

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food Safety and Nutrition

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
503	Quality Maintenance in Storing and Marketing Food Products	5%	20%	0%	5%
703	Nutrition Education and Behavior	30%	30%	0%	35%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	30%	20%	70%	20%
723	Hazards to Human Health and Safety	30%	10%	30%	20%
724	Healthy Lifestyle	5%	20%	0%	20%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	3.0	2.7	2.0
Actual Paid Professional	27.0	3.5	1.2	2.0
Actual Volunteer	0.0	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
734655	156314	164449	345805
1862 Matching	1890 Matching	1862 Matching	1890 Matching
734655	129323	315064	271318
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Safe handling of food was taught to handlers in the food service industry and the general public. Commercial food processors were targeted in an effort to improve commercial food processing efficiencies and effectiveness/develop new markets/improve commercial handling, processing, preservation and packaging to provide safe and high quality foods. Attention was given to providing consumers with scientifically based, reasonable nutrition and food safety information via the media. Food-borne illnesses were defined and conditions discussed that encourage bacteria growth. Agents and specialists covered topics such as common food-borne pathogens, additives, preservatives and basic kitchen safety techniques were taught.

Participants increased knowledge and skills in safe handling of food. Managers and supervisors were certified to train food handlers in safe food handling techniques. Food handlers practiced safe food handling techniques. Specialists assisted in the development of new food businesses. Regulatory compliance was promoted.

A Perinatal Awareness for Successful Outcomes (PASOs) Program was conducted and covered the topics of eating smart being healthy during pregnancy, feeding your new baby, and feeding your baby solid foods. Community-based research continues to reach Hispanic audiences. Specialist continue to improve educational materials, "Celebrando la Salud," for Hispanic populations in the Upstate region of South Carolina. Research was conducted on nanotechnology applications for food safety and quality. There were special efforts to develop strategies and processes that can reduce the presence and risk of pathogenic bacteria on foods. Food safety though enhanced packaging technologies was another research focus. Research is proceeding on the DNA of a bacterium widely used as starters in yogurt and cheese. By understanding its genetic characteristics of this bacterium, scientists can improve the commercial usefulness, such as fermentation rate, flavor and sweetness.

1890 Research is continuing to investigate the effects of ozone and probiotics on inhibiting food-borne pathogens associated with poultry and meats. Poultry and beef samples were purchased bi-weekly for experimentation. Experiments were performed testing the effects of lactic acid (a byproduct of probiotics) on the growth of E. coli. Competitive growth experiments were performed using E. coli and Streptococcus thermophilis. The media provided would not support the growth of S. thermophilis. A new media was ordered, which will support the growth of both organisms. Results indicated that lactic acid exhibited bacteriocidal properties at 16% concentration on E. coli. Therefore, studies are planned to use lactic acid on E. coli found in beef and salmonella/campylobacter found in poultry to see if similar results will be generated. The Food Safety Laboratory was established. Students were trained on how to

successfully use equipment and supplies.

Also, research is conducted to investigate the effects of two different resistance exercise regimens on the diabetic profile of a Type 2 diabetes mellitus patient. The research used innovative signal processing techniques to study kinetic patterns of muscular fatigue. The training portion of the research was successful. A preliminary analysis of data was completed. Subjects in the band exercise group reported, after a couple of months of training, one person improved his strength, balance and stability so much he packed away his walking cane. Another subject reported her leg cramps disappeared after a few weeks of training. A subject in the isokinetic training group reported improved strength and flexibility that allowed her to perform simple tasks such as tying shoelaces and using a dust pan, while sweeping floors for the first time in years. Other subjects in the isokinetic group also reported improved functioning and balance in everyday tasks.

2. Brief description of the target audience

The target audience includes community leaders, agencies, policy makers, general public, EFNEP - limited resource families, food service managers, supervisors, food handlers, producers, commercial food handlers, processing and packaging industry, entrepreneurs seeking to start food businesses or improve existing food business, media and other marketing contacts, and publication outlets - doctors' offices and grocers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	13765	100	716	500

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

Oxygen scavengers comprising a free radical and a transition metal.
Carolina Canning

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	1	8	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Licenses

Year	Actual
2013	0

Output #2

Output Measure

- Disclosures

Year	Actual
2013	0

Output #3

Output Measure

- Number of people completing educational workshops.

