Getting Innovation Down to a Science

LINDSEY COBLENTZ, Associate Editor, Food Manufacturing

The National Center for Food Safety and Technology (NCFST) at the Illinois Institute of Technology (IIT) has functioned as a scientific collaboration between the university, the food industry and the Food and Drug Administration (FDA) since it was established in 1988. NCFST's unique relationship with the FDA has allowed the center to conduct state-of-the-art food safety research, an aspect of the industry that continues to grow in importance, especially as the FDA continues its implementation of the Food Safety Modernization Act (FSMA).

An Institute Is Born

Throughout its history, the center evolved from its initial concentration on improving food safety to a broadened scope including nutrition studies and food-processing innovation. Realizing NCFST's expanded focus, Dr. Robert E. Brackett, IIT Vice President and Director of IFSH, opened discussions with the center's board and university administration to determine how best to utilize NCFST's expanded research tools.

"I saw a great national need to bring to the university and the country more core expertise in food processing, especially in the area of developing innovative new processes that promoted food safety and health," Brackett says. "That was a vacuum in the U.S., and there wasn't one place where the food industry and government could come to get that core expertise."

The idea of elevating NCFST to “institute” status was born, and the change was approved by the IIT Executive Committee on December 8, 2010. As vice president and director, Brackett was charged with putting together a transition team of staff and faculty to establish the center as an institute within IIT. The group’s first task was to decide on a name change that better reflected the new institute’s expanded activities. After gathering input from the Executive Advisory Board, FDA partners and lead staff, the new entity was named the Institute for Food Safety and Health.

Once IFSH was formed, NCFST became its own entity within the organization, with its original cooperative agreement between IIT and the FDA remaining in place.

ISFH held its inaugural launch event on April 11, 2011, announcing NCFST’s transition to a principal operating center within the institute, along with three additional area-specific centers: the Center for Nutrition Research, the Center for Processing Innovation and the Center for Specialty Programs. Together, these centers allow IFSH to offer food companies a comprehensive research facility that offers knowledge and applications throughout the entire spectrum of the food industry, from food safety and health promotion to processing and packaging systems.

A Unique Relationship

Today IFSH is the only location in the U.S. where an entire FDA division works onsite. Brackett says this gives the institute an advantage over other food research facilities. “IIT food scientists and food companies can work with the FDA scientists collaboratively to come up with food safety and nutrition solutions that have a positive impact on applications and regulations that promote public health outcomes.”

As part of the IIT-FDA partnership, NCFST focuses on a variety of collaborative projects with the FDA’s Center for Food Safety and Applied Nutrition (CFSAN) division, including research in the fields of microbiology, chemical constituents, allergens, food processing, packaging, methods validation and nutrition.

IFSH plans to play an important role in promoting national food safety as the FDA begins to implement FSMA. “On the educational side, our organization’s role is to help small- and mid-sized companies understand from a technical point of view how they can comply with FSMA,” Brackett says.

According to Brackett, the institute anticipates helping food companies determine how to validate their processes, as well as the development of newly required food safety plans. Possible training programs may also be developed as FSMA guidance and mandates continue to be implemented.

Brackett anticipates FSMA will touch every aspect of the institute. NCFST and the Center for Processing Innovation will assist with the FSMA’s focus on risk assessment as the centers work to determine how food-borne pathogens grow and survive in order to develop new process controls and technologies to help improve food safety.

The Center for Specialty Programs features a proficiency testing program through which government and private labs can be tested for compliance with the new FDA mandate to establish accredited laboratories. IFSH anticipates that the Center for Nutrition Research will be impacted by the FSMA as well, as the unit works to ensure microbial inactivation of pathogens while maintaining nutrition content.

First-Class Facilities

State-of-the-art working facilities at IFSH create an ideal environment for developing new processing technologies, and researching the latest industry trends and solutions. Food companies and allied industries, which pay annual dues as members of IFSH, are offered priority use of the facilities. Currently, the institute has more than 50 members, including many large names, such as Kraft Foods, Hormel and General Mills.

The Center for Processing Innovation features a biosafety level 3 (BSL-3) laboratory and biocontainment plant, high-pressure processing (HPP) bay, and a GMP pilot plant and kitchen area. Researchers at this center have experience in a variety of industry areas, including validation of aseptic processing and novel pathogen reduction technologies, and HPP technology and related methods for food preservation and validation of sanitation processes.

The BSL-3 facility is a particularly unique feature at the institute, and Brackett anticipates high demand for use of the laboratory. “The BSL-3 is going to be vitally important for companies in validating their processes in compliance with FSMA provisions over the next 18 to 36 months of implementation.”

The lab features full-scale equipment available to the institute’s member companies to test cleaning methods and other preventive process controls in a real-world production environment. An attached lab ensures the process remains contained in one building specially designed for work with large amounts of hazardous pathogens.

The biosafety level 2 (BSL-2) Processing Innovation Laboratory functions as a center for the development of new processing and process control technologies. Members of IFSH are offered use of the GMP processing area, an FDA-certified pilot plant suited for creating new formulations and testing new processes before actual production begins. “The main pilot plant enables us to scale up new innovation processes or to provide hands-on training on how to use processing equipment,” Brackett says.

The Center for Nutrition Research features a variety of chemical laboratories geared towards nutrition analysis. Scientists study nutrient properties, obesity and related diseases, and child nutrition by determining the health benefits of foods and food components.

The newly renovated 1,000-square-foot Applied Chemistry Lab at the Center for Nutrition Research houses analytical equipment, such as a rapid resolution liquid

chromatograph and various spectrometers, for studying the effect of food compounds, as well as food contaminants, such as pesticides and heavy metals. The center also houses the Nutrition and Biochemistry Laboratory, Analytical Chemistry Laboratory and the Clinical Nutrition Research Center.

A Future of Collaboration & Innovation

As it looks toward the future, IFSH plants to continue expanding its technological and research capabilities. The institute has already launched a new research project thanks to a $25 million collaborative grant from the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA).

The grant will fund a research team led by North Carolina University that will establish the USDA-NIFA Food Virology Collaborative. The collaborative will study human noroviruses across the food supply chain in an effort to help reduce the number of virus-related food-borne illnesses.

IFSH plans to continue advancing its technological capabilities for both the food industry and the educational realm. IIT as a whole is currently working to increase its university technology, video conferencing and distance learning to reach a broader audience.

Brackett says IFSH plans to play a role in that university-wide goal as well. “We will be working on developing distance learning portals that will reach more food industry professionals than ever before with technical assistance and educational opportunities.”

Through its comprehensive network of research centers, IFSH stands to be an industry leader in processing technologies, food safety research and nutrition studies for years to come. The institute's unique relationship with the FDA and other regulatory agencies, as well as a knowledgeable staff of scientists, will help IFSH stay true to its tagline of “Innovation through Collaboration.”

For more information, please visit www.iit.edu/ifsh [1].

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