

NORTH DAKOTA STATE UNIVERSITY

DEPARTMENT OF ANIMAL SCIENCES

ANIMAL NUTRITION LABORATORY

Laboratory Safety Orientation & Guidelines for the Animal Sciences Nutrition Lab

Hultz 119/135

Before beginning work in the Nutrition Lab, you must complete and are responsible for the following training available at:

https://www.ndsu.edu/police_safety/annual_notices_and_training/

Baseline Safety Training

Global Harmonization

Hazard Communications Training

Laboratory and Chemical Safety Training Modules 1 through 6

A. Laboratory attire

- ❖ Lab coats are required to be worn when working. Remove your lab coat when leaving the lab area (e.g., office, break room, restroom). Lab coats may be laundered in Hultz Hall in the lab washer and dryer; please let a lab technician know if you spill a reagent on your lab coat (e.g. acid or base) and require it to be laundered.
- ❖ Shorts and short skirts are not permitted in the laboratory while doing hazardous work. Also, wear appropriate shoes for hazardous work; no open-toed or canvas shoes when working at the lab bench.
- ❖ Gloves are to be worn when working with acids, bases, carcinogens, neurotoxins, and biohazardous materials. Always cover open wounds on hands with adhesive bandages. Dust masks are available when dust irritation persists.
- ❖ Choose the proper eye protection for the procedure:
 - Safety glasses or prescription eyewear are appropriate for general bench work.
 - Face shield is used when pouring concentrated acids

B. Work area

- ❖ The laboratories in the Animal Sciences department are very collaborative. Learn who has access to the laboratory. Report any suspicious activity/personnel to the supervisor.
- ❖ Do not work in the laboratory alone during off-hours if hazardous materials will be used.
- ❖ Keep lab crowding and clutter to a minimum.
 - Close cupboard doors.
 - Return reagents to shelves.
 - Have only the notes and books needed at your bench.
 - Leave walkways open when not in use (no boxes on the floor, chairs pushed in knee holes)

No smoking in the building. Food and drink are not permitted in the general lab space; they are allowed only at the desk areas (designated “safe” areas). No storage of food in the chemical refrigerators.

- ❖ Always use absorbent paper to protect the lab bench and to contain spills.
- ❖ Wipe down the lab bench with soap and water when finished.
- ❖ The lab must be locked when it is not occupied (e.g., at lunch time, overnight).
- ❖ Always wash your hands after working in the laboratory.
- ❖ Recycle glass and plastic bottles (room 151; rinse three times and label accordingly). Broken glass should be placed in one of the Broken Glass receptacles dispersed throughout the lab.

C. Chemical handling and storage

- ❖ Read the labels on all reagents before use. They provide information on storage conditions, incompatibilities, human toxicity, and expiration dates. [Material] Safety Data Sheets (MSDS or SDS) are on file (green ring binders by Weigh Room) for chemicals used in the Nutrition Lab. The Merck Index is also a good source of chemical information. Outside
- ❖ Any new chemicals received should be dated and initialed. Fill out and affix a National Fire Protection Association (NFPA) label to the container if there is not one there already. The Global Harmonization System (GHS) is used by suppliers of chemicals, but NDSU uses NFPA labeling in addition to the GHS. You are responsible to be familiar with both labeling systems. An MSDS sheet must be on file for the chemical; if not, obtain an MSDS sheet from the supplier. This includes outside researchers using Nutrition Lab space – you are responsible for making MSDS sheets available to anyone using the space. These MSDS should be stored in a central location on the MSDS cart in the nutrition lab (by the balance room).

