

V(A). Planned Program (Summary)

Program # 5

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
501	New and Improved Food Processing Technologies	30%		32%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	30%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	30%		29%	
806	Youth Development	10%		34%	
	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	28.0	0.0	13.0	0.0
Actual Paid Professional	29.0	0.0	12.0	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
635538	0	266301	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
605232	0	281482	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

IANR will use a holistic approach in addressing food safety from farm to fork. Research and extension programming will target reducing food borne illnesses. A variety of teaching strategies will be used for program delivery including face-to-face education, distance learning technologies, and eXtension programming.

2. Brief description of the target audience

The target audience for this program includes:

- producers,
- food processing and retail establishment owners/workers, and
- consumers.

3. How was eXtension used?

Food Safety programming continues to benefit from eXtension resources. In addition to serving as a reference for new topics, eXtension content is regularly linked back to our umbrella food website (food.unl.edu) which houses our food safety resources. UNL Extension faculty are regular contributors to the eXtension site in the food/nutrition and food safety areas.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1500	3400	1900	20000

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	3	37	40

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of scholarly publications and curricula related to food safety.

Year	Actual
2012	16

Output #2

Output Measure

- Number of extension in-depth workshops.

Year	Actual
2012	24

Output #3

Output Measure

- Percentage of Agricultural Research Division HATCH projects in food safety.

Year	Actual
2012	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased adoption of pre-harvest methods for beef quality and safety.
2	Increased implementation of safe food handling practices by food service providers and consumers.
3	Nebraska will have access to higher educated workforce trained in the new biology with skills applied to addressing critical science in food safety.

Outcome #1

1. Outcome Measures

Increased adoption of pre-harvest methods for beef quality and safety.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	2500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture is the economic driver in Nebraska's economy accounting for 12 billion dollars annually. Over half, 7.1 billion dollars, of this revenue comes from the beef industry. Improving the profitability of beef producers contributes to the economic vitality of Nebraska cities and towns. There are 1.71 million beef cows in Nebraska, ranking us 4th nationally. The cow-calf enterprise is a complex production system that integrates human, financial, and natural resources. As world populations continue to grow, the efficient, sustainable conversion of forage and feed resources into high quality protein products will be increasingly important. Nebraska farmers and ranchers are positioned to be leaders in the production of economical, safe, and healthy food.

What has been done

UNL Extension's Beef Systems program focuses on:

- * Improving the competitiveness, diversity, sustainability and profitability of Nebraska's beef producers,
- * Adoption of approaches to animal care that improve health, well-being, quality and wholesomeness,
- * Improving business and management skills,
- * Increasing consumer education about beef systems

Programs include:

- * Ranching practicums that deliver in-depth educational programming
- * Beef systems home study courses emphasizing nutrition and health,
- * Satellite delivery of the latest research through Beef Satellite Short Course,
- * Nationally recognized web delivery including Ask an Expert (<http://beef.unl.edu> and <http://www.extension.org/beef+cattle>)
- * Chuck roll cutting demonstrations and basic meat science

For example, the 4-H Livestock Quality Assurance (LQA) Online Program teaches youth about the quality of meat and food products that come from livestock. Quality assurance for livestock producers means making a promise to the consumers, or the people who consume the meat, milk and dairy products, and eggs that come from livestock poultry. The promise made is that products from livestock will be the highest possible quality and producers will do everything possible to make these products safe to eat. All Nebraska 4-H youth ages 8-18, who are enrolled in a livestock project (beef, dairy cattle, dairy goat, meat goat, poultry, rabbit, sheep, and swine) are required to complete three modules in the LQA Online Course in order to get certified. Certificates of completion are then turned into their local Extension office in order to receive full credit for completion allowing youth to participate in local, state and regional livestock competitions.

Results

Since March of 2012, 2,438 youth have participated in the 4-H Livestock Quality Assurance (LQA) Online course reaching youth in 80% of Nebraska counties, with 7,972 module certificates earned (youth are required to complete at least three for LQA certification each year). Certificates are only issued when a youth has achieved an 80% competency on the module content. Resources have been accessed over 155,000 times. Youth have access to the course from a variety of locations (home, extension office, library, etc.) including one youth who told us they were able to complete their LQA requirements on the bus using their smartphone on the way to a basketball game. Examples from youth when surveyed, "Why do you think it's important to learn about LQA": so I know what to do when my animal is sick; so I can provide a good product for consumption; keep animals and meat safe; and so our animals are treated properly and we are safe around them.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
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
806	Youth Development

Outcome #2

1. Outcome Measures

Increased implementation of safe food handling practices by food service providers and consumers.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

About 48 million people (1 in 6 Americans) get sick, 128,000 are hospitalized, and 3,000 die each year from foodborne diseases, according to recent data from the Centers for Disease Control and Prevention (CDC). The Food Safety Modernization Act (FSMA), signed into law by President Obama on January 4, 2011, when fully implemented will shift the focus of food safety for federal regulators from responding to contamination issues, to preventing them.

