

Nutriceutical Formulation



Located in the Chenoweth Laboratory the Nutriceutical Formulation facility houses equipment for isolation of bioactive food components, production of delivery systems such as emulsions and powders and several food processing operations including concentration by reverse osmosis, ultrahigh and HTST pasteurization, spray drying. Instruments are available to characterize liquid and dried delivery systems and test their biological efficacy. Space is also available for standard food production operations.

The facility accepts samples and will perform requested analysis. We offer training to users who want to conduct their experiments independently. We charge a fee for a service for both internal and external researchers, academic or industry based. Following an initial consultation, training and setting up of experiments is arranged through the director.

ACCESS

To request access, training, or additional information please contact David Prodanas at dprodana@foodsci.umass.edu.

Our rates are competitive and tiered based on needs and usage. Visit our website at umass.edu/ials/nutriceutical-formulation for current listing.

TRAINING

Training for new users consists of:

- lab safety training,
- operation of the instrument and associated software,
- use of data analysis software,
- exporting or presenting data,
- clean up and shutdown of the instrumentation.

Once the training is complete, researchers may schedule their experiments through the director of Nutriceutical Formulation (David Prodanas) or online through FOM (Facilities Online Manager) at fom.umass.edu/fom

UMassAmherst | Core Facilities

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PARTNER WITH US!

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Nutriceutical Formulation

Institute for Applied Life Sciences
University of Massachusetts Amherst



Isolates and Concentrates
Bioactives, Ultra-High
Pasteurization and Agitating
Retort, Thermal Processing,
Spray and Freeze Drying,
Emulsion System

Revision (08/08/18)

RESEARCH CAPABILITIES

Equipment for isolation of bioactive food components, production of delivery systems such as emulsions and powders and several food processing operations including concentration by reverse osmosis, ultrahigh and HTST pasteurization, spray drying. Instruments are available to characterize liquid and dried delivery systems and test their biological efficacy. Space is also available for standard food production operations.

Bioactives Isolation/Concentration:

- Supercritical CO² extraction
- Preparative HPLC with Mass Spectroscopy
- Reverse osmosis/ultrafiltration unit

Delivery System Production:

- UltraHigh/High Temperature, Short-Time pasteurization unit
- Agitating retort
- Freeze dryer
- Nano-crystallization unit (CR5 PureNano Microfluidizers)
- Pilot plant spray dryer and agglomeration system

Delivery Systems Characterization:

- Powder laser diffraction unit
- Gas sorption surface area analysis
- Polymer characterization HPLC
- Colonic fermenter

EQUIPMENT



Pilot Plant Agglomeration System

Pilot Plant Agglomeration System

This GEA system allows for spray drying and agglomeration to produce powders from food and bioactive delivery systems.

What Makes Us Unique

- Facility gives opportunity to isolate, concentrate and further process food components.
- Small-scale equipment allows for testing multiple small batches for process development.
- Processing can be done on any food and non-food products, as long as ingredients are GRAS.
- Opportunities to hire students to help or continue testing.



Agitating Retort

Agitating Retort

A pilot scale retort for sterilization of flexible pouches.

UHT/HTST Pasteurization Unit

The Microthermics system allows for both High-Temperature Short Time and UltraHigh Temperature pasteurization and aseptic filling.

Preparative HPLC with Mass Spectroscopy

The Shimadzu system can be used for preparative scale isolation and identification of bioactive using standard HPLC techniques.

Laser Diffraction Particle Size Analyzer

Conducts analysis of physical characteristics of powders.

Size Exclusion Chromatography

HPLC technique to characterize biopolymers.

Nano Crystillization Units

Homogenization technique that can be used to produce nanocrystals for food and pharma applications.

Colonic Fermenter

A model colonic microbial model system that can be used to test the metabolic fates of nutrients and pharmaceuticals.



Freeze Drying System

Freeze Drying System

A small scale lyophilization system for food grade components.

Supercritical Fluid System

A carbon dioxide method for the clean isolation of bioactive compounds from biological materials.

Gas Absorption Analyzer

Fully automated, high vacuum, manometric gas sorption analyzer capable of analyzing surface area, pore size distribution, pore volume and isothermal heats of adsorption using a variety of coolants and adsorbates for a wide variety of sample types.



Reverse Osmosis Pilot Plant Ultrafiltration Unit

Reverse Osmosis Pilot Plant Ultrafiltration Unit

A technique for the removal of water and small molecular weight compounds from aqueous systems.

MASSACHUSETTS
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A significant portion of core equipment has been purchased through MLSC grant funding support.