

2009 University of Wyoming Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 06/02/2010

I. Report Overview

1. Executive Summary

Agriculture is at a crossroads and faces many challenges and opportunities in the 21st century. Agriculture, as well as land-grant institutions, is challenged to compete in a global economy while still responding to the needs of a diverse U.S. population. Ensuring that agriculture remains profitable and sustainable, while addressing environmental concerns, places new demands on the industry. Issues involving production agriculture, natural resource management, and quality of life generate diverse research and extension directives. Stakeholders play a vital role in identification and prioritization of needs at the University of Wyoming.

The College of Agriculture and Natural Resources has a mission to serve the educational and information needs of students, Wyoming citizens and communities, and the global community by providing and distributing unbiased, scientifically sound information. Research and extension programs at the University of Wyoming focus on five initiatives: 4-H and Youth Development, Community Development Education, Nutrition and Food Safety, Profitable and Sustainable Agriculture Systems, and Sustainable Management of Rangeland Resources. The College of Agriculture and Natural Resources has added five additional planned programs: Global Food Security and Hunger; Climate Change; Sustainable Energy; Childhood Obesity; and Food Safety, which will be a separate plan from Nutrition as documented in this accomplishment report. The University of Wyoming research and extension efforts have been addressing issues outlined in the new plans for several years; some of the accomplishments have been included in the five initiatives outlined in this report. Because the five new planned programs were added after the conclusion of the 2009 reporting year; we do not have specific data on time and effort and thus cannot report FTE's devoted to these plans. As UW AES and CES transition efforts into the new planned programs, there will be some overlap in reporting outcomes and accomplishments.

Fiscal year 2009, the University of Wyoming research and extension programs reported success in all five initiative areas. The College of Agriculture and Natural Resources is third at the University of Wyoming in total grant dollars brought in for research and extension. In-depth educational programs such as the Master Cattleman, the High Plains Ranch Practicum, Range 101 School, Dining with Diabetes, Wyoming Youth Leadership Education (WYLE) and Extension Volunteer Organization for Leadership, Vitality, and Enterprise (EVOLVE) institutes report strong impacts for citizens of the state. Each of the above CES programs are multi-session educational classes with 8 to 70 hours of class contact time with participants. These are just a few examples of high impact educational efforts by the University of Wyoming. Research and Extension Centers at UW and across the state are producing research which is relevant and vital to agriculture, families, and communities. Being an energy rich state, UW researchers are looking at possible alternative fuels. Reclamation of mined lands is an important issue being addressed through the Department of Renewable Resources and CES. The addition of two new planned programs on Climate Change and Sustainable Energy are not only timely, but very important to the state of Wyoming due to the energy resources which we have in abundance. In 2009, CES partnered with the UW School of Energy Resources to fund a Energy Extension Coordinator; the incumbent for this position started in September.

The College of Agriculture and Natural Resources brought in over \$11 million in external grants in these five areas of emphasis in 2009. These funds, along with state and federal formula funds, greatly add to the success of our programs.

During 2009 both research and extension at UW completed the process of academic planning for 2009 through 2013. Implementation is currently underway of the academic plan. With stakeholder input and a structured process, objectives and action plans were developed to guide College efforts over the next five years. Emerging issues such as energy and management of small acreage land which was once farmland, forest, or rangeland are topics for UW to address.

This accomplishment report will provide data and impacts on 2009 research and extension efforts.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	93.0	0.0	47.6	0.0
Actual	108.5	0.0	47.6	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

The merit review process for extension programs covers all programs conducted by UW CES. A team leadership model is utilized to review program plans and chart direction for CES educational programs. Program initiative teams develop and review programs on an annual basis. Teams make decisions to maintain, modify, or create new programs to meet the needs identified through external and internal stakeholder input. Five area external advisory boards comprised of stakeholders review CES programs annually. Spring, 2007 UW CES held a CSREES program review of the total extension program. The review report was used as CES moves forward in academic planning for 2009 to 2013. In 2009 the UW CES academic plan was approved and implementation is in progress.

All projects supported with formula funds (Hatch, Multi-State, McIntire-Stennis, Animal Health) must be approved projects. The project proposal is transmitted to the department head and the head appoints a minimum of two internal scientific reviewers who are knowledgeable in the field to review the proposal. After a proposal is revised based on the above review, it is transmitted to the Experiment Station Director. The director's office assigns three external scientific reviewers who are knowledgeable in the field to review the proposal. The Wyoming Agricultural Experiment Station also administers an internal competitive grants program using a portion of federal dollars. Proposals are reviewed by a ten member university-wide committee. Each proposal is also sent to a minimum of two external reviewers. During FY-2009 CES implemented a competitive grants program to provide funds for innovative programs. All proposals are reviewed by a three member committee comprised of both internal and external professionals. With a new planned program focussing on energy, fall of 2009, UW CES implemented an internal innovative energy grants program. Proposals are reviewed by a minimum of three internal reviewers.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

Brief explanation.

During the past year stakeholder input came to the College of Agriculture and Natural Resources Cooperative

Extension Service and Agricultural Experiment Station through a variety of methods. The joint research and extension needs assessment conducted in 2004 was used as a baseline for determining efforts for this POW. The surveys (mail and telephone) addressed preferred methods for receiving information. As part of the CES academic plan, a working group has been formed to explore methodology to gather statewide stakeholder input. Stakeholder input gathered through all methods is shared with counties in annual area advisory committee meetings with representatives from each of the five initiative areas who meet in sub-groups to identify specific needs and issues. This input is summarized and shared statewide with both CES and AES. All counties have had targeted advisory meetings to gather stakeholder input on reaching limited resource audiences in the Cent\$ible Nutrition program. County 4-H educators conducted 4-H Expansion and Review committees to specifically address outreach efforts toward underserved youth audiences. County personnel also utilize collaborative partners to learn the needs within communities of the state. In 2007 UW CES had a CSREES program review of the total extension system. In 2008 both research and cooperative extension went through an academic planning process which was integrated into the College of Agriculture and Natural Resources plan. The College of Agriculture and Natural Resources academic plan was approved as part of the 2009 to 2013 University of Wyoming Academic Plan. Each of the four Research & Extension Centers held an advisory committee meeting to gather input on existing research and outreach programs and to identify new priorities in relation to research. The College of Agriculture and Natural Resources maintains a separate statewide advisory committee which meets annually. Three departments, Animal Science, Family and Consumer Sciences, and Veterinary Sciences, have separate advisory committees that provide input on programs in those departments.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Originally, CES advisory committees were formed in the nine extension areas. In FY 2008 the areas in the western side of Wyoming were reconfigured to allow for greater efficiency in program delivery and to meet needs of all counties. In 2009 the eastern side of Wyoming also reconfigured areas. There are currently five extension areas. Advisory committee members are nominated by extension staff by subject matter interest. Selection to serve on advisory committees is based on gender, geographic representation, race, national origin, and underserved audiences. In 2009, the Northwest Area piloted a community meeting format to assess needs in the area. A series of small focus groups were used in the West area to gather more in-depth input on issues.

