

FPDL Safety Orientation Manual

The Food Science Department Pilot Plant is one of the finest facilities of its kind in the country. Occupying 10,000 sq. ft. of space, it has capabilities in food handling, thermal processing, chemical and enzyme treatment, concentration, freezing, drying, fermentation and packaging. The Raw Products Facility provides equipment for cleaning, grading and preparation of material from the field as well as controlled storage environments.

Policy

Use of the Pilot Plant and Raw Products facilities is readily available to faculty, staff, students, other department personnel, and industry. In order to ensure maximum safety and the most orderly working environment, access privileges are subject to established authorization and scheduling procedures.

Authorization

1. Each individual must thoroughly read this document).
2. After such, the Safety Instruction Form must be signed and submitted to the Projects & Resources Coordinator. This form must be on file before working in either of these facilities.
3. Every individual must either be thoroughly familiar with or receive instruction on the proper use of equipment they will be using. Faculty are personally responsible to ensure that staff, outside company personnel and/or students are adequately trained in safety procedures and safe operation of equipment.
4. Other specific authorizations include:
 - Only certified forklift operators are allowed to use the forklift
 - Only trained personnel are to operate the overhead crane system.
5. ONLY properly trained Cornell University employees, students, faculty and staff are authorized to utilize the equipment. Vendors and clients are not allowed to operate the equipment.

Scheduling and Access to the Facilities

1. Any activity in the Pilot Plant should be scheduled with the Projects & Resources Coordinator **at least 24hrs. in advance** preferably using Corporate Time software (proxy: **fpdl**). In the Corporate Time program, note the type of product and the people involved as the 'new activity'. Equipment use is on a first-come-first-served basis. Request all necessary equipment needed in 'Notes'. Under 'labels' - the yellow label can be used to indicate that you need assistance either with the process or the equipment.

2. Normal hours for Pilot Plant and Raw Product use are 8 AM to 5 PM. Work should be completed within this time frame. When exceptions are necessary, you must notify either the Pilot Plant manager or Projects & Resources Coordinator of your plans. **At no time may any individual work in these facilities after hours alone.** There must be a second person with you at all times.
3. Try to be somewhat flexible in your plans as occasionally schedules may have to be changed depending on availability of equipment and/or floor space. It is advisable to come to the Pilot Plant the day before to assist with setup.
4. Schedule visitors and/or tours with the Pilot Plant manager in advance so as to be made aware of any potentially dangerous conditions.

Note: In any issue involving personnel safety, the Pilot Plant manager has the authority to deny access to the facilities until the issue is satisfactorily resolved.

Using Services and Equipment

While the Pilot Plant and Raw Products facilities are safe places to work, there are dangers and extreme care is necessary at all times. Be aware of potential hazards.

Do not use any of these services or equipment until you know:

1. How to safely connect them
2. How to safely use them
3. How to safely disconnect them
4. How to safely disassemble, clean, and reassemble them.

Do not start your operation -- if you have any question about the above four points.

Your work may involve use of a variety of services including:

- *cold and hot water,*
- *RO water (reverse osmosis water),* you must see the General Manger before using RO Water as quantities are limited.

WARNING: Avoid spraying water on any motor or electrical outlet.

- *distilled water,* which is located just to the right of the ground floor and the balcony doors of the Pilot Plant;
- *electricity* (110v and 220v, 440v service)

WARNING: Check carefully for any frayed cord or loose connections. If noticed, stop immediately and notify the Pilot Plant manager.

- *compressed air* (40 and 100 psi),
- *vacuum,*

- *culinary steam and medium pressure steam*(50 and 150psi).

The medium pressure steam outlets are coded with a red handle.

WARNING: Steam lines are under high pressure and represent one of the most common dangers in the Pilot Plant. Improper connecting, use, or disconnecting may result in severe burns. Steam kettles, especially, are dangerous because of the various types of kettles available -- steam inlets and outlets can be confused. Before emptying steam kettles filled with hot water, cool thoroughly to prevent burns. ASK before attaching or detaching if unsure!

