

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Food Safety

- Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
404	Instrumentation and Control Systems	0%		8%	
501	New and Improved Food Processing Technologies	0%		25%	
511	New and Improved Non-Food Products and Processes	0%		8%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		8%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		43%	
723	Hazards to Human Health and Safety	0%		8%	
724	Healthy Lifestyle	100%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	1.5	0.0	1.5	0.0
Actual Paid	0.4	0.0	1.9	0.0
Actual Volunteer	7.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
736	0	49059	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
88077	0	354724	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	117571	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

New government standards such as Good Agricultural Practices and Good Handling Practices (GAP & GHP) developed by agencies such as the USDA and the US Food and Drug Administration are putting edible crop producer's agricultural practices under close scrutiny. The objective of GAP & GHP is to minimize risk or outbreaks associated with food borne illnesses. We suspect legislative and government regulations addressing microbial food safety hazards will shortly become mandatory government regulated policies. Increased food safety measures may minimize hazards related to microbial food borne illnesses, increase consumer confidence in the safety of locally produced fruits and vegetables, and increase marketing potential for producers. At present GAP and GHP are voluntary programs. However, implementation of the Food Safety and Modernization Act (FSMA) in the near future will greatly accelerated concerns over food safety and compliance.

In FY2014, CTAHR continued efforts to educate growers about food safety practices on farm and in packing areas with the assistance of CTAHR food safety coaches, educational workshops, production of two thorough and locally-appropriate posters for display on-farm, and development of a comprehensive food safety website with a pre-audit checklist. In addition, CTAHR's Local and Immigrant Farmer Education (LIFE) program offers workshops for socially disadvantaged producers on correct handling and application of pesticides, fertilizer/pesticide monitoring and record keeping, and sanitation requirements to reduce risk of food borne illness. CTAHR faculty also conducted food handling workshops for employees in food processing facilities in Hawaii and throughout the American Pacific.

Research efforts in FY2014 stressed both field detection of contaminants and pathogens, and improved/alternative methods of sterilization and decontamination of tropical fresh and processed foods. Technology for handheld devices for pathogen detection in the field by isothermal DNA amplification and detection were released commercially; and the properties of a peroxidase from the windmill palm tree, *Trachycarpus fortunei*, were evaluated for possible use in biosensors or immunochemical kits for field pesticide residue detection. Risks to consumers from pesticide contamination were also addressed in pesticide residue evaluations under the IR-4 program to establish guidelines for pesticide registrations for use in minor crops.

Computational modeling for combined microwave and ohmic heating in a continuous flow system were established in FY2014, allowing future design of a production scale unit for evenly cooking solid-liquid food mixtures, such as in processing of canned soups. For post-harvest microbial decontamination of fresh produce surfaces, a photothermal guiding system was developed with a pulsed carbon dioxide laser and adjustable beam expander. This system was optimized to ensure uniform radiation of the sample, and microbial inactivation was increased by addition of conjugated gold nanoparticles to the fruit surfaces. In trials in FY2014, there were no traces of microbial survivors after a treatment time of three

minutes, demonstrating the efficacy of this novel technique. To enhance the safety of fresh-cut produce and unpasteurized tropical fruit juices, java plum juice was tested against pathogens both in culture and on inoculated fresh-cut cantaloupe. Java plum juice significantly reduced pathogen concentration, likely due to its high content of organic acids and phenolic compounds. This may provide an eco-friendly solution to enhance the microbiological safety of cut fruit.

2. Brief description of the target audience

This program reaches from farms to food processing facilities; to consumers, hospitals and research facilities. Detection and mitigation of food-borne pathogens is a critical concern for local farms and processing facilities, home gardeners, medical laboratories, and the many importers and retailers of food products imported from outside of the State of Hawaii.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	125	300	270	120

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

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	14	14

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of workshops, field days and demonstrations

Year	Actual
2014	4

Output #2

Output Measure

- Presentations at national and international meetings.

Year	Actual
2014	6

Output #3

Output Measure

- Grant proposals submitted.

Year	Actual
2014	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people adopting one or more practices which result in improved food safety.
2	Dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Number of people adopting one or more practices which result in improved food safety.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Protection of food safety is both an individual and well as a societal responsibility. Farms, food processors, markets, restaurants as well as the individual consumer all have their respective responsibilities in maintaining a safe food supply. CTAHR has the responsibility to provide science-based information on food safety to all these groups.

What has been done

Training of farmers and food processors has been accomplished through individual coaching, extension publications, websites, workshops and non-formal education. Individuals have reported adoption of practices learned.

Results

The safety of Hawaii's fresh and processed foods has been improved through these activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
511	New and Improved Non-Food Products and Processes
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

724 Healthy Lifestyle

Outcome #2

1. Outcome Measures

Dollar value of grants and contracts obtained.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	323085

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improved food safety practices by food producers, processors and consumers are needed to protect public health. Funding is needed to support these programs, as well as research on improving food safety.

What has been done

Extramural funds have been obtained, and education in food safety provided.

Results

Hawaii's food supply is safer, and Hawaii's agricultural industry is more competitive and better prepared for the Food Safety Modernization Act and compliance programs required by retailers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
404	Instrumentation and Control Systems
501	New and Improved Food Processing Technologies
511	New and Improved Non-Food Products and Processes
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

724 Naturally Occurring Toxins
Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Retailers and consumers have a strong interest in food safety, but processors and farmers face difficulties from the costs associated with food safety certification, particularly in a weak economy. Thus, funding for this program, and public/client and political interest is inconsistent.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

All projects conducted under this program were peer-reviewed before initiation. Annual progress reports were collected and evaluated by the associate deans for research and extension. Funds are not released for those projects which did not show tangible progress.

Key Items of Evaluation

None.