

Integrated Food Safety Education and Research

Impacts and Impressions



Integrated Food Safety Education and Research: Impacts and Impressions

**Cooperative State Research, Education,
and Extension Service – USDA**

Jodi P. Williams, PhD



Overview of NIFSI

- **Purpose**
- **Eligible Applicants**
- **Award Amounts**
- **Priority Areas**
- **Type of Grants**
- **Integrated Programs**
- **Evaluation Criteria**
- **FY 2006 Statistics**



Purpose of NIFSI

- **To support projects that address selected priority issues in food safety**
- **To support projects that use an integrated approach to solving problems in food safety**



Eligible Applicants

- **Faculty from accredited 4-year colleges and universities**
- **Faculty from the 1994 Tribal Colleges**
- **Collaboration with other public and private groups and institutions is encouraged through subcontracts**



Collaborative Efforts

- **Encourage collaboration**
 - local, state, and Federal governments, professional associations, public or private organizations
- **To improve communications with high risk, underserved and hard to reach audiences**
 - **Encourage collaborations**
 - 1890 Land Grant Institutions
 - 1994 Land Grant Institutions
 - Hispanic Serving Institutions



Priority Issue Areas

- **Encompass issues in research, education, and extension**
- **Reflect priorities of other federal agencies**
- **Developed from stakeholder input**



Priority Issue Areas

- **Risk Assessment**
- **Control Measures for Pathogens**
- **Source & Incidence of Pathogens**
- **Safety of Fresh Produce**
- **Food Defense**
 - Threat prevention, threat response, risk management, communications, and public education



Priority Issue Areas

- **Food safety education for consumers, youths, and high-risk audiences**
- **Training and certification for industry**
- **Food processing & preservation**
- **Alternative food processing technologies**



Priority Issue Areas

- **National Support and Coordination**
 - **Developing databases, interactive software**
 - **Conducting international, national, regional conferences**
 - **Conducting satellite video-teleconferences**
 - **Developing and implementing new communication transfer technologies**



Award Amounts and Duration

- **Standard Grants - \$600,000**
 - 3 years
- **Bridge Grants - \$100,000**
 - 2 years
- **Conference Grants -- \$50,000**
 - 2 years
- **Special Emphasis Grant -- \$2.5 M**
 - 4 years



Integrated Programs

- **At least 2 of the 3 components must be included in the research**
 - Research and Education
 - Research and Extension
 - Education and Extension
- **Programs should be multi-disciplinary, multi-institutional, and/or multi-state**
- **All of the components should be absolutely necessary to the successful outcome of the program**



Applied Research

- **NIFSI focuses on applied research**



Basic vs. Applied Research

- **Basic research focuses on developing new knowledge, new processes, or new technologies**
- **Applied research focuses on applying new knowledge, processes, or technologies**



Applied Research

- **Applied Research**
 - **Scientific or Laboratory Research**
 - **Behavioral Research**
 - **Educational Research**
 - **Evaluative Research**
 - **Survey Research**
 - **Focus Group Research**
 - **Message Development and Testing**
 - **Etc.**



Education

- **Food safety education and training implemented in a formal classroom setting**
- **Includes elementary, secondary, undergraduate, graduate, or post-graduate education**



Education

- **All educational components must include**
 - **Evaluation tool – evaluate the effectiveness of the educational intervention in accomplishing intended objectives**



Extension/Outreach

- **Food safety education and training implemented in a non-formal setting**
 - Includes industry and retail training and education
 - Development and distribution of educational materials
 - Pamphlets
 - Flyers
 - Fact sheets
 - Training curricula
 - Videotapes
 - Audiotapes
 - CD-ROMS
 - Interactive software
 - Website development
 - And a variety of other audiovisual and print media



Extension/Outreach

- **All extension intervention programs must include an evaluation of the effectiveness of the intervention in accomplishing the intended objectives**
 - **The focus should be on behavior change or adoption of safe practices as opposed to how many pamphlets, etc. were distributed**



Special Emphasis Grants - \$3.0M

- **Priority Areas – Food safety education and training for consumers**
- **Must involve**
 - **Multidisciplinary teams from multiple states and/or multiple institutions**
 - **Must be a strong evidence of integration**
 - **Strong evidence that these individuals worked collaboratively to develop the proposal**



Bridge Grant - \$100,000

- **Designed to assist small, mid-sized and minority serving institutions**
 - **By enhancing collaboration among institutions, states, disciplines, and functions (research, education, or extension) that might lead to future funding opportunities**
 - **Applicants may not apply directly for bridge grant funding**
 - **They are awarded by the panel who sees the project as meritorious, but falls below the funding cut-off during the peer review process**



