V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Food 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
213	Weeds Affecting Plants	15%		0%	
307	Animal Management Systems	5%		0%	
308	Improved Animal Products (Before Harvest)	15%		0%	
315	Animal Welfare/Well-Being and Protection	10%		0%	
404	Instrumentation and Control Systems	10%		0%	
503	Quality Maintenance in Storing and Marketing Food Products	5%		0%	
604	Marketing and Distribution Practices	5%		0%	
703	Nutrition Education and Behavior	10%		0%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%		4%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		77%	
723	Hazards to Human Health and Safety	5%		19%	
806	Youth Development	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	5.2	0.0	4.1	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**
221791	0	209798	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
221791	0	209798	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
124487	0	1269879	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities included conducting research in areas where knowledge gaps exist. For example, 1) the development of resistant weed species as a result of overuse of herbicides to identify alternative control measures, and 2) ensuring the health of Iowa's food animals. Dissemination of research findings as new or continuing extension programming is a way individuals, agricultural related industries, and communities learn about applying research so they can change. Maintaining an open dialogue with food professionals in the private food industry helps ISU focus on which wellness, nutrition, and food safety issues are current priorities. From the industry perspective, the main protector of our food supply is not regulatory authorities but the food industry itself. Dairy specialists have conducted educational workshops, developed publications, technical reports, fact sheets, and collaborated with industry partners to plan and present educational events, such as Dairy Farm Open Houses. Food professionals have availed themselves of training opportunities provided by ISU Extension, which have included topics such as HACCP training for food and animal products processors.

Faculty participate in the following associated multistate research committees: NC213, NC1023, NC1025, NC1031, S294, S1027, S1033, and W1009.

2. Brief description of the target audience

Target audiences include farmers, food processors, youth, media, retail managers and food services, food industry professionals and suppliers, dietary professionals such as nutritionists and dieticians, health professionals such as doctors and nurses, retail managers, and consumers.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA	{NO DATA	{NO DATA	{NO DATA
Actual	11617	9162	2000	2000

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

Patent Applications Submitted

Year: 2010

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	24

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of consumers attending workshops and educational events that enhanced their knowledge of modern dairy practices which assures animal health and comfort, product quality and safety, and environmental stewardship and preservation.

Year	Target	Actual
2010	{No Data Entered}	4200

Output #2

Output Measure

- Number of dietary professionals attending workshops and educational events that enhanced their knowledge of modern dairy practices which assures animal health and comfort, product quality and safety, and environmental stewardship and preservation.

Year	Target	Actual
2010	{No Data Entered}	1015

Output #3

Output Measure

- Number of retail store personnel (specific managers like dairy case managers and / or dietary professionals) attending workshops and educational events that enhanced their knowledge of modern dairy practices which assures animal health and comfort, product quality and safety, and environmental stewardship and preservation.

Year	Target	Actual
2010	{No Data Entered}	180

Output #4

Output Measure

- Number of youth aged 7-12 and their teachers attending school based curriculum workshops and educational events that enhanced their knowledge of modern dairy practices which assures animal health and comfort, product quality and safety, and environmental stewardship and preservation.

Year	Target	Actual
2010	{No Data Entered}	1000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of consumers that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.
2	Number of dietary professionals that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.
3	Number of retail store personnel (specific managers like dairy case managers and / or dietary professionals) that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.
4	Number of youth aged 7-12 and their teachers that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.
5	Dollars saved throughout the food supply chain due to implementing Quality Management Systems and Food Safety/Quality Management Systems by educational programs presented through the Iowa Grain Quality Initiative (IGQI), which reduced redundant audits.
6	Number of swine farm personnel participating in QMS/EMS (Quality management systems/Environmental Management Systems) training sessions.
7	Number of individuals certified to implement Hazard Analysis and Critical Control Point (HACCP) in meat, poultry, and egg production plants.

Outcome #1

1. Outcome Measures

Number of consumers that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	4200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A large percentage of the U.S. population lives in an urban or suburban environment and are disconnected from agriculture and food production. At the same time, there is increasing interest and concern in the general population about food safety and quality, animal health and well being, farm systems that produce food, and sustainability. Consumers and the public need access to unbiased information and educational events that increase their awareness and knowledge of these topics to make sound decisions regarding nutrition and practices.