Year	Actual
2013	10490

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants reporting increased knowledge in safe food handling and nutrition.
2	Number of managers/supervisors/food handlers completing educational program and receiving a course certificate
3	Number of participants reached with food safety information by volunteers who participated in an Extension training program
4	Number of new or improved food products entering the market as a result of adopting recommended practices
5	Number of people reached through media outlets that utilize Extension food safety, food biotechnology and nutrition resources

Outcome #1

1. Outcome Measures

Number of participants reporting increased knowledge in safe food handling and nutrition.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1398

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The program promotes healthy lifestyles and improves the quality and safety of food for the citizens of South Carolina.

What has been done

Food Safety agents conducted educational programs for the general public reaching 1,420 adults. Carolina Canning is an example of an educational program that equips consumers with science-based knowledge to produce safe, high quality canned, dried, or frozen foods. Extension staff members have recruited experienced home canners as volunteer Canning Coaches and have developed training materials to update their knowledge so they can provide or assist with home food preservation programs. Volunteers from over 23 counties have been trained as Canning Coaches. A 4-lesson canning curriculum is tailored to South Carolina's specialty crops (but broadly applicable to other foods) has been produced. Workshops have been marketed by multiple means including a new Facebook page. Food Safety & Nutrition agents have delivered hands-on canning workshops to audiences that included members of the general public, youth and limited resource individuals.

Agents conducted 251 food safety programs for the general audience. Over 40 canning coaches and other volunteers were trained and delivered programs or information. Over 271 media programs were delivered covering topics of Food Safety, Nutrition, and Health. Agents distributed information via newspaper articles, websites, other external publications, and on Facebook, radio and television. In addition, specialists are collaborating with NC State University to prepare a food safety manual in Spanish to target Spanish-speaking food processors.

Results

Of the adults participating in the educational programs, 98% reported a gain in knowledge. Over 77% reported using practices learned. Food Safety and Carolina Canning web activity:

<http://www.facebook.com/carolinacanning>

<http://www.facebook.com/#!/pages/Food-Safety-Nutrition-and-Health->

http://www.clemson.edu/extension/food_nutrition/canning/index.html

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Number of managers/supervisors/food handlers completing educational program and receiving a course certificate

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	125

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Centers for Disease Control reports that there are five situations which cause most of the outbreaks of foodborne illness. Those situations are poor personal hygiene, improper holding temperatures, purchasing food from unsafe sources, failing to cook food adequately, and using contaminated equipment. In South Carolina, foodborne illness outbreaks from restaurant facilities numbered approximately 100 in both 2009 and 2010, according to data collected by the South Carolina Department of Health and Environmental Control. The CDC estimates for the whole nation that 5200 deaths from foodborne illness occur annually.

What has been done

In an effort to reduce food-borne illness, agents conducted ServSafe® food safety training for managers, supervisors, and other food handlers.

Results

A total of 125 food service employees received a course completion certificate, representing 110 food establishments. These food handlers can potentially affect thousands of people. The National Restaurant Association has estimated that the average cost of a food-borne illness outbreak to an establishment is about \$75,000. The approximate economic value of the training sessions could be as high as \$8,250,000 by preventing outbreaks.

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety

Outcome #3

1. Outcome Measures

Number of participants reached with food safety information by volunteers who participated in an Extension training program

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of new or improved food products entering the market as a result of adopting recommended practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	43

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food entrepreneurs need knowledge on marketing and selling safe, high quality food. Their product must be in compliance with all local, state, and federal regulations. The Food Safety program promotes healthy lifestyles and improves the quality and safety of food for the citizens of South Carolina.

What has been done

Over 68 contacts were made with food entrepreneurs, representing 13 food companies. Quality testing was conducted for 14 products. Specialists have assisted food processors regarding food laws, delivered a national commercial food canning workshop for Abbott pharmaceutical in Arizona, a Food Plant Sanitation workshop in Spanish in Mexico, a HACCP program for a local company, a commercial food canning workshop , and a probiotics session for health care professionals. A food safety workshop was delivered in Spanish targeting Hispanic businesses. One specialist is collaborating with NC State University preparing a manual in Spanish targeting Spanish speaking food processors.

Results

Some 43 new or improved food products entered the market as a result of adopting Extension recommendations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #5

1. Outcome Measures

Number of people reached through media outlets that utilize Extension food safety, food biotechnology and nutrition resources

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Based on questionnaires and evaluations, participants' preservation of local fruits and vegetables have increased and they now have the knowledge to preserve South Carolina food products safely. Food handlers and managers have made changes in their practices when serving the public.

Key Items of Evaluation