Food Science and Technology
Ph.D. Program

www.umes.edu/fdst
Overview  The Food Science and Technology Center is a state-of-the-art facility designed to fulfill research, teaching, and outreach missions of our Land Grant University. At the Center, faculty teach future scientists, train and work collaboratively with the food industry and faculty at other universities, and provide educational programs with allied state and federal agencies. The Center houses the Ph.D. program in Food Science and Technology and the UMES/ARS Center of Excellence Food Safety Program. Research, education, and extension programs focus on the safety and quality of foods, including formulating new or modified foods that meet the needs of consumers and industry, developing innovative processing methods, and predicting existing or potential conditions that compromise food safety. Special emphasis is placed on poultry, seafood, produce, and small farm animals. Some teaching and research programs focus on Food Defense, a critical national priority. Such programs relate to agricultural sustainability, food safety, and protecting biodiversity.

Facilities  This 37,250 square foot facility contains laboratories for: the quantification and identification of pathogenic and spoilage microorganisms; research in food preparation and handling, product testing, and product development/enhancement; food composition analysis and research in food safety, food quality, and product shelf life; process development and research in food handling and packaging; and isolation and characterization of microorganisms at the genetic level.

An animal exhibition hall is also available for unloading, housing, and short-term maintenance of animals for use in teaching, research, and demonstration. Other facilities include frozen storage, refrigerated handling and storage, an animal room for growing chickens, lecture and demonstration rooms, offices and conference spaces, a library, and a computer laboratory.

For more information: (410) 651-8497 or www.umes.edu/fdst
Food Safety

Research, teaching and extension efforts combine to ensure the safety and quality of foods important to our region. Pathogens commonly studied in the labs include *Salmonella*, *Campylobacter*, *Listeria*, *Vibrio* and *E. coli*. Research projects are designed to better understand growth, survival or death of these pathogens under various time, temperature and other processing conditions. This leads to the development of models which are able to predict behavior of pathogens under various processing conditions. Such tools are useful in developing procedures or formulations that reduce or eliminate the presence of pathogens in food products. Other projects conducted at the Food Science and Technology Center are designed to characterize antibiotic-resistant *Salmonella* spp. isolated from chicken carcasses, and to reveal the mechanism of pathogen transmission and location of pathogens on poultry carcasses during processing.

Little is known about the seasonal distribution of *Vibrio parahaemolyticus*, a pathogen frequently associated with oysters and Chesapeake Bay seawater. Projects analyzing oyster and water samples throughout the year are providing information necessary to ensure the safety of this important shellfish.

Assistance is provided to small seafood processors in Maryland by coordinating and executing the Maryland Crabmeat Quality Assurance Program which has now been conducted for over twelve years. Training programs resulted in documented improvements in the safety of regional seafood and poultry products. Educational programs assist the regional food industry to stay current with constantly emerging policies and regulations on food safety and food defense.

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The Food Science and Technology Center is equipped to assist companies in product development or conduct research leading to the value-added processing of underused raw materials or processing wastes. A sensory evaluation laboratory located in the Center is used to conduct taste tests on fish, poultry and red meat products. Various analyses are performed for a range of products. Other projects support the application of new packaging systems as well as development of product formulations and processing methods for novel products. For example, the Maryland seafood industry faces an increasingly competitive global marketplace, but is composed of numerous small companies that lack dedicated departments or resources for the development of new packaging concepts or processing methods. The Center hosts workshops for processors as well as restaurant management and employees to teach not only safe handling methods but also strategies for the optimal utilization of seafood, especially for locally harvested and produced seafood products. All these activities strengthen the economic outlook for the regional food industry.

A new project is underway to utilize surplus watermelons, which are not currently sold on the fresh produce market, for processing into juice, fermented juice, or wine and snacks. Novel processing technology will be applied to produce safe, high quality products that sustain healthy lifestyles. Another project investigates the availability of edible seaweeds in Delmarva bay areas and determines their nutritional composition. Data generated provide information for potential utilization of edible seaweeds for niche markets.

An emerging project supports the utilization of grains or crops to develop bio-based energy technologies for economic diversification of farmers and rural communities and to assist the nation to move more toward energy independence.

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