What has been done
ISU Extension Dairy Team partnered with Iowa's dairy producer and industry associations, other farm and commodity organizations (ISU site) and the Midwest Dairy Association (regional dairy check-off organization), to plan and host 3 Dairy Farm Open House workshops. The purpose was to provide experiential events incorporating a tour of a dairy with designated stations to showcase and educate on specific attributes of dairy farms (animal comfort and health, milking practices, product safety and quality, environmental stewardship). A post workshop survey was conducted to rate their experience of the dairy tour, assess their knowledge and trust of dairy practices, and evaluate their interests in the dairy industry and dairy products.

Results
A total of 4200+ participants were involved in the 3 events with many families and young children, and most participants from non-agricultural backgrounds and 600+ surveys were completed. Prior to the event, 86% had a positive (70% extremely positive) opinion and trust in dairy farms. Participants' opinion of modern dairy farms following the event was positively and significantly increased. More results included under Evaluation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #2

1. Outcome Measures

Number of dietary professionals that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1015

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many people rely on and trust dietary professionals for reliable, factual, unbiased educational information, guidelines, and recommendations for dietary principles, practices, and health. This information includes how and where the food is produced, as well as an understanding and assurance of the nutrition, health, and safety of the animals and systems producing the food, and the final milk and dairy products produced. Most dietary professionals have never been exposed to agriculture, farms, and different dairy production systems and practices.

What has been done
Five interactive workshops for dietary professionals (different delivery methods and settings) discussing modern dairy practices and dairy sustainability as well as addressing emerging food issues and the positive role dairy plays in making sustainable food choices were developed and jointly conducted by ISU Dairy Extension and Midwest Dairy Association. These included one 2 hr. face to face workshop with dieticians (n =65), three dairy on-farm interactive workshops for

school nutrition professionals (n = 300), and one webinar (direct and archived) for Midwest dieticians (350 direct webinar contacts; 300 indirect (completed workshop via website only within one week post webinar)). All workshops had post workshop evaluations completed.

Results
Dietician face to face workshop: Post workshop evaluations showed all participants 1) better prepared to address dairy questions and issues (avg. 4.75 [0 = strongly disagree, 6 = strongly agree]), 2) had learned new information (5.58), 3) rated the information highly credible (5.50) and would highly recommend this to peers and clients (4.97). Eighty-five to ninety-six percent of all responses were >/= 4 (above average to strong agreement and satisfaction).

Dairy on-farm interactive workshops for school nutrition professionals: 100% of participants learned new information and 96% ranked the information highly credible. 100% stated they had a greater understanding of dairy practices and dairy sustainability and would use the information with their peers and clients. 100% fully endorsed the on-farm experiential learning modules and highly ranked the hand and farm-on approach.

"Dairy Conversation" webinar for dieticians and nutrition professionals: 88% found the webinar materials and content highly informative and relevant to their practice and clients. 80% strongly agreed the information was presented in an interesting, easy-to-follow manner. Ninety-four percent plan to share the information, resources, and recommendations as part of their client practice. Ninety-seven percent were highly interested in attending related future webinars. The dairy farm practices and sustainability presentations and materials delivered by ISU extension dairy specialists were ranked highest among participants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #3

1. Outcome Measures

Number of retail store personnel (specific managers like dairy case managers and / or dietary professionals) that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	180

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There are a wide variety of highly nutritious, safe and affordable dairy products that meet and exceed all milk quality standards and tests. Differential labeling is sometimes confusing to consumers, and they also have many interests and questions regarding how their food is produced, and the quality, safety, and assurance of animal well being, farm sustainability, and dairy product quality and safety. Dairy grocer case managers and in- store dietary professionals (only some stores) are often the front line and only source of credible information and recommendations for consumers and the public. Many of these professionals have never been exposed to agriculture, farms, and different dairy production systems and practices which form the basis for the great variety of dairy products as well as consumers' attitudes, understandings, and choices.

What has been done
Three all-day dairy academies (which included both on-farm and milk processing plant tours and education modules, as well as other presentations on dairy practices, dairy sustainability, and animal health and well being) were conducted for dairy grocer case managers and in-store dieticians and health professionals by ISU Extension and Midwest Dairy Association. Pre and post tests on attendees understanding of dairy facts and knowledge were conducted as well as a personal satisfaction survey.

