For over 30 years the Center for Crops Utilization Research has been committed to increasing the utilization of corn, soybeans and other crops and creating new agricultural enterprises by developing advanced technologies and high-value products.

Over 35,000 square feet of pilot plant processing and support space is available for wet processing, dry processing, fermentation and product recovery, industrial product development, food preparation, and consumer and sensory testing. CCUR can provide you with innovative research solutions for developing new crop-derived technologies and products in an industry-friendly setting.

MAIN SERVICES
» Wet milling, grinding, mixing, centrifugation, spray drying, filtration, cold and dry storage
» Dry milling and separation, cooking, extrusion
» Film and sheet extrusion, compression and injection molding, tray drying, food extrusion
» Fermentation and process development
» Analytical services for grain composition and quality, carbohydrate chemistry, protein and vegetable oil characterization
» Consumer evaluation services
» Technical consulting services
STAFF ASSISTANCE

Professional and Scientific Staff
Per Hour ................................................................. $135

Student Equipment Operator
Per Hour ................................................................. 40

FACILITIES

Fermentation Facility
The Fermentation Facility fee schedule can be found at www.ccur.iastate.edu/fermentationfacility/feeschedule.html.

Industry Incubator Space
Pilot plant
Per square foot, per year ............................................. $35

Laboratory (typically 400 square feet)
Per square foot, per year ............................................. 30

Office (typically 120 square feet)
Per square foot, per year ............................................. 25

Technology Transfer Theatre
Up to 4 Hours ........................................................ $50
Full Day ......................................................................... 100
Additional Services (base charge for first hour) .......... 52
Additional Services per hour ...................................... 36

Test Kitchen and Sensory Labs
Kitchens
Additional cost for fryers or convection oven may apply
Daily ........................................................................ $250

Sensory Evaluation Booths with Computers
Per Session ............................................................... 70

Sensory Evaluation Booths without Computers
Per Session ............................................................... 35
SERVICES

Charges are based on days of equipment usage, cost of supplies and materials and need for equipment operators.

**Analytical Services**

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crude Free Fat (Oil) Content</strong></td>
<td>$40</td>
</tr>
<tr>
<td>Goldfisch extraction method, includes duplicate replications</td>
<td></td>
</tr>
<tr>
<td><strong>Moisture and Solids Content</strong></td>
<td>$20</td>
</tr>
<tr>
<td>AACC standards method using convection oven, includes duplicate replications</td>
<td></td>
</tr>
<tr>
<td><strong>Total Nitrogen and Protein Content</strong></td>
<td>$20</td>
</tr>
<tr>
<td>Dumas method using the Vario-Max CN Analyzer, includes duplicate replications</td>
<td></td>
</tr>
</tbody>
</table>

**Corn Milling**

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dry Corn Milling</strong></td>
<td>Call for Quote</td>
</tr>
<tr>
<td>1 kg product only</td>
<td></td>
</tr>
<tr>
<td><strong>Dry Corn Milling</strong></td>
<td>Call for Quote</td>
</tr>
<tr>
<td>1 kg product and mass balance</td>
<td></td>
</tr>
<tr>
<td><strong>Wet Corn Milling</strong></td>
<td>$500</td>
</tr>
<tr>
<td>100 g product only</td>
<td></td>
</tr>
<tr>
<td><strong>Wet Corn Milling</strong></td>
<td>$750</td>
</tr>
<tr>
<td>100 g product and mass balance</td>
<td></td>
</tr>
<tr>
<td><strong>Wet Corn Milling</strong></td>
<td>$1,000</td>
</tr>
<tr>
<td>1 kg product only</td>
<td></td>
</tr>
<tr>
<td><strong>Wet Corn Milling</strong></td>
<td>$1,300</td>
</tr>
<tr>
<td>1 kg product and mass balance</td>
<td></td>
</tr>
<tr>
<td><strong>Wet Corn Milling</strong></td>
<td>$2,500</td>
</tr>
<tr>
<td>10 kg product only</td>
<td></td>
</tr>
<tr>
<td><strong>Wet Corn Milling</strong></td>
<td>$3,000</td>
</tr>
<tr>
<td>10 kg product and mass balance</td>
<td></td>
</tr>
</tbody>
</table>

**Sensory Evaluations**

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Analysis</strong></td>
<td>$3,800</td>
</tr>
<tr>
<td>10 panelists, 2-5 samples, 3-5 attributes, 6 training sessions, 3 test sessions</td>
<td></td>
</tr>
<tr>
<td><strong>Consumer Preference/Acceptability</strong></td>
<td>$4,200</td>
</tr>
<tr>
<td>8-10 panelists, 3-5 samples</td>
<td></td>
</tr>
<tr>
<td><strong>Difference Test</strong></td>
<td>$1,800</td>
</tr>
<tr>
<td>50 panelists, 2 samples</td>
<td></td>
</tr>
</tbody>
</table>

**Soy Processing**

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feed-grade Soybean Extraction</strong></td>
<td>$2,310</td>
</tr>
<tr>
<td>1 bu soybeans</td>
<td></td>
</tr>
<tr>
<td><strong>Food-grade soybean Extraction</strong></td>
<td>$2,640</td>
</tr>
<tr>
<td>1 bu soybeans</td>
<td></td>
</tr>
<tr>
<td><strong>Soy Protein Concentration</strong></td>
<td>$3,000</td>
</tr>
<tr>
<td>Acid washed, 15 kg soy meal</td>
<td></td>
</tr>
<tr>
<td><strong>Soy Protein Isolation</strong></td>
<td>$5,000</td>
</tr>
<tr>
<td>15 kg soy meal</td>
<td></td>
</tr>
</tbody>
</table>
**LAB AND PILOT PLANT EQUIPMENT**

All charges are based on a daily rate. Charges do not include labor.

### Aspirators
- Aspirator, cascade, Kice Metals .............................................. $100
- Aspirator, small, Carter-Day ................................................... 100

### Baking
- Baking dough roller/sheeter, National ...................................... $100
- Baking flour mixograph, Brabender ........................................ 200
- Baking oven, rotating, National ............................................... 150
- Baking proof box, National ..................................................... 100
- Bread slicer, countertop, Oliver ............................................... 100

### Centrifuges
- Centrifuge, 12-inch basket, Ametek ........................................ $200
- Centrifuge, cream separator, stacked disc .............................. 100
- Centrifuge, disc continuous (BPTX 205), clarifier, Alfa-Laval .... 800
- Centrifuge, high-speed, CEPA ................................................. 510
- Centrifuge, Model J-20XPI, Beckman Avanti .......................... 100
- Centrifuge, three-phase, continuous horizontal decanter, Centrisys ......................................................... 800

### Conveyors
- Conveyor, conditioner, auger, steam ...................................... $100
- Conveyor, mobile screw grain conveyor, Flexifeeder ................ 100

### Dairy Processing
- Homogenizer, Avestin Emulsiflex 20B ..................................... $500
- Ice cream freezer, dual-hopper (minimum 6-L per hopper), Taylor ................................................................. 500
- Pasteurizer, vat, 50-gal, C van’t Riet ...................................... 500
- Pasteurizer, with 100-gal tank, MicroThermics ...................... 400

### Dryers
- Dryer, drum, mini, custom .................................................. $150
- Dryer, Fluid-bed, Lab-Line .................................................. 500
- Dryer, lab, Fisher Scientific .................................................. 100
- Dryer, spray dryer, mini, solvent, Buchi ................................. 400
- Dryer, spray, spinning-disk atomizer, APV Crepaco Inc. .......... 600
- Dryer, tray, medium, VWR .................................................. 150

### Extruders
- Extruder, autogenous, with cutter, Insta-Pro ......................... $300
- Extruder/expander, cooker, with oil cage, Anderson International .......................................................... 400
- Extruder, twin-screw, large, Leistritz .................................... 500

### Feeders
- Feeder, blue on yellow cart .................................................. $100
- Feeder, screw, small, Schenck AccuRate ............................. 150
- Feeder, variable speed, Nelson ............................................. 100
- Feeder, variable speed, Schenck AccuRate ............................ 150
- Feeder, variable speed, Vibra Screw Corp ............................. 100

### Filters
- Filter, drum, rotary, vacuum, Filtration Engineers ................ $300
- Filter, vertical plate, Industrial Filter .................................. 200

### Freeze Dryers
- Dryer, freeze, 8-tray, Virtis Ultra 35-SL
  - Set-up ................................................................. $200
  - Daily ................................................................. 250
- Virtis Unitrap II Freeze Dryer
  - Set-up ................................................................. $200
  - Daily ................................................................. 100

### Fruit and Vegetable Processing
- Blancher, vegetable, Dixie Canner Equipment ..................... $100
- Can seamer ........................................................................ 100
- Potato peeler, mechanical, Hobart ...................................... 100
- Pulper, vegetable, F.H. Langson Kamp ................................ 100
- Retort, 50-gal, Dixie ........................................................ 300

### Hydroclones
- Hydroclone, germ, Dorr-Oliver .......................................... $100
- Hydroclone, starch-gluten, Dorr-Oliver ............................... 100

### Injection Molding Machines
- Injection molding machine, 20-ton, Boy Machines, Inc. ....... $200
  - Injection molding machine, 101-ton, Battenfeld HM 90/350 .......................................................... 500
### Jet Cookers
- Jet cooker, Pick .................................................. $400
- Jet cooker, with pump and hydro-heater, Hydro-Thermal ........................................ 400

### Kettles
- Kettle, 10-gal oil, refining and bleaching .............................................................. $100
- Kettle, large, twin-agitator, jacketed, Lee ................................................. 300
- Kettle, variable-speed, twin-agitator, heated (steam), Groen .................................. 100

### Membrane Filtration Units
- Membrane-filtration unit, MPMC ............................................................... $600
- Membrane-filtration unit, North Carolina SRT .................................................. 600

### Mills
- Mill, burr, Mahlkonig ...................................................................................... $100
- Mill, colloid, Chemicolloid Labs ................................................................. 200
- Mill, disc, 12-inch disc, Andritz Sprout-Bauer ............................................ 100
- Mill, disc, with stone plate, Glen Mills ......................................................... 100
- Mill, dry-corn milling system, Witt Corrugation ........................................... 150
- Mill, hammer, Horvick Manufacturing ......................................................... 150
- Mill, hammer, Viking Model C ..................................................................... 150
- Mill, impact, Entoleter .................................................................................. 200
- Mill, impact (comminuting), Fitzpatrick ......................................................... 300
- Mill, lab, Thomas-Wiley ................................................................................ 100
- Mill, microcut grinder, Stephan Machinery Corp. ......................................... 200
- Mill, pellet, California Pellet Mill .................................................................. 200
- Mill, pellet, plastic, Brabender ....................................................................... 100
- Mill, turbo/pin, with dust and powder collectors, Bauermeister ....................... 500
- Mill, ultra-centrifugal, Retsch ......................................................................... 100
- Roller mill, cracking, Blount Ferrell-Ross Lapage ........................................ 200
- Roller mill, flaking, Roskamp ......................................................................... 300
- Roller mill, Lapage cut, Blount Ferrell-Ross Lapage ..................................... 200

### Mixers
- Mixer, blender, Henschel ............................................................................... $100
- Mixer, dough, National .................................................................................... 100
- Mixer, planetary food, Doyon .......................................................................... 100
- Mixer, portable, SPX Lightnin’ Mixer .............................................................. 100
- Mixer, ribbon, Marion Mixer .......................................................................... 100
- Mixer, stand, Kitchen-Aid ............................................................................. 150
- Mixer, tempering drum, rotating, Gilson ....................................................... 100
- Mixer, variable speed gear, Mixco ................................................................ 100
- Mixer, with lifting cart, SPX Lightnin’ Mixer ................................................ 100

### Pelletizers
- Pelletizer, plastic, large, Rieter ...................................................................... $150
- Pelletizer, plastic, small, Scheer Bay ............................................................. 100

### Pumps
- Pump, 1-5 gpm Moyno, Robbins/Myers ....................................................... $150
- Pump, 6-16 gpm, rotary lobe, Waukesha .................................................... 150
- Pump, centrifugal, Mobile ............................................................................. 100
- Pump, flexible impeller, Jabsco ................................................................. 100
- Pump, lobe, explosion-proof, Waukesha ..................................................... 150
- Pump, peristaltic, small, lab ......................................................................... 100
- Pump, peristaltic, medium, wine ................................................................. 100

### Reactors
- Reactor, 3-gal, hastelloy, high-pressure reactor, Fluitron ................................ $500
- Reactor, glass, 20-L, Chemglass .................................................................. 200

### Scales
- Scale, 25-lb, bench, Avery Weigh-Tronix .................................................. $100
- Scale, 100 lb-max, bench, Avery Weigh-Tronix .......................................... 100
- Scale, 100-lb, Avery Weigh-Tronix ............................................................... 100
- Scale, mobile, platform deck, 1,000-lb, Avery Weigh-Tronix ..................... 100

### Screens
- Screen, oscillating with sweep washing system, Kason Vibroscreen .............. $200
- Screen, sifter, small, Sweco ........................................................................... 150
- Screen, sifter, large, Sweco ........................................................................... 150

### Screw Presses
- Screw press, Hander Oil Machinery .............................................................. $200
- Screw press, Komet ....................................................................................... 150
### Soymilk Processing

- Soymilk, extractor, small .................................................. $200
- Soymilk plant with tofu press, automatic, Takai .................. 700

### Tanks

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixing Tank, 500-gal, with agitator, Mueller</td>
<td>$500</td>
</tr>
<tr>
<td>Tank, 70-L, jacketed, with Lightnin’ mixer, Feldmeier</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 50-gal, mobile, with agitator, St. Regis</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 50-gal, mobile, jacketed, with agitator, Cherry Burrell</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 50-gal, mobile, with agitator</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 70-gal, jacketed, Process Storage</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 70-gal, mobile, jacketed, with agitator</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 70-gal, stainless steel</td>
<td>100</td>
</tr>
<tr>
<td>Tank, 80-gal, stainless, with air and electric mixer, Walker</td>
<td>200</td>
</tr>
<tr>
<td>Tank, 200-gal, stainless, with variable speed mixer, Walker</td>
<td>300</td>
</tr>
</tbody>
</table>

### Other Equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler, culinary steam, Lattner</td>
<td>$300</td>
</tr>
<tr>
<td>Chiller</td>
<td>150</td>
</tr>
<tr>
<td>Chromatography unit, Variant</td>
<td>800</td>
</tr>
<tr>
<td>Cooker/conditioner, 3-stack, French Oil Mill Machine</td>
<td>150</td>
</tr>
<tr>
<td>Corn dry degeminator</td>
<td>100</td>
</tr>
<tr>
<td>Crystalize, scraped-surface heat exchanger/margariner, Armfield</td>
<td>500</td>
</tr>
<tr>
<td>Desolventizer toaster, Crown Iron Works ........................................... Call for Quote</td>
<td></td>
</tr>
<tr>
<td>Drum cooler and spray coater, Insta-Pro</td>
<td>100</td>
</tr>
<tr>
<td>Evaporator, single-effect, C.E. Rogers</td>
<td>200</td>
</tr>
<tr>
<td>Filter press, plate and frame, Star Systems</td>
<td>150</td>
</tr>
<tr>
<td>Freezer, reach-in freezer, True-Food</td>
<td>100</td>
</tr>
<tr>
<td>Gravity table, Kamas Westrup</td>
<td>200</td>
</tr>
<tr>
<td>High-pressure reactor, oil hydrogenation</td>
<td>600</td>
</tr>
<tr>
<td>Incubators, Fisher Scientific</td>
<td>100</td>
</tr>
<tr>
<td>Moisture balance, Denver Instruments</td>
<td>100</td>
</tr>
<tr>
<td>Packaging machine, vacuum, modified atmosphere, Koch</td>
<td>150</td>
</tr>
</tbody>
</table>