

# Cornell Food Science Extension Programs 2019 Annual Report





*Farm to fork.*

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# Highlighting 2019

“Extension work is not exhortation ... [it] is a plain, earnest, and continuous effort to meet the needs of the people on their own farms and in the localities.”

*Liberty Hyde Bailey*

**We are proud** to chair a food science department whose extension teams strive to meet the technical needs of food producers in our state and our nation, ranging from small entrepreneurs to large companies, to ensure a safe, high quality food supply. Even a partial list of their activities is remarkable: The Cornell Craft Brewing Institute (CCBI) is developing new programming and analytical testing services for brewers, winemakers, and other producers; our Dairy Foods Extension Team is providing over 30 workshops on topics from artisanal cheese to dairy safety; the Produce Safety Alliance (PSA) staff is advising farmers, large and small, on meeting federal regulations; the National Good Agricultural Practices (GAPs) program is developing training materials for farmworkers; our Institute for Food Safety (IFS@CU) is launching online courses in Good Manufacturing Practices for food producers; and our Food Venture Center (CFVC), in its 31st year of operation, is providing consultation to over 500 food producers for the creation of over 2,000 products. We hope you enjoy reading about their efforts – earnest, continuous, and anything but plain – as much as we did!

Sincerely,



**Carmen I. Moraru**  
Professor and Chair  
Department of Food Science  
Cornell University



**Gavin Sacks**  
Professor and Associate Chair  
Department of Food Science  
Cornell University



## Accomplishments

- The Department of Food Science celebrated the naming of the 3M Food Safety and Quality Lab and its renewal of a five-year partnership between CALS and 3M (pictured above).
- The CFVC developed a course to inform small food processors about safe food preservation practices and FSMA requirements. The course was piloted for about 100 stakeholders from underserved regional populations.
- The CFVC continued to expand the outreach of its services in 2019, completing a total of 2,532 requests for services and issuing 2,232 scheduled processes.
- The Dairy Foods Extension certificate program had twenty graduates in 2019, their largest class of students since the program began in 2012. Those individuals completed a four-course track to earn their certificates.
- Within two years of launching the IFS@CU's Online Good Manufacturing Practices Part 117 Course, more than 1,000 participants have completed it.
- The PSA achieved a major milestone in training and outreach – over 50,000 individuals have attended the PSA Grower Training Course, domestically and internationally!

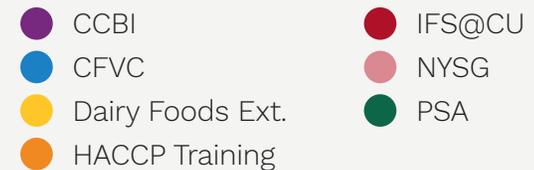
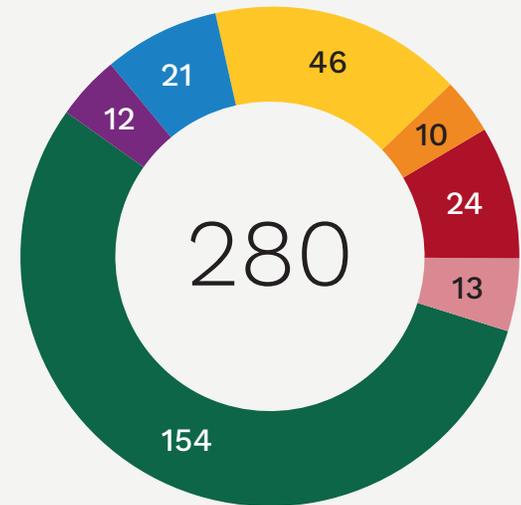
# Trainings & Events

**Cornell Food Science Extension Programs** integrate research and outreach education in areas related to food safety, food production and the principles of food science. Understanding the participants and elements of food systems, we provide farmers, business owners, and industry partners with support and knowledge essential for growth and success in food production, from *farm to fork*.

Our programs enhance the quality and safety of food and beverage production by offering a range of trainings and workshops from on-farm food safety practices to proper food and beverage processing. Examples of these trainings and workshops include Good Agricultural Practices (GAPs), Better Process Control School (BPCS), Good Manufacturing Practices (GMPs), Hazard Analysis Critical Control Points (HACCP) and Safe Quality Food (SQF) Certification.

