

Food Tech Lab - Ingram Hall – Dr. Sathivel/Dr. Joongmin Shin

Pilot equipment in the Food Tech lab includes mechanical separators and desinewers, centrifuge, grinders, Koch SS Grinder, flaker, tumbler, Blentech Twin Shaft Paddle Lab Mixer, Blentech Lab Vacuum Tumbler Mixer, formers, batter/breader, freezing tunnel, freezing cabinet, blast freezer, coolers, Lynntech Industries-Ozone generator-Model 30T, packagers (MAP tray sealer, Koch Ultravac 55 Dbl. Chamber Vacuum System, Koch skin-pack), continuous oven, cryogenic freezers, spray dryer, and poultry slaughter, drip line, cut-up saw, Vulcan Hart-2 ranges, a deep fat fryer, and Cayard's-fat fryer.

<http://www.lsu.edu/departments/foodplant/process%20capacities.html>

Meat Lab- Pilot Facility – Francioni Hall – Dr. McMillin

Processing capabilities include sawing, grinding, cubing, mixing, injecting, vacuum tumbling, forming, vacuum stuffing, curing, heating (smokehouse, institutional broiling and convection), smoking, drying, chilling, freezing, fermenting, and packaging (overwrap, vacuum, modified atmosphere) to produce whole muscle bone-in and boneless cuts, ground beef, sausage (fresh, smoked, fermented), bacon, ham, roast beef, restructured roasts and steaks, jerky, boudin, tasso, and pickled pork.

Analytical capabilities are vacuum oven drying for moisture, Goldfisch apparatus for crude fat, distillation for thiobarbituric acid reactive substances (TBARS), light microscopy, stomacher and incubator for total plate microbial counts, centrifugation for separation, high speed explosion-proof blender, portable reflectance spectrophotometer for color, texture analyzer for texture and shear force, portable gas analyzer (O₂, CO₂, CO).

Fruits and Vegetable Processing Equipment – Julian C. Miller Hall - Dr. Paul Wilson

Complete fruit and vegetable canning facility from washing/peeling of raw materials to final heat processed canned product.

Equipment includes: Robbins continuous lye bath peeler (2 tons per hour), lye makeup tank, small Dixie Equip. batch-type lye peeler, Hobart abrasive peeler, Robbins continuous rotary reel washer (2 tons per hour), potato slicer/dicer, Urschel bean/okra cutter, small Dixie Equip. batch-type steam blancher, sanitary continuous inspection belt, Dixie Equip. continuous steam injected can exhaust tunnel, two Dixie Equip. atmospheric can closing machines, two Dixie Equip. vacuum closing machines, Dixie Equip. convertible vertical retort (steam pressure or hot water with air/steam overpressure) and loading crane.

Fruit and vegetable juicing and fermentation facility for pickled vegetables, fruit juices, hot sauces and fermented beverages.

Equipment includes: grape crusher/destemmer, mechanical fruit press, hydraulic fruit press, large dry/wet Fritzpatrick mill with screens, continuous juice finishing machine with screens, fermentation vessels, small water cooled distillation column.

Other processing equipment includes: small dry hammer-mill with screens, dry Wiley shear mill with screens, two commercial Hobart food processors/choppers with attachments, batter/breeding machine, steam injected drum drier, 40 gal. scrap-surface steam jacketed kettle,

30 gal. scrape-surface vacuum kettle and condenser, 5 gal. scrape-surface steam jacketed kettle, 2.5 gal. mixing steam jacketed kettle, two 40 gal. steam jacketed kettles, three 10 gal. steam-jacketed kettles, two 2.5 gal. steam jacketed kettles, 40 gal. steam jacketed tank.

Refrigeration/Freezing equipment includes seven large walk-in coolers operating at temperatures 35-60F, -10F walk-in holding freezer, -30F walk-in blast processing freezer, York pilot-scale fluidized bed freezer.

