V(A). Planned Program (Summary)

Program # 8

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
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	10%		10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	90%		90%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	2.0	0.0
Actual Paid Professional	4.0	0.0	1.4	0.0
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
61581	0	64295	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
61581	0	64295	0
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

University of Wyoming Extension collaborates with the Wyoming Department of Agriculture, Consumer Health Division and Wyoming Environmental Health Association, and local health agencies in partnership as the Wyoming Food Safety Coalition. Educational efforts include a series of workshops or classes targeting food industry personal. In addition, utilizing ServSafe, the certification course of the National Restaurant Association in depth classes which include end of session certification testing are conducted. Classes, workshops, displays, and demonstrations are used to reach a general consumer audience. Youth are reached through school programs on handwashing and avoidance of cross contamination.

Educational programs on food preservation including pressure and water-bath canning, freezing, and drying foods will be delivered using multiple methods to ensure safety of the end product.

Research will focus on more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately deliniate genes that promote survival in the environment and result in disease contamination of food.

2. Brief description of the target audience

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in all programs regardless of their race, national origin, gender, age, religion, or disability. Specific target audience groups for the CNP (EFNEP) program: Low-income adults, Youth in Title I schools. All other food safety efforts targeted audiences include: general public, both adults and youth and policy makers.

3. How was eXtension used?

eXtension is utilized as a resource both to educators and clientele. The University of Wyoming Extension Web site prominately displays eXtension on its' home page. eXtension professional development oportunities are publicized to all extension personnel.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2027	10000	500	5000

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

Patent Applications Submitted

Year:	2012
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Research; Evaluate the ability to detect and analyze for the presence of food-borne pathogens. Target is number of publications, reports, bulletins, and presentations.

Year	Actual
2012	3

Output #2

Output Measure

- Number of food safety programs which promote safe handling practices in the public and food service industry.

Year	Actual
2012	115

Output #3

Output Measure

- Number of partcipants in educational programs offered by the Wyoming Food Safety Coalition.

Year	Actual
2012	2429

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improve personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is the number of participants reporting outcome.
2	Increased awareness and knowledge of food safety practices. Target is the number of participants reporting outcome.
3	Research: Transfer of knowledge on the ability to detect and analyze for the presence of food-borne pathogens. Target is the number of projects reporting this outcome.
4	Research: Research will result in easier, more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately deliniate genes that promote survival in the environment and result in disease contamination of food. Target is the number of projects with results that deomonstrate outcome.
5	Food service industry personnel pass ServSafe certification test. Target is the number of participants who complete course and pass test of the National Restaurant Association.

Outcome #1

1. Outcome Measures

Improve personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is the number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	2028

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Microbial contamination of food is a serious public health problem: Each year in the U.S., food-borne diseases cause approximately 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths. It is estimated that the average cost per foodborne illness is $1,850. With approximately 60 percent of food-borne illness outbreaks nationwide attributable to food-service establishments, food-service personnel are key to reducing the risk of food-borne illness. Additionally, home food preparers and consumers are important groups to reach with food safety education because their behaviors greatly affect the safety of food that they serve to others and/or eat themselves

What has been done
UW Extension collaborates with the Wyoming Department of Agriculture, Consumer Health Division and Wyoming Environmental Health Association, and local health agencies in partnership as the Wyoming Food Safety Coalition (WFSC). Educational efforts include a series of workshops or classes targeting food industry personal. In addition, utilizing ServSafe, the certification course of the National Restaurant Association in depth classes which include end of session certification testing are conducted. Classes, workshops, displays, and demonstrations are used to reach a general consumer audience. Youth are reached through school programs on handwashing and avoidance of cross contamination.

Results
Based on data from an evaluation project conducted by UW Extension for the WFSC, this year 97 percent of participants made at least one change related to cleanliness, for example, washed their hands more often. Eighty percent made at least one change related to cooling foods. Another 78 percent made at least one change related to food preparation, for example, prevented cross-contamination by keeping raw meats, cooked foods, and fresh produce separated. Seventy-five percent made at least one change such as monitored critical control points more closely. Improved food handling behaviors increase the likelihood that food served in Wyoming is

safe and, therefore, that lives have been saved, illnesses avoided, healthcare cost controlled, fewer work days missed, and local businesses and institutions made sstronger.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #2

1. Outcome Measures

Increased awareness and knowledge of food safety practices. Target is the number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	2500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food-borne diseases cause approximately 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths. It is estimated that the average cost per foodborne illness is $1,850. With approximately 60% of food-borne illness outbreaks nationwide attributable to food-service establishments, food-service personnel are key to reducing the risk of food-borne illness. Additionally, home food preparers and consumers are important groups to reach with food safety education because their behaviors greatly affect the safety of food that they serve to others and/or eat themselves.

What has been done
115 classes ranging from ServSafe certification courses, ServeSafe Starters, Going for the Gold food safety classes for food service handlers, consumer food safety classes and school workshops on proper handwashing methods were conducted. Additionally classes on safe food preservation were taught statewide. In 2012 numerous courses were also taught in Spanish in Western Wyoming.

Results

100 percent of participants reported through both formal and informal evaluations increased awareness and knowledge of food safety practices.
97% made at least one change in regard to cleanliness.
80% made at least one change in regard to cooling food.
78% made at least one change related to food preparation.
75% made at least one change such as monitored critical control points more closely.
70% made at least one change related to cooking food.
Improved food handling behaviors such as those listed above increase the likelihood that food served in Wyoming is safe, and therefore, that lives have been saved, illnesses avoided, health care costs controlled, fewer work days missed, and local businesses and institutions made stronger.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Research: Transfer of knowledge on the ability to detect and analyze for the presence of food-borne pathogens. Target is the number of projects reporting this outcome.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Contamination of food through microorganisms, toxins, or physical and chemical contaminants results in a hazard for consumers. Food borne diseases cause illnesses, hospitalizations and death. In order to keep food safe, a methodical process known as Hazard Analysis Critical Control Point (HACCP) is used in food processing and food services.

