



## Collecting Waste Vegetable Oil

Collecting waste vegetable oil is one of the seldom discussed issues when the subject of using BioDiesel comes around. This information black-hole is caused by the wide variety of variables that come into play due to the different circumstances and requirements of each biodiesel producer. Geography, local competition, social status or business contacts, financial limitations, volume requirements and even your own physical appearance are all major factors that will dictate how you set up your collection techniques.

This document will cover some of the variables but will mostly be directed at explaining how I have set up my system. A complete collection system consists of:

- Finding potential supplies of oil
- Testing potential supplies of oil
- Getting approval to take the oil
- Physical collection and transportation of the oil

You can't make biodiesel without the raw oil. Finding oil can become a nightmare without a proper plan of action. If you follow these instructions, this nightmare can be reduced to a just a few hours each weekend until you have an adequate supply. For some reference, it took me about three months (Saturdays only) to build a reliable supply network of 350 to 400 gallons per week with over 50% of that being pure canola oil and an over-all titration value of around 5. I am very picky about what I accept for making biodiesel, a less picky person could double that figure if you don't mind a lower quality oil supply.

### Finding the Oil

The first step is to find the oil. Take a look at a map of your local area and pick a quadrant on one side of town. Lay out a road plan to drive down each major street where consumer stores are located. Make a plan so you drive the shortest distance possible while covering every major road with businesses that might have a grease dumpster. Types of businesses that might have dumpsters are fast food chains, take-out pizza, family restaurants, movie theaters, bowling alleys, hotels, game parks, bars, gas stations with cooked food, schools, hospitals, donut shops, large grocery stores and even large industrial potato chip manufacturers. There are countless others!

## Make Sample Collection Box

Once you have your road trip planned, you need to make up a sample collection box and fill it with empty sample collection containers.

Find yourself a large box or two and line the box with a plastic garbage bag in a fashion so that it will hold water. You are going to drip oil all over the inside of the box so tape the plastic bag to the sides really good.

A nice plastic box would be ideal but I use cardboard so I can throw it out instead of having to clean it.



Next, you will need a bunch of small oil sample containers that have sealable lids. I'm a fan of cottage cheese and I eat one of these 16oz containers about once a week. They are dishwasher safe and have a nice snap on lid. You could use just about any container that will let you collect a very small scoop full of oil. What's a scoop full? Well, you need only 1ml to do a test titration on the oil but I usually grab about 200ml just in case I want to do more testing.



By using containers that are all the same, the operation becomes better organized and the containers can all stack together requiring less space.

Stock up as many collection containers as you think you will need for a single road trip or two. I have about 30 sample containers but I usually only scout about 15 to 20 places when I go hunting.

You should also bring along a roll of masking tape and a felt tip permanent ink marker like a sharpie. Each time you collect a sample of oil, the container should be labeled to identify where it came from.



I label mine as shown but I also bring a clip board with me so I can record the exact address of the business, the condition of the area around the dumpster, how full the dumpster is and any other relevant information I can think of such as date, type of restaurant, etc.

You are going to want to start keeping records because it will save you a lot of time and running around later on.

## Execute The Planned Road Trip

Now that you're all set to leave, lets discuss a few details about the physical attributes of the sample collection process.

First off, you need to dress for it. Tall people have an easier time but short folks should wear a shirt they don't mind getting dirty. The edges of dumpsters can be pretty mucky places and when you lean in to grab a sample of oil, you will probably get a bit on yourself.

In addition, you may also want to consider driving conditions. Many of the food related establishments are grouped together geographically. This means you are going to be entering and exiting these establishments every few minutes and in close proximity to each other, traffic can make this a nightmare operation. I usually do my sample collecting late in the evening to avoid traffic. A three or four hour task is quickly reduced to less than an hour if the streets are empty. My local area is quite safe from a crime perspective so you should consider that.

## Sorting the Good from the Bad

When you get back with all your samples, perform a standard titration on each of them and record this information.

Pick out the oil samples you think are best and find the phone numbers for each location.

Now its time to make your phone calls to ask permission to start taking their oil. This is where many people start to have problems. Some folks are great face-people and prefer to actually visit the restaurant while other get extremely nervous. There are those who prefer to go have lunch and talk it up with the manager, some send letters, and others like me just make a simple phone call.

My experiences in my area have shown that most restaurant managers are happy to have it taken away and will let you take every drop if you want it.

How you go about getting permission is going to be largely determined by the specific area you are operating within and your own personal preferences.

Over-all, I have to sample about 10 restaurants to find a good 40 gallon per week supply of quality oil. I am successful at obtaining permission to take this oil about 9 out of 10 times with a two minute telephone conversation.