Conference Grants - \$50,000

- **Professional meetings**
 - Food safety researchers, educators, and extension professionals
 - Focus of the meetings
 - Enhancing collaboration among food safety researchers, educators, and extension professionals
 - Updating information and advancing the field of food safety
 - Identifying future research, outreach, and educational needs



Evaluation Criteria – Standard Grant

- **Overall Merit of the Application**
 - Proposed goal is related to selected priority areas
 - Objectives are clearly described
 - Need for the project is demonstrated
 - Target audience is identified
 - Proposed technique, procedure, or methodology is clearly described
 - Technique, procedure, or methodology is suitable and feasible for the proposed project



Evaluation Criteria – Standard Grant

- **Qualification of Proposed Project Personnel, Adequacy of Facilities and Budget Request**
 - Roles of project personnel are clearly defined
 - Evidence that the project personnel have significant expertise to complete proposed project
 - Support personnel, facilities, and instrumentation are adequate
 - Sufficient time has been allocated for completion of objectives
 - Budget narrative provides justification for all budget categories



Evaluation Criteria – Standard Grant

- **Relevance of proposed project to current issues in food safety and related topical areas**
 - **Description of relevance to food safety issues**
 - **Project makes a unique contribution to food safety**



Evaluation Criteria – Conference Grant

- **Relevance of proposed conference to food safety in fostering interaction among food safety researchers, educators, extension professionals, and Others**
- **Qualifications of Organizing committee and Appropriateness of Invited Speakers to Topic Areas Being Covered**
- **Uniqueness and Timeliness of Conference**
- **Appropriateness of Budget Request**