Food Science Extension hosted or participated in 280 meetings, trainings, workshops, demonstrations and programs last year. Our extension professionals delivered over 66,000 hours of training. More than 13,750 stakeholders attended these events in 2019. In addition, Food Science Extension provided services such as laboratory analysis and shelf life studies, pilot testing to develop new products and processes to scale-up production, process authority evaluation and validation, and regulatory guidance.

## Events Hosted/Delivered, 2019



## Hours of Training Delivered, 2019

<b>7,765</b>	Cornell Craft Beverage Institute
<b>5,765</b>	Cornell Food Venture Center
<b>16,436</b>	Dairy Foods Extension
<b>4,472</b>	HACCP Training
<b>8,536</b>	Institute for Food Safety at CU
<b>10,897</b>	New York Sea Grant
<b>12,256</b>	Produce Safety Alliance
<b>66,127</b>	<b>Total Hours</b>

# Institute for Food Safety at Cornell University

**The Institute for Food Safety at Cornell University (IFS@CU)** takes a comprehensive approach to providing training and conducting applied research to support the food industry in reducing foodborne illness risks. With expertise in fresh produce, dairy, juice and food processing, the IFS@CU aids the food industry in complying with federal regulatory requirements in the Food Safety Modernization Act (FSMA) and addresses food safety challenges that stretch from farms to consumers' tables.

This data represents training activities conducted by the IFS@CU team, as a cumulative total since June 2017.

 **GMPs Part 117 Online Course**  
1,265 Participants

 **FD152 Course**  
71 Participants



Top: The IFS@CU utilizes an instructional approach that incorporates the delivery of informative content with hands-on activities to create a blended learning experience for participants at in person workshops and courses.

Bottom: In 2019, the IFS@CU participated in more than eight community and outreach events, educating stakeholders about food safety practices as well as sharing resources, services and trainings available from IFS@CU collaborating programs.

# Produce Safety Alliance

**The Produce Safety Alliance** (PSA) provides fundamental, science-based, on-farm food safety knowledge to fruit and vegetable growers, packers, educators, regulatory personnel, and others interested in the safety of fresh produce.

Established in 2010, the PSA is a collaboration between Cornell University, FDA, and USDA to prepare produce growers to meet the regulatory requirements included in the FDA's FSMA Produce Safety Rule. Through the development of novel educational materials and training approaches, the PSA also provides technical assistance to growers and trainers.

This data represents training activities conducted by the PSA team, along with their national and international cadre of trainers, as a cumulative total since September 2016.



**2,195 Grower Training Courses Offered**

**51,768 Participants**



**92 Train-The-Trainer Courses Offered**

**2,938 Participants**



Top: As implementation of the FSMA Produce Safety Rule becomes a reality for many farms, advanced hands-on workshop activities such as water testing, cleaning and sanitation practices, and compost management enable educators to better provide technical assistance to produce growers.

Bottom: Classroom training, paired with active learning opportunities, helps to engage course attendees in produce safety and reinforce the science supporting best practices.

# Dairy Foods Extension

**Dairy Foods Extension's** mission is to provide comprehensive training and consulting to the dairy industry to assist in the sustainable manufacture of safe, quality dairy products.

Courses provide training to dairy processors in vital topics including milk and dairy product quality and safety, basic dairy microbiology, GMPs, unit operations, sanitation, food safety plans, audits, and state and federal regulations. Our program offers an extensive set of workshops that lead towards certificates in fluid milk production, cheese production, membrane filtration and separation, and production of other cultured dairy products.



**46 Courses Offered**

**16,436 Training Hours**



**986 Participants**



Top: Workshop participants conduct environmental swabbing in the Cornell Dairy Plant during a Pathogen Environmental Monitoring workshop.

Bottom: Instructors and participants work together to make cheese in the Science of Cheese Workshop.

# Cornell Food Venture Center

**Cornell Food Venture Center** (CFVC) provides comprehensive assistance to new and established food entrepreneurs, processors and farmers to enhance food safety, satisfy regulatory compliance and promote economic development. Services include scheduled process and process review validation for processed foods, laboratory services and consultation for product safety and stability, reduced oxygen packaging hazard analysis and validation, heat penetration studies, food classification letters, and training. The CFVC Pilot Plant assists entrepreneurs, small business owners, and established food companies with product development and process scale-up efforts in a newly renovated facility with state-of-the-art technology and equipment.