The manager is available to perform all steam connect and disconnect operations. If, for some reason, Pilot Plant personnel are not available, follow this procedure:

1. While wearing insulated gloves and safety glasses, carefully unscrew the bleeder valve from the cap to release any possible pressure or condensate. Only then can the end-piece on the steam line be removed.
Attach the steam hose to the connector and firmly press down the wing-levers.
2. With the end of the hose directed away from any person, carefully and slowly, open the steam line slightly to allow any residual condensate to disperse.
3. Close the steam valve at the line.
4. Now attach the other end of the hose to the desired piece of equipment, firmly securing the wing-levers.
5. Tie down the wing levers

NOTE: A good practice is to have the steam outlet of the equipment open slightly so that condensate can be released (usually both the inlet and outlet steam valves of a piece of equipment will be left open). Using protective gloves, slowly open the main steam valve at the supply line.

To disconnect a steam hose from a piece of equipment:

With insulated gloves and eye glasses, close the steam valve at the supply line; carefully open the steam inlet and outlet valve on the piece of equipment. Allow the hose to cool before releasing the wing-levers and disconnecting the hose from the equipment and/or steam supply line.

If hose connectors or valve stems leak -- shut off steam and notify Pilot Plant manager immediately.

Completion of the **Equipment Use Sheet** which can be obtained from the Pilot Plant manager is mandatory. Fill out your name or the company's name; the name of the machine and the number of hours

you have used this piece of equipment. This tracking form is not only used for billing purposes but also serves as a machinery maintenance log.

Remember, do not use any of these services or equipment until you know:

1. How to safely connect them
2. How to safely use them
3. How to safely disconnect them
4. How to safely disassemble, clean, and reassemble them.

If you do not know the proper operational procedure or need additional information -- BE SURE TO ASK.

Hazardous Equipment Usage

The use of any equipment which presents a high degree of hazard will require direct authorization from the Pilot Plant manager.

- Retorts require FDA certified operators.
- Use of the forklift in requires a certified operator.
- Use of overhead crane requires a certified operator.

Personal Gear

1. Clothing - Long pants are required in the Pilot Plant. No shorts or skirts. Clothing should be snug, not loose or floppy. Lab coats are undesirable especially when unbuttoned. No loose ties or apron strings.
2. Footwear - Non-skid enclosed shoes or boots; rubber pullover boots are highly recommended. Absolutely no open-toed or open-heel footwear.

Warning: When wet, the floors of the Pilot Plant can be extremely slippery.

3. Hair Coverings - **A hair covering must be worn upon entering** (baseball caps are acceptable). Hair nets are located on or near all interior doors entering the Pilot Plant.
4. Safety Glasses - It is recommended that safety glasses be worn whenever working in the Pilot Plant. They are supplied for you and are located on the safety cabinet.

Full face shields are also available upon request.

5. Ear Plugs - Ear plugs are provided whenever you are working with excessively noisy equipment. If your work will produce high noise levels, post the sign "[Hearing Protection Required](#)" at the entrance to the Pilot Plant. The sign is in the safety cabinet. Ear protection is available at the safety cabinet.

6. Insulated Gloves - Rubberized insulated gloves are in the safety cabinet and should be used whenever you are working with steam or chemicals. Please return these to the cabinet when you are finished using them.
7. Disposable Gloves - Must be used when handling foods that will be consumed. Take care not to cross contaminate.

Hygiene and Other Common Sense Matters

1. Jewelry should not be worn in the Pilot Plant. Rings and watches should be removed.
 2. It is expected that sanitary hygienic practices are followed whenever you are working with food.
 3. Handle food only with clean hands or gloves.
 4. Wash hands thoroughly before returning from the restroom (hands should be under water and scrubbed with soap for a period of 15-60 seconds; rinse well and dry).
 5. There should be no food or drink in the pilot plant area; no chewing gum.
 6. Do not sit on the work tables.
 7. "Lock-in" the casters of any work table or equipment you're using.
- No smoking in any building on the campus.

Chemical Usage

When using chemicals, other than detergents, you must:

1. Have ready access to and follow precautions in Material Safety Data Sheets
2. Notify others in the area of potential hazards.

Properly label every container with the compound(s), concentration, date, and name of person who either prepared it or is using it. Follow the RTK (Right-to-Know) procedure.

Never store chemicals in the Pilot Plant or Raw Products facilities.

In case of a minor spill, a spill response kit is located in the stockroom.

Failure to Follow Safe Practices

Upon failure to observe safe practices an individual will:

1. Be immediately notified by the manager and the incident recorded
2. Upon continued failure, be reported to their direct supervisor
3. Upon further problems, be referred to the department chairman

Personal Injury Accidents

Accidents often happen when doing repetitious jobs or when taking shortcuts or just not paying close attention to the work at hand. Consider the "*what ifs*".