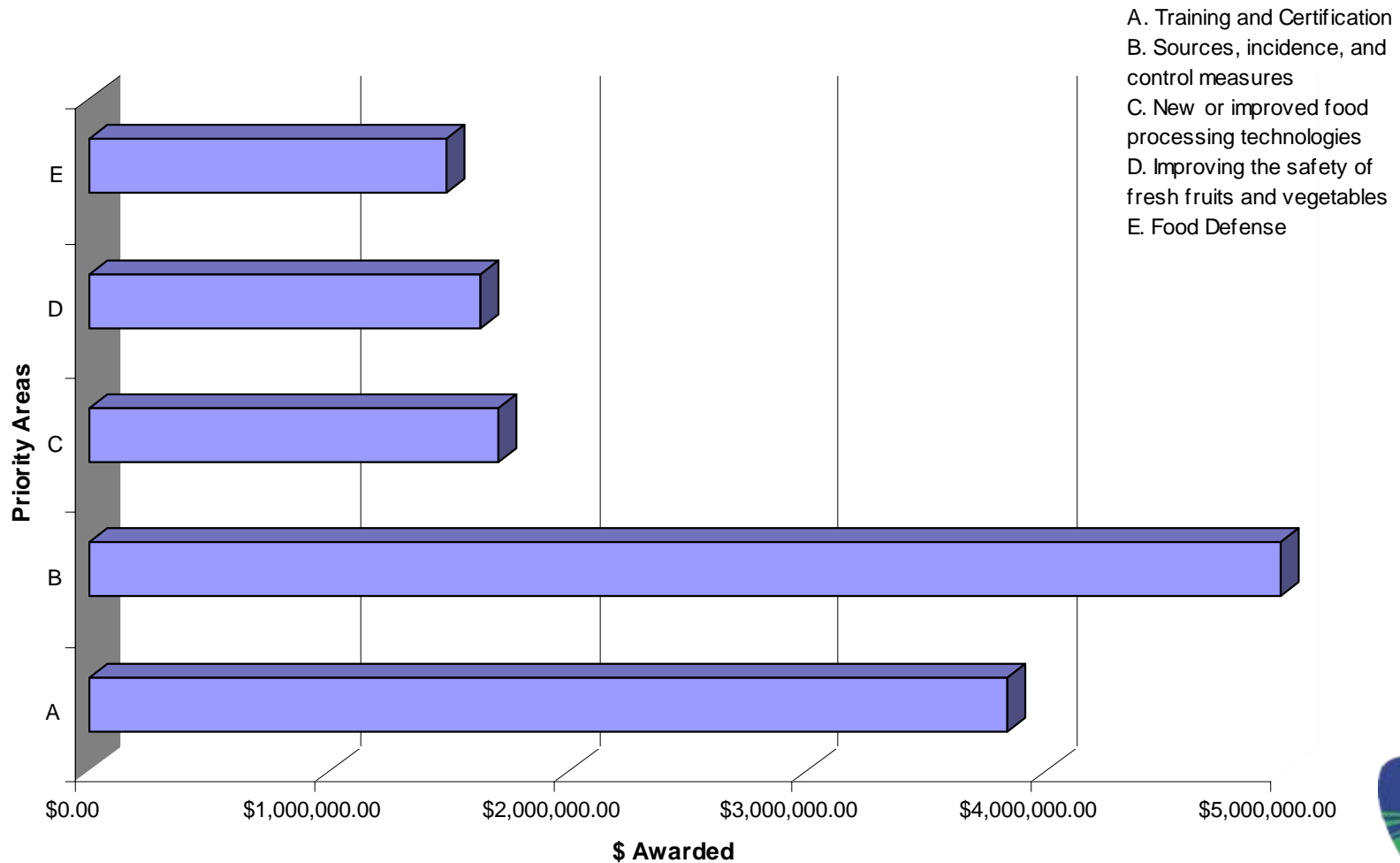


FY 2006 Statistics

- **FY 2006**
 - **Proposals submitted - 82**
 - **Proposals awarded - 30**
 - **% success – 37% (standard grants, special emphasis, and conference grants)**
 - **Average award size – \$492,831 (standard grants)**
 - **NIFSI program is 100% integrated at the project level**



FY 2006 Statistics



NIFSI Program Contacts:

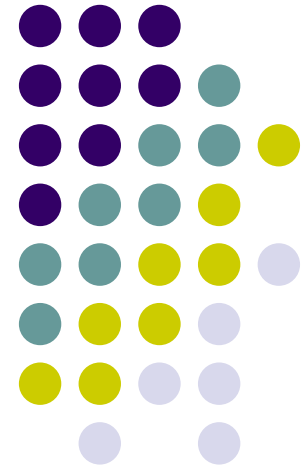
- **Jan Singleton, PhD, RD**
 - National Program Leader, Food Science & Food Safety
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- **Damanna Ramkishan Rao, PhD**
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- **Jodi P. Williams, PhD**
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Cooperative State Research, Education & Extension Service

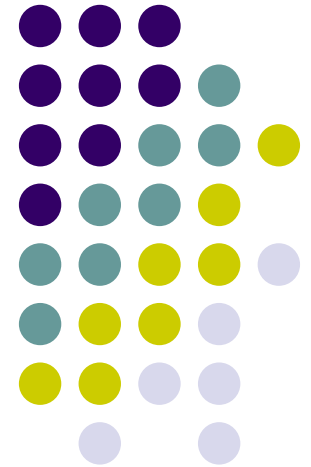
United States Department of Agriculture

Jan Singleton, PhD, RD
National Program Leader,
Food Science & Food Safety



Integrated Food Safety Education and Research

Impacts and Impressions





Has NIFSI Made a Difference?

- 207 grants, and \$95 M have been awarded from 2000-2006
- Approximately two thirds are still active
- One third have submitted final reports
- Most have submitted descriptive or qualitative data
- Fewer than 10 percent have submitted behavioral data
- Impacts beyond the actual grants are varied



Has NIFSI Made a Difference?



- Data are reported in the USDA database known as CRIS
 - Current Research Information System
 - Used Department-wide
 - Tracks grants funded through USDA
 - Requires annual accomplishment reports
 - Requires a final report
 - Includes primarily research impacts
 - Includes some education and extension impacts



Has NIFSI Made a Difference?



- Impact summaries are periodically solicited by the program
- Research highlights are summarized and distributed
- Newsletter articles summarize specific grant program impacts





Reported Impacts in CRIS

- Non-technical summary
- Objectives
- Approach
- Progress
- Impact
- Publications





Additional Reported Impacts

- Did you conduct any education and/or training courses during your project?
 - If yes, please list them
 - How many attendees were present at each?
- Did you reach any new or unique target audiences?
 - If yes, please describe them





Additional Reported Impacts

- Did you conduct any conferences, meetings, workshops, etc. to disseminate the results of your project?
 - If yes, please list them
 - How many attendees were present at each?
- Did you develop any new courses, course sections, degree programs, or graduate programs during your project?
 - If yes, please list them
 - How many students participated?





Additional Reported Impacts

- Were any CDs, DVDs, videotapes, brochures, fliers, or other media developed during your project?
 - If yes, please list them
 - How many were produced and distributed?
 - What was the impact of these materials on your target audience(s)?
- Has your project resulted in any publications in professional journals?
 - If yes, please list them





Additional Reported Impacts

- Has your project resulted in the development of any new technologies or applications?
 - If yes, please describe them
- Has your project resulted in changes in industry standards, including the regulatory industry?
 - If yes, please describe the changes



Additional Reported Impacts



- Have you published any new guidelines, procedures, or industry standards as a result of your project?
 - If yes, please list them
 - Where were they published?
- Has your project resulted in any new patents or Cooperative Research and Development Agreements (CRADAs)?
 - If yes, please list them