What has been done
The manual for HACCP training of small, rural, non-meat food processors was revised and in its second printing, B1200r. This is a step-by-step guide to developing an individualized HACCP

program. Also written and in its first printing was the facilitator's guide, B-1200.1. This guide is used by the trainers from the Wyoming Food Safety Coalition (WFSC). Trainings have been conducted throughout the year in different parts of the state.

Results
The increase in the safety of the food produced and manufactured in the state increases the safety of the consumer. The WFSC is a multi-agency, multidisciplinary partnership that has become the primary source of food safety education throughout the state. The heart of WFSC is a core of trained teams which are located in communities across the state. They include environmental health specialists, the state Department of Agriculture/Consumer Health specialists, extension educators, and college faculty. "The Wyoming Department of Agriculture's Consumer Health Services depends on Coalition team members to deliver food safety education throughout the state. WFSC is an invaluable partner in helping keep food safe in Wyoming" says the manager of Wyoming's Department of Agriculture's Consumer Health Services.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Outcome #4

1. Outcome Measures

Research: Research will result in easier, more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately deliniate genes that promote survival in the environment and result in disease contamination of food. Target is the number of projects with results that deomonstrate outcome.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Listeria monocytogenes is a pervasive foodborne pathogen that causes hundreds of cases of the severe disease, listeriosis, in the US every year. Although other foodborne bacteria such as

Salmonella and E. coli cause more illnesses, L. monocytogenes is the deadliest of the common foodborne bacteria, having a mortality rate of approximately 20%. One source of infections is the consumption of fresh produce that is contaminated with the bacterium. Currently, little is known about the cellular components that allow L. monocytogenes to adhere to the surfaces of fruits and vegetables.

What has been done
We recently identified genes responsible for the synthesis of a surface exopolysaccharide in L. monocytogenes. Exopolysaccharide commonly is used by bacteria to attach to plant surfaces and resist environmental insults such as desiccation. In future research, we will examine the role of the listerial exopolysaccharide in the attachment of cells to produce and the resistance of the bacterium to environmental stressors.

Results
This research will lead to a better understanding of the factors underlying the adherence and persistence of L. monocytogenes on produce and will guide efforts to prevent colonization and inhibit the growth of the bacterium on produce.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #5

1. Outcome Measures

Food service industry personnel pass ServSafe certification test. Target is the number of participants who complete course and pass test of the National Restaurant Association.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	359

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Microbial contamination of food is a serious public health problem: Each year in the U.S., food-borne diseases cause approximately 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths. With approximately 60 percent of food-borne illness outbreaks nationwide attributable to

food-service establishments, food-service personnel are key to reducing the risk of food-borne illness.

What has been done
UW Extension collaborates with the Wyoming Department of Agriculture, Consumer Health Division and Wyoming Environmental Health Association, and local health agencies in partnership as the Wyoming Food Safety Coalition (WFSC). Educational efforts include a series of workshops or classes targeting food industry personal. In addition, utilizing ServSafe, the certification course of the National Restaurant Association in depth classes which include end of session certification testing are conducted. Classes are also being taught in Spanish in Western Wyoming.

Results
Of the 359 participant's in WFSC's ServeSafe and ServSafe Starters workshops : 92% passed the certification exam.
97% made at least one change in regard to cleanliness.
80% made at least one change in regard to cooling food.
78% made at least one change related to food preparation.
75% made at least one change such as monitored critical control points more closely.
70% made at least one change related to cooking food.
Improved food handling behaviors such as those listed above increase the likelihood that food served in Wyoming is safe, and therefore, that lives have been saved, illnesses avoided, health care costs controlled, fewer work days missed, and local businesses and institutions made stronger.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Turnover of personnel offers challenges in Wyoming; Food Preservation as part of food safety also requires specialized training to provide competency in that subject area.

Populations changes (immigration, new cultural groupings, etc.)
Economy

Appropriation changes
Government Regulations

Competing Programmatic Challenges
Public Policy changes

V(I). Planned Program (Evaluation Studies)

Evaluation Results

End of session questionnairs, follow up surveys were used to document outcomes.
100 percent of participants reported through both formal and informal evaluations increased awareness and knowledge of food safety practices.
97% made at least one change in regard to cleanliness.
80% made at least one change in regard to cooling food.
78% made at least one change related to food preparation.
75% made at least one change such as monitored critical control points more closely.
70% made at least one change related to cooking food.
Improved food handling behaviors such as those listed above increase the likelihood that food served in Wyoming is safe, and therefore, that lives have been saved, illnesses avoided, health care costs controlled, fewer work days missed, and local businesses and institutions made stronger.

Key Items of Evaluation

UW Extension is a key leader with the Wyoming Food Safety Coalition (WFSC) started in 1995. WFSC is a multi-agency, multi-disciplinary partnership that has become the primary source of food-safety education throughout the state. The heart of WFSC is a core of local trained teams, most of which include area UW Extension Nutrition and Food Safety educator and a health inspector from either the Wyoming Department of Agriculture or a local city/county health department of both. These teams plan and conduct a wide variety of educational programs. The addition of bi-lingual educators has increased UW Extension's capacity to provide educational programs to Spanish speaking clientele.

Improved food handling behaviors such as those listed above increase the likelihood that food served in Wyoming is safe, and therefore, that lives have been saved, illnesses avoided, health care costs controlled, fewer work days missed, and local businesses and institutions made stronger.