Results
100% ranked this as a highly effective educational event and a highly credible, understandable source of dairy practices and information. There was a 73% increase in post workshop test scores compared to pre-workshops scores. Dairy grocer case managers rated this as the most highly effective educational training and workshop of their careers. 100% stated they had greater understanding of dairy practices and dairy sustainability, and would use this information with their peers and clients. Grocer case managers estimated individual interactions with > 1000 customers/ year and felt they were the sole person at the store to respond to dairy issues and questions. In store dieticians also highly ranked the information and education very highly, 100% planned future use with peers and clients, and estimated 300+ individual clients and contacts/year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #4

1. Outcome Measures

Number of youth aged 7-12 and their teachers that understand modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many young children are formulating and implementing nutritional principles and practices that will affect them now and many years to come. Many of these children have never been exposed to agriculture, farms, and food production systems. Many of these children enhance their knowledge primarily through school based curriculums and teachers. However, many teachers have also never been exposed to agriculture, farms, and food production systems. These teachers and children need access to unbiased information and educational modules and curriculum that can enhance their knowledge in these subject areas in order to make sound nutrition decisions and practices.

What has been done
Iowa's Dairy Story program workshop and curriculum was established 10 years ago and is coordinated by a three way partnership between Iowa State University Extension and its county Extension Councils, Northeast Iowa Community College, and the Northeast Iowa Dairy Foundation (grassroot dairy farm / industry organization). Iowa's Dairy Story is a one day field trip to the Northeast Iowa Dairy Foundation educational facility and dairy farm with curriculum to

educate students, primarily 3rd, 4th, and 5th graders, and their teachers about modern dairy practices and the role they play in assuring animal health and comfort, dairy product quality and safety, and environmental stewardship and preservation. Curricular materials and knowledge gained in these workshops provide the foundation for multiplicative education to other students and peers outside these workshops.

Results
Over 10,000 students and teachers have been educated on modern dairy practices over the past decade with 1000+ in 2010. A total of 38 schools have participated in this program, plus some additional after school and summer programs. Students and teachers rank knowledge learned and educational success of the program extremely high. Teachers highly rank the curricular materials and use them for multiplicative education with other students and people in their schools and communities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
806	Youth Development

Outcome #5

1. Outcome Measures

Dollars saved throughout the food supply chain due to implementing Quality Management Systems and Food Safety/Quality Management Systems by educational programs presented through the Iowa Grain Quality Initiative (IGQI), which reduced redundant audits.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Several food safety recall events stemming from bulk food products have demonstrated the need for more precise food safety management and for improved ability to trace products through their supply chain. Other procedures-based activities require the same documentation and tracking skills; such as environmental foot printing, worker safety, and biosecurity. Agricultural operations will become increasingly monitored and precise to satisfy safety precautions.

What has been done

Systems were developed for process mapping, geo-location of traceable units, bulk grain tracking, and cost-benefit analysis that simplified quality or food safety/quality management systems (QMS or FS/QMS). This allowed collaborating grain firms to report significant economic benefits for operational improvements/efficiencies. Enhanced public health through compliance to new food safety legislation results from organized QMS or FS/QMS. Findings were published and presented in relevant professional venues. The end of project conference proceedings, and the end of project report were released and web-published (www.iowagrain.org). IGQI partnered with a company to submit a grant for the development of a web-based electronic quality manual/compliance program to simplify and automate supply chain firms' ability to apply FS/QMS management systems. ISU staff is participating in the AACC/Food Industry Task Force on Food Safety Audit to develop a uniform audit schema around the ISO22000 Standard. A study of the connection between quality climate and occupational safety climate in a company was initiated.

Results

Food safety, quality management, and occupational safety compliance support each other at significant cost savings to the organization. Savings in the $ billions from reduced redundant audits could result through development of a uniform audit schema around the ISO22000 Standard. Food chain organizations facing global customer pressures and national regulatory scrutiny show benefit cost ratios of 2:1 because of the economic sustainability of QMS and FS/QMS. Closer contact, communication and trust among supervisors and employees appear to have simultaneous benefits in worker safety and product quality.