In addition, the Wyoming County Commissioners Association has formed an advisory committee of county commissioners who meet with the CES Director during quarterly meetings of their association. Research and Extension Center Advisory committees are represented by CES educators, industry leaders, and landowners (government and private) in all counties that they service. Advisory committee members are nominated by CES, AES, and administrative personnel and meet one to two times per year. In addition to these systematic methods of gathering stakeholder input, both AES and CES utilize both individuals and groups throughout the state to identify relevant issues of critical importance. Just a few examples include: commodity groups - such as Wyoming Wool Growers, Stock Growers, Wyoming Wheat Growers, Wyoming Crop Improvement Association, local and state nutrition councils, youth organizations such as Big Brothers, Big Sisters, and School Districts. These groups and individuals provide input through both formal and informal discussions with both research and extension personnel.

Faculty, CES specialists and educators also gather relevant input from professional colleagues in Wyoming and across the nation.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

Stakeholder input is collected through a variety of methods to reach the broadest scope of individuals and groups in Wyoming. CES utilizes annual area advisory meetings which involve both traditional and non-traditional stakeholders. The AES also utilizes annual advisory meetings to gain input on research activities. Surveys, both mail and on-line are used to assess needs. CES educators and researchers target key stakeholders such as agriculture commodity groups, youth organizations, and schools through meetings where discussion is held on needs and issues. University of Wyoming educators and faculty assess needs throughout the year based on individual contact with citizens at meetings and in local communities. Faculty and CES specialists and educators gather relevant input from professional colleagues through personal contact and interaction at professional meetings.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

Stakeholder input is used by AES and CES initiative teams to identify emerging issues. Input gathered is used in program planning, evaluation of current programs, and redirection of programs when applicable. Stakeholder input from area advisory groups, county commissioners, and area teams assist in staffing priorities. Search committees comprised of local stakeholders provide input on screening, interviewing and hiring decisions for CES.

Input from all sources is used in development, implementation, and evaluation of extension and research programs. Stakeholder input is collected through a variety of methods to reach the broadest scope of individuals and groups in Wyoming. CES utilizes annual area advisory meetings which involve both traditional and non-traditional stakeholders. The AES also utilizes annual advisory meetings to gain input on research activities. Surveys, both mail and on-line are used to assess needs. CES educators and researchers target key stakeholders such as agriculture commodity groups, youth organizations, and schools through meetings where discussion is held on needs and issues. University of Wyoming educators and faculty assess needs throughout the year based on individual contact with citizens at meetings and in local communities.

Brief Explanation of what you learned from your Stakeholders

4-H and Youth Development - 1) increase volunteer training, 2) increase afterschool and summer programs for

non-traditional 4-H 3) develop school mentorship programs and programs that address high risk behaviors 4) initiate workforce skill training for youth; 5) increase marketing efforts to reach underserved youth and retain older youth in the program.

Community Development Education - 1) continue financial management training efforts to include youth; utilizing methods such as on-line courses, 2) expand efforts in leadership development including leadership institutes in rural areas, 3) expand non-profit board training; 4) workforce training; 5) energy efficiency; 6) research on economic analysis of federal land management planning is essential to the state.

Nutrition and Food Safety - 1) expand efforts in food safety at both food service and consumer level. 2) obesity continues to be identified as a priority issue for adults and youth. 3) basic nutrition and cooking skills are a priority as many schools have eliminated family and consumer science curriculums, 4) research on the safety of food is essential to consumer confidence, 5) sustainable food and agriculture systems including growing, preserving, and preparation of foods; 6) childhood obesity.

Profitable and Sustainable Agriculture Systems - 1) energy including wind, oil, gas and the impact on agriculture; 2) specialty crops and alternative forages; 3) increased need for educational programming for small acreage owners, 4) mediation training is needed for agriculture producers due to increased land use for energy expansion and federal land agencies; 5) new methods to deliver information are needed such as newspaper inserts, current information on Web site, and utilize the Northern Ag Network radio stations to reach producers.

Sustainable Management of Rangeland Resources - 1) hands-on range monitoring workshops, 2) water management including quality, quantity and efficient use 3) drought and ranch sustainability 4) small acreage workshops to educate new land owners 5) renewable energy - energy development and reclamation; 6) water management, livestock/wildlife interface; 7) and coalbed Methane water quality.

