

2013 Program Report Card: Preventing Chemical Contamination of Food and Consumer Products (The Connecticut Agricultural Experiment Station)

Quality of Life Result: All Connecticut's citizens consume food and purchase consumer products that are free of contamination with toxic chemicals.

Contribution to Result: The Analytical Chemistry Department monitors fresh and processed foods for over 1000 pesticides, toxic chemicals and poisons, including several dozen agents of concern for chemical terrorism. The Department also conducts targeted chemical analysis of select consumer products. Through surveillance, research, and effective dissemination of our findings, citizens are protected from unwanted exposure to toxic chemicals.

Actual SFY 12 Total Program Expenditures: \$1,027,903

State Funding: \$453,382

Federal Funding: \$505,152

Other Funding: \$69,369

Estimated SFY 13 Total Program Expenditures: \$1,130,000

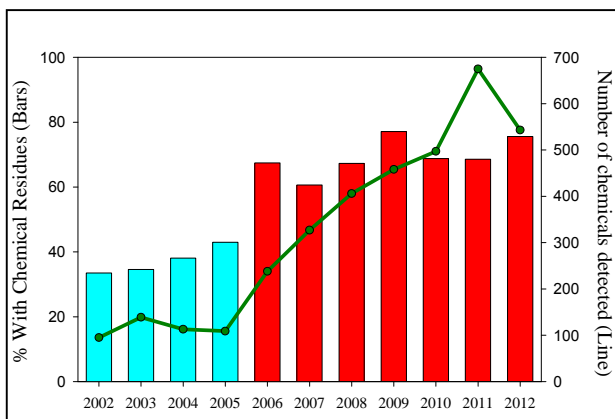
State Funding: \$460,000

Federal Funding: \$600,000

Other Funding: \$70,000

Partners: US Food and Drug Administration (FDA), US Department of Agriculture (USDA), CT Department of Consumer Protection (DCP), CT Department of Public Health (DPH), CT Department of Agriculture (DoAg), US Federal Bureau of Investigation (FBI) Weapons of Mass Destruction (WMD) Program, CT National Guard 14th Civil Support Team (CST), CT Department of Energy and Environmental Protection (DEEP), US Centers for Disease Control and Prevention (CDC)

Performance Measure 1: Determine the amount of chemical residues in food.



Percent of food samples tested found to contain chemical residues, from 2002-2012. FDA and DCP determine which foods are collected. EPA establishes tolerances for chemicals in food.

Story behind the baseline: Food production and distribution systems are global and it has become more likely that foods will contain unwanted chemicals. We modified our methods in 2006 to achieve greater sensitivity than those of the FDA. The results of that increased sensitivity can be seen in Figure 1, in both the % of foods found to contain chemicals (bars) and the number of chemicals found (green line). Approximately 225 food samples are analyzed by our laboratory each year. We are working with FDA to validate a new extraction and analysis method for their federal program. DCP, FDA, or USDA handle the regulatory response for foods that exceed legal tolerances.

Trend: ▲ Yes

Performance Measure 2: Protect consumers by analyzing products for chemical contamination, potential tampering, foreign material presence or label accuracy.

Numbers of consumer products analyzed for potential tampering, chemical or foreign material contamination, or label claim accuracy. DCP, DoAg, and the Consumer Product Safety Commission handle the regulatory responses.

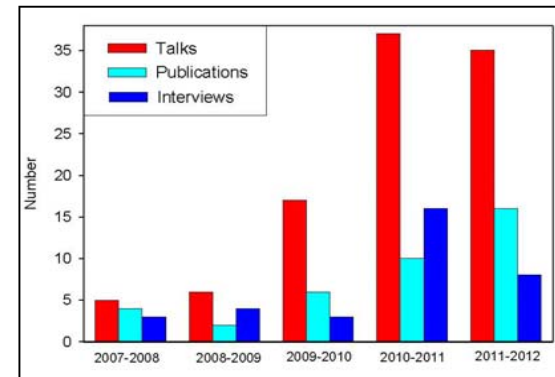
Year	# products analyzed
2008-2009	458
2009-2010	281
2010-2011	599
2011-2012	252



Story behind the baseline: The production and distribution systems for consumer goods have become increasingly global. As such, the potential for accidental or intentional contamination with toxic chemicals, foreign materials, or for label claim inaccuracy has increased. Our laboratory works closely with the DCP and the DoAg to ensure consumer safety. Toys such as crayons, pencils, and children's jewelry are analyzed for toxic metals such as lead and cadmium. We detected formaldehyde, banned in CT, in DCP-collected samples of an insulation product being sold in the state, and the product was removed from commerce. We are working with the DCP Liquor Control Division on new field portable techniques to determine the authenticity and purity of alcoholic beverages (above, right).