Additional Reported Impacts

- Were any additional funds leveraged from other sources as a result of your project?
 - If yes, please list the sources and the amounts leveraged
- Please list all of your project collaborators by name, title, and institutional affiliation





Additional Reported Impacts

- Did your project involve any new or unique collaborators not typically reach by food safety projects?
 - If yes, please describe them
- Did your project involve any international collaborators?
 - If yes, please describe them



Additional Reported Impacts

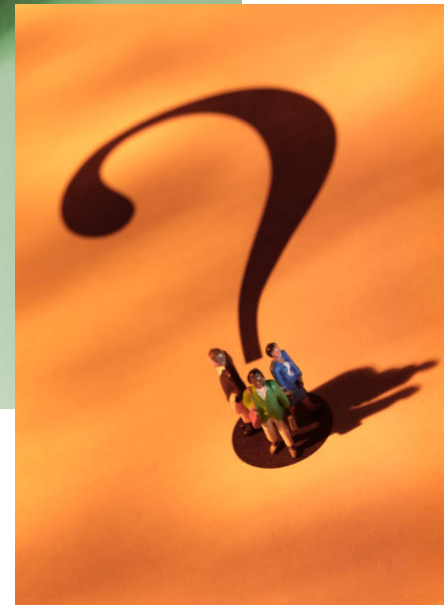


- “All educational and extension interventions must include an evaluation of the effectiveness of the intervention in accomplishing intended objectives (e.g., improving knowledge, changing behavior, attitudes, or perceptions).”

Integrated Research, Education, and Extension Competitive Grants Program – National Integrated Food Safety Initiative, Request for Applications, 2006



Has NIFSI Made a Difference?



Has NIFSI Made a Difference?



- The following is a representative sample of the impact reports that have been submitted through a variety of reporting methods



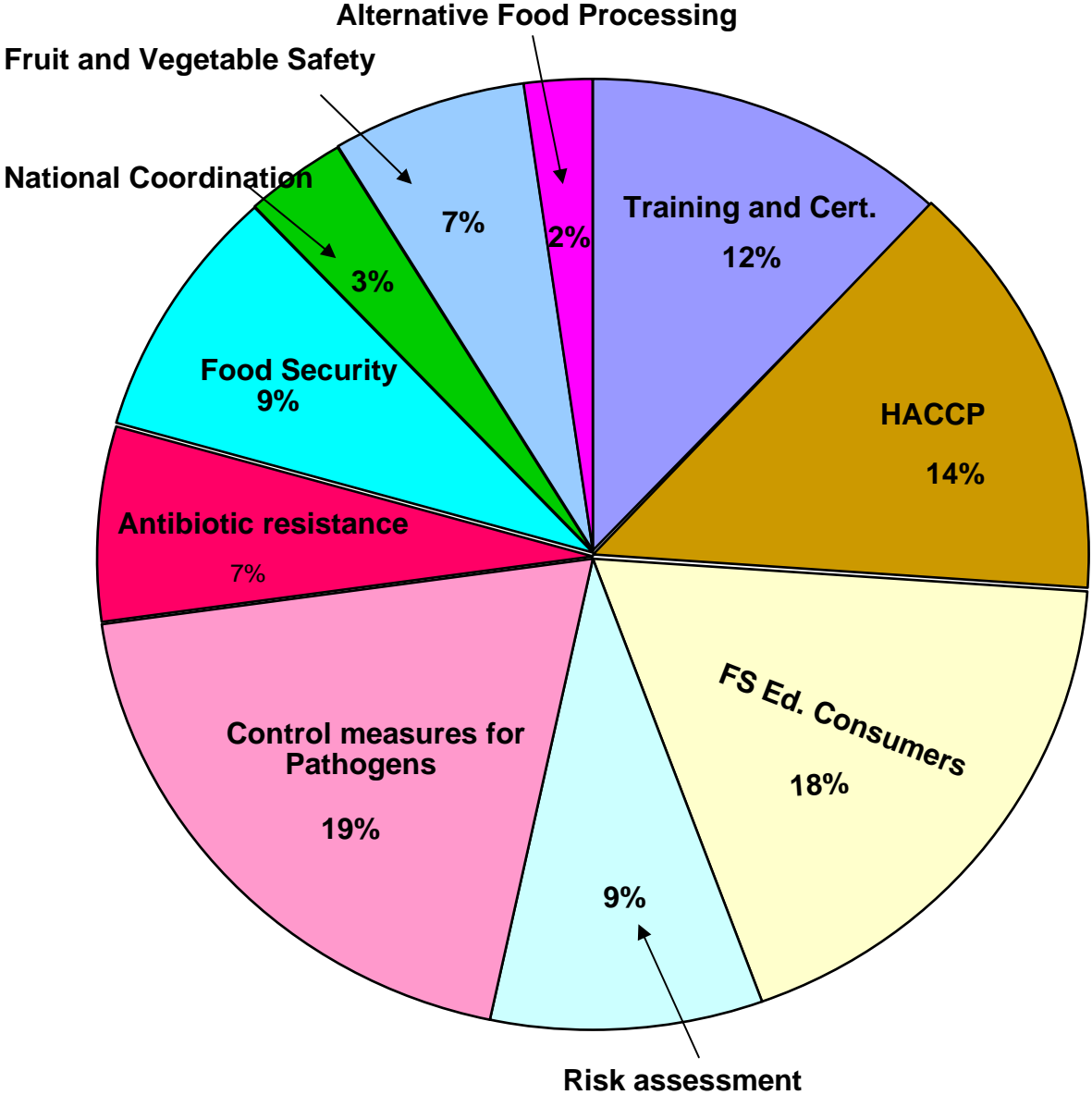
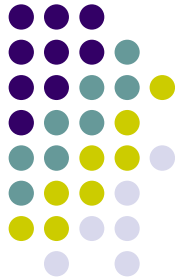
Priority Areas for Grant Funding