A number of the issues or topics identified fit within the scope of the five new planned programs included in this accomplishment report.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1467184	0	1701430	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1467184	0	1707430	0
Actual Matching	8757267	0	6121223	0
Actual All Other	0	0	0	0
Total Actual Expended	10224451	0	7828653	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from				
Carryover	0	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Profitable and Sustainable Agriculture Systems
2	Community Development Education
3	Nutrition and Health
4	4-H and Youth Development
5	Sustainable Management of Rangeland Resources (SMRR)
6	Global Food Security and Hunger
7	Food Safety
8	Sustainable Energy
9	Climate Change
10	Childhood Obesity

V(A). Planned Program (Summary)**Program # 1****1. Name of the Planned Program**

Profitable and Sustainable Agriculture Systems

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
202	Plant Genetic Resources	5%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	5%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
215	Biological Control of Pests Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	5%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	5%		5%	
305	Animal Physiological Processes	5%		5%	
307	Animal Management Systems	10%		10%	
311	Animal Diseases	5%		5%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	26.0	0.0	30.0	0.0
Actual	27.6	0.0	30.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 373219	1890 Extension 0	Hatch 1076111	Evans-Allen 0
1862 Matching 2229068	1890 Matching 0	1862 Matching 3857914	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Any or all channels of the media were used to familiarize the public with UW College of Agriculture and Natural Resources areas of research and extension programming and personnel. Media releases in local newspapers, radio spots and television advertisements inform the public of upcoming extension programs and research field days including contact persons. Newsletter articles distributed both electronically and through the mail by county offices, area teams, and the University of Wyoming will reach producers locally, regionally, and statewide. Reflections, a yearly publication by AES showcases research, extension, and education programs in the College. This publication is distributed to over 6,000 households and businesses throughout the state. Public educational programs with invited speakers and extension specialists and educators presenting research-based information will continue to be held in response to local, state, and national crop and livestock production, horticultural and small acreage issues. Demonstrations of technology and skills training will be included in education curriculum to enhance educational effectiveness. Field tours will be organized to provide producers with the opportunity to observe industry procedure (i.e., tour of an ethanol plant).

Areas of focus in livestock systems: emphasis will be placed on the four main areas; herd management and traceability, herd development, cropping systems and livestock development, risk and operation management techniques and alternatives to enhance the stability of Wyoming livestock producers. The new Sustainable Agriculture Research and Extension Center (SAREC) located at Lingle, Wyoming will provide a resource base for integrating livestock/forage based programs.

From the Ground Up television news segments will continue to be developed by UW CES field staff and aired on statewide television stations to disseminate horticulture information. Newsletter articles distributed both electronically and through the mail by county offices, Master Gardener organizations, area teams, and UW will reach producers, consumers and volunteers. UW CES specialists will continue to develop Horticultural Train the Trainer events for the benefit of training UW CES field staff and long term Master Gardener volunteers. Recruitment of Master Gardeners, 4-H leaders, and youths as well as other volunteers will occur on an ongoing basis. With on going recruitment Wyoming will see an increase in the number of Master Gardeners. 4-H Vegetable and Forestry judging programs will provide youth with opportunities to evaluate the value of fresh produce and forest products. 4-H gardening project leaders and youth will receive training in proper gardening practices.

Development of a statewide database of defining characteristics of small acre owners. Educational programs targeted at small acreage landowners emphasizing sustainable land management practices. Individual interaction with small acreage landowners educating them on resources available to assist them with sustainable land management practices. Development and distribution of a targeted, user friendly publication providing education on sustainable land management practices. Coordination with other interested agencies to provide education to this clientele, and funding for this effort. Provide educational opportunities for professionals involved with small acreage landowners. Seek external funding to provide education to natural resource professionals, and small acreage landowners.

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. Participants will include policy makers for county, state, and federal government agencies, crop producers, livestock producers, ag lenders, potential investors, and the scientific community. An existing secondary audience will be the media, general public, and interest groups not directly involved in production agriculture (i.e., environmental groups).

The targeted audience for horticulture programs include: horticultural crop producers and consumers, Master Gardener and 4-H volunteers, youths, lenders, and potential investors. An existing secondary audience will be the media, general public, and interested groups not directly involved in the production of horticultural crops or products.

The target audience for small acreage programming is individuals who reside on small acreages of 40 acres or less.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	20000	50000	500	1000
Actual	52719	156000	2120	1000

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

Patent Applications Submitted

Year: 2009

Plan: 4

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	2	25	
Actual	6	30	36

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of horticulture contacts reached. Target is the number of contacts.

Year	Target	Actual
2009	15000	20114

Output #2

Output Measure

- Research efforts will develop new and improved forages for high elevation livestock systems. Target measures are new or improved forages.

Year	Target	Actual
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2009	1	1
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Output #3**Output Measure**

- Ultimately, this program will improve livestock value through cropping practices, herd selection, and management for Wyoming livestock producers. Targets include number of programs conducted, livestock producers reporting change in practices as a result of educational efforts.

Year	Target	Actual
2009	1	5

Output #4**Output Measure**

- Number of subscriptions to Barnyards and Backyards publication. Target is paid subscription numbers for magazine.

Year	Target	Actual
2009	2500	3000

Output #5**Output Measure**

- Develop improved methods of estimating forage base under varying environmental conditions. Targets included new methods developed for assessing forage base and growth.

Year	Target	Actual
2009	1	0

Output #6**Output Measure**

- Number of Master Gardener Volunteers statewide. Target measure is new volunteers recruited and trained.

Year	Target	Actual
2009	150	400

Output #7**Output Measure**

- Research will develop more sustainable dryland cropping systems using extended rotations, ley pastures and narrow row fallow systems. Short term goals include increased grants and demonstration projects. Target is the number of demonstration projects implemented.

Year	Target	Actual
2009	2	2

Output #8**Output Measure**

- Research: Wildlife/livestock disease interaction and transfer: long term goal to maintain Wyoming's Brucellosis free status and determine CWD transfer from cervids to domestic livestock. Targets are defined as projects developed.

Year	Target	Actual
2009	2	2

Output #9**Output Measure**

- Research: Improve pest management practices. Long term goal is to reduce pesticide applications and increase use of IPM practices. Targets are programs implemented.

Year	Target	Actual
2009	2	5

Output #10**Output Measure**

- Research: Development of biological control practices that effectively reduce populations of invasive weeds. Targets are listed as new programs developed on various weed species.

Year	Target	Actual
2009	1	2

Output #11**Output Measure**

- Research: Development of simple blood test for diagnosis of brisket disease. Short term goals include increased grant funding and demonstration results. Target is grant funding obtained.

Year	Target	Actual
2009	1	1

Output #12**Output Measure**

- Research: Determine the impact environment has on the ability of female ewes to produce healthy offspring. The long term goal is to develop models to predict production performance under different environments. Targets listed are new projects intended.

Year	Target	Actual
2009	1	5

Output #13**Output Measure**

- Develop profitable and sustainable forage based livestock systems for the High Plains. Targets are defined as new systems developed.