Trend: ▲ Yes

Performance Measure 3: Dissemination of scientific findings to the public and other scientists to increase awareness of chemical contamination of food and consumer products.



Story behind the baseline: Results obtained from our laboratory have successfully impacted local and scientific communities by increasing knowledge of chemical contamination of food and consumer goods. Findings from our work are published in both technical and non-technical formats. Station Bulletins intended for the general public are published annually in hard and electronic formats and describe surveillance results of chemical contamination of food, label accuracy of feeds, fertilizers and other consumer goods. Our findings on chemical terrorism and the food supply are sensitive in nature and, therefore, are only communicated to the FDA. We have been able to publish on new analytical methods developed in our laboratory. Since 2008, we have published 20 peer-reviewed articles and 16 non-technical articles describing our work.

Trend: ▲ Yes

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Quality of Life Result: All Connecticut's citizens consume food and purchase consumer products that are free of contamination with toxic chemicals.

Performance Measure 4: Protect CT and US citizens against new chemical threats to our food supply.

Story behind the baseline: With an increased focus on chemical terrorism, federal and state agencies have become increasingly concerned about the potential for a chemical attack on the food supply. Our department is one of 14 laboratories nationally in the FDA Food Emergency Response Network (FERN) Chemistry Cooperative Agreement Program (cCAP). The Analytical Chemistry Department participates in training, testing, and surveillance exercises to ensure that the food supply is safe from chemical attack. Although the national food supply has not been attacked, FERN has been activated in response to several events, including the 2010 Deepwater Horizon Oil spill in the Gulf of Mexico. Seafood from the Gulf of Mexico is shipped nationally and internationally. The Analytical Chemistry Department was one of three laboratories in the country asked by FDA to develop a new chemical method to detect petroleum-related compounds in seafood. That method was adopted by FDA, and analyses in our department were used to re-open waters off the coast of Louisiana, Florida, and Alabama. In the summer of 2012, the Analytical Chemistry Department was activated and asked to analyze frozen ice cream desserts for ricin as part of the Republican National Convention and fresh tomatoes for toxins/poisons as part of the Democratic National Convention.



Proposed actions to turn the curve:

Recent surveillance of imported fresh/dried herbs revealed an 86% violation rate for chemical residues. The average rate for our program is 6-7%. We are using these samples in a project with the FDA to compare the effectiveness of a new field instrument to our laboratory methods. The DART (Direct Analysis in Real Time) can be deployed with US Customs and Border Protection to screen food coming into the country. The analysis is performed in minutes, and contaminated food can be turned away before entering the United States.



We have begun a concerted education and outreach effort focused on terrorism surveillance and disaster response programs within the state. Partners include the FBI WMD Coordinator (New Haven), the DPH Bioterrorism Coordinator, 14th CST Mobile Laboratory (CT National Guard), and the CT DEEP Mobile Laboratory. There are several target audiences for these programs. Three recent educational events included a summer camp at St. Vincent's College in Bridgeport (150 middle school students), a half-day event at Region 16 Long River Middle School (400 students), and a program for the CT Association of the Gifted *Minds in Motion Program* (50 students). In January of 2013, the DPH Bioterrorism Coordinator requested our Department's assistance in the Annual First Responder Training (April 2013). This table-top exercise involves approximately 150 first responders participating in a simulated terrorist attack and response.

Proposed actions to turn the curve:

The US FDA has purchased sophisticated analytical equipment for the Analytical Chemistry Department to enable the measurement of inorganic arsenic in fresh and manufactured foods. Once training and instrument validation is completed in the late winter of 2013, the Analytical Chemistry Department will begin analyzing state samples of rice and rice based foods, as well as commercially grown seaweed from Long Island Sound, for inorganic arsenic.



Data Development Agenda:

The success and impact of our work on the chemical contamination of food and consumer products is measured in a number of ways. Our laboratory receives competitive grant funding from the USDA National Institute for Food and Agriculture (NIFA), FDA FERN, and FDA Office of Regulatory Affairs (ORA) that supports several staff members and programs within the department. All agencies require annual reporting and the release of subsequent funding is conditional upon successful performance during the reported year. In addition, the USDA also requires a five year Plan of Work and the collection of data to document the impact of research in annual reports. The CAES Record of the Year is available on our website and includes detailed summaries of all outreach and research efforts. We at the Station clearly recognize the importance of measuring the success and impact of our programs. As such, we will continue to collect data to measure the quantity and quality of our work and how CT stakeholders have benefited through these efforts.



Trend: ▲ Yes