- Consumer Food Safety Education
- Industry Training and Certification
- Pathogen Control Measures
- Alternative Processing Technologies
- Fruit and Vegetable Safety
- HACCP
- Food Defense
- Risk Assessment
- Antibiotic Resistance
- National Support and Coordination



Priority Areas for Grant Funding



Consumer Education



- \$11.2 million have supported consumer education programs and related activities
- 18 percent of NIFSI grant funds



Consumer Education Highlights



- **Washington State University**
- **Germ City Hand Washing Program**
- Science-based program
- Increases awareness of the link between poor hand washing and foodborne illness incidence (personal health)
- Improves effectiveness and frequency of hand washing
- Targets a diverse group of individuals and facilities
 - Schools
 - Special needs children
 - Food service executives
 - Hospitals and other health facilities
 - Fairs, pantries, churches



Consumer Education Highlights



- Washington State University
- Results
 - Program started in 3 states (WA, WV, HI); has expanded to include:
 - More than 52 Germ City units in 14 states
 - On-going program delivery, reaching more than 400,000 residents



Consumer Education Highlights



- Washington State University
- Results
 - A behavior change survey of 2,524 youths and adults indicated that 13-27 percent of respondents planned to change their behavior
 - During another intensive evaluation, soap usage doubled from 300 gallons to 600 gallons
 - At a health care facility 84 percent reported improved hand washing techniques, while 85 percent reported washing hands longer after a 6 month follow-up



Consumer Education Highlights



- Washington State University
- Results
 - In school evaluations, even after 4-6 weeks, independent observations by educators and researchers found increased frequency of hand washing and thoroughness of hand washing
 - Teachers reported greater awareness of the need for hand washing among students



Consumer Education Highlights



- United Tribes Technical College
- An education and outreach program providing culturally relevant food safety messages among Native Americans
- The program targeted:
 - College students enrolled in Nutrition
 - Vocational students enrolled in food service courses:
 - Elementary school students
 - Students at summer camp



Consumer Education Highlights



- **United Tribes Technical College**
- **Results:**
 - 53% of students enrolled in food service courses passed the ServSafe exam
 - 72% of commercial food retailers who attended the food safety institutes at the tribal college have completed and passed the ServSafe exam
 - Tribal casinos now have certified foodservice workers with increased knowledge and skills
 - Tribal sanitarians are proposing adoption of a tribal food code requiring food safety training for owners/managers in food service settings on tribal lands, including powwows with temporary food vendors



Consumer Education Highlights



- United Tribes Technical College
- Results:
 - Prior to 2004 food safety programs for tribal communities and businesses were not taught on tribal lands in ND
 - At an estimated \$400 per employee, tribal businesses have invested approximately \$86,000 for per diem and travel for 215 participants in tribal food safety training programs
 - About 95 percent of all participants taking the ServSafe exam are taking it for the first time



Consumer Education Highlights



- United Tribes Technical College
- Results:
 - Fifteen events sponsored by student groups were held
 - Students in Nutrition and Food Service courses assisted with the student group activities
 - Two hundred elementary school students were reached through on-campus elementary school and summer camp activities



Consumer Education Highlights



- Alabama State University
- Provided training to parents, childcare providers, early childhood teachers, and children under 5
- 12 train-the-trainers workshops were conducted
 - Food safety education training module
 - Training support materials
 - Training guide and training procedures module
- More than 185 childcare providers were among those trained



Training and Certification for Industry and Retail



- \$7.1 million have supported food safety training and certification programs for industry and retail
- 12 percent of NIFSI funds





