USDA

Western Regional Research Center

ARS

THE PILOT PLANTS

Industrial Products

Biobased Products/Biofuels

Food Processing

The Pilot plants at the Western Regional Research Center in Albany, California encompass an acre of specialized facilities that have nurtured the success of many research projects during the Center's 65 year history. These are some examples:

Criteria for optimized conditions for frozen foods Time-Temperature Tolerance (T-TT) studies;

Technology for individual quick blanch (IQB) and vibratory spiral blanching;

Technologies for food dehydration and concentration (foam-mat dehydration, dehydrofreezing, Wurling evaporator, and belt-trough drier);

Chemical and mechanical peeling and cleaning of grains (bulgur), potatoes, tomatoes;

Bulk chemical and mechanical fractionation of alfalfa leaf protein and carotene concentrate;

Fermentation technologies to utilize waste crops and crop components for fuels and novel products;

Fermentor designs for biofuel conversion of field wastes on mobile platforms,

Extrusion and advanced processing technologies for healthy fruit-and vegetable-based convenience foods;

Physical and solvent refining of citrus byproduct phytonutrient chemicals to combat diseases;

Formulation and application of edible coatings to preserve lightly-processed fruits and vegetables;

Physical and solvent fractionation of cereals and cereal brans and other cholesterol-lowering foods to increase utilization in the diet; develop biobased products;

Unique biorefinery prefermentation concepts for conversion of crops and residues to biofuels; and

X-ray based recognition of pest-contaminated contraband, sorting methods for aflatoxin, other toxins and insects in almonds, pistachios, and other products.

Resources:

Specifically defined areas are available for safe and confidential processing of agricultural crops and marine products leading to edible food products and non-food biobased products and fuels. The space is flexible allowing use of modular equipment as well as the assembly of coordinated process sequences. The pilot labs are equipped with process equipment representing most important unit operations needed for foods and crop conversion and component separation.

Partnerships:

We are eager to explore new partnerships that would make use of the WRRC Pilot Plants in such areas as development of new biobased products, biofuels and bioenergy from agricultural products/byproducts; new healthy food forms utilizing fruits, vegetables, and cereal grains; and water and energy-efficient new methods for food processing and preservation. Partnerships may take the form of Cooperative Research and Development Agreements, Trusts, and Reimbusables.

Future:

In order to improve the R&D Facility to meet present and future needs, a multiphase modernization was initiated by ARS in 1997. Phases 1 and 2, which addressed major parts of the area used primarily for biobased product and biofuel research, were completed in 2005. Phase 3a modernization, which will include additional biofuel research capability as well as upgrades to the Food Processing laboratory and its extrusion facilities, is expected to be completed in 2008. The modernized facility will be home to research involving 70 or more Agricultural Research Service scientists and scientific support staff, as well as industry Cooperative Research and Develelpment Agreement partners and University collaborators, many of whom are already using the facility as modernization proceeds.

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Process Equipment Supported Capabilities for Food and Industrial Applications

Ambient and Heated Mixing
Atmospheric and Vaccuum Canning
Batch and Continuous Centrifugation
Blanching
Coating
Comminuting
Compression molding
Culinary Steam
Cutting
Emulsifying
Extrusion (single and double screw)
Fermentation
Fiber Spinning
Filtration: (physical, ultrafiltration, reverse osmosis)
Freeze Drying
Freezing
Heat Transfer
Homogenizing / Emulsification
Milling
Pasteurizing
Peeling
Plastics molding and extrusion
Puffing
Reverse Osmosis
Screen Separation
Size Reduction
Solvent Extraction
Solvent Processing space.
Spray Drying
Spray Drying
Ultra Filtration
Ultrasonic Treatment
Vacuum Evaporation

Solvent Processing Space

Full Range of Materials Testing Instrumentation

Working space physical overhead varies from one to four stories.
Research bays may be compartmentalized for confidentiality.
An acre (45,000 ft^2) of total floor space.

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