A National Food Safety Education Program:
Building a Multidisciplinary Food Safety Training Pipeline from K-12 to Graduate School

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BACKGROUND

•Foodborne diseases cause 48 million illnesses and 3000 deaths in the US each year (Scallan et al 2011).

•Improving the safety of our food supply requires a well educated and diverse workforce at all levels of training, including BS, MS, and PhD degrees for employment by industry, government, and academia.

INTRODUCTION

•Purpose: create and conduct innovative research and classroom-based graduate and undergraduate training activities in the area of food safety in order to build an overall pipeline of students that will be prepared for employment in the area of food safety.

•Participating Institutions: Cornell, Colorado State, Purdue, North Carolina State, Alabama A&M, North Carolina A&T, and Texas Wesleyan

TARGET GROUPS

•K-12 students
•K-12 teachers
•Undergraduate students
•Graduate students
•Underrepresented minorities
•Students nationwide

GOALS

The overall goal of this project is to increase the number of qualified food safety professionals. The supporting objectives are:

Objective 1: Develop and conduct science teachers' workshops that enable the teachers to use food safety experiments in the classroom and advise students on careers in food safety.

Objective 2: Develop and deliver K-12 food safety activities and experiments to be taught by graduate and undergraduate students.

Objective 3: Develop and conduct a multi-institutional undergraduate summer research program in food safety.

Objective 4: Recruit and train undergraduate students through a "food safety track" within existing food science undergraduate programs.

Objective 5: Develop and implement multi-institutional course-based Masters of Professional Studies (MPS), research-based M.S., and Ph.D. training programs in food safety.

IMPACT

•We seek to foster an interest in food safety and increase awareness of food safety careers.

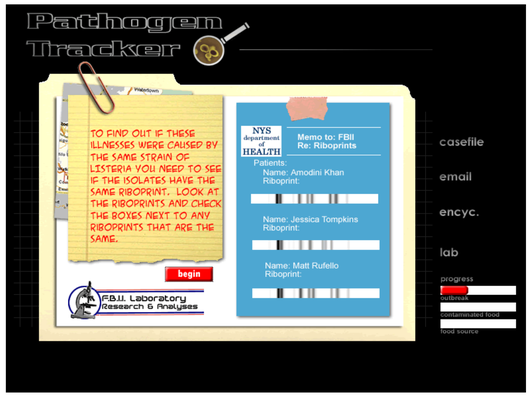
•These efforts will result in a pipeline of students that are specially prepared for employment in industry, academia, or government in the area of food safety.

ACCOMPLISHMENTS

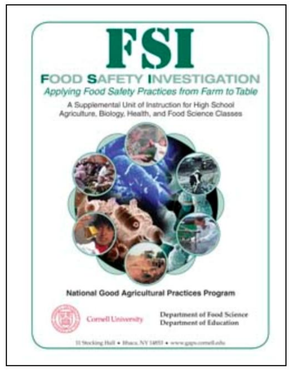
Objective 1: Science Teachers' Workshops

•Upcoming workshops: North Carolina A&T (July 25, 2011), Texas Wesleyan (August 3, 2011), Cornell (October 22, 2011), Science Teachers' Association of New York State (STANYS) conference (November 7, 2011).

•We will discuss food safety careers and present food safety-based lessons and experiments that high school science teachers can use in their classrooms. Material to be presented will include The Pathogen Tracker computer game and the Food Safety Investigation (FSI) Curriculum.



PathogenTracker guides students through a simulated outbreak investigation using case data and molecular subtyping data. http://game.pathogentracker.net/



FSI is a discussion-based curriculum designed to bring food safety into the classroom. http://www.gaps.cornell.edu/FSI.html

Objective 2: K-12 Student Outreach

North Carolina A&T 2011 high school summer researchers: Dedrick Dunton, Caleb S. Locklear, and Lisa Wamban are working on food safety projects related to yogurt cultures as well as E. coli O157:H7.

