Meat Science & Animal Biologics Discovery
UNIVERSITY OF WISCONSIN–MADISON

Food Safety
Features and Capabilities

The Meat Science & Animal Biologics Discovery (MSABD) Food Safety Lab (also referred to as Biosafety Level 2 or BSL2) space will provide facilities and a wealth of meat science and food microbiology expertise in microbial food safety, formulation safety, and challenge studies in meat and processing collaborating with and leveraging the Food Research Institute (https://fri.wisc.edu/) and their initiatives.

We offer facility use, fee-for-service, and sponsored research options to corporate, governmental, non-governmental, and academic organizations. Facility use refers to a project conducted by the client company with company employees in BSL2 space with MSABD- or client-supplied equipment. Fee-for-service refers to a client-supplied project or analytical request that is completed by MSABD staff using MSABD- or client-supplied equipment. Hybrids of these two options are available. Sponsored research refers to a client-funded project that involves intellectual input by UW-Madison faculty and/or staff.

The MSABD-BSL2 facility offers the ability for all microbiology functions to occur within a single building with a fully functional microbiology wet-lab for microbial laboratory work (plating, sampling, counting, etc.) and processing spaces featuring building and equipment designs that mimic and exceed current industry practices and standards.

MSABD-BSL2 program areas of focus will include:

- Further processed meat (fresh through RTE) food safety validation including:
  - Effect of antimicrobial ingredients
  - Stabilization strategies (cooling)
  - Processing parameters for lethality
  - Fermented sausages and other dried meat products
- Equipment sanitation evaluation/validation
- Pre- and Post-harvest strategies on food safety
- Developing surrogates for validation studies
- BSL2 pathogens: *Clostridium perfringens, Listeria monocytogenes, Staphylococcus aureus, Bacillus cereus, Salmonella,* Shiga-toxin producing *E. coli* (e.g. O157:H7)

The MSABD-BSL2 microbiology laboratory includes essential equipment and safety procedures to conduct food challenge studies to mimic in-process and post-process routes of contamination:

- Micro wet lab equipment: Biological safety cabinet, chemical fume hood, biocontainment centrifuge, microscope, homogenizers, equipment for proximate analysis (moisture, pH, salt, water activity).
- Autoclave capability.
- -20C and -80C sample freezers.
- Incubators capable of storage temperatures from -2C to +60C.
- Capability to work with BSL-2 pathogens of concern to meat and protein processors:
    - *Clostridium perfringens*
    - *Listeria monocytogenes*
    - *Staphylococcus aureus*
    - *Bacillus cereus*
    - *Salmonella*
    - Shiga-toxin producing *E. coli* (e.g. O157:H7)

The MSABD-BLS2 Processing Plant includes equipment dedicated for inoculated-pack studies with BSL-2 pathogens as well as utilities (120-480V electricity, steam, carbon dioxide, compressed air, etc.) to support equipment brought into the facility for testing purposes/studies.

- Modern meat processing equipment is available for up to 500 lb batch sizes supporting processes for manufacture of whole muscle and comminuted further processed meat products including:
    - Processing: Grinder, mixers, injector, tumbler, vacuum filler, bowl chopper, etc.
    - Thermal processing: Two one-truck smokehouses (Alkar and Kerres) equipped with natural and liquid smoke capabilities, impingement oven, kettles, griddle, BBQ smoker, grill combi-oven (convection/steam), etc.
    - Post-thermal processing: Intensive chilling unit, vacuum packager, etc.

The MSABD-BSL2 Special features

- An isolatable de-contamination room is available for decontaminating equipment brought in for testing.
- Animal harvest capability (small scale) for BSL2 exposed/infected animals.
- Process flow and facilities to support and shower-in/out activities.