

Converting Animal Fat into Biodiesel

© 6 March 2015

By JaQuasha Rumph

Reprinted 2015

By *Aquosus Potentia*

www.aquopotent.net

I. Introduction

- A. Are you tired of the constant changes in gas prices?
- B. With biodiesel as the world's fuel source, the earth will be a much cleaner place, gas prices will remain low, biodiesel factories would provide jobs for unemployed people, and it will reduce America's dependence on foreign countries. However, there are a few problems that will come in the way.
- C. Thesis: Using biodiesel manufactured from animal fat will be beneficial to the world. It may come with some difficulties, but in the end it will help change the economy for the better.

II. Body

A. Background

- 1. What is biodiesel?
- 2. History on biodiesel and the procedure it goes through to be converted into biodiesel using animal fat.

B. Pros

- 1. Cleaner environment
- 2. Lower gas prices
- 3. Positive impact on the economy
- 4. Reduce our dependence on foreign countries

C. Cons

- 1. Food shortages
- 2. Low funding
- 3. Lower power and fuel economy
- 4. Clogging in engine

D. Review of main argument

III. Conclusion

- A. Biodiesel manufactured from animal fat can help solve some of the fuel problems, such as helping clean the environment, lowering gas prices, helping America gain energy independence, and providing jobs for the unemployed. Society should take advantage of all available renewable resources.
- B. Final restatement of the thesis

Are you tired of the constant changes in gas prices? Gas prices in America are constantly changing because we have to depend on other countries for oil. To help put a stop to the ongoing fight with other countries for oil, biofuel is the best solution. With biodiesel as the world's fuel source, the earth will be a much cleaner place, gas prices will remain low, biodiesel plants and factors will provide jobs for unemployed people, and it will reduce America's dependence on other countries for energy. However, there are a few problems that will come in the way. Using biodiesel manufactured from animal fat will be beneficial to the world. It may come with some difficulties, but in the end it will change the economy for the better.

Biodiesel is a renewable, biodegradable fuel that can be manufactured from vegetable oil, animal fat, and recycled cooking oil ("Biodiesel," 2014). Biodiesel is a cleaner version of diesel and can be used in any engine that uses diesel. Biodiesel and diesel are mixed together in order to perform a number of different tasks. For instance, in New England, people mix biodiesel with kerosene in order to heat their homes (Lewison, 2011). Biodiesel and diesel have a similar property, which allows biodiesel to work in diesel-powered engines.

Many people may think that biodiesel is a new creation, but it has actually been around since the mid-1800s. Experiments on biofuel were even being performed before the first diesel engine was even made. Biodiesel is known for being made from vegetable or plant oil; however, it can also be manufactured from animal fat and algae. Rudolph Diesel was given credit to introducing the first biodiesel engine to the world; however, Diesel's engine ran off of peanut oil, and biofuel is not manufactured from that product (Adams, Gerpen, & Schumacher, 2004). Animal fat is broken up by a process called transesterification and converted into

biodiesel. This process breaks up the fat or triglyceride and is aided by an agent to help make a chemical reaction. Since biodiesel is made mostly of fat acids and alcohol, the agent, commonly catalytic, is added to make sure that the right chemical reaction occurs. If the right chemical reaction doesn't happen, then soap will start to form in the biodiesel. In the article "The Foolproof Way to Make Biodiesel" by Aleks Kac, he stated, "To make biodiesel fuel efficiently from animal fat we have to avoid one major problem: soap formation" (n.d.). Soap is formed when sodium ions combine with the fatty acids in the animal fat during the base-catalyzed stage of the transesterification process (Kac, n.d.).

Using biodiesel manufactured from animal fat will be beneficial to the world. Since biodiesel doesn't release harsh toxins and releases only a small amount of carbon dioxide into the air, it will help make the world cleaner. Biodiesel uses lower carbon dioxide and fuel emission, which helps put a stop to global warming and increases the health of individuals. Biodiesel is safer to handle than regular diesel. The high flash point of biodiesel allows it to be stored and shipped for a longer amount of time. Biodiesel can be shipped across the ocean without the risk of oil spilling in the ocean. In fact, biodiesel has an oil-dissolving property in it that can clean up oil spills. When burned, biodiesel does not give off a harsh smell or the nasty black smoke like diesel gives off. Biodiesel actually smells nice and can be tolerated better than diesel (Lewison, 2011).

Also, using animal fat to produce biodiesel will help lower gas prices. This way gas prices can remain steady, and America wouldn't have to go to war or depend on other countries for oil to make diesel. America can take all of the leftover animal fat or waste from butcher shops and other food manufacturing companies and use it to make biodiesel to power

all vehicles, therefore gaining its dependence from foreign countries. According to the Environmental Protection Agency's (EPA) projection highlights, biodiesel prices will increase at a slower rate than crude oil prices ("Biofuels," 2014). With America using biodiesel as its main fuel source, we can save more money. We wouldn't have to spend money on buying oil or on the expense of going to war with another country for it; therefore, the price of gas would remain at a steady cost instead of going up and down every month.

People throw out animal fat every day, and instead of it polluting landfills, researchers can help find other useful ways to convert it into fuel. For instance, researchers at Arkansas University have come up with a way to convert chicken fat into biodiesel fuel (Ngo, 2008). With time, more and more new methods and factories will start popping up all around the world. With new biodiesel factories and plants opening up, it will be a big change to the working economy. A lot of unemployed people will have the opportunity to get a job and take care of their families. Biodiesel will not only help with cleaning the earth, but it will also help improve the economy, too.