- ❖ All reagents should be labeled with chemical ID, date, and initials of the person making the reagent as well as with an NFPA diamond label (blue = health, red = flashpoint, yellow = reactivity, white = specific hazard). Expiration date and unusual storage conditions should be indicated.
- ❖ Remember the “acid to water” rule. When mixing chemicals which combine to produce heat (exothermic reaction) have ice on hand to control the reaction (e.g., making 10 N NaOH).
- ❖ Choose proper storage containers/labware. For example, acetone may be stored in polypropylene containers but not polystyrene or polycarbonate. Cole-Parmer and Nalgene catalogs as well as other companies selling plasticware have chemical resistance tables.
- ❖ Volatile and fume-producing reagents are to be used in the fume hood.
- ❖ Storage: acids, bases, and organics are stored physically apart if possible. Note incompatibilities. No acetic acid with nitric acid, ethylene glycol, or perchloric acid. No perchloric acid by acetic anhydride or by organics, wood, or paper. No acetone by sulfuric acid or nitric acid. No sulfuric acid with chlorates or perchlorates. Also, no more than 4 L of any one chemical can be stored in the laboratory at one time. Any more than this must be stored in a satellite chemical location.
- ❖ Disposal: Do not sewer organics, large quantities of acids or bases, carcinogens/mutagens, or hazardous material. Refer to the North Dakota State University Chemical Hygiene Plan.

D. Instrumentation

You must be trained in the proper use of any laboratory equipment/instrumentation by a Nutrition Lab Technician before being allowed to use/operate it on your own. Always check for fraying cords and odd sounds and smells. These could mean electrical problems and instrumentation malfunction. Scheduling of instrumentation use is a must – let a Nutrition Lab Technician know of dates and times you will be using equipment to ensure availability and proper training.

- ❖ Homogenizers/polytron - homogenize in a well-ventilated area or in a fume hood to prevent buildup of explosive vapors.
- ❖ Centrifugation - choose the correct container for the speed you wish to use. For example, borosilicate glass test tubes will not withstand 10,000 x g, be sure centrifuge is balanced prior to use – if you do not know how to do this please consult a Nutrition Lab Technician.
- ❖ Fume hoods: use when making stock reagents with acids and some organics, or any chemical that is particularly fume-producing. The blower must be on.
- ❖ Shut down lab computers when use is completed. This includes the computer for the microplate reader

F. Safety equipment/first aid

- ❖ Note the location of the eyewashes and safety showers, fire alarm pulls (in the foyers), fire extinguishers, and fire blankets (see safety map). Learn how to operate them. Do not hesitate to call for help when you need it. Visit other laboratories in the building. Learn the location of their safety equipment. Note building exits and escape routes – this information is posted in the laboratory

- ❖ In the event of a building evacuation (fire or other emergency), exit the building via the safest and closest outside door to you and proceed to the Designated Assembly Points. If you exit the front (east) or side (south) doors of the building, go immediately to the doorway of Dunbar Hall (or inside in inclement weather); if you exit by the back (west) door, go immediately to the doorway of Thorson Hall (or inside in inclement weather). Wait for the “all clear” before re-entering the building.
- ❖ In the event of a tornado, move away from the windows and chemical storage areas. Go to Hultz 104 or 124, and if possible, close doors of any open rooms that you pass by. Sit on the floor, and cover your head with coats or blankets. Wait for the “all clear.”
- ❖ Emergency phone: 911. For non-emergency calls dial 9 for an outside line.
- ❖ Report any accident or unsafe condition to the supervisor. A Near Miss Report or an Incident Report available under the Forms tab at https://www.ndsu.edu/police_safety/ may need to be filed. In the event of an accident requiring medical care, notify your immediate supervisor and NDSU’s Claims Management Coordinator, 231-6740. Our medical provider is Sanford Clinic Occupation Medicine, 3838 12th Ave N, Fargo; 701-234-4700. Our after-hours care provider is Sanford Health Emergency Center, 720 4th St. N, Fargo; 701-234-5121.

Additional reading for those working in the Nutrition Laboratory:

North Dakota State University Chemical Hygiene Plan available at
https://www.ndsu.edu/police_safety/environmental_health_and_safety/chemical_safety/.

NDSU Emergency Action Guide: https://www.ndsu.edu/police_safety/emergencymanagement/

NDSU Policy 164 Emergency Procedures:
https://www.ndsu.edu/police_safety/emergencymanagement/.

Laboratory Safety Checklist available under the Forms tab at https://www.ndsu.edu/police_safety/.