

JAMES MADISON UNIVERSITY®

Madison

REDUCING THE COST OF BIODIESEL PRODUCTION IN THE SHENANDOAH VALLEY

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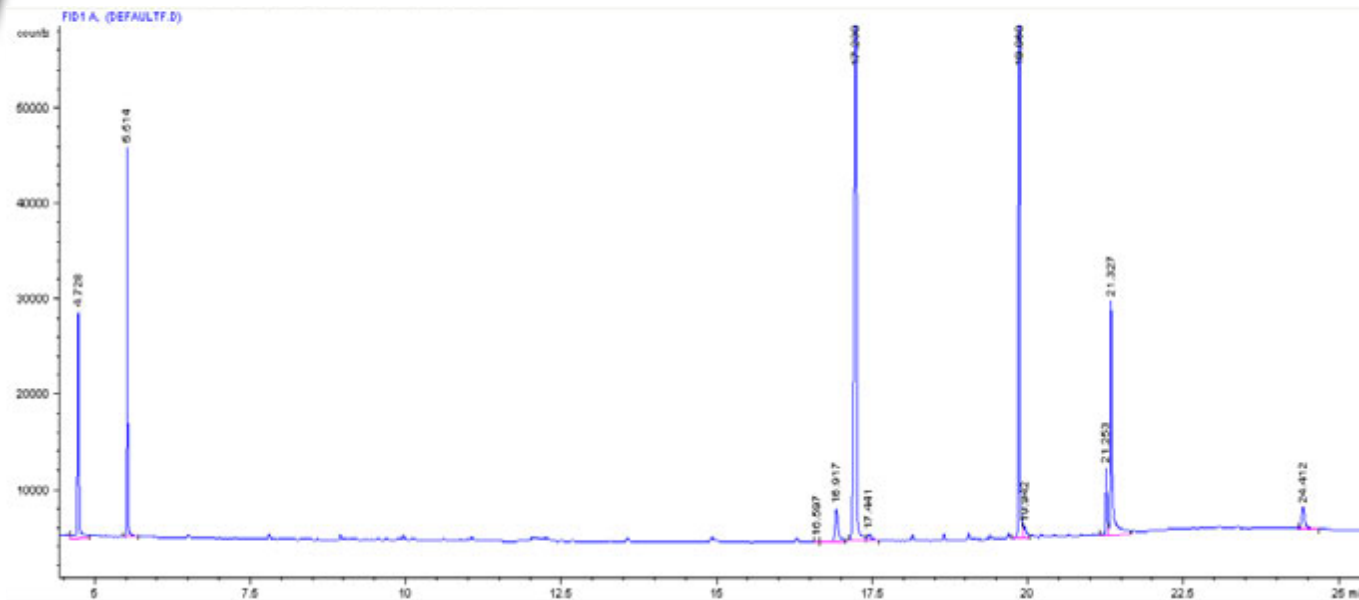
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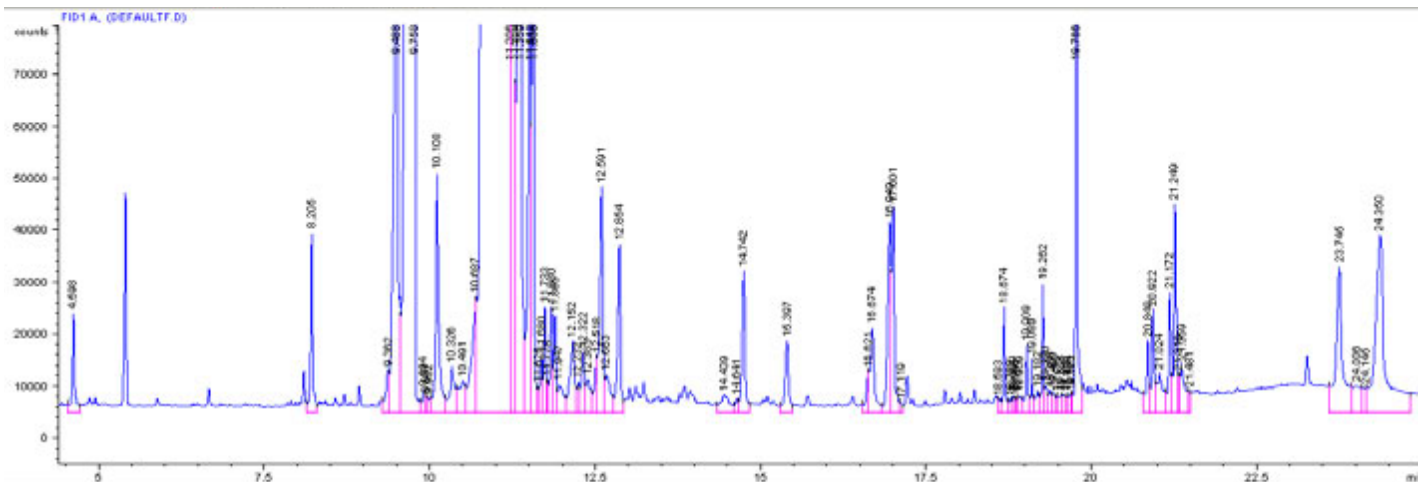
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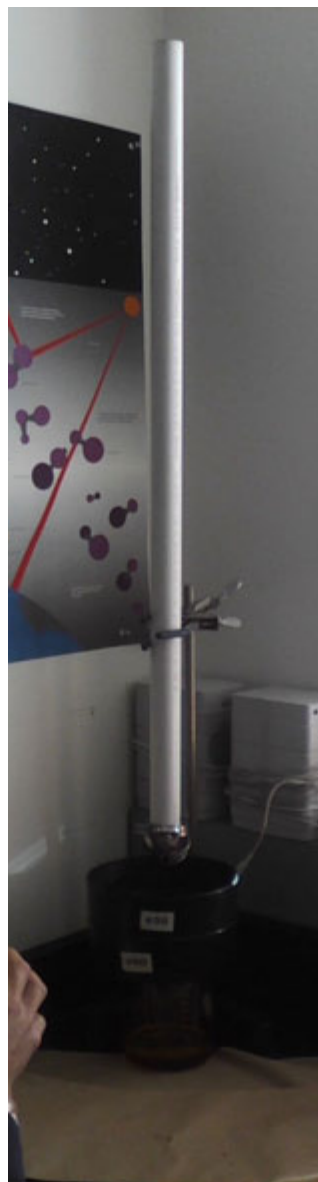
- Why is oil so “cheap”?
- What’s the price difference?
 - Petroleum Diesel: Less Expensive
 - Biodiesel: \$4.60
- Main costs in biodiesel production
 - Feedstock (80%)
 - Refining/Purification (5-10%)
- Primary goal of our project is to reduce the cost of locally produced biodiesel
- Rudolph Diesel’s original intention – helping people reduce dependence on oil barons
 - World’s fair, peanut oil (original biodiesel?)