Year	Target	Actual
2009	1	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Awareness created through extension and research efforts. Target is number of participants in extension and research programs reporting that they have gained awareness on topic.
2	Pasture land owners and/or managers will be able to recognize indicators of pasture condition and will possess decision-making skills necessary to make needed management decisions. Target is number of participants reporting outcome.
3	Producers with the resources to irrigate their crops and/or pasture will know and understand costs and returns associated with their irrigation practices and systems. Target is number of producers reporting outcome.
4	Wyoming producers will implement electronic animal identification to gain advantages in herd management. Target is number of producers implementing outcome.
5	Producers will gain an understanding of heifer development as well as opportunities for matching genetic improvement with successful marketing strategies. Target is number of producers reporting outcome.
6	Wyoming producers will benefit through an increased value of livestock and crops related to improved cropping practices, herd selection, and management. Target is number of producers reporting positive outcome as a result of educational efforts.
7	Wyoming crop producers will be able to substitute traditional or current crop production with alternative horticultural crops to market if increased profitability may result. Target is number of crop producers utilizing alternative crop production practices.
8	Water conservation will improve the profitability and sustainability of Wyoming's green industry and municipal water supplies. Target is number of participants reporting outcome.
9	Youth and their families will choose gardening as a healthy choice for active living. Target is number of participants reporting outcome.
10	Research: Awareness created; change in knowledge through publications and integration into extension programs. Target is number of research projects. Research outcomes often take multiple years to establish results. The target numbers indicate on-going research projects.
11	Research - Awareness created in animal systems; Change in knowledge through publications and integration into extension programs. Target is number of projects. Outcomes from research efforts often take multiple years. The number of projects reflects efforts.
12	Research - Awareness created on IPM; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes that have been integrated into extension programs.
13	Research - Awareness created in plant systems; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes integrated into extension programs.
14	Research in animal reproduction - awareness created; change in knowledge through publications and integration into extension activities. Target is number of projects which are on-going which have generated publications or integration into extension programs.

Outcome #1**1. Outcome Measures**

Awareness created through extension and research efforts. Target is number of participants in extension and research programs reporting that they have gained awareness on topic.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	6476

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. Livestock producers throughout the state of Wyoming face an ever changing industry with issues such as; increasing cost of production, increasing pressure for individual animal identification, changing requirements for marketing knowledge. All of the issues are coupled with the need for producers to be able to raise livestock in a sustainable operation with limited resources.

What has been done

Extension Educators in Profitable and Sustainable Agriculture Systems conducted 409 educational programs including field days, workshops, classes, multi-session courses, and volunteer training. In addition media is utilized to reach citizens through television, newspaper inserts, magazines, news columns and special articles, and radio. Educators also write educational newsletters distributed by mail and on line.

Results

Formal and informal evaluations were used to determine outcome. 100 percent of agriculture producers participating in educational activities reported increased awareness.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #2**1. Outcome Measures**

Pasture land owners and/or managers will be able to recognize indicators of pasture condition and will possess decision-making skills necessary to make needed management decisions. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	363

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. The largest component of Wyoming agriculture is the beef cattle industry, accounting for approximately 70 percent of all cash receipts and 86.5 percent of all livestock production. Sheep, lamb, and wool receipts in 1998 were \$29 million. Forage sustains the Wyoming livestock industry. Hay is the leading crop in Wyoming with 1998 production valued at \$185 million, mostly marketed through livestock.

What has been done

CES educators conducted 10 classes, workshops, tours on pasture management and grazing for Wyoming producers. In addition, educators published articles in local newspapers, newsletters, special newspaper inserts and discussed the topic on radio programs.

Results

100 percent of pasture land owners and/or managers reported being able to recognize indicators of pasture condition. They also indicated through formal and informal evaluations that they increased confidence in decision making skills necessary to make needed management decisions. Producers reported increased knowledge and awareness of pasture conditions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
104	Protect Soil from Harmful Effects of Natural Elements
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

- 213 Weeds Affecting Plants
- 601 Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Producers with the resources to irrigate their crops and/or pasture will know and understand costs and returns associated with their irrigation practices and systems. Target is number of producers reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	126

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Crop producers across Wyoming are challenged with increasing production costs, global market competition, environmental pressure, and decreased labor availability. Alternative markets, improved management practices, and cost efficiency is critical to ensure profitability and sustainability for Wyoming producers. Irrigation is a key factor identified by CES area advisory committees and AES advisory groups.

What has been done

CES educators in the Profitable and Sustainable Agriculture Systems initiative conducted classes, workshops and taught at conferences. Topics included pasture management, introduction to irrigation, and the Wyoming Water Conference, and Wyoming Water Association tour.

Results

All 126 participants in educational activities reported gaining knowledge and awareness of resources and methods of irrigation and cost related to each method. Because Wyoming is in a severe drought, information was rated as extremely valuable to producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
601	Economics of Agricultural Production and Farm Management

Outcome #4**1. Outcome Measures**

Wyoming producers will implement electronic animal identification to gain advantages in herd management. Target is number of producers implementing outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10	82

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In 2006, there were approximately 4,800 operations producing beef cattle in Wyoming, with more than 735,000 head of beef cows. In 2001, there were approximately 5,500 producers, with more than 835,000 head. Thus, in five years, Wyoming's beef cow herd was reduced by nearly 100,000 head and 700 fewer producers were actively involved in cattle production. Many factors contributed to the decline including drought, market pressure, and trade issues. Improving sustainability of the livestock industry in Wyoming has been identified by area advisory committees and industry groups as a priority.

What has been done

The Master Cattleman Class, which met weekly for eight weeks, provided 24 hours of classroom instruction. Over a three year period classes have been held in all seven areas of the state reaching a total of 102 producers. The Wyoming Master Cattleman program was designed to help producers focus on their goals while helping to improve ranch management skills. Producers will not only be able to analyze the production strategies presented in this program for individual applicability and success but will also be given tools to analyze future production strategy options presented to them. Additionally programming on country of origin labeling was conducted.