Industry and Retail Highlights

- University of Idaho
- Trained consumers how to properly use food thermometers for small cuts of meat
- A survey was conducted to determine food thermometer use among consumers, industry, and retail audiences
- The training program was developed based on survey results
- Studies were done to determine pathogen survival on surfaces



Industry and Retail Highlights



- University of Idaho
- Results
 - Kitchen shops had the greatest selection of thermometers
 - Dial, but not digital, thermometers were readily available in grocery stores
 - Time to register temperature varied from 10 to 30 seconds
 - Double-sided and single-sided grills with multi-turnover were the best cooking methods due to greatest pathogen reduction
 - Washing with warm or hot water followed by wiping with a paper towel was sufficient to eliminate E. coli from surfaces



Industry and Retail Highlights



- University of California, Davis
 - 3 novel training courses for high school students
 - Food Safety Courses for South Carolina Food Service Managers
 - Ready, Set, Food Safe
 - Don't Bug Me
 - One of the courses has been distributed to over 125 trainers



HACCP



- \$8.8 million have supported HACCP programs and related activities
- 14 percent of NIFSI funds



HACCP Highlights



- Pennsylvania State University
 - An introductory HACCP course given 4 times since 2004
 - The course includes a training manual and video
 - 15 very small plants in 3 geographically distinct regions have implemented a combination treatment for reducing pathogens
 - Water wash
 - 5-minute drip
 - 2% lactic acid rinse
 - Materials can be adapted for the 5000+ small or very small plants in the U.S.



HACCP Highlights



- Iowa State University
 - Administered a questionnaire to determine barriers to HACCP programs in assisted-living facilities
 - Used a modified Delphi process to develop the questionnaire
 - Food service managers at 40 facilities received training in basic food safety and HACCP
 - Technical assistance was provided to those completing the training



Fresh Fruits and Vegetables



- \$2.8 million
- 7 percent of NIFSI grant funds





Fresh Fruits & Vegetables Highlights

- **Mississippi State University**
- Studied the influence of packing procedures on survival of pathogens in fresh fruits and vegetables
- Those trained included farmers, packers, and others
- GAPS and GMPS formed the basis of the trainings
- Topics covered included:
 - Methods to identify contaminated product or surfaces
 - Best method to analyze berries
 - Sanitation principles
- Two sessions were conducted for the blueberry industry with over 100 total participants





Fresh Fruits & Vegetables Highlights

- **North Carolina State University**
- Developed modules and educational DVDs on GAPS and proper hand-washing procedures for field workers
- Over 120 Extension professionals have participated in train-the-trainer courses across the South East region
- Over 1000 copies of the bilingual DVD have been requested by those attending the training courses
- A 7-minute video on GAPS was produced and distributed across the region with a bilingual flip chart
- Altogether, the program has trained over 200 trainers, who have in turn trained approximately 20,000 growers in the south east
- The southeast has the second largest number of third party audit growers





Fresh Fruits & Vegetables Highlights

- **Oregon State University**
 - Enhancing Microbial Safety of Northwest Fresh Fruits and Vegetables
 - Processed Berries and Good Agricultural Practices for Fresh Fruits and Vegetables
- The courses were conducted at the Northwest Center for Small Fruit Research at annual meetings that have targeted over 200 berry growers, processors, and inspectors
- Over 50% of participants report taking additional steps to ensure microbial safety of their products
- A Food Safety and Sanitation course has been incorporated into the OSU curriculum and 117 students have enrolled
 - 44 students have taken the National Food Safety Managers Examination and passed
 - Student certification prepares them for training of future processors, regulators, educators, and inspectors





Fresh Fruits & Vegetables Highlights

- Oregon State University
- Chitosan-based antifungal and antimicrobial edible coatings were developed to enhance microbial safety of fresh berries
- The small fruit industry has expressed interest and is currently evaluating the efficacy of the product





Risk Analysis, Control Measures, and Food Defense

September 28, 2006

Food Safety Education Conference

Denver

D. Ramkishan Rao, National Program Leader



OUTLINE

Areas of Emphasis (2000-2006)
Examples of Projects and results
Statistics (2000-2006)
Strengths and opportunities



Risk Analysis

Microbial risk of moisture
enhancement of pork

Risk-based approach to “best
consumed by”

Perchlorate risk-Colorado river water

Cadmium health risk

Products labels and risk
communication messages



Risk Analysis

Predictive modeling for validating critical limits

Prioritizing interventions to reduce risk

Salmonella risk in almonds

Risk of Listeria in dairy and beef

Food safety risk analysis distance training

Antimicrobial resistance

Alternative Processing Technologies

- High Hydrostatic Pressure
- Ohmic Resistance
- Pulsed Electric Field
- Microwave Heating
- Chemicals (Chlorine Dioxide)

