

# *Putting Science to Work for Society*



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# THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION (CAES)

## WHAT IS IT?

- **Independent** state agency, not affiliated with Department of Agriculture, UCONN, Extension Service
- Established 1875 by **Analytical Chemist** to analyze feeds and fertilizers
- **First** ag experiment station in US; each state has at least one experiment station; Connecticut has two—CAES (plants) and UCONN (animals)
- CAES has 3 locations: New Haven, Hamden, Windsor
- 6 departments: Analytical Chemistry, Biochemistry & Genetics, Entomology, Forestry & Horticulture, Plant Pathology & Ecology, Soil & Water

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# *Putting Science to Work for Society*

**SERVICE**

**RESEARCH**

**OUTREACH**

# *Putting Science to Work for Society*



## **Protecting the Food Supply and More: New Initiatives in Analytical Chemistry**

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# **Protecting the Food Supply** and More: New Initiatives in Analytical Chemistry

# PROJECTS OF LONG-STANDING DURATION

- Marketbasket survey conducted in cooperation with CT Department of Consumer Protection for more than 40 years
- Product tampering investigations done in cooperation with CT Department of Consumer Protection
- Cooperation with local health and police departments

# New Initiatives

## Presidential Directive issued 30 January 2004: Defense of U.S. Agriculture and Food

- Develop nationwide laboratory networks for **food**, animal, plant, and water quality that integrate existing Federal and State laboratory resources and utilize standardized protocols and procedures
- Develop coordinated surveillance and monitoring systems, including international information, for animal disease, plant disease, wildlife disease, **food**, public health, and water quality to provide early detection of disease, pest, or poisonous agents



# The Food Emergency Response Network (FERN)

- Initiated before presidential directive was issued through discussions between USDA and US FDA
- Developed over course of more than two years through federal and state partners—USDA, FDA, Connecticut, Florida, Georgia, New York

**Mission:** network the nation's food-testing laboratories to enhance the detection and identification of threat agents in food.

# The Food Emergency Response Network (FERN)

## AGENTS OF CONCERN

chemical, biological, radiological

## LABORATORY MEMBERS

federal and state participants with expertise in  
food analysis

# **New Initiatives: Food Safety, FERN, and Analytical Chemistry at CAES**

- Participated in FERN organizational discussions
- Participated in FERN surveillance and proficiency exercises
- Submitted Cooperative Agreement Application

**AND**

- **Selected as Cooperative Agreement Recipient**

# FERN Objectives

- **Prevention** – enhance federal/state food surveillance programs
- **Preparedness** – strengthen laboratory capability/capacity
- **Response** – assure surge capacity under emergency conditions
- **Recovery** – document post-event food safety to the consumer

# FERN Objectives

- **Preparedness** – strengthen laboratory capability/capacity

Acquisition of new instrumentation

analysis for toxic agents not possible previously;  
recent examples from marketbasket program

Proficiency tests

assessment of analytical capability

# Liquid Chromatography/Mass Spectrometry

## LC/MS



# Gas Chromatography/Mass Spectrometry

## GC/MS



# Inductively Coupled Plasma/Mass Spectrometry

## ICP/MS





# Enzyme Linked Immunosorbent Assay

## ELISA



# MICROWAVE OVEN



# FERN Objectives

- **Prevention** – enhance federal/state food surveillance programs

Fall 2005, import surveillance exercise, CAP labs

Fall 2004, surveillance exercise

# FERN Objectives

- **Preparedness** – strengthen laboratory capability/capacity

Two new full-time employees

# FERN Objectives

- **Response** – assure surge capacity under emergency conditions

Additional instrumentation, additional employees for 24/7 operation

# FERN Objectives

- **Recovery** – document post-event food safety to the consumer

Implement uniform instrumentation and methodologies. Staff from Analytical Chemistry has participated in numerous training courses including ones conducted in FDA laboratories.

# Food Analysis in Analytical Chemistry: The Future

1. Continual update of inventory of new active ingredients (AI)
2. Incorporate new AIs into analytical methods
3. Update sample preparation method for marketbasket survey
4. Incorporate new instrumentation into marketbasket survey
5. Overlay marketbasket work with FERN work
6. Initiate and maintain communication with laboratory staff in both federal and state partner labs

# Protecting the Food Supply **and More:** New Initiatives in Analytical Chemistry



# Cooperation among Connecticut Laboratory Partners

1. Connecticut Department of Public Health,  
Chemical Response Laboratory
2. 14<sup>th</sup> Connecticut Civil Support Team, mobile  
laboratory
3. Connecticut Department of Environmental  
Protection, mobile laboratory