Results

Producers were asked to evaluate each of the sessions using an electronic response system. Follow-up discussions were held with a sample of participants one month after the program. Effectiveness of each session ranges from 57-100 percent, with an average of 80.5 for the class.

Forty-five producers from throughout Wyoming participated in the Master Cattleman program. All took part in the weekly discussions.

End of 2009 program evaluations reported:

96 percent gained knowledge of production strategies

92 percent gained knowledge of enterprise analysis and risk management

100 percent plan to implement one or more ideas

Comments included:

'I really liked the sounds of that cull cow strategy until we worked through the partial budget (group work).'

'This has been an excellent program. Lots of new information. Great exchanges with other participants and the presenters.'

Follow up surveys conducted five months after the program to all participants provided the following impact:

Over 75 percent found the information on electronic animal identification to gain advantages in herd management useful.

100 percent have implemented a practice or changed a practice because of attending this program.
 100 percent felt the program has made or will make a positive impact on the profitability of their operation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Producers will gain an understanding of heifer development as well as opportunities for matching genetic improvement with successful marketing strategies. Target is number of producers reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10	45

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2008, there were approximately 4,800 operations producing beef cattle in Wyoming, with more than 757,000 head of beef cows. In 2001, there were approximately 5,500 producers, with more than 835,000 head. In seven years, Wyoming's beef cow herd was reduced by nearly 100,000 head and 700 fewer producers were actively involved in cattle production. Many factors contributed to the decline including drought, market pressure, and trade issues. Improving sustainability of the livestock industry in Wyoming has been identified by area advisory committees and industry groups as a priority.

What has been done

The Master Cattleman Class, which met weekly for eight weeks, provided 24 hours of classroom instruction. Over a two year period classes have been held in all seven areas of the state. The Wyoming Master Cattleman program was designed to help producers focus on their goals while helping to improve ranch management skills. Producers will not only be able to analyze the production strategies presented in this program for individual applicability and success but will also be given tools to analyze future production strategy options presented to them.

Results

Producers were asked to evaluate each of the sessions using an electronic response system. Follow-up discussions were held with a sample of participants one month after the program. Effectiveness of each session ranges from 57-100 percent, with an average of 80.5 for the class.

Forty-five producers from throughout Wyoming participated in the Master Cattleman program. All took part in the weekly discussions.

End of 2009 program evaluations reported:

- 96 percent gained knowledge of production strategies
- 92 percent gained knowledge of enterprise analysis and risk management
- 100 percent plan to implement one or more ideas

Comments included:

'I really liked the sounds of that cull cow strategy until we worked through the partial budget (group work).'

'This has been an excellent program. Lots of new information. Great exchanges with other participants and the presenters.'

Follow up surveys conducted one month after the program to all participants provided the following impact:

100 percent have implemented a practice or changed a practice because of attending this program.

100 percent felt the program has made or will make a positive impact on the profitability of their operation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
305	Animal Physiological Processes
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Wyoming producers will benefit through an increased value of livestock and crops related to improved cropping practices, herd selection, and management. Target is number of producers reporting positive outcome as a result of educational efforts.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	1857

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The value of agriculture to Wyoming's economy approaches \$1 billion each year. The largest component of Wyoming agriculture is the beef cattle industry, accounting for approximately 70 percent of all cash receipts. Sheep, lamb, and wool receipts in 1998 were \$29 million. Forage sustains the Wyoming livestock industry. Hay is the leading crop in Wyoming with 1998 production valued at \$185 million, mostly marketed through livestock. Crop producers across Wyoming are challenged with increasing production costs, global market competition, environmental pressure, and decreased labor availability. Alternative markets, improved management practices, and cost efficiency is critical to ensure profitability and sustainability for Wyoming producers.

What has been done

CES educators in the Profitable and Sustainable Agriculture team conducted 65 workshops, classes, tours, and conferences reaching 1857 Wyoming producers. Topics ranged from Master Cattleman 8 week class to weed management, bio-fuels, marketing options, genetic tools, nutrition and feeding of livestock, cost control and risk, natural resource tours and the Wyoming Agribility conference. Educators also publish educational articles in newspaper inserts, news columns, and newsletters.

Results

All participants in educational activities reported gaining knowledge and awareness. Because of the depth and breadth of programs presented a variety of evaluations were used. A sample of responses: Participants in the Master Cattleman course reported a 56 percent increase in knowledge as a result of the course. Over 90 percent implemented use of the analysis tool.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
301	Reproductive Performance of Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #7

1. Outcome Measures

Wyoming crop producers will be able to substitute traditional or current crop production with alternative horticultural crops to market if increased profitability may result. Target is number of crop producers utilizing alternative crop production practices.

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Water conservation will improve the profitability and sustainability of Wyoming's green industry and municipal water supplies. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	460

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Wyoming, horticulture involves commercial production of vegetables, fruits, herbaceous and woody ornamentals, turf grass sod and seed. The commercial green industry in Wyoming is young, diverse, and widely dispersed. It is comprised of greenhouses, florists, garden centers, landscape care companies, nurseries, tree care companies, interior landscapers, etc. Wyoming's environment includes less than optimal soil conditions, a very harsh climate for many horticultural crops and growing practices, the variation in elevation across the state as well as short to very short growing seasons all contribute to difficult growing conditions.

What has been done

CES educators and specialists conducted 18 educational sessions on water-wise gardening, Xeriscape landscape design, dealing with drought, water cycles, flowers and grasses for the High Plains Gardener, and Wyoming climate. In addition, water conservation in horticulture is a topic of the Master Gardener volunteer training program. UW CES produces 70 second TV spots 'From the Ground Up' which airs on a commercial station in Casper, which also covers water conservation topics.