**754 Clients/Businesses Assisted by CFVC**

**30 Clients/Businesses Assisted by CFVC Pilot Plant**



**7 Food Safety & Processing Training Courses Offered**

**226 Participants**



**2,232 Scheduled Processes for Value-Added Food Products**

**34 Products & Processes Developed in CFVC Pilot Plant**



**86 Tours**

**515 Participants**



Top: Small-scale entrepreneurs consult with the CFVC on how to develop viable processes on a scalable level to manufacture and market safe and stable food products.

Bottom: Graduate students use the CFVC Pilot Plant to press apple cider, which is pasteurized by UV and used as a fundraising event for scholarships aimed at funding local high school students interested in pursuing an agricultural business career.

# Cornell Craft Beverage Institute: Brewing & Distilled Spirits

**The Brewing & Distilled Spirits** extension program, part of Cornell Craft Beverage Institute (CCBI), supports craft producers through quality control programs and also helps to promote New York breweries. The lab and pilot facilities provide product evaluation and pilot testing on industrial-scale equipment to improve processing, product composition and quality.

The Cornell Vinification & Brewing Technology Laboratory is a pilot plant dedicated to research and extension outreach in wine, cider, spirits, and brewing sciences. Craft beverage services include laboratory analyses, regulatory guidance and troubleshooting for fermented beverages, fruit and hop analysis, and alternative beverage industries.



**12 Courses Offered in  
Craft Beverage Production**



**172 Participants**



Top: Hops analysis plays an important role in supporting the NY brewing supply chain.

Bottom: Brewing Extension Associate Kaylyn Kirkpatrick, Senior Enology Extension Associate Chris Gerling, and Associate Professor Anna Katharine Mansfield toast the creation of the Cornell Craft Beverage Institute.

# Cornell Craft Beverage Institute: Wine & Cider

**The Wine & Cider** extension program (part of CCBI) provides resources to help winemakers and cider makers with important decisions from fruit sourcing and fermentation techniques to quality assurance and regulatory compliance. Cornell staff translate research, tools, and extension support into research-based innovations and technologies that benefit growers, producers and consumers.

In addition to training and workshops, the extension program also offers services through the Cornell Craft Beverage Analysis Lab. Services include chemical, microbiological and sensory analyses of juice, wine, cider, beer, and distillates for quality assurance, troubleshooting and regulatory compliance.



**4,450 Samples  
Analyzed from Cornell  
Research & Extension Groups**



**2,196 Samples  
Analyzed from Craft  
Beverage Businesses**



Top: Senior Enology Extension Associate Chris Gerling punches down the cap on a fermenting research wine in the Cornell Vinification & Brewing Technology Laboratory.

Bottom: Technician Molly Cappiello tests samples for titratable acidity, one of the many analyses available in the Cornell Craft Beverage Analysis Lab.

# Food Microbiology & High Pressure Processing

**Cornell's Food Microbiology Laboratory** specializes in evaluating the microbial safety of fruit and vegetable processed foods and beverages. In addition to analytical services, the team provides training and assistance to the food and beverage industries as well as state and federal inspectors. The High Pressure Processing (HPP) Validation Center conducts cutting-edge research and tests HPP processed food products requiring a validation to establish processing conditions that meet regulatory requirements.



**141 HPP Safety Validations**  
**250 UV Validations**



**80 Shelf Life Studies**



Top: As an alternative to thermal processing, HPP offers a solution to keep food products safe while maintaining freshness, delivering superior sensory quality, and preserving nutritional characteristics.

Bottom: The Food Microbiology Laboratory and the HPP Validation Center not only conduct cutting-edge research, but also provide technical services for the food and beverage industries.

# HACCP Training for Food Processors

**Principles of Hazard Analysis and Critical Control Points** (HACCP) is a systematic approach to identify, assess and control the risk of hazards from a food production process. HACCP is a preventive strategy to ensure safe processing of food, especially meats, seafood, dairy and juice. FDA and USDA have issued regulations specific to juice, seafood and meat processing in response to concerns about foodborne illness outbreaks and securing the U.S. food supply. Trainings are designed to provide industry and inspectors with the knowledge they need to develop or evaluate HACCP plans and practices.