For example,

What if a machine needs to be shut off fast -- where is the on/off switch, where is the electrical plug or the circuit breakers?

What if you need help fast -- is someone nearby, where are the phones, the first aid kit?

Be prepared for an accident **before** something happens.

1. In case of a serious accident call an ambulance immediately - dial (911). Report any injury to the manager of the FPD, Rob Ralyea, 255-7643, rdr10@cornell.edu or Mackenzie Brown 255.8798, mb2269@cornell.edu
2. The first aid kit is next to the door of the pilot plant office. There are also first aid supplies in the safety cabinet.
3. Safety shower and eye wash station are located by each hand sink on the ground floor of the Pilot Plant. On the second floor the eye wash station is located in the hallway.
4. Fire alarm is located next to overhead door control on the first floor and the east exit door on the second floor.
5. Fire extinguishers are located on each floor. Next to overhead door control on the first floor and the east exit door on the second floor.

Food Safety, Processing of Low Acid Foods, Food Storage

Sensory Evaluation Products and Record Keeping

Sensory testing involving human subjects must first be approved by the University Committee of Human Subjects (UCHC). Refer to their Web site for instructions and training requirements.

<http://www.osp.cornell.edu/Compliance/UCHS/homepageUCHS.htm>

Again, use common sense and follow good hygienic practices. Use clean wholesome food. Clean and sanitize the equipment, utensils, and cutting boards. Wear disposable gloves. Be aware of temperature exposure. Clean as you go. Dispose of unwanted or unusable foods properly.

Notify the Pilot Plant manager if you are using a non-certified FDA procedure. Any non-certified process is extremely dangerous and the containers of such products must be clearly marked with a red slash and a 'poison' sign (skull & crossbones). They should be stored in the researcher's lab not in common storage, preferably under lock and key.

Label and date every container that enters the storage rooms clearly and completely. Use permanent markers and labels that adhere well regardless of temperature.

If products are outdated, moldy, rotten, or unwanted - dispose of it properly and thoroughly wash any reusable container.

Products produced for Sensory Evaluation

1. Low acid foods must meet FDA approved methods.
2. Use only food grade additives in products to be consumed.
3. Use disposable gloves when handling food for consumption.
4. See protocol form on pg. 21 of the manual.

Additional Information: For specific details of general food safety, food storage protocol and record keeping refer to pp. 8 & 9 in the *Pilot Plant / Raw Products Safety Manual*.

Clean-up

It is the responsibility of each user to clean their work area, equipment and utensils. Sweep up all solids and discard in trash receptacles **before** hosing down the floor.

Do not wash food down the drain.

Keep everything spotless. There are washing and sanitizing kits (labeled bottles) in carriers located near the sink as well as brushes and scrubbers.

WARNING: Be careful not to spray water onto electric motors and cords.

Each individual should remove their own trash to the dumpster behind the barn (department truck is usually available to assist with this task).

Again, before cleaning a piece of equipment first ascertain that the power is off and it's disconnected from the electricity. Thoroughly wash, scrub, rinse and sanitize equipment. Allow to air dry before reassembling. If knives, blades or other cutting surfaces are exposed, use extreme caution. If possible, cover these areas and post a warning of the potential danger.

General Safety Considerations

Use common sense and work carefully at all times. Try to prevent an accident from happening -- think before you act!

Unplug equipment before cleaning, disassembling and while not in use.

Be very careful with water sprays especially around electricity.

Do not stick hands, fingers or any utensil into any machine while it is operating or even while it is plugged in.

Do not try to catch falling knives or glassware. Don't even try to catch or reposition fruits/vegetables entering running machinery.

Lockout/Tagout Protocol

The lockout/tagout program is designed to prevent the continued use of damaged or malfunctioning equipment. Lockout devices are in the safety cabinet. Each individual is responsible to lockout and tag any piece of equipment he or she believes is unsafe or not operating properly. Steam lockouts consist of a plastic housing closed over the steam valve and padlocked. To lock electrical equipment, enclose the plug in the lockout housing and padlock it. Remember to sign the card and inform the manager.

Miscellaneous Information

Phone numbers:

Mackenzie Brown—255-8798, Resources and Projects Coordinator/Support Technician

Rob Ralyea—255-7643 Pilot Plant Manager

Restrooms – are located on the first floor as well as the mezzanine level

2013-2014 Dept of Food Science Pilot Plant Safety Training Record

I have received and reviewed the Food Processing and Development Laboratory (FPDL) Safety Orientation Manual.

Name

Date