Results

Over 75 percent of participants in educational programs targeting water conservation and efficiency reported implementing at least one idea from sessions. 100 percent of participants reported gaining knowledge and awareness. Master Gardener participants take pre- and post-session test to measure knowledge gained. Average test scores were 87 percent, which showed a 35 percent increase in knowledge.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water

Outcome #9

1. Outcome Measures

Youth and their families will choose gardening as a healthy choice for active living. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Research: Awareness created; change in knowledge through publications and integration into extension programs. Target is number of research projects. Research outcomes often take multiple years to establish results. The target numbers indicate on-going research projects.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Stem rust race 'Ug99' was first detected in Uganda (1999) and has spread throughout the East African highlands. Ug99 can cause 100% crop loss in susceptible varieties with an 80% yield loss occurring recently in Kenya. Due to efforts by the University of Wyoming's winter wheat development program (supported by the Wyoming Wheat

Marketing Commission) and private plant breeding programs there is a strong likelihood that by the time Ug99 reaches the Great Plains, resistant varieties will be available and 'Ug99' will be a non-issue.

What has been done

The University of Wyoming's winter wheat development program has had a rewarding and productive relationship with the WWMC for over two decades. The commission annually provides funds to help sustain the program. Six joint releases involving other public institutions are evidence of this productive relationship with two additional releases pending in 2010. It will take additional releases containing Ug99 resistant traits to defeat this new stem rust threat.

Results

Roughly one quarter of the state's winter wheat acreage is now planted to one of three of these varieties. This is a noteworthy accomplishment considering that UW's program is focused on variety development and not on variety marketing. Further impact comes in terms of providing non-biased information on the performance of numerous varieties within the crop production regions of the state. This information is available through the WY Wheat Grower's newsletter and on the Web at UW Plant Sciences Variety Testing. It was recently provided to Wyoming State Department of Agriculture personnel who used it to answer inquiries from the state legislature concerning the value of the mandated winter wheat check-off program that is managed by the WWMC.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
202	Plant Genetic Resources
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #11

1. Outcome Measures

Research - Awareness created in animal systems; Change in knowledge through publications and integration into extension programs. Target is number of projects. Outcomes from research efforts often take multiple years. The number of projects reflects efforts.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

High sulfur (S) levels are becoming increasingly problematic in many sources of livestock drinking water, and often in combination with high-S feeds, result in combined dietary S that exceeds levels considered safe. High dietary S is associated with depressed performance and is also implicated as a primary cause of polioencephalomalacia in

ruminants. Currently, there is no gainful method for S removal from surface water sources, and alternative water sources are usually neither readily available nor cost effective.

What has been done

The objective of this study was to determine if supplementing Molybdenum (Mo), a metallic trace element known to interact with S, improves health and performance of forage-fed steers administered high-S drinking water. Yearling steers (n = 96) were randomly assigned to one of three treatment groups for a 56 day trial.

Results

Results indicate that a Mo supplement is not beneficial in counteracting the effects of high-S water consumption, and Mo itself may exacerbate the effects associated with high dietary S.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
307	Animal Management Systems
311	Animal Diseases

Outcome #12

1. Outcome Measures

Research - Awareness created on IPM; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes that have been integrated into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Non-indigenous plant species can become invasive weeds on rangeland and wild areas, causing both ecological and economic harm.

What has been done

Activities included: (a) obtaining federal permission to release a new insect species from Kazakhstan to Wyoming for the first time for control of one of the state's worst weed species, Russian knapweed, (b) releases of the insect species in Fremont and Park Counties in collaboration with State and Federal Agencies, (c) research on the biology and ecology of the insect species, and (d) outreach on this biological control program to land managers and state and federal employees.

Results

Land managers now have a new tool for management of Russian knapweed in Wyoming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #13

1. Outcome Measures

Research - Awareness created in plant systems; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes integrated into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The economic and environmental sustainability of conventional, reduced input or organic approaches on crop-range-livestock operations affects local producers, farmers, ranchers, and policy makers.

What has been done

An experiment was established at the Sustainable Agriculture Research and Extension Center near Lingle, Wyoming. Data collection was initiated in Fall 2009.

Results

Environmental and socio-economic impacts of these three practices are being evaluated. Local producers are provided with alternatives for crop-range-livestock production in a semi-arid environment. Extension materials and demonstrated fields have been generated for outreach and education.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #14**1. Outcome Measures**

Research in animal reproduction - awareness created; change in knowledge through publications and integration into extension activities. Target is number of projects which are on-going which have generated publications or integration into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	5

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

A survey of Wyoming sheep producers indicated that sexual behavior is currently not utilized as a basis of ram selection. Producers acknowledge that breeding performance (i.e., libido) is important for flock productivity and rams with proven breeding competence are more valuable than those with unknown breeding competence (Uthlaut 2009). However, producers are unable to incorporate behavior into the selection process due to a lack of an available selection tool.

What has been done

Rams consigned to the Wyoming Ram Test have been tested for expression of sexual behavior and that data has been correlated to their production data to determine any correlation between production and expression of sexual behavior. Rams in the 2008-2009 and 2009-2010 ram test were fed using the Gro-Safe system, making the data set more complete and interesting. This data will be presented at the national ASAS meeting this summer.

Results

The use of behavior identified rams would decrease overall ram costs while increasing genetic progress and profitability and, therefore, sustainability of sheep production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
305	Animal Physiological Processes

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Drought continues to be an issue in Wyoming for all agriculture producers, both livestock and crop. It also impacts the green industry and horticulture for consumers.

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)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 2****1. Name of the Planned Program**

Community Development Education

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	5%		5%	
602	Business Management, Finance, and Taxation	5%		5%	
604	Marketing and Distribution Practices	5%		5%	
608	Community Resource Planning and Development	50%		50%	
801	Individual and Family Resource Management	25%		25%	
802	Human Development and Family Well-Being	5%		5%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	11.0	0.0	2.1	0.0
Actual	15.0	0.0	2.1	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
202837	0	75328	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1205895	0	270054	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**

Educational and research activities and efforts of the CDE program include:

Development of models to explain the impact changes have on the ability of communities to capture and retain dollars such as the impact of eliminating snowmobiling in Yellowstone National Park or the impact of reducing grazing permits in Bridger Teton National Forest.

Family resource management programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of anticipated programs. Outputs include methods such as train-the-trainer workshops, home-study courses, and such approaches as the Internet (www.uwyo.edu/CES/FRM/), and satellite. Also included are publications, meetings, news releases, and feature articles.