What has been done

UNL Extension continues to be the "go to" organization for food safety education for the meat processing industry, food service providers, and consumers. For example, UNL Extension reached 137 small and very small sized meat processing operations in Nebraska, Kansas, Missouri, and South Dakota with education on Hazard Analysis and Critical Control Point (HACCP) information.

When FSMA is fully implemented, fruit and vegetable growers may be facing new regulations aimed at reducing the potential for microbial contamination of produce by bacteria, viruses, and parasites that cause human illness. The issue of foodborne illness and its prevention is a new one for most fruit and vegetable growers. Contamination of produce may occur at any stage of production- field or greenhouse growth, harvest, postharvest handling or transportation- but there are many things that can be done to reduce risk. In the Good Agricultural Practices (GAPs) series of workshops, participants learned what causes foodborne illness, and how contamination can be prevented. They began to assess the current strengths and weaknesses of their production operations regarding food safety, learned how to integrate GAPs into their farm operations, and began to write a farm food safety plan.

In a new program offered through UNL Extension, 600 child care providers received food service safety training as part of a distance education program. In addition, UNL Extension reached 683 foodservice managers with 12 hours of training related to food safety and sanitation through the ServSafe course with a statewide pass rate of 86%.

The research components of the new USDA grant, "Food Safety for Diverse Families (Native American and Hispanic) with Young Children" has begun. Two graduate students have completed their research proposals and have submitted their IRB's for conducting the knowledge survey validation and focus groups. The project is a Multi-state project with the University of New Mexico

UNL Extension partnered in the development of the "4 Day Throw Away" program includes an iPhone app that helps consumers understand how long to keep leftover food for safety. The app provides specific time frames for specific foods and links food to the common culprit microorganism. Each microorganism listing includes symptoms, who is most at risk, how long after exposure before you get sick, what is the recovery and long-term complications, foods associated with this microorganism, and how to prevent getting sick. Social marketing drives the campaign. Traditional media (press releases, radio PSAs) and mascot appearances at grocery

stores were conducted. The website (4daythrowaway.com) contains videos with interactive polling, and food safety myths. The videos help families understand the importance of using leftovers within four days or throwing the items away. The "4-Day Throw Away" application software (app) features hundreds of individual food items, storage recommendations, reheating instructions and special considerations around food safety. The app also gives information on related foodborne illnesses, with details on symptoms, duration, complications and prevention.

Results

As a result of HACCP education HACCP workshop participants indicated that they felt more comfortable in utilizing the HACCP principles in their programs and indicated that they would be using them regularly. The overall comfort levels of the participants for working with HACCP plans increased after completion the course and they indicated they would be more willing to discuss HACCP plans with co-workers.

In 2012, assistance was given to twenty small meat processing businesses for HACCP plan development, reassessment, and implementation of food safety procedures including standard operating procedures for E. coli O157:H7 sampling to small processors. And, assisting one company with establishing the USDA grant of inspection and provided startup advice to two additional companies.

As a result of the GAPs training, participants were surveyed following each program to measure knowledge gain in issues pertaining to good agricultural practices. (n=103): 85% increased their knowledge about the need for farm food safety; 95% increased their knowledge of field production practices that reduce the risk of produce contamination; and 92% increased their knowledge GAPs recordkeeping requirements.

As a three month follow up, GAPs participants indicated they made the following practice changes. (n=27): 74% implemented a hygiene program for all employees; 67% implemented a common sense recordkeeping system; 59% implemented a system to clean all harvest equipment on a scheduled basis; and 55% developed a food safety program for their farm that incorporated good agricultural practices

A research project on the impact of meat product mixing time on cooked product quality when reduced salt (sodium) levels are used or when salts of organic acids used as antimicrobial ingredients was conducted. Because the reduction of salt (sodium chloride) in meat products can impact food safety and shelf life and greatly impacts the texture and quality of meat products, this work will help meat processors understand the effects of reduced salt in their formulations and processing techniques that can enhance product quality.