Control Measures, Sources and Incidence

- Immunobiology, antimicrobial films, nanoparticles, genomics, tracking, modeling
- Electron beam irradiation (diet, MAP)
- Chemical and biological treatments
- Method modification (Drying, Optimization)
- Incidence in home environment
- Natural antimicrobials

Antimicrobial Resistance

- Quinolone, macrolide, and cephalosporin
- Dairy cattle, calves, swine, and poultry
- Interventions for control
- Source and diversity
- Moral economy
- Fast screening test

Food Defense

Food defense certification program

Transportation of Liquid Food

Economic, Social and Psychological
Consequences

Intergovernmental Collaboration

National Education and Outreach



Examples of Some Projects and Results

**MINIMIZING THE RISK OF
LISTERIA MONOCYTOGENES
AND OTHER PATHOGENS IN
(HOME) DRIED FOODS
(FY 2000)**

**John N. Sofos, Patricia A. Kendall,
Gary C. Smith, and John Samelis
Colorado State University**

MAIN OBJECTIVES

- Develop modified home drying procedure that will result in safe and palatable products (e.g. Jerky)
- Assess survival of pathogens (L. monocytogenes, E. coli O157:H7, and Salmonella) during home-drying of foods using methods recommended by Cooperative Extension
- Disseminate/teach new method and assess adoption

Integration (Sofos et. al.)

Research

Assess safety aspects of methods of home drying of Jerky / F&V
↓
Assess modification needs (hazards and CCPs)
↓
Develop modified procedure
↓
Study pathogen inactivation and palatability
↓
Modified home drying procedure

Extension

Outreach

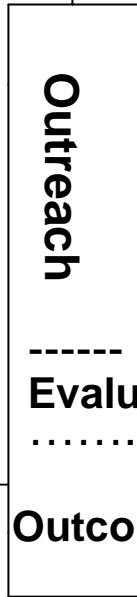
Develop educational materials on modified procedures
↓
Teach extension agents and Master Food Preservers
↓
Information to food preparers
↓

Evaluation

Assessment of adoption

Outcome

FSIS Compliance Manual
Majority likely to adopt modified method



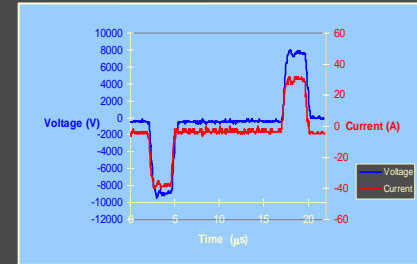
Stakeholder input-
Home drying of Jerky



Safety of Foods Processed by Four Alternative Processing Technologies



**Ohmic Heating –
Chicken chow mien**

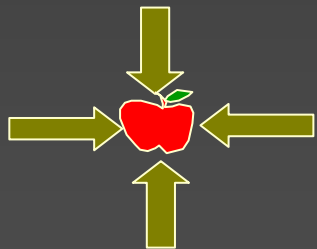


**PEF Processing -
Apple cider**

Partners
The Ohio State University
University of California, Davis
North Carolina State University
Washington State University
US Army Natick Soldier Center



**Microwave Heating –
Cheese sauce (Cont.)
Beef slices in gravy (Packed)**



**High Pressure Processing -
Salad dressing**

NIFSI



**Cooperative State Research,
Education, and Extension Service**

Research, Education, and Economics

Progress at the 2.5 year mark

Research

- Key Food safety knowledge generated

Education

- Course offered at UC Davis on April 4-5, 2005 and April 3-4, 2006
- Fact sheets published
- Course for process authorities planned Oct. 9-10 2006 in Raleigh, NC

Outreach

- Pasteurized juice products developed by PEF and commercially adopted
 - Other commercialization being pursued
-

Genesis Juice (Oregon) commercializes PEF Products



Processed by pulsed electric field

Food Safety Risk Analysis Distance Training Program (FY 2001)

D. Lei and V McAlpin

JIFSAN - Microsoft Internet Explorer

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JIFSAN Web Sites

The Joint Institute for Food Safety and Applied Nutrition (JIFSAN) was established between the United States Food and Drug Administration (FDA) and the University of Maryland (UM) in April 1996. The Institute is a jointly administered, multidisciplinary research and education program and includes research components from the FDA Centers for Food Safety and Applied Nutrition (CFSAN) and Veterinary Medicine (CVM), and UM.

View our online Newsletter

Winter 2006 edition now available!



Joint Institute for Food Safety and Applied Nutrition News

[Back issues of JIFSAN Impact can be found here](#)

Hot Topics

- [Food Safety Risk Analysis Professional Development Training Program](#)
- [2006 CSL / JIFSAN Symposium](#)
June 6-7, 2006
- [Research Associate position now available](#)
posted 9/29/2005
- [JIFSAN Announces New Initiative for Training Food Safety in Exporting Nations](#)
August 15, 2005

[Workshop proceedings](#) now available!