CES educators conducted community-based leadership training institutes (EVOLVE) Extension Volunteer Organization for Leadership Vitality and Education. Also skill training workshops i.e. board training. General public information and educational efforts included i.e. public media materials; information/educational meetings and workshops; books, booklets, bulletins, training materials; providing data. Facilitation of community processes. Analyses of community data and economic impact. Assessments to identify individual strengths and areas to be strengthened to guide personal development and grow talent. Media resources to promote community capital development extension education and increase awareness of extension resources.

Outputs for entrepreneurship programs include publications, meetings, classes, workshops, conferences, one-on-one consultations, and Web sites.

Research efforts will include economic analysis of federal land management planning. These efforts provide important information that is used to assist in the planning process to make decisions that are critical to the future of Wyoming.

2. Brief description of the target audience

The University of Wyoming College of Agriculture and Natural Resources 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 programs regardless of their race, national origin, gender, age, religion, or disability. The ultimate consumer of the educational products for financial management programs will be all individuals (including youth and senior citizens), families (including low-income families), and in general people at risk of experiencing financial stress. The group of educators, specialists, and faculty responsible for leading and delivering the outputs in the program is the smallest of the University of Wyoming's Cooperative Extension Service groups. A priority for program development is to use methods of information and instruction that make it possible for the most constituents to be assisted while minimizing face-to-face work. Thus the team will emphasize train-the-trainer courses, newsletters, and electronic delivery of information and programming.

Targeted audiences for leadership development include: Elected officials. Members and leaders of formal and informal community organizations. Faith-based leaders and members. Business owners/managers/employees. Trade/produce groups. Educational entities. Federal/state/local agency leaders/members.

Entrepreneurship programs target audiences who will manage or may develop ventures relating to food and agricultural systems, a non-farm extension of a farm business, forestry, home trades, crafts, services, etc. Other audiences through which Wyoming CES programs may be delivered include: teachers, public and private agencies, business owners/managers/employers, trade/produce groups, educational entities, identified publics, youth groups/students, and small acreage owners.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	2000	200	1000
Actual	1940	2000	469	1000

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

Patent Applications Submitted

Year: 2009

Plan: 0

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	2	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Family Resource Management programs will ultimately benefit all families in Wyoming. Short term effects may be increased grant funding and increased involvement in regional and multi-state projects. Target is number of programs.

Year	Target	Actual
2009	1	71

Output #2

Output Measure

- Number of individuals participating in programs. Target is number of individuals.

Year	Target	Actual
2009	300	1940

Output #3

Output Measure

- Number of programs in group process, leadership, facilitation, and other CD topics delivered. Target is number of programs.

Year	Target	Actual
2009	25	138

Output #4

Output Measure

- Entrepreneurship output targets include: number of individuals assisted.
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Participation in entrepreneurship programs designed for specific audiences including beginning farmers, multi-generation farm families, part-time farmers, and existing farmers. Target is number of participants.

Year	Target	Actual
2009	30	48

Output #6

Output Measure

- Research efforts will include community economic analysis which includes improving efficiency of existing firms, improve efficiency to capture and retain dollars and attract new businesses. Targets show number of projects.

Year	Target	Actual
2009	1	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Permanent changes in practices as determined by follow-up surveys with those attending meetings, events, and workshops. Target is number of participants.
2	Financial stability and security in Wyoming households. Target is number of households.
3	Improved quality of life for participants through adoption of management principles. Target is number of participants reporting outcome.
4	One or more management principles from educational programs on personal finance management are adopted by workshop participants. Target is number of participants reporting outcome.
5	Wyoming schools will increase awareness of UW CES as a source of financial management curriculum. Target is number of schools contacted.
6	Improved credit debt-management skills reported by participants in workshops. Target is number of participants reporting outcome.
7	Increased public interest in personal finance as determined by attendance at meetings, workshops, events, and demonstrations. Target is number of participants.
8	Knowledge and confidence gained as measured by end of workshop evaluations. Target is number of participants.
9	Participants of leadership classes will develop skills and confidence necessary for community participation, find resources to enhance community capital, recognize the needs for community vision, capacity building, and direction, and strengthen inner-community relationships. Target is number of participants.
10	Leadership participants will be able to utilize collaborative/coalition building practices to implement visionary community programs in order to provide the community with leaders, officials, and volunteers who are able to affect desired change or stability. Target is number of participants reporting outcome.
11	Increased rural economic diversification. Target is number of participants implementing change.
12	Enhanced incomes and jobs through business expansion or new businesses. Target is participants reporting outcome.
13	Long term changes in action documented through follow-up surveys of program participants regarding planning, improved management of risk, insurance, and labor. Improved confidence and ability to market, produce and finance, and promote products from new enterprises. Target is number of participants reporting outcome.
14	Short term outcome of research efforts include increased grant funding and increased involvement on regional and multi-state projects. Target is number of projects reporting outcome.
15	Development of impact models which will improve community economic analysis as well as mitigate unwanted consequences. Target is number of impact models developed.

Outcome #1**1. Outcome Measures**

Permanent changes in practices as determined by follow-up surveys with those attending meetings, events, and workshops. Target is number of participants.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	551

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Many county-appointed board members want to complete their assigned duties yet lack the skills and training needed to perform to the best of their ability. County commissioners across the state have expressed the desire to provide training to current and new members appointed to county boards so they might more properly fulfill their duties and responsibilities. The University of Wyoming Cooperative Extension Service's Community Development Education (CDE) initiative team developed materials to support training programs for county boards.

What has been done

The CDE team developed curriculum and educational materials to support the program. Area educators used these materials to develop a four-hour educational program for county-appointed boards in the state. Twenty-four training sessions were held reaching 551 individuals. The CDE area educator presented the subjects of board vs. executive director duties, officer roles, effective meetings, and parliamentary procedure during the four-hour session. Board members received written and verbal instruction on the proper functions of boards, board members, and executive directors. Additionally in 2009, the curriculum was available on line which enhanced learning opportunities.

Results

Participants ended by drawing a visual representation of how they wanted their board to be functioning in five years. Using a Likert scale of 1 to 5, with 5 being high, the following average ratings were secured through written evaluations:

Work activities 4.74

Effective class 4.82

A sample of participant comments: (an attorney and judge) "This training should be offered for continuing legal education credit."