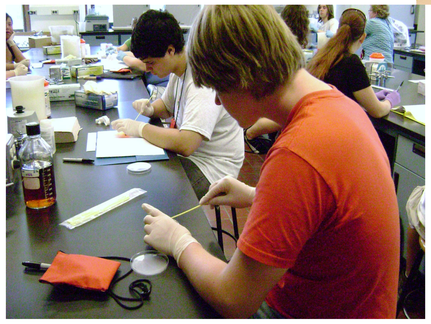
2011 Cornell 4H Career Explorations Participant Feedback:

•"I loved this program. I learned a lot and felt like a real microbiologist!"

•"Taught me about the usefulness of genetic science in keeping food healthy…learned things about what college and grad school is like."

•"It was great and I now might take this as a minor."

Cornell hosted a 2.5 day workshop (June 28-30, 2011) as part of the Cornell Cooperative Extension 4H Career Exploration program for high school students from across New York State. 12 students from 8-12 grade worked through a simulated outbreak investigation using epidemiology and molecular biology.



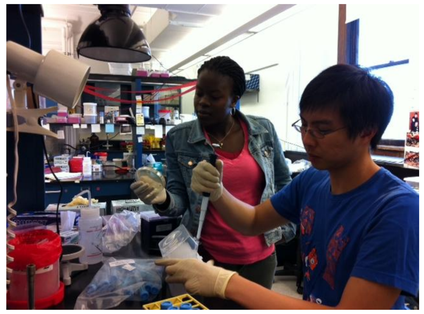
•"I like science more now."

•"This program has increased my interest in science."

•"It showed more fields of careers to me and showed how narrowing down my interests is a learning experience."

Objective 3: Undergraduate Summer Research

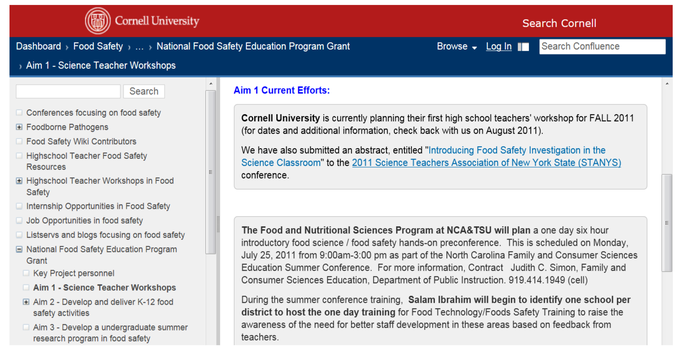
•Cornell: developed a Food Science Summer Scholars Research program.
•Texas Wesleyan: piloting a similar program.
•Students: recruited from across the nation to work with faculty and graduate students to carry out a research project over the summer.
•Current topics: *E. coli* diversity, *Salmonella* pathogenesis, and *Listeria* virulence and survival.



Cornell's 2011 summer researchers: Jessica Wooten, a junior in Nutrition at North Carolina A&T is investigating the genomic diversity of *E. coli*; Fritz Foo, a senior in Molecular Environmental Biology at UC Berkeley, is researching the pathogenesis of *Salmonella*.

INFORMATION DISSEMINATION

Information on completion of project objectives, as well as materials and methods, are being made publicly available via the Food Safety Wiki at: https://confluence.cornell.edu/display/FOODSAFETY/



FUTURE PLANS

Objective 4: Undergraduate Education: Cornell, Purdue, and North Carolina State will initially develop a list of core competencies for undergraduates in food safety and will use these core competencies to develop an undergraduate curriculum specific to food safety.

Objective 5: Graduate Education: A clearinghouse of opportunities in food safety training and internships will be implemented, a new advanced food safety class will be developed and taught via videoconference, and a professional Masters degree in food safety will be developed.

ACKNOWLEDGEMENTS

This project was supported by Agriculture and Food Research Initiative Grant no. 2010-04502 from the USDA National Institute of Food and Agriculture, National Education Programs for Food Safety – A4151 within the AFRI Priority area "Food safety, nutrition, and health."

References

[1]Scallan E, Hoekstra RM, Angulo FJ, Tauxe RV, Widdowson M-A, Roy SL, et al. Foodborne illness acquired in the United States – major pathogens. Emerg Infect Dis. 17:7-15.