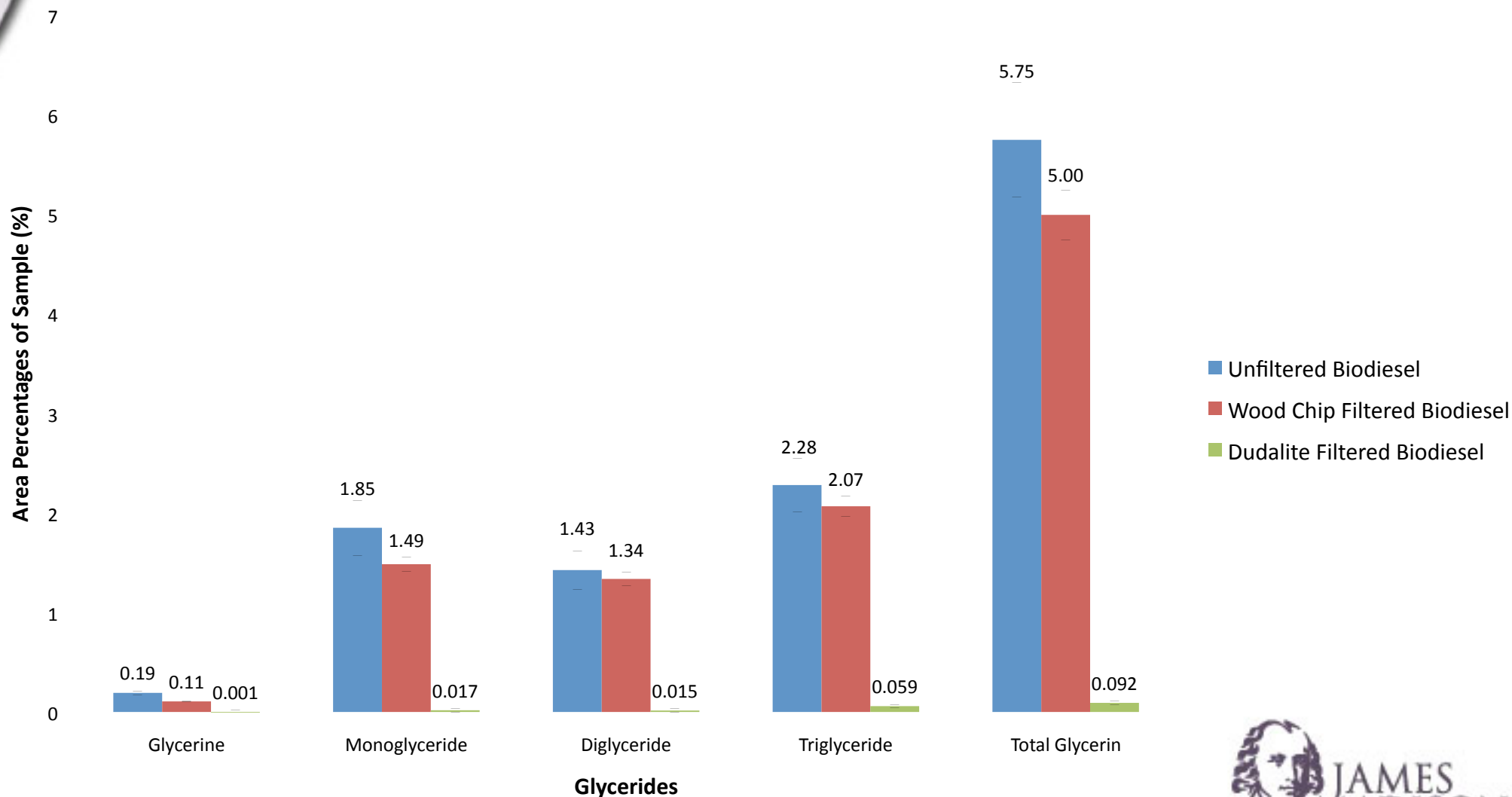
- Had to learn integration tools in ChemStation
- Repeatability of instrumentation and measurement techniques
- Standardization and calibration provide template for peak recognition
- Area counts vs. area percentage



- Wood chips acquired from R.S. Monger and Sons, Inc.
- Dudalite Ion Exchange Resin
- PVC piping
- Mesh screens to filter additional debris in flow through
- Sample prep (unfiltered/filtered), n=3, run test



Comparison of Area Percentages of Free and Total Glycerol in Spiked Biodiesel



- There were large standard deviates between trials due to the small number of trials ran (3, wood chips).
- The initial results show that wood chips did successfully filter some of the free and total glycerin from the sample

	Impurity Reduction (%)				
	Glycerin	Monoglyceride	Diglyceride	Triglyceride	Total
Unfiltered	0.19	1.85	1.43	2.28	5.75
Wood Chips	0.11	1.49	1.34	2.07	5.00
Reduction	8%	36%	9%	21%	75%
Dudalite	0.001	0.017	0.015	0.059	0.092
Reduction	99.4%	99%	98.9%	97.4%	98.4%