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TITLE: General Laboratory Safety Precautions Concerning Mycotoxin Analysis

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PURPOSE:

1. Ensure personnel safety while performing mycotoxin analysis.
2. To ensure that all hazardous waste related to mycotoxin analysis are properly and safely managed, from its generation through handling, storage and disposal.

SCOPE:

The procedures detailed herein apply to all Universidad del Valle de Guatemala personnel, visiting research staff, undergraduate students, exchange program students and dissertation project students working in the analysis of mycotoxins.

GENERIC SAFETY RISKS:

Working with solvents is one of the main hazards that you will face during mycotoxin analysis. Many organic solvents are highly flammable and can form explosive air-vapor mixtures; most organic solvents are harmful or toxic. Failure to handle solvents correctly may result in:

- Skin and eye irritation;
- Skin defatting or dermatitis from prolonged or repeated skin exposure;
- Central nervous system depression;
- Reproductive and fetal effects;
- Chronic toxic effects, such as liver or kidney effects, from skin contact or inhalation of solvent vapors;
- Acutely toxic effects, including blindness and death;
- Flash fires and explosions.

Moreover, all corn samples suspected of being contaminated with mycotoxins must be handled with care, since mycotoxins are potent carcinogenic substances.

RESPONSIBILITIES:

Laboratory supervisors are responsible for ensuring that:

- Laboratory workers have been educated in relevant safety issues regarding the handling of organic solvents, mycotoxin standards and samples.
- Only appropriately trained individuals are allowed to work with organic solvents and mycotoxins.
- Adequately ventilated areas are available for extraction procedures utilizing organic solvents.
- Laboratory workers have the necessary personal protective equipment.
- Laboratory workers are familiar with the protocol in case of emergency.

Laboratory workers are responsible for ensuring that:

- They are satisfied that they have received adequate supervisory guidance/training for a procedure involving use of solvents and mycotoxins.
- They do not undertake a procedure involving solvents and mycotoxins without prior consideration of the hazards involved.
- They are aware of appropriate emergency procedures, the location of spill kits and their use before working with solvents and mycotoxins.
- They use due diligence and specified personal protective equipment/facilities when working with solvents and mycotoxins.

MATERIALS AND EQUIPMENT

- **EYE PROTECTION.** Eye protection is necessary for most solvent operations and should be mandatory in the research laboratory. Laboratory workers must wear safety glasses when working with solvents and mycotoxins.
- **RESPIRATOR/PROTECTIVE MASK.** Depending on the planned use of solvents and assessed risks, a chemical cartridge respirator may be required. When grinding the corn samples a respirator/protective mask must be worn to avoid inhalation of dust potentially contaminated with mycotoxins.
- **GLOVES.** Gloves shall be worn whenever organic solvents and mycotoxins are handled. Lightweight PVC gloves are sufficient to prevent incidental contact. Heavier nitrile gloves are required for cleaning up spills and are required whenever hands or fingers must be immersed in solvent. Gloves should be removed and left to ventilate in a fumehood when solvent is spilled on the gloves.
- **PROTECTIVE CLOTHING.** A lab coat is required for active bench work with solvents and mycotoxins, and when disposing of solvents in the waste containers. Standard polyester lab coats are suitable for protection against small laboratory splashes.
- **FUMEHOODS.** A fume hood should be used when dispensing solvents from the containers; do not dispense flammable solvent in the presence of apparatus that is hot or that may generate a spark.
- **SPILL MATERIALS.** Spill kits should be available to deal with laboratory spillages. Paper towels or adsorbent materials such as spill control pillows, and chemical resistant gloves should also be available.
- **HYPOCHLORITE BLEACH SOLUTIONS:** Bleach solutions should be available to decontaminate the workspace, mycotoxin spills and every material used after working with mycotoxins.
- **WASTE SOLVENT CONTAINERS.** Appropriate containers to collect liquid waste from mycotoxin extraction should be available. The liquid (i.e. organic solvent and water) must be compatible with container material (e.g. acids must not be placed in a metal container).