This data represents the Accredited Basic HACCP course and the HACCP for Meat and Poultry Processors offered by the Dairy Foods Extension program as well as the Juice HACCP course offered by the Food Microbiology and High Pressure Processing program. Data for Seafood HACCP are reported on the following page under New York Sea Grant: Seafood Safety Training.



**10 Courses Offered**



**347 Participants**



Top: Food Science Professor Dr. Randy Worobo mentors a group during a breakout session as part of Juice HACCP training offered at Cornell University.

Bottom: The FDA issued juice regulations based on the principles of HACCP in 2001 to ensure the safety of juices, including those processed domestically as well as imported.

# New York Sea Grant: Seafood Safety Training

**New York Sea Grant** (NYSG), a cooperative program of Cornell University and the State University of New York (SUNY), is one of 33 university-based programs under the National Oceanic and Atmospheric Administration's National Sea Grant College program.

Since 1971, NYSG has represented a statewide network of integrated research, education and extension services promoting coastal community economic vitality, environmental sustainability, citizen awareness and understanding about the State's marine and Great Lakes resources.



**Seafood HACCP  
Online Course**

**1,322 Participants**



**61 Participants Earned  
Seafood HACCP Certification**



The New York Sea Grant: Seafood Safety Training program works with the seafood industry to promote safe, sustainable production of high quality seafood by providing training and resources for consumers, producers, processors and fishermen.

# Cornell Institute for Food Systems

**The Cornell Institute for Food Systems** (CIFS) is a group of over one hundred Cornell University Faculty Fellows who, with staff and students, share a vision to create and apply knowledge for the purpose of ensuring a safe, appealing and nutritious food supply for all, today and in the future.

The Cornell Institute for Food Systems Industry Partnership Program (CIFS-IPP) is a public-private partnership that expands and enhances the engagement of CIFS Faculty Fellows, staff and students with industry scientists, engineers and business leaders across complex global food systems. By combining expertise in scientific research, business economics and industry practice, CIFS-IPP finds solutions to today's food systems challenges and shapes tomorrow's discoveries. CIFS-IPP works to advance industry practice with cutting-edge science that propels its food industry partners to the forefront of research, development and technology.



Located in Stocking Hall, the Cornell Institute for Food Systems (CIFS) expands and enhances engagement of Cornell University faculty and staff with industry scientists, engineers, and business leaders throughout the food system.

## For More Information

Department of Food Science Extension Programs

[foodscience.cals.cornell.edu/extension](http://foodscience.cals.cornell.edu/extension)

Institute for Food Safety at Cornell University

[instituteforfoodsafety.cornell.edu](http://instituteforfoodsafety.cornell.edu)

Produce Safety Alliance

[producesafetyalliance.cornell.edu](http://producesafetyalliance.cornell.edu)

Dairy Foods Extension

[dairyextension.foodscience.cornell.edu](http://dairyextension.foodscience.cornell.edu)

Cornell Food Venture Center

[cfvc.foodscience.cals.cornell.edu](http://cfvc.foodscience.cals.cornell.edu)

Cornell Craft Beverage Institute

[cals.cornell.edu/cornell-craft-beverage-institute](http://cals.cornell.edu/cornell-craft-beverage-institute)

High Pressure Processing Validation Center

[foodscience.cals.cornell.edu/hpp-validation-lab](http://foodscience.cals.cornell.edu/hpp-validation-lab)

Juice HACCP

[foodscience.cals.cornell.edu/juice-haccp-certification-course](http://foodscience.cals.cornell.edu/juice-haccp-certification-course)

New York Sea Grant: Seafood Science and Technology

[seagrant.sunysb.edu/articles/t/seafood-science-and-technology](http://seagrant.sunysb.edu/articles/t/seafood-science-and-technology)

Cornell Institute for Food Systems Industry Partnership Program

[foodscience.cals.cornell.edu/industry-partnership-program](http://foodscience.cals.cornell.edu/industry-partnership-program)

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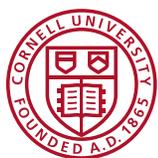
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