



BioEnergy Testing and Analysis (BETA) Laboratory

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Biomass Feedstock Analysis	Fee
Sample Preparation / Size Reduction	\$35
Bulk Density (ASTM E873)	\$46
Proximate Analysis (Moisture, Volatile Matter, Fixed Carbon, Ash)	\$133
Moisture Analysis (ASTM E871-82)	\$29
Fixed Carbon (by difference after ASTM E871, E872 and D1102)	\$29
Ash Analysis (ASTM D1102-84)	\$29
Volatile Matter (ASTM E872)	\$58
Ultimate Analysis (C, H, N, S, O by difference)	\$150
Slagging and Fouling Determination* (Rs, Rf, Rb/a, BAI, AI) <i>*Requires ash preparation of sample.</i>	\$427
Eutectic Point Analysis* (Compressive Strength) <i>*Requires ash preparation of sample.</i>	\$578
Gross Calorific Value via Bomb Calorimeter (ASTM E711)	\$69

Fuel Testing Analysis	Fee
Acid Number of Petroleum Product by Potentiometric Titration (ASTM D664)	\$40
Cloud Point of Petroleum Products (ASTM D5773)	\$40
Water and Sediment (ASTM D2709)	\$40
Water using Volumetric Karl Fischer Titration (ASTM E203)	\$46
Flash Point by Pensky-Martens Closed Cup Tester (ASTM D93)	\$69
Kinematic Viscosity of Transparent and Opaque Liquids (ASTM D445)	\$69
Distillation of Petroleum Products (ASTM D1266)	\$75
Sulfur in Petroleum Product by Potentiometric Titration (ASTM D664)	\$75

Gasification and Pyrolysis	Fee
Fluidized bed gasification	\$3465/day
Fluidized bed pyrolysis	\$3465/day
Batch pyrolysis (Slow to Medium)	\$1733/day



Full-day fluidized bed gasification demonstration (mobile system)	\$6930/day
Biooil Analysis	
Biooil Sample Preparation (depends on extent of dissolution / solvent extraction)	\$347
GC/MS Analysis (for sample injection-ready solvent extracted compounds only)	\$485/run
Hydrogenation Experiments (moderate pressure and temperature)	\$485/run
Hydrogenation Experiments (high pressure and high temperature)	\$750/run
Deoxygenation Experiments (using Micro-Berty Catalytic Reactor)	\$750/run
Biochar Analysis	
BET Surface Area / Pore Volume Analysis	\$347
Adsorption / Absorption Isotherm Experiments	\$347
Synthesis Gas / Greenhouse Gas Analysis / Anaerobic Digestion / Composting	
Complete syngas / biogas / GHG analysis using GC	\$347
Complete greenhouse gas analysis (CO ₂ , CH ₄ and N ₂ O)	\$347
Air Quality (Federal Reference Method)	
FRM PM _{2.5} Measurement	\$693/day
FRM PM ₁₀ Measurement	\$693/day
FRM Single Event Sampler (equipment rental only)	\$185/day
	\$578/week
	\$1617/month
FRM Continuous Sampler (equipment rental only)	\$208/day
	\$693/week
	\$1848/month
DJI Phantom (equipment rental only)	\$35/day
DJI Matrice 600 Pro (equipment rental only)	\$289/day
Seed Oil Extraction Tests	
Solvent Extraction (8-hour runs)	\$379/day
Mechanical Oil Seed Press (5 kg/hr)	\$528/day



Ultra-sonication / Cell Lysis Algae Oil Extraction / Solvent Extraction	\$528/day
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Vegetable & Animal Fat Oil Refining Tests	Fee
Phosphorus	\$77/day
Degumming	\$154/day
Neutralization	\$154/day
Dewaxing	\$154/day
Bleaching	\$154/day
Deodorization	\$154/day

Biodiesel Transesterification Experiments	Fee
30-gallon Batch Reactor (maximum)	\$1518

Fermentation and BMP Tests	Fee
Complete Sugar Analysis (Using HPLC)	\$81
Complete Fermentation / BMP Experiment (5-day experimental runs)	\$3465/run

Animal Manure Management Analysis (in partnership with TAMMI)	Fee
Bacteria indicators Total Coliform Bacteria & E. Coli (water/manure effluent) <i>*Quantitative – Most probable number (MPN) Analysis</i>	\$50
Bacteria indicators Total Coliform Bacteria & E. Coli (manure Solids) <i>*Quantitative – MPN Analysis. Additional dilutions, and grinding/blending needed</i>	\$75
Manure Characteristic Analysis, Basic <i>*pH, Total Solids, and Volatile Solids</i>	\$50
Manure Characteristic Analysis, Plus <i>*pH, Total Solids, and Volatile Solids</i>	\$75
Manure Characteristic Analysis, Full Panel <i>*Bulk density, pH, moisture, EC, Total Salts, TSS, Total Solids, and Volatile Solids</i>	\$95
Particle size distribution <i>*Different sieve sizes available.</i>	\$50-\$100
Ash content	\$30
Volatile Acids	\$55
Nitrogen, Total Kjeldahl (TKN)	\$55



Nitrogen, Nitrate, and Nitrite	\$45
Total Nitrogen (TN) in liquid	\$30
Total Nitrogen (TN) in solid	\$65
Total Carbon (TC) in liquid	\$30
Total Carbon (TC) in solid	\$50
Total Organic Carbon (TOC) in solid	\$95
Alkalinity (CaCO ₃)	\$30
Bicarbonate Alkalinity	\$45
Hardness, Total (Calmagite)	\$40
Phosphate, Ortho	\$55
Phosphorus, Total (TP)	\$55
Phosphorus, Total Kjeldahl (TKP)	\$55
Silica (Reactive)	\$40
Sulfate	\$55
Sulfide	\$60
Elemental Analysis (ICP) – P, K, Ca, Mg ions	\$75
Elemental Analysis, Full Panel (ICP) – Ca, Mg, Fe, Cu, Zn, Na, K, Al, Mn, Sr, S, P, Si, Ba ions	\$125
COD Analysis	\$35
BMP Analysis (21-day) <i>*Final CO₂/CH₄ concentrations are included. Gas composition during experiment available upon request.</i>	\$500
Onsite Air Quality General Analysis <i>*Temperature, humidity, atmospheric pressure, PM10, and PM2.5 measurement</i>	\$35
Odor and Total Volatile Organic Compounds (TVOC) <i>*Thermal Desorption and GC</i>	\$500
Hydrogen Sulfide	\$20
Ammonia gas	\$20
Ammonia in liquid (Spectrophotometer)	\$45



Ammonia in solid (Spectrophotometer)	\$55
Methane (GC)	\$40
Carbon Dioxide (GC)	\$40
Nitrous gases (GC)	\$40
Oxygen	\$20
PM10 and PM2.5	\$20
Onsite Gas Detection and Measurement <i>*Temperature, humidity, and atmospheric pressure</i>	\$50
Onsite Gas Detection and Measurement (select an item*) <i>*Hydrogen sulfide, ammonia, carbon dioxide, hydrogen sulfide, sulfur dioxide, nitrous gases, ozone measurement.</i>	\$25-\$75
Manure sampling (under 6 liters) when less than 100 miles**	\$1/mile
Manure sampling (under 6 liters) when greater than 100 miles**	\$1.15/mile
Sample Shipping**	\$15/lb

***Coordinate with lab personnel for specific analysis/trip information.*