How to Make Oil at Home for Biodiesel

In a SHTF scenario, knowing how to convert used vegetable oil into usable oil for biodiesel at home is going to be critical. It will be a skill that you need for yourself, and will also be a valuable bartering skill because people are going to need it. Today we're going to tell you exactly what you need to do to make oil at home for conversion into biofuel.

Whether you're using biodiesel in order to be independent, to save some money, or to save the environment, you're doing the right thing. Biodiesel is not-toxic, biodegradable and organic. It doesn't hurt the environment and it doesn't rely on petroleum or other fossil fuels for production.

In other words, by using biodiesel, you're breaking free of petroleum dependence AND you're helping the environment. It's a win-win. Let's get started.

Materials and Ingredients

You're going to need more than just vegetable oil for this process. Here's your list:

- Used vegetable oil, also known as WVO
- Lye of potassium hydroxide (KOH)
- A large stock pot
- An eye dropper
- At least 5 glass quart jars
- Distilled or purified water
- Isopropyl alcohol

Collect Your Oil

You can use fresh vegetable oil, but that can get expensive and it’s also a waste. Instead, get your oil for free from local restaurants and bars. In a survival situation, you won’t want to waste your valuable fresh oil on fuel but you will want to recycle your own and whatever you can still collect.

Many restaurants are willing to give away used vegetable oil because they typically have to pay for its removal. Go around, make friends with managers, and establish some sources.

Don’t rely on just one though; putting all of your eggs in one basket is never a good idea. It’s easiest if the restaurant just puts the used oil back into its original container once it cools off. Since this oil is going to have bits and pieces of fried foods in it, it’s best to let the oil settle for a couple of days after you pick it up.

Filter Your Oil

You don’t need to remove every single impurity but you definitely need to remove the largest chunks. Using a fine screen or even a paint screen will do the trick. Make sure that all of your oil is filtered, though. Simply put the screen over what we refer to as a holding tank and pour the oil through the screen and into the tank. Don’t pour the chunks and sediment that have settled on the bottom through. Leave them in to original container.

Heat the Oil

This is an optional step but we do it in order to remove excess water and sediment. Gently heat the oil to 70 degrees Celsius and keep it there for a few hours. The water and sediment will settle to the bottom of the oil. Siphon the oil off the top, leaving the water and sediment.

Why Used Oil Needs Prepared

Used cooking oil has food chunks in it that need to be filtered out. Also, when you fry vegetables in the oil, water gets trapped in the oil. We can get most of that out by heating the oil gently to 70 degrees Celsius. The water will settle on the bottom and we just drain it off.

The combination of water and heat from frying also causes a chemical change in the composition of the oil. The oil becomes more acidic. The triglycerides (fat molecules) in the oil break down and form what are known as free fatty acids, or FFAs; fat molecules that aren't bound to glycerin.

That's a bad thing because that reaction uses up the catalyst and keeps it from turning the triglycerides into biodiesel. When the FFAs bind with the catalyst, they turn to soap.

Balance the pH of Your Oil

To counteract this, it's necessary to balance the acidity in the oil. This means that we introduce a base to counteract an acid in order to restore the oil to something that will convert into biodiesel. Now, if you're like me, your head is probably spinning and you've decided that making biodiesel is above your pay-grade. Relax. There's a simple procedure called titration that chemists have figured out. It's based upon the concept that one molecule of base neutralizes one molecule of acid.

In order to figure out how much extra base (either KOH or lye)

that you need to add to you oil in order to begin the transesterification reaction (turn it into biofuel) here is what you do. Use oil that you've already filtered, heated, and siphoned:

1. Dissolve 1g of KOH or lye in 1L of distilled or purified water.
2. Put this reference solution in jar 1.
3. In jar 2, add 20ml of isopropyl alcohol.
4. Pour 10 ml of the alcohol into jar 3.
5. Add 2 or 3 drops of phenolphthalein solution (a pH indicator) to jar 3.
6. Swirl to mix.
7. Add 1ml of your oil to jar 3 and swirl to thoroughly mix. Bubbles in the oil will separate and start to mix with the alcohol.
8. Repeat steps 3-7 two more times so that you have 3 separate jars of this solution. It's called the analyte.
9. Now begin the titration process. Record the amount of reference solution in the burette.
10. Start with 1 jar of analyte solution under the tap of the burette of reference solution.
11. Add one drop of reference solution at a time to the analyte, swirling between each drop to see if color goes away.
12. Continue to add reference solution until the mixture of analyte and reference solution turns pink and stays pink for 30 seconds while swirling.
13. Record how much reference solution you used by finding the difference between how much reference solution you started with and the final volume. Record quantity used as *T.*
14. Complete titration with the other two jars of analyte.
15. Calculate the average value for *T* using the three trials.

This sounds really technical, but when you actually do it,

you'll see how easy it actually is. What *T* equals is the amount of EXTRA base (either KOH or lye) that you'll need to add per liter of used oil in order to properly turn it to biodiesel. If you were using virgin vegetable oil, you would use 7g of KOH or 5.5g of lye per liter of oil. So, to figure how much you'll need in total, use this formula:

KOH: *T* + 7g = how much KOH to add per liter of oil

Lye: *T* + 5.5g = how much lye to add per liter of oil

Now you know how to make oil at home for conversion into biodiesel. The actual process of making biofuel is fairly easy and can be completed with very little effort.

However, you're now a step ahead of many other people and this skill will be extremely useful in a SHTF scenario. We did our best to simplify the process so that it's easy to understand!

This article has been written by ***Theresa Crouse*** *for Survivopedia.*

Photo sources: 1, 2.