



Feedstocks used in the production of biodiesel

What is biodiesel?

- Biodiesel, n. -- a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM D 6751.

What is *NOT* biodiesel ?

Biodiesel is NOT raw or straight vegetable oil (SVO), and is not straight grease.

Biodiesel Physical Properties



- Flash Point - (260° F vs. 150° F)
- High Cetane - (>50 vs. 42)
- Highest BTU Content of any Alternative Fuel
- No Aromatic Content
- Superior Lubricity
- 10X Less Toxic than Salt
- Biodegrades as fast as sugar
- Safe as Vegetable oil to transport
- Positive energy balance. For every unit of energy needed to produce biodiesel 3.2 units of energy are gained



How Biodiesel is Made

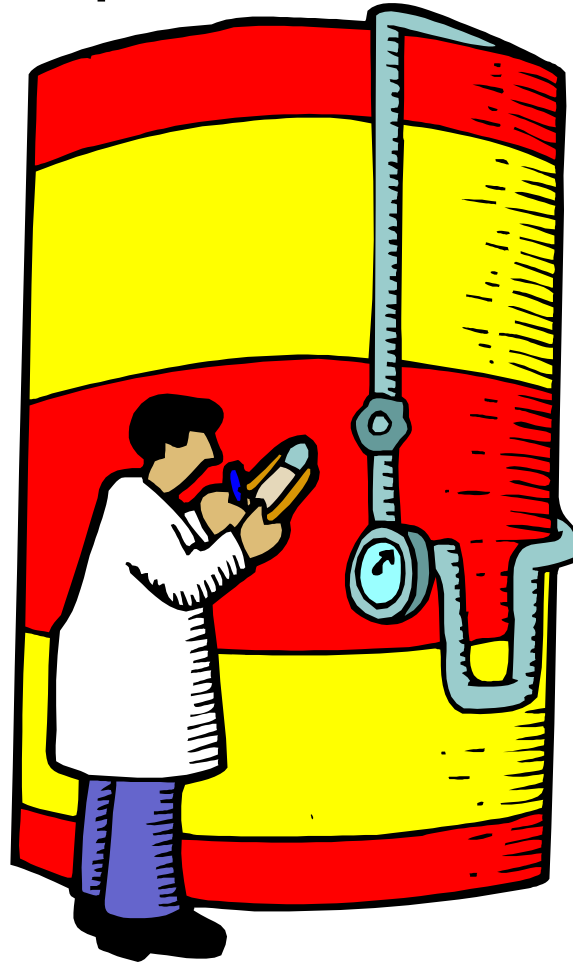
In the presence of a catalyst

Combining

Vegetable Oil or
Animal Fat
(100 lbs.)

+

Methanol or
Ethanol
(10 lbs.)



Yields

Biodiesel
(100 lbs.)

+

Glycerine
(10 lbs.)

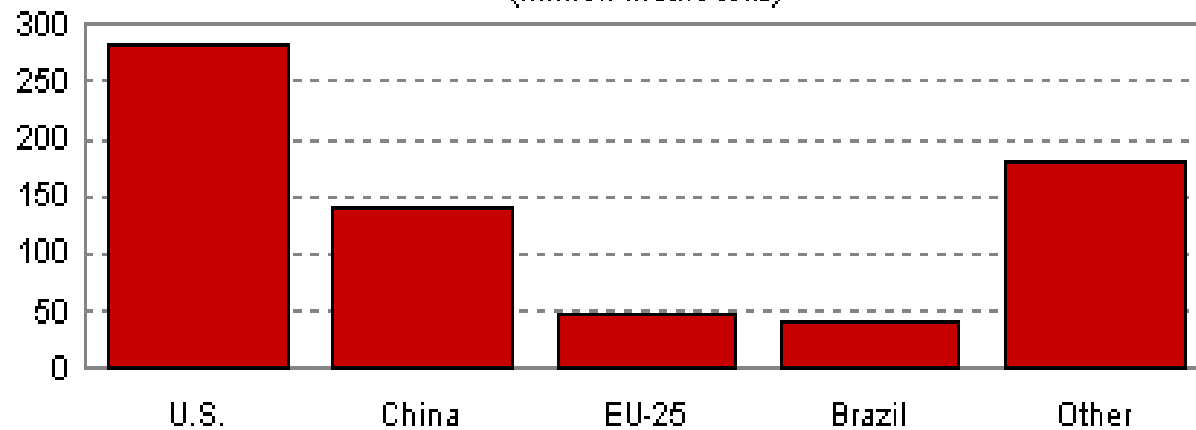
Corn:

King of American Crops

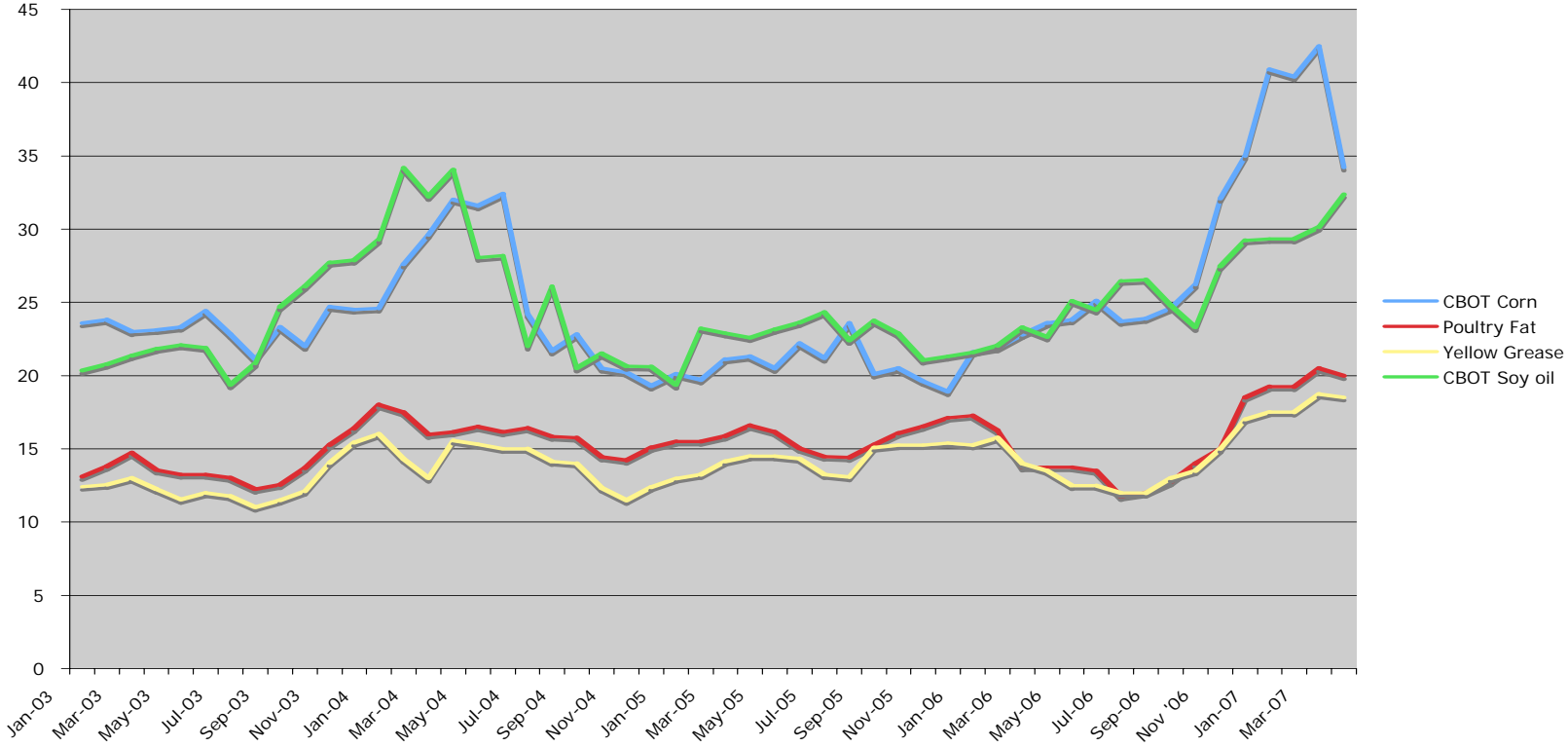
(And the most important feedstock In biodiesel)

QuickTime™ and a
TIFF (Uncompressed) decompress
are needed to see this picture.

2005-2006 major corn producers
(million metric tons)



