Food Product Development, Processing and Safety

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Food Product Development, Processing and Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	15%		35%	
502	New and Improved Food Products	10%		30%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	75%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	5.0	0.0
Actual	1.7	0.0	6.1	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c 84356	1890 Extension 0	Hatch 724596	Evans-Allen 0
1862 Matching 69629	1890 Matching 0	1862 Matching 724596	1890 Matching 0
1862 All Other 583922	1890 All Other 0	1862 All Other 1636284	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "To determine form, stability, and/or function of food components and the effects of processing and/or stability of food or fiber" included continued development of ultrasound technology as a new food processing modality [with the goal of providing a promising alternative to traditional thermal food preservation methods, especially those dealing with liquid food processing]; experiments and the results from those experiments on the use of membranes in combination with sub-critical fluids to refine crude vegetable oils; use of sensory-directed flavor [aroma] analysis, such as combined gas chromatography-olfactometry and sensory descriptive analysis, to allow for the identification of key odorants in foods; modification of our inverse gas chromatography system with an atmospheric pressure chemical ionization mass spectrometer [APCI-MS] which allows us to be the first to study competitive binding and sorption parameters between multiple flavor compounds and soy protein; research that has focused on the chemistry of lipids in chocolate as affected by storage conditions and the translation of this into the impact on human perception of chocolate texture and flavor release; and transformation investigations that produced a 2,4-D tolerant wine grape, Improved Chancellor [this could facilitate large scale wine grape growing near grain crops encompassing states and regions previously unsuited to grape culture].

Activities under the sub goal "To determine chemical and/or microbial parameters related to chemical and/or microbial safety and/or stability of food and fiber" included the development of protocols for pretreatment of corn fibers using acidic and alkaline electrolyzed water at different temperatures and treatment times as well as research designed to develop best practices for both the standard saturated salt solution method and the new automated water sorption instruments and to comprehensively compare [including accuracy, precision, and uncertainty analysis] each of the new automated water sorption instruments to each other, as well as to the standard saturated salt solution method.

Conferences and presentations made by Investigators under this planned program in 2008 included the Annual Meeting of the Institute of Food Technologists, Institute of Food Technologists, Toxicology, and Safety Evaluation, Institute of Fuel Technologists, American Dairy Science Association, 2009 Conference of Food Engineering, American Chemical Society, Pennsylvania Manufacturers Confectioners Conference, and the Horseradish Grower’s School.

University of Illinois Extension provides food safety training annually to employees of establishments that prepare or serve food. The 5-hour Food Sanitation Refresher Course workshops conducted in 2008 helped 365 participants maintain their certification through this continuing education program and completion of a re-certification exam. Another major area of Extension programming focused on food safety is targeted at teaching approximately 2,000 youth and their parents and teachers correct hand washing and cleanliness habits when preparing food. Information is shared through presentations in pre-schools, schools, and 4-H materials and workshops. Other activities include Serve It Safely presentations to 800 volunteers who serve food, and Master Food Preserver training [104 volunteers].

2. Brief description of the target audience

Scientists familiar with crop physiology and plant breeding, specifically those involved in trying to improve nitrogen use and nitrogen use efficiency of crop plants, persons interested in gastrointestinal function, soy food manufacturers, distributors, producers, scientists working with irradiation of meat products and the meat industry, and students and researchers in industry and academia interested in nanotechnology, biopolymers, protein self-assembly, tissue scaffolding, and microencapsulation. Extension programs target youth, certified food handlers, and volunteers who serve food to the public in communities for fundraisers, community organizations and family events [such as reunions and weddings].

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	76000	153000	88000	102000
2008	4169	2311	6067	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	1
2008:	1

Patents listed
One patent was submitted in 2008, 11,990,471.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	45	
2008	0	30	30

V(F). State Defined Outputs

Output Target
Output #1

Output Measure
Number of completed research projects.

Year	Target	Actual
2008	5	1

V(G). State Defined Outcomes

O No.	Outcome Name
1	Number of people reporting or demonstrating KASA changes.
2	Number of people reporting or demonstrating practice changes including improved decision-making.
3	Using Aromoa Analysis To Develop Superior Food Manufacturing, Development, And Storage Processes
4	To Facilitate Large Scale Wine Grape Growing Near Grain Crops Encompassing States And Regions Previously Unsuited To Grape Culture
5	Monitoring Proper Temperatures Of Food Served To The Public To Prevent Foodborne Illnesses

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Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

V(H). Planned Program (External Factors)

External factors which affected outcomes

Economy
Appropriations changes
Government Regulations
Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Retrospective (post program)

Evaluation Results

In November of 2008, data were collected through mail questionnaires to verify whether or not the workshops helped participants improve food handling within their establishments. Subjects were selected through list sampling from recertification class rosters for the calendar years of 2006 and 2007.A total of 342 workshop participants were randomly sampled from a list of 784.Respondents were asked to remain anonymous.A second mailing of the questionnaire was made to all respondents in early January of 2009.Seven questionnaires were returned as undeliverable. A total of 206 [61.5%] of those who actually received surveys returned a questionnaire. The survey instrument asked about 18 food safety practices.Practices included cooking, reheating, holding temperatures, cooling practices, sanitation and personal hygiene.Participants could respond with "did prior to the refresher course," "done as a result of the course", and "not applicable."Also offered as responses, but not considered in this report was "plan to do" and "don't plan to do."

What were the areas where practices were improved? Between 30 and 40% of the participants *who found the question applicable* indicated that as a result of the Refresher Course for Food Handlers training that they now: 1) "Have an awareness of HACCP principles" [39.6% of 187 responding]. [HACCP refers to "Hazard Analysis Critical Control Points"and is an approach in which potential hazards are identified and controlled]; and 2) "Have an awareness of what bacteria need to grow" [39.2% of 186 responding].

In addition, between 30 and 40% of participants *who found the question applicable* indicated that they now practice the following as a result of the training: 1) "Cook and reheat microwaved protein foods 25 degrees higher than conventional temperature" [38% of 134 responding]; 2) "Chill ingredients for mixed food [example: tuna salad] before combining" [36.7% of 147 responding]; 3) "Post a consumer advisory if undercooked food is served" [34.7% of 75 responding]; 4) "Check thermometers regularly for accuracy and recalibrate when needed" [32.1% of 187 responding]; and 5) "Use double strength sanitizing solutions in spray bottles" [31.4% of 140 responding].

How many improved on one or more practice? Slightly more than 73 percent or 151 of the 206 respondents reported adoption of one or more improved food safety handling practices as a result of the training.Of that number slightly less than 60 percent or 125 of the 206 respondents reported adoption of one or more improved food safety practices related to monitoring proper food temperatures. Respondents reported adopting on average between three and four food safety practice behaviors [3.91].

To what extent did participants share what they had learned with others? One hundred eighty-three or about 95% of the respondents indicated they shared what they learned with others.Three out of four times this was with co-workers.Seven out of ten times it was with friends or family. Slightly over half shared the information with volunteers or friends who helped them.

Key Items of Evaluation

The results of a random follow-up survey with participants in the University of Illinois Extension Food Safety Recertification workshop indicate that this program does more than meet the continuing education requirements for food handlers to remain certified.Nearly three-fourths of the respondents reported improving their actual food handling with between three and four improved behaviors being reported on average. Nearly 61 percent reported improving food temperature monitoring practices.Based on the information on the conservative number of meals participants reported serving daily [100] and the annual number of food handlers trained on average per year [350] Extension training helps ensure that an estimated 35,000 meals per day are free of contaminants that can cause food borne illnesses.