Audubon Sugar Institute –Dr. Don Day

Audubon Sugar Institute has the largest range of pilot fermentation and separation equipment in the LSU system. This facility provides over 27,000ft² of world-class laboratory and pilot space. For preparation of biomass and extraction there is a 100 lb. per hour 3-roll Farrel mill (the 9 roll Squire Pilot mill is currently dismantled for moving), a chipper, a Jeffrey shredder and a 2-roll Tilby splitter and separator (for separation of pith and rind of plants such as sugarcane and kenaf). Other pilot size equipment include: a French oil mill, juice clarifiers, storage tanks of capacities from several gallons to 2m³, steam-heated heat exchangers, appropriate pumps and piping connections, a calandria type 1m³ vacuum evaporator, one 50 L and one 95 L stainless steel vacuum crystallizers, three 1/3 m³ cooling crystallizers and a 60cm basket centrifuge. In the filtration and ultrafiltration pilot laboratory, there is a series of semipilot and pilot units, including a 0.1 m² Putsch filter press, a small Filtomat continuous self cleaning screen filter, a 0.05 m² cross-flow ceramic membrane system and another system fitted for RO/UF/MF spiral wound membranes, and a pilot size Bird-Flottweig horizontal decanter. The process chromatography laboratory centers around a 50 L automated low-pressure simulated moving bed chromatography unit, a semi-pilot Corning glass vacuum crystallizer and a number of smaller batch chromatography systems. A recent addition is a CSEP pilot plant simulated moving bed system from Calgon Carbon, a Yamato 10L rotavap, and a Yamato spray drier. Since 1979 we have been building a capability in biotechnology. As part of this program (in addition to the appropriate research laboratories)we have constructed a fermentation pilot plant which is probably unique at Universities in the South (and perhaps the Country). The equipment includes a range of fermentors, ranging in size from the very small (500 and 1000 ml) , through the intermediate(30 l) to the pilot-production scale (500 l). Associated with this equipment are the appropriate size membrane filtration equipment (5 to 150 sq ft) for harvesting and product purification. An auxiliary analytical facility (HPLC, GLC, etc.) is also available. The microbiology laboratory is a Level 2 laboratory equipped with a NUAIRE biohazard safety hood, a Beckman Coulter UD 800 UV/VIS spectrophotometry system, two Dupont and one Eppendorf centrifuges, two New Brunswick shaker incubators, a Virtis freeze drier, a Bio-Rad thermal cycler PCR system, and a range of fermentation systems with 1L, 20 L and 500 L fermentation capacity.

The analytical laboratory operates a range of instruments to support the research programs. These include four Dionex IC systems, three Waters HPLC systems, an Agilent 6890 gas chromatograph, three HP 5890 gas chromatographs, two Lasentec laboratory back-scattering instruments for crystal size determination, a flame photometer, flow-through preparative LC detectors (RI, UV/VIS, PAD, ECD) etc. The analytical chemistry laboratory operates a CSEP pilot plant simulating moving bed system from Calgon Carbon, four Dionex IC Systems, three

Waters HPLC Systems, a Wyatt mltiangle laser scattering/GPC system, and flow-through preparative LC detectors (RI, UV-VIS).

Also Available through cooperation with the USDA Southern Regional Research Center – New Orleans

Mills and Homogenizers

Bauer Mill 8” model 148-2 for wet or dry grinding. Traditionally used to pre-grind nuts to make butters.

Microfluidizer Homogenizer 110-T.

Gaulin Homogenizer.

Extruders

Leistritz Extruder Model MIC -18/GL-6R. Five temperature zones and attachment for making extruded films.

Brabender single screw Model D-7500 extruder with four temperature zones.

Werner Pfleiderer Model ZSK-30 twin screw extruder with accurate material feeder.

Dryers

Yamamoto (For sensitive materials) and Niro spray dryers.

Blue M Bread Making Oven with temperature and humidity controls.

Double drum dryer with drum dimensions of 18”x12”.

Fluidized bed dryer with temperature capability of up to 600°F.

Aeromatic grain dryer.

Rice Mills

Complete continuous Satake rice mill from paddy dehusker to color sorting machine.

Satake Model TM-05 table top Grain testing mill.

Kettles and Reactors

Kettles stainless steel from 5 to 30 gallons.

Parr 4843 batch reactor, double jacketed, temperature and pressure controls and direct injection of any reactant under pressure.

Continuous Centrifuges

Nozzle disc centrifuge

DeLaval Liquid-Liquid Centrifuge.

General Equipment

Table top stainless steel V-blender

Carver Laboratory Press for making low fat nuts and extraction of oil.

Robert Coupe Model R-10 Chopper and blender.

Continuous belt fryer which can be used in conjunction with an extruder.

Restaurant style batch fryer

Enrober Model KV-1 for e.g. enrobing nuts with chocolate.

Microferm Model MI -114 fermenter.

Accucut Model A-12 air classifier to classify dried material for e.g fiber from rest of the flour.
Reiser Vacuum packaging machine uses cryovac bags of different sizes. Pilot plant sized.
Market Forge steam blancher for blanching vegetables.
Southbend blancher EZ-3 for blanching vegetables.

Patented Processes Developed by SRRC Scientists in Food Pilot Plant:

Process for quick-cooking brown and wild rice
Process for pure rice starch and edible rice protein
Sun Butter
Low-fat peanuts

Possible Uses for Food Pilot Plant :

Developing snack foods.
Drying fruits and Vegetables
Processing rice from the field to the table.
Particle size reduction of grains or other components of crop in dry or liquid form
Drying of slurries/proteins
Making food films
Classifying flours into desired components
Processing nuts for use in snacks.
Extracting oil from oilseeds using oil press or hexane or other solvents
Extracting bioactive components using supercritical, subcritical fluid extraction or other methods
Developing innovative fruit and vegetable snacks
Producing bioactive compounds and alcohol using fermentation.
Developing fermented nutraceutical products.