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development

- 801 Individual and Family Resource Management
- 802 Human Development and Family Well-Being
- 803 Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #2

1. Outcome Measures

Financial stability and security in Wyoming households. Target is number of households.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	636

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year. The second critical issue is the spending habits of adolescents. Many adolescents earn income, of which they spend 98 percent, and do not have to pay for many living expenses such as housing.

What has been done

Family resource management programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of programs. Four courses were held which were six to eight week series in addition to nine single session programs totaling fifty-five classes reaching 636 individuals. Wyoming Saves program was implemented with 72 individuals enrolled, committing to start a saving plan.

Results

End of session evaluations indicated 100 percent of the participants increased knowledge and awareness of financial principles. Over 50 percent reported adopting and implementing at least one financial practice principal as a result of the classes. These included better credit management; financial recovery after bankruptcy; and initiating a savings plan. All 72 individuals enrolled in Wyoming Saves wrote a savings goal. Twenty-two participants reported saving a total of \$18,412 or an average of \$837 per person. All 22 reported they plan to continue to save on a regular basis.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #3**1. Outcome Measures**

Improved quality of life for participants through adoption of management principles. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	0	636

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year. The second critical issue is the spending habits of adolescents. Many adolescents earn income, of which they spend 98 percent, and do not have to pay for many living expenses such as housing.

What has been done

Family resource management programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of programs. Four courses were held which were six to eight week series in addition to nine single session programs totaling fifty-five classes reaching 636 individuals.

Results

End of session evaluations indicated 100 percent of the participants increased knowledge and awareness of financial principles. Over 50 percent reported adopting and implementing at least one financial practice principal as a result of the classes. These included better credit management; financial recovery after bankruptcy; and initiating a savings plan. Of the 72 individuals enrolled in Wyoming Saves, 22 participants reported saving a total of \$18,412 or an average of \$837 per person.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
801	Individual and Family Resource Management

Outcome #4**1. Outcome Measures**

One or more management principles from educational programs on personal finance management are adopted by workshop participants. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	636

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year. The second critical issue is the spending habits of adolescents. Many adolescents earn income, of which they spend 98 percent, and do not have to pay for many living expenses such as housing.

What has been done

Family resource management programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of programs. Four courses were held which were six to eight week series in addition to nine single session programs totaling fifty-five classes reaching 636 individuals.

Results

End of session evaluations indicated 100 percent of the participants increased knowledge and awareness of financial principles. Over 50 percent reported adopting and implementing at least one financial practice principal as a result of the classes. These included better credit management; financial recovery after bankruptcy; and initiating a savings plan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #5**1. Outcome Measures**

Wyoming schools will increase awareness of UW CES as a source of financial management curriculum. Target is number of schools contacted.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Improved credit debt-management skills reported by participants in workshops. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	430

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year.

What has been done

Twenty-eight classes focusing on credit,debt reduction,and bankruptcy were held in FY 2009 reaching 430 individuals.

Results

One hundred percent of participants reported learning something new. 85 percent indicated they would begin using a spending plan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #7

1. Outcome Measures

Increased public interest in personal finance as determined by attendance at meetings, workshops, events, and demonstrations. Target is number of participants.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	1105

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year. The second critical issue is the spending habits of adolescents. Many adolescents earn income, of which they spend 98 percent, and do not have to pay for many living expenses such as housing. The third critical issue is improving the financial health of Wyoming households.

What has been done

Fifty-five classes were held for adults reaching 636 individuals and eleven classes were held for 469 youth on financial management topics. Over half of the classes were multi-session ranging from 4 - 8 weeks.

Results

One hundred percent of participants indicated through both formal and informal evaluation gaining awareness and knowledge as a result of the courses. End of session evaluations and surveys indicated a request for more classes on money management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #8

1. Outcome Measures

Knowledge and confidence gained as measured by end of workshop evaluations. Target is number of participants.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2009 100 0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year. The second critical issue is the spending habits of adolescents. Many adolescents earn income, of which they spend 98 percent, and do not have to pay for many living expenses such as housing. The third critical issue is improving the financial health of Wyoming households.

What has been done

Over 67 programs including multi-session classes ranging from 4 - 8 weeks in length were conducted reaching over 1100 individuals. Topics covered included Debtor education for individuals filing for bankruptcy, credit, basic money management for youth and adults, and financial planning.

Results

End of session evaluations showed that 100 participants in classes and workshops increased their confidence in financial management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #9

1. Outcome Measures

Participants of leadership classes will develop skills and confidence necessary for community participation, find resources to enhance community capital, recognize the needs for community vision, capacity building, and direction, and strengthen inner-community relationships. Target is number of participants.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	109

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Leadership development was identified as a need by the Wyoming Rural Development Council's Community Assessments. This was later reaffirmed by Area Advisory Committees and the Extension Research Needs Assessment in 2004. The Wyoming Business Council has shared their vision of community economic development using a building block model. At the base are three blocks - leadership development, workforce development, and

community capacity building. The second level has two blocks, existing business development and entrepreneur development, and one block on the top for recruiting.

What has been done

In FY 2009 five EVOLVE leadership institutes were conducted. Each institute meets monthly for 8 sessions ranging from 6 - 8 hours in length. Topics covered include teambuilding, communication, conflict management, a fishbowl simulation of leadership assessment, community involvement, and overall leadership.

Results

In 2009, 109 EVOLVE graduates from five community leadership institutes in Wyoming completed a survey reflecting their perceptions of the institutes. More than 90 percent (90 respondents) reported they were more aware of their strengths and weaknesses. In fact, respondents reported they agreed leadership behavior improved in all areas listed. 'Has your overall involvement in the community strengthened (in quality or quantity)through participation in the Institute?' Fifty-six respondents (69.1 percent) agreed or strongly agreed. There was also a doubling in the number who reported participating in five to six leadership roles after the institute.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #10

1. Outcome Measures

Leadership participants will be able to utilize collaborative/coalition building practices to implement visionary community programs in order to provide the community with leaders, officials, and volunteers who are able to affect desired change or stability