Here are some tips on what to say, and what not to say.

\*Be very direct. "My name is Joe Somebody and I would like permission to take some of your waste vegetable oil."

\*If/when they inquire why you want it, make your answers short and honest. Be sure to include something about it being good for global warming and oil independence.

\*If you detect any uncertainties in their reactions, be sure to let them know you never spill a drop.

\*Be gracious and polite if you get denied.

## Transportation

Pumping waste oil from a collection container behind a restaurant and transporting that oil to your processor can be back breaking work and not a lot of information is available on how to do it properly. The amount of oil you need to move and your geographical location is going to play a huge role in which technique you choose.

However you decide to transport your waste oil, you should give serious consideration to the following issues.

- 1) Professionalism goes a long way. Being polite, presentable and keeping your word to the restaurant manager can make or break an oil source in no time.
- 2) Cleanliness is a top priority with almost all restaurants. Always bring a clean up kit with you in case you drip or spill any oil on the ground. The closer the container is to the path the customers travel, the cleaner the area will generally be and the better you need to clean up after yourself.
- 3) Secure the load! Always make the load of oil you are transporting is secured to your vehicle. Accidents and close-calls can happen to any driver and slamming on your breaks at even slow speeds can cause a massive shift in the physical position of your container(s) of oil. Any tanks or pumps should be chained, bolted or secured in a fashion to prevent a spill during a quick maneuver or an unfortunate traffic collision.

For those who only require 20 or 30 gallons a week to fulfill their fuel requirements, one of the most economical ways to collect the oil is to ask the restaurant to put the oil back into the original containers it came in. Many restaurants do this anyhow but some clean their fryers while hot and are forced to use a metal container.

If you only need a small volume of oil every week, this is a really good way to go.

Individual containers require no investment  
Reasonably safe due to the small volume  
Not practical for larger volumes over 30 or 40 gallons.



12 Volt Electric Oil Pumps are another option. There are various models of these oil pumps but my research has shown them to be unsuitable for collecting waste vegetable oil. One of the reasons is that they are designed for changing oil in an engine where the pump is only running for a short time period. The intermittent duty pump can not handle the continuous duty nature of oil collection and as a result, the motor usually over heats and goes bad.



For the small volume transfers, one model we have heard to be of high quality is made by Fill-Rite. These pumps are cast iron and come with some pretty rugged and high quality motors. While I do not personally own one of these pumps, I do own a Fill-Rite fuel pump and I can vouch for the high quality standards that go into these units. There are many sellers of this pump but we know <http://www.utahbiodieselsupply.com/fillritepump.php> to be a very reputable dealer for them.



Trash Pumps work well for oils that are liquid in warm climates but they start to lose suction fast in cooler temperatures when the oil is thicker. They can also be fairly expensive and they take up a lot of room.

- Trash pumps are common and easy to find.
- They are loud and attract unwanted attention.
- Most require gasoline and diesels are extremely expensive.
- They do not work in cooler climates.
- They are complicated and require maintenance.
- Can easily emulsify the oil.



I believe the vacuum collection method to be far superior to all other techniques short of a dedicated and manufactured truck that is customized for the purpose.

In simplest terms, the device is called a Super Sucker and does exactly what its name implies. It is made by drawing a deep vacuum on a tank and then channeling that vacuum through a hose and valve. The operator dips the hose into the waste oil container and then opens the valve. The vacuum in the tank will draw in the thick oil. A Super Sucker is not much different than an ordinary wet/dry shop vacuum. The biggest difference is that it is much more powerful and uses a positive displacement pump instead of a blower fan to draw the deep vacuum required to collect waste oil in cooler climates.



No one sells a Super Sucker to my knowledge so if you want to go this route, you will have to build one.

**Super Sucker Plans can be purchased at <http://www.murphymachines.com/supersucker.html>**

While it looks complicated, its nothing more than a small 12 volt dc vacuum pump\* hooked up to an air-compressor tank with a vacuum gauge\*\*.

- Easy to Build
- Inexpensive if you can find a pressure tank to hold the deep vacuum
- Reliable because there are few moving parts
- Will suck up cold thick oil
- Works for all volume requirements from five gallons to five thousand gallons
- Will not emulsify your oil like a centrifugal pump
- Quiet operation. Does not add to noise pollution

\* - Vacuum Pumps can be purchased at <http://www.murphymachines.com/supersuckerpump.html>

\*\* - Vacuum Gauges can be purchased at <http://www.murphymachines.com/supersuckergauge.html>