Even though biodiesel can be beneficial, it still has challenges in its way. One problem is food shortage. People are reluctant to support biodiesel because they fear that the price of meats will go up. This can become a major problem if the demand for meats became too much for society to fill. When the public has a high demand for something, the price of that said item will automatically go up. Businesses will look at this problem as a benefit for their company to grow and take full advantage of the situation. However, this problem is not a concern because biodiesel is being made from waste animal fat that does not compete with food items (Ali, Ahmad, Farhan, & Ahmad, 2012).

One of the major problems is low funding for the biodiesel industry. The article “Lapse of Deferral Subsidy a Setback for Biofuel Industry,” by Ryan Chatelain (2010), talks about the financial difficulties and political problems biofuel companies face. They have poor funding because investors who want to contribute to the companies are hesitant because they don’t know if the companies’ tax credit is guaranteed to go through or not. The result of poor funding is the lack of local biodiesel companies. The article also discusses the troubles biodiesel has competing with traditional diesel. Since biodiesel isn’t very popular, companies will have to work extra hard to compete with diesel; however, there is one company in New Zealand that may be the very first successful biodiesel company. Z Energy was featured in the *Timaru Herald* newspaper for being the first biodiesel company that will be able to sell biodiesel to the public (McNicol, 2014). This company manufactured its biodiesel from inedible animal fats. Their company provides fuel mainly in the New Zealand and the surrounding areas. This company is one of many successful biodiesel companies located around the world that will help better the world and the environment (McNicol, 2014).

Another issue standing in the way that biodiesel has low fuel power. Biodiesel is lower in energy than regular diesel; therefore, it requires more biodiesel fuel to compare with regular diesel. This means that a consumer will have to make more trips to the gas station than he/she normally would. Biodiesel is blended with diesel, and the amount of the concentrated blends determines if the biodiesel is going to be high or low-leveled. There are four types of biodiesel blends: B100, B20, B5, and B2. Low-leveled blends are anything below B20, and high-leveled blends are anything B100 and higher. The number after the B represents what percentage of biodiesel is in each blend. B20 is the most common and efficient blend, and B100 is the least

common and costs more (“Biodiesel Blends,” 2015). The higher the blend, the lower fuel power it will have. A car cannot run off of pure biodiesel because it costs more, and it doesn’t perform well in low temperatures. Biodiesel has to be mixed with petroleum diesel in order to run smoothly, but the problem is that it is releasing some, not much, pollution in the air. Despite some of the minor flaws and setbacks, biodiesel manufactured from animal fat is the best solution to America’s fuel problem.

When people use biodiesel in their cars, the biodiesel cleans their engines. People may think this a plus for biodiesel, but the problem is when the engine is being cleaned, dirt gets clogged in the fuel filter. This is not necessarily a big problem because someone can easily change the filter at home. When people hear about biodiesel clogging engines, they may think that it isn’t worth the trouble. Biodiesel doesn’t clog the engine all of the time; it mainly cleans the engine, but in some situations, people might have to change their filter more often than they do now.

The world is constantly facing problems every day. Biodiesel manufactured from animal fat can help solve some of their problems, such as help cleaning the environment, lowering gas prices, helping America gain energy independence, and providing jobs for the unemployed. Society should take advantage of renewable resources. People should want to keep the air that they breathe as clean as possible. Making biodiesel the earth’s main fuel supply will be beneficial to everyone. Even though it may come with some challenges, it is well worth the fight. There are a lot of biodiesel companies located in different parts of the world. If people would start using biodiesel instead of gas, we could start switching over to the safer fuel source and start cleaning our world.

References

- Adams, B., Gerpen, J., and Schumacher, L. (2004). Biodiesel fuels. In *Encyclopedia of energy*. Oxford, United Kingdom: Elsevier Science & Technology.
- Ali, A. S., Ahmad, F., Farhan, M., & Ahmad, M. (2012). Biodiesel production from residual animal fat using various catalysts. *Pakistan Journal of Science*, 64(4), 282-286.
- Biodiesel. (2014). *Alternate Fuels Data Center*. Retrieved from <http://www.afdc.energy.gov/fuels/biodiesel.html>
- Biofuels. (2014). *Paris: Organisation for Economic Cooperation and Development (OECD)*.
- Chatelain, R. (2010). Lapse of deferral subsidy a setback for biofuel industry. *New Orleans City Business*.
- Energy efficiency & renewable energy. (2015). *Alternate Fuels Data Center*. Retrieved from http://www.afdc.energy.gov/fuels/biodiesel_blends.html
- Kac, A. (n.d). The foolproof way to make biodiesel. *Journey to Forever Project Online*. Retrieved from http://journeytoforever.org/biodiesel_aleksnew.html
- Lewison, S. (2011). *Biodiesel*. In M. Shally-Jensen (Ed.), *Encyclopedia of contemporary American social issues* (Vol. 4, pp. 1289-1293). Santa Barbara, CA: ABC-CLIO.
- McNicol, H. (2014, April 4). Z plans biofuel. *Timaru Herald*.
- Ngo, P. (2008). University research offers new route to animal fat biodiesel. *Ethanol & Biodiesel News*, XX(1).