Approximately 600 Childcare Providers who participated in the Web-based Food Safety Training reported improvements in several areas. For example, 51% increased their use of thermometers to measure food temperatures, 41% increased efforts to prevent cross-contamination

In 2012, UNL Extension trained 500 managers on ServSafe. These managers trained nearly 10,000 front-line staff. ServSafe Starters reported that: 52% increased their knowledge on calibrating thermometers, 38% increased their knowledge about the food temperature danger zone, 35% increased their knowledge on proper minimum cooking temperatures. As a result of ServSafe: 34% increased their knowledge of proper cooking temperatures, 32% increased their knowledge of how to not purchase food from unsafe sources.

As a result of "4 Day Throw Away" new audiences that may not be familiar with Extension were reached with food safety education via social media and traditional methods. In its first year of the campaign, 5000 magnets were distributed; 500 posters with tear-off cards were posted which

directed recipients to a website (over 4000 visits) with leftover food safety information. The viral campaign included 4 YouTube videos (over 9000 views); a Facebook page (150 users with over 18,000 post views); and 48 followers on Twitter. Multiple media methods were necessary for success to increase awareness and change health behaviors. Traditional and social media methods used in the 4 Day Throw Away campaign reached the intended audience.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
806	Youth Development

Outcome #3

1. Outcome Measures

Nebraska will have access to higher educated workforce trained in the new biology with skills applied to addressing critical science in food safety.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Preparing Nebraska's youth to pursue meaningful career choices, especially in the areas of science and the new biology continues to be a top priority of Nebraska 4-H. The 2012-2017 Nebraska 4-H Strategic Plan sought to teach our youth the value of opportunity and connectivity, and to develop the skills necessary for acting on those opportunities. Through various 4-H programs, projects, and activities, youth were able to discover and pursue their interests as they relate to future career possibilities. In each of these endeavors, a special emphasis was placed on careers related to science. It is anticipated that this focus will help generate a new pool of science-ready students who can take on the challenge of feeding nine billion people. Food safety plays a critical role in meeting that challenge.

What has been done

As a part of their experience, each Nebraska 4-H participant is challenged to engage in projects that are of interest to them and match their skills. 4-Hers are then empowered to connect the dots between that set of skills and potential careers. The new Career Explorer app released in 2011 has been downloaded 2,143 (including 625 downloads in the last 90 days) with total game plays that reached the final page totaling 9,909. Top 10 careers chosen through the Career Explorer app in order were: lawyer, veterinarian, singer, actor, surgeon, pediatrician, animal breeder, architect, teacher and fashion designer.

Results

While not all directly related to food safety, the work of Nebraska 4-H in helping young people be college-ready and prepared to choose careers that would benefit the state are obvious. Over the last five years, the efforts of Nebraska 4-H have been evidenced by the significant increase in percentage of youth respondents who know a college major related to their 4-H program or project. After participating in a 4-H program, 83% said they interacted with someone working in a career area they're interested in; an increase of 55% from before the program; 97% of students agreed that they now understand the value of higher education in their future; 84% agreed that they understand the path to their desired career, an increase of 21% from 2011.

Nebraska 4-H is developing science interests, skills and abilities in the areas of agriculture, energy, environmental stewardship, food science and technology. When surveyed, 88% of 4-Hers agreed or strongly agreed that they can explain their science-related decisions to others; 89% agreed or strongly agreed that science is important in solving everyday problems and 99% agreed or strongly agreed that good scientists work together to solve problems.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
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
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

UNL Extension has been able to successfully meet goals as planned in the area of food safety. Research and Extension Faculty continue to be watchful for emerging issues and world conditions that could change food systems and the global trust that consumers have of U.S. agriculture. In addition, UNL Faculty are at the forefront of basic research in food allergies, food safety through the food chain, and microbiome profiling.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UNL Extension has developed an impact report for each of its Action Teams. These can be found on our Extension home page at: <http://www.extension.unl.edu//>.

The Nebraska Agricultural Experiment Station measures its success in our ability to provide Extension with cutting edge research results that impact Nebraska. In addition, we have begun to use a commercial product (Academic Analytics) to assess faculty productivity measures. We are still in the process of determining the robustness of their dataset.

Key Items of Evaluation

UNL Extension continues to identify signature outcomes and indicators in each of its programming areas and is collecting statewide data to assess progress made toward achieving those outcomes. In 2012, each Extension Action Team completed an outcome report highlighting their efforts and the impact of those efforts on clientele. These reports have been instrumental in working with stakeholders who in turn used them to advocate on behalf of the Extension program. Additional efforts are underway to enhance the skills of Action Team leaders in order to strengthen selected indicators and evaluation strategies.

Information regarding Academic Analytics can be found at: <http://www.academicanalytics.com/>