- [Acrylamide in Food Workshop Proceedings](#)
April 13-15, 2004
- [Food Safety Risk Analysis Clearinghouse](#)

Food Safety Risk Analysis

Professional Development Training Program

JOINT INSTITUTE FOR FOOD SAFETY
AND APPLIED NUTRITION



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About Program

2006 Schedule of Courses

Course Descriptions

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Program Policies

Registration

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Information, Maps

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2006 Distance Learning Course Schedule

On-line Distance Learning has opened up risk analysis training opportunities for the world. Lectures and assignments are posted to a class web site for students to access when it is most convenient.

[Overview of Risk Analysis](#)

January 31 - February 17

[Food Safety Risk Communication](#) *

February 21 - April 18

[Food Safety Risk Assessment](#) *

April 18 - June 13

[Food Safety Risk Management](#) *

September 20 - November 15 (Subject to change)

* It is strongly recommended that this course be taken after you have completed the Overview of Risk Analysis course. The Overview course provides contextual information about risk analysis that is not repeated here.

[Frequently Asked Questions](#)

For registration, [click here](#).

For additional distance learning information contact: FSRA-help@umd.edu.

Questions regarding course content should be referred to Wes Long wesley.long@cfsan.fda.gov or Dan Trachewsky dtrachew@cfsan.fda.gov.

Questions regarding schedule, fees or payment should be referred to Customer Service, occe-contedu@umd.edu.



HACCP Training and Research to Assist Meat Processors with Process Deviations for Lethality and Stabilization.

Collaborators:

Harshavardhan Thippareddi 

Dennis E. Burson 

Vijay K. Juneja 

Elizabeth A. E. Boyle 

Mindy Brashears 



Main Objectives

- (i) Develop computer predictive modeling program for growth of foodborne pathogens during processing with temperature deviations
- (ii) Incorporate the developed programs into the International HACCP Alliance accredited workshops and post on web sites



Outcome and Impact

- Predictive models developed were useful in assessing safety of cooked, RTE meat and poultry products involved in stabilization process deviations

More than 25 processors were able to use the models so far

- The models are presently being incorporated into a website for use by processors

Statistics

Number of proposals funded (2000-2005): 177

Risk Analysis: 19

Alternative processing technologies: 5

Control measures, sources and incidence: 40

Antimicrobial resistance: 14

Food defense: 4

Strengths and Opportunities

Strengths

- Excellent stakeholder input into RFA formulation
- Very good progress in partnership between educators and researchers
- Integration of functions steadily improved
- Integration at project level well appreciated by panels
- Good collaboration with sister Federal agencies
- Multi- approach very good

Strengths and Opportunities

Opportunities

- Improvements in data reporting (CRIS)
- Involvement of end user in the integration
- Proposals oriented toward solving a problem of the end user
- Making public health connection



THANK YOU



Has NIFSI Made a Difference?

- Integrated programs have involved some unique collaborations
 - Industry and academe
 - Government and academe
 - International collaborators
 - Federal laboratories
 - Media consultants





Has NIFSI Made a Difference?

- Applied research has received a new and unique focus
 - Research, education, and extension
 - Most are research and extension
 - Most target industry for outreach
 - Basic research has been deemphasized
 - Joint research with NRI is possible





Has NIFSI Made a Difference?

- High risk and hard-to-reach audiences are being targeted
 - Immune-compromised
 - Pregnant and nursing women
 - Farm workers
 - Native Americans
 - Specialty foods retailers
 - Small and very small processing plant owners and operators



Has NIFSI Made a Difference?



- Multidisciplinary research teams are evolving to include:
 - Evaluators
 - Educators
 - Sociologists
 - Curriculum developers
 - Media consultants



Has NIFSI Made a Difference?



- Evaluation methods are strengthening
 - Intensive sub-sample evaluations
 - Observation studies
 - 6-month to 1-year follow-ups



Can NIFSI Impacts be Improved?



- Behavioral Impacts are under-reported
 - Fewer than 10% currently report behavioral impacts
 - What specific behaviors are you trying to change?
 - How do you measure behavior change?
 - Evaluation experts are a must!



Can NIFSI Impacts be Improved?



- Evaluation experts
 - Should be involved in conceptualizing and writing the proposal
 - Evaluation instruments should be submitted with the proposal
 - 6 months to 1 full year should be dedicated to impact evaluation
 - Appropriate funds should be diverted to support evaluation



Can NIFSI Impacts be Improved?



- Reporting mechanisms within CRIS should be strengthened
 - Some standardized data across the program should be collected
 - Some actual impact indicators should be developed
 - More quantitative data should be aggregated across the program



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