Department of Food Science Technology List

Laboratory Instrumentation & Analytical Resources

The Sacks Laboratory: enology, flavors, food chemistry

Contact: Gavin Sacks, 607.255.2335, gls9@cornell.edu

- QuantStudio™ 6 Flex Real-Time PCR System is ideal for laboratories with multiple applications and end users on a limited budget. With a planned upgrade path to a QuantStudio™ 7 Flex System that accommodates automation or TaqMan® Array Cards, the QuantStudio™ 6 Flex System is an ideal qPCR platform to accommodate changing future needs.
- LECO Pegasus 4D GCxGC-TOF-MS system with CTC CombiPal Autosampler (SPME, headspace, and liquid injection). Potential applications include targeted and non-targeted metabolomics studies of food, beverages, raw materials, breath, and other matrices, volatile profiling, and quantification and identification of trace volatiles in complex foods or beverages
- Shimadzu TQ8040 GC-MS-MS System, capable of both positive and negative ion mode operation. Ideal for ultra-trace quantification (sub-part-per-trillion) of targeted volatiles with low sensory thresholds, e.g. thiols, pyrazines, haloanisoles, and unsaturated aldehydes.
- Thermo Discovery Access MS/MS with Direct Analysis in Real Time (DART) or Surveyor HPLC sample introduction. DART source allows for direct analysis of sample with no sample prep: ideal for analysis of surface or headspace components. HPLC source allows for quantitative analysis of trace non-volatile food components.

Food Safety Laboratory and Laboratory for Molecular Typing

Contact: Martin Wiedmann, 607.254.2838, mw16@cornell.edu

- RiboPrinter, microbial characterization system
- Pulsed Field Gel Electrophoresis (PFGE), genetic fingerprinting
- PCR and Sequence Based characterization (16S, rpoB, etc.)
- Agilent 2100 Bioanalyzer, REP-PCR based microbial characterization
- Illumina, Full Genome Sequencing (Life Sciences Core Laboratory)
- ABI Prism, Real time PCR detection system

Food Safety Laboratory

Contact: Randy Worobo, 607.255.3614, rww8@cornell.edu

- Ultraviolet processing unit for fluids
- Hiperbaric 55L High Pressure Processing unit for pathogen challenge studies only (Summer 2016)
- Shimadzu HPLC with analytical columns
- Basic equipment for pathogen challenge and shelf life studies
- D and z value capabilities

Dairy Foods Engineering Laboratory

Contact: Syed Rizvi, 607.255.7913, ssr3@cornell.edu

- Supercritical fluid extraction systems for liquid and solid foods
- Dynamic mechanical analyzer and Brookfield viscometers
- Supercritical fluid extrusion system (Wenger TX-52)
- Texture analyzer (TA-XT)

Dairy Foods Processing and Food Safety Engineering Laboratory

Contact: Carmen Moraru, cim24@cornell.edu

- Strain-controlled Advanced Rheometric Expansion System (ARES) (TA Instruments)
- Zeta potential and particle size analysis instrumentation (Brookhaven Inc.)
- Thermal analysis system (DSC and TGA, Seiko Instruments)
- Pulsed Light treatment unit (Xenon Corp.)
- Incubators
- Colorimeter (Konica Minolta CR-400)
- Basic equipment for physical, chemical, and microbiological analyses
- Pilot scale, automated microfiltration unit equipped with ceramic membranes

Milk Quality Improvement Program

Contact: Nicole Martin, 607.255.2894, nhw6@cornell.edu

- Autoplate 4000
- Q-Count

New York Wine Analytical Laboratory (Geneva)

Contact: Chris Gerling, 315.787.2277, cjg9@cornell.edu

- Shimadzu HPLC, currently configured for organic acids, sugars and ethanol measurement
- Agilent 6890 GC, currently configured to measure ethanol and methanol
- Randox RX Monaco automated chemistry analyzer
- NovaLum luminometer
- OenoFoss FTIR juice and wine analyzer
- FIAStar flow injection juice and wine SO2 analyzer

Vinification & Brewing Laboratory (Geneva)
Contact: Chris Gerling, 315.787.2277, cjg9@cornell.edu

- Pilot scale grape de-stemming and pressing equipment
- 30 30 gallon jacketed red wine fermenters with chilling/ heating capacity and computer tracking and control
- 120 liter Carl still, suitable for producing any distilled spirit except for vodka
- Pilot scale filters – cartridge, pad and even a crossflow

Pilot Plants

Fruit & Vegetable Processing Pilot Plant (Geneva)
Contact: John Churey, 315.787.2258, jjc2@cornell.edu

High Pressure Cookers:
- Vertical still retorts with over pressure
- FMC steritors
- FMC Pouch Cookers

Low Pressure Cookers:
- Applesauce line
- Heat exchanger
- Steam Injection System
- Exhaust tunnel

Dehydration:
- Cabinet hot air dryers
- Freeze dryers

Juice Extractors:
- Rack and frame presses
- Hydrolic press
- Continuous screw press
- Decanter

Juice Pasteurizer:
- Pasteurizer tube in tube
- Micothermic HTST
- UV pasteurization

Filters:
- Plate & frame filters

- Ultra filter

Freezing:
- Blast Freezer

Blanchers:
- Steam belt & cooling
- Vacuum blanch chamber

Fruit/Vegetables:
- Choppers
- Dicers
- Slicers
- Bertocchi TuborExtractor

Packaging:
- Bottle Filler
- Vacuum packaging

Additional Facilities:
- Raw Products Building
- Cold Rooms

Food Processing and Development Laboratory (FPDL, Ithaca)

Contact: Mackenzie Brown, 607.255.8798, mb2269@cornell.edu

Drying Capabilities:
- Model 1 Niro Atomizer Versatile Utility Spray Dryer, 22kg/hr. evaporative capacity
- 100SRC Virtis Freeze Dryer, 45.5kg condenser ice capacity
- Model GA 31 Yamato Pulvis Mini Spray Dryer, 1600 mL/hr evaporative capacity
- Buflovak Laboratory Atmospheric Double Drum Dryer, 8” drying width

Evaporator:
- Model Type E-Anhydro Laboratory Vacuum Evaporator (rising film)

Ice Cream Freezers:
- Technogel 80, continuous freezer
- Armfield 25 BA Scraped Surface Processing system, continuous freezer 20 L/hr
- Emory Thompson, 20qt batch freezer

Plate heat exchangers:
- 1 pt/min to 15 gal/min

HTST/UHT Pasteurizing Equipment
- PMS University Pilot Plan, 3L/min (HTST)

- Microthermics 25DG, 1-2 L/min (HTST/UHT indirect steam application)

Vat Pasteurizing Equipment:
- Walker Scraped Surface Cone Bottom Processor, 30min/100gal max capacity
- Vat pasteurizer with VFD agitation (30min/50 max capacity)
- Additional jacketed vats, 2 400gal vats (not inspected for pasteurization currently)

Extruder:
- Wenger TX 52

Mixing Equipment
- Various high and low shear mixers

Membrane Filtration Equipment:
- Pilot scale microfiltration unit equipped with a ceramic membrane, with automated data acquisition and a CO2 injection system for minimizing membrane fouling
- TetraPak M7 ceramic UTP
- GP pilot scale microfiltration system for separation of casein from milk serum proteins
- Various high and low shear mixers

Cheese Making Equipment:
- Kusel A-frame cheese press
- Kusel L/I Laboratory cottage cheese vat
- Damrow S4-2M Starter Tank
- Supreme Mini Mixer Mozzarella cheese stretcher
- 4 Damrow 5-can open vats
- 2 Kusel “Double-O” 5-can automatic vats
- 300gal Semi-Automatic cheese vat

Gaulin Two Stage Homogenizers
- 42 gal/hr to 1000 gal/hr

Butter Churn
- Model A 50SS Vane Churn

Canning Equipment
- Model 23 Dixie Canner

Separators/Clarifiers
- Equipment Engineering Model 590
- DeLaval Model 340 and Model 366
- 1750 lbs/hr to 13,0000 lbs/hr
- Pending: Westfalia KNA 3-06-076 Clarifier (quark separator)

Packaging Systems:
- Koch Multivac vacuum sealer

- Filler Specialties ½ gallon and gallon plastic Jug Filler
- Pending: Modern Packaging SR-8DC Rotary Denesting, Filling, and Heat Sealing machine for 6oz plastic containers

Utilities
- Electrical, chilled water, steam (culinary and regular), reverse osmosis water and pressurized air utilities

Coolers:
- Various walk-in coolers and wind tunnels, temp range from -40F to 105F

Dairy Processing Plant

Contact: Tim Barnard, 607.255.2888, tjb233@cornell.edu

- Two 3,000gal silos for raw milk storage
- Tetra Centri cold milk separator (1,200 gal/hr)
- Industrial batching system (automated or manual) including 200gal blender and three batching tanks (500, 1,000, and 1,500 gallons)
- HTST System (With Homogenizer)
- Tetra Plex plate heat exchanger (1,200 gal/hr)
- VTetra Alex homogenizer (1,200 gal/hr; 3,000 psi two-stage)
- Includes 22-second legal hold tube and 90-second extended hold tube
- Three 2,000gal silos, one 1,000gal silo and one 500gal pasteurized storage tank, all jacketed with ice water cooling
- Fluid Milk/Juice Filling:
    - Two 12-valve rotary bottle fillers (Federal) with coding and labeling capabilities
    - 8oz (25 to 50 cpm)
    - Squat quart, half gallon and gallon (25 to 35 cpm)
    - Bag-n-Box, 1 to 5 gallon dispenser bags
- Ice cream manufacture and packaging
- Yogurt manufacture and packaging