Correlation among Biofuels feedstocks



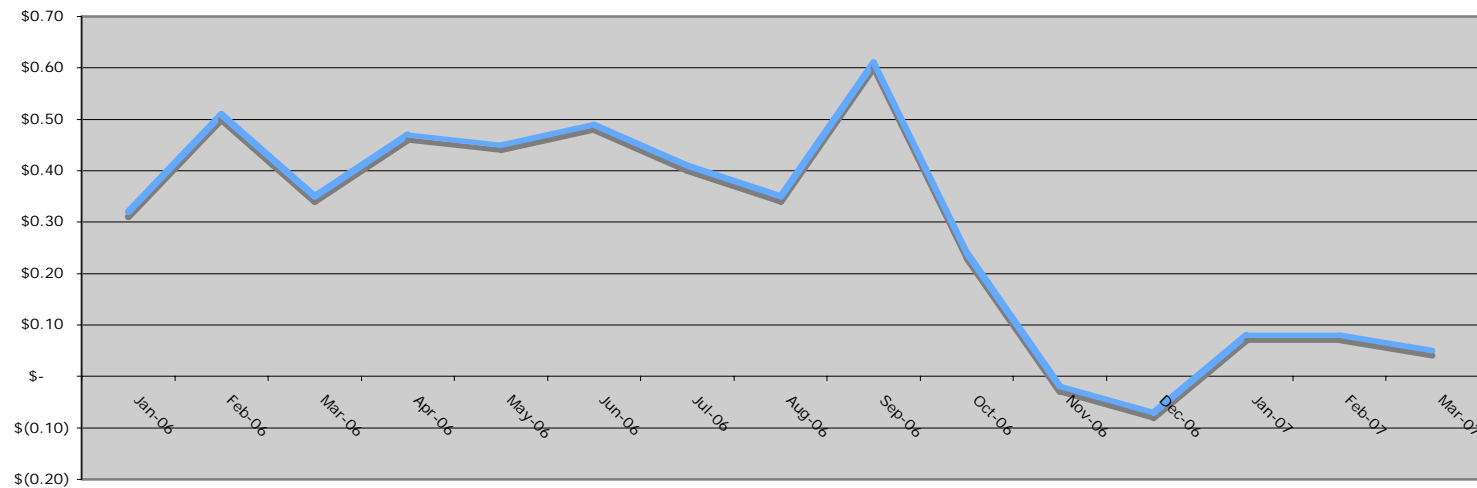
“In a regression analysis of annual data over the last 40 years, prices on soybean oil primarily and corn secondarily “explained” nearly 90 percent of the variation in tallow and yellow grease prices”

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Feedstocks used in Biodiesel: The oilseeds

Soybean Oil

- Most popular feedstock in Biodiesel - over 200 MGY in 2006
- Easiest feedstock to process into Biodiesel
- Large potential supply - over 2.6 Billion gallons per year
- Current demand in the food and feed industries
- Expensive



Oilseeds Continued

Palm oil

- Large worldwide supply - over 1 billion pounds
- Current demand in food markets
- Cloud point issues
- Questionable environmental impact

Canola (Rape seed) oil

- Higher oil yields per acre than soy
- Suitable for marginal land
- Limited production
- More expensive than soybean oil

Feedstocks for Biodiesel: The Fats

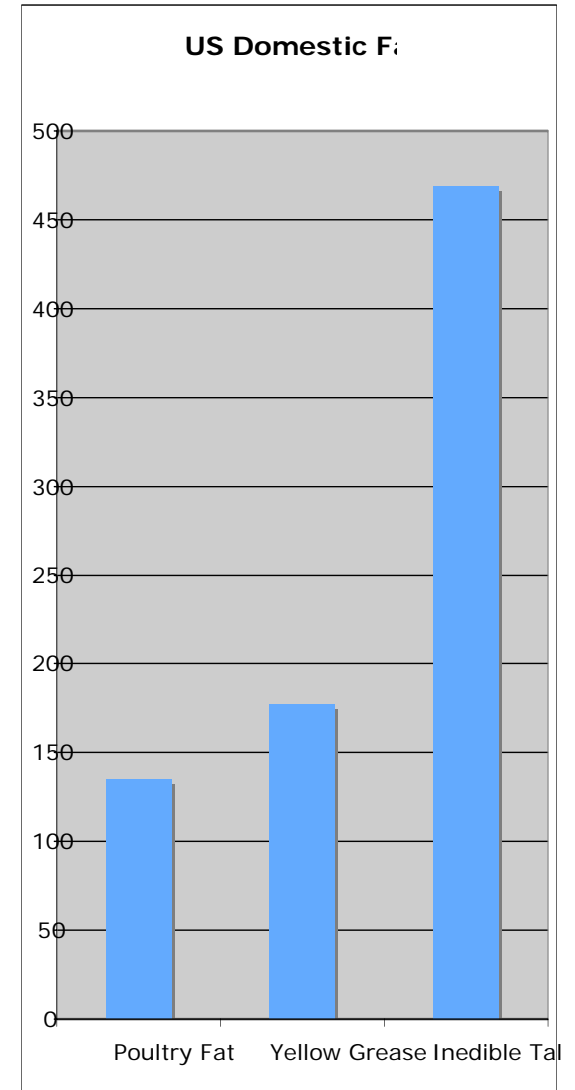
Beef Tallow

Choice white grease (pork)

Stabilized poultry fat

Yellow grease (used Fry oil)

- Large supply from multiple producers
- Cheaper than the oils
- Difficult to make into Biodiesel



Feedstocks for Biodiesel: The Alternatives

Dried Distillers Grains (DDG's)

- Byproduct of the ethanol process
- Large supply - 200 MGY
- Relatively cheap

Camelina (mustard) / Hemp

- High oil yield per acre
- Suitable on less arable land

Lipid Storing Algae

- Very high oil yields per acre - 10,000 gallons +
- Complex to manufacture