4. Associated Knowledge Areas

KA Code	Knowledge Area
404	Instrumentation and Control Systems
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
723	Hazards to Human Health and Safety

Outcome #6

1. Outcome Measures

Number of swine farm personnel participating in QMS/EMS (Quality management systems/Environmental Management Systems) training sessions.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	700

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Swine producers are undergoing increased scrutiny about the environment, animal well-being and food safety by consumers, retailers, and processors and are being asked to document performance in these areas, sometimes with third party verification. A national animal identification system is necessary to help protect American animal agriculture from disease threats. The ability to find potentially sick or exposed animals early in a disease outbreak is essential to controlling the outbreak quickly. Most swine harvest facilities in Iowa now require all suppliers to be certified in the Pork Quality Assurance Plus (PQAPlus®) and the Transport Quality Assurance® (TQA) systems designed by the National Pork Board. Also, suppliers will soon be required to pass a site assessment in order to assess compliance. These programs are very important as they relate so closely to market access.

What has been done
A "Quality Management Systems" approach has been found to be most effective in meeting producers' educational needs, as well as having other benefits such as increased market access, lower cost of production, and enhanced employee management capabilities. Funding from the Smithfield-State of Iowa settlement supports QMS educational activities, such as environmental management systems; premise ID, national animal identification system, PQAPlus certification of producers, TQA, ISO9000/14000 certification and other process verification based programs. Producers and other landowners were encouraged to register their premises during the Iowa Pork Congress in the IPIC/ISU display. ISUE swine specialists affiliated with livestock production have registered their own premises, and based on their experience, promote the program and its simple registration process to attendees at educational programs throughout the year.

Results
More than 60 educational meetings have resulted in more than 700 certified PQAPlus advisors. The target goal of 4,500 registered premises in Iowa was easily reached. More than 75 percent of all premises in Iowa have been registered. The positive outcomes from this program include an increased awareness by the producers for 1) the importance of maintaining the highest level of food safety, and 2) the increasing importance of animal well-being to the consumer.

4. Associated Knowledge Areas

KA Code	Knowledge Area

308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #7

1. Outcome Measures

Number of individuals certified to implement Hazard Analysis and Critical Control Point (HACCP) in meat, poultry, and egg production plants.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	64

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There is an ongoing need for training on the philosophy and principles of the Hazard Analysis and Critical Control Point system and how to implement HACCP in meat, poultry, and egg production plants. ISU's HACCP training program is consistent with the intent and scope of the USDA, FSIS regulation.

What has been done
Iowa State University annually offers a "HACCP Workshop for Meat, Poultry and Egg Plants". This course is designed for individuals that have little or no knowledge of HACCP and individuals that would like to have a refresher on HACCP and learn of the changes that have taken place in HACCP during the last 2-3 years. Topics that will be covered in the workshop include: HACCP Overview; Definition of HACCP Terms; Chemical and Physical Hazards; Microbiological Hazards; Developing SOPs and GMPs; Critical Limits, Monitoring Methods and Corrective Action; Record Keeping and Verification; HACCP Plan Validation; and HACCP Plan Reassessment. One of the working groups is designated an "Advanced HACCP Training Working Group." This working group, which is limited to those that are already HACCP trained, will discuss Validation, Verification, Reassessment, Lethality, Stabilization and Listeria Control.

Results
Sixty-four people successfully completed the October 21-23, 2010 HACCP Workshop for Meat, Poultry and Egg Processing Plants at the Iowa State University Meat Laboratory. Topics covered

during the workshop included; developing GMPs and SOPs, principles of HACCP, microbiological hazards, chemical hazards, physical hazards, validation, verification and reassessment. As a result of completing this course attendees were classified as HACCP Trained Individuals enabling them to develop or reassess HACCP Plans for their companies. Also, Individuals that complete the course will receive a certificate indicating they are a HACCP trained individual and their name will be added to a registry of HACCP trained individuals that is maintained by the International Meat & Poultry HACCP Alliance.

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

ISU Extension Dairy Team partnered with Iowa's dairy producer and industry associations, other farm and commodity organizations (ISU site) and the Midwest Dairy Association (regional dairy check-off organization), to plan and host 3 Dairy Farm Open House workshops. 100% rated the 3 dairy events successful and educational with 88% rating excellent and 9% rating very good. Post workshop, 99% believed dairies provided the best care and handling of animals. Post workshop, 97% believed dairies are protective of the environment and excel at environmental stewardship. Post workshop, 99% stated dairies provided extremely safe and wholesome milk and dairy products. 100% supported growth of the dairy industry in Iowa. Post workshop, 99+% stated modern dairies and dairy

practices were impressive and had extreme confidence and trust in dairy farms and the dairy industry.

Key Items of Evaluation