First we had to dry them in an oven, and then we put them through our mechanical press to extract the fat. It was a gooey, smelly process. It was difficult to separate the oil from the rest of the larvae. Maybe hexane extraction would have been a better option. We found that the fat was very high in free fatty acids—about 80%. The theory is that the larvae produce an enzyme in their bodies to break down the fat and use it for life support.

The photo below shows biodiesel made from coffee oil, hemp oil, karanja oil, and black soldier fly fat.



Why do we bother with all these strange feedstocks? Sometimes we are commissioned to analyze biodiesel from a particular feedstock by a company, but sometimes it's just plain curiosity. I love to see how different kinds of oils and fats transform into their own unique kind of biodiesel. Some feedstocks produce a really pretty biodiesel: hemp biodiesel is fluorescent green, and karanja biodiesel is bright red. Some smell beautiful: coconut biodiesel is like perfume. Others have interesting properties: castor oil biodiesel is so thick that it won't pass the viscosity specification for marketable biodiesel, but it could be used after mixing with a lower-viscosity fuel.

We recently got some used coffee grounds from Starbucks and extracted the oil with hexane (it's about 10% oil), and since I like coffee so much, I thought it was cool to make biodiesel from coffee oil.

Sometimes the co-product is interesting. When we pressed the oil out of Georgia peanuts, the peanut meal came out like little potato chips, except made from peanuts; quite tasty.

The photo below shows biodiesel made from fish oil, algae oil, and coconut oil.



A while ago, a man from Mississippi shipped us a 55-gallon barrel of what he called "pond scum." I don't know how he harvested it or how much degradation it went through in shipment, but it had about an 85% free fatty acid content. This is not all bad. In fact it lends itself well to some new processes we are trying at the moment.

If you have an unusual biodiesel feedstock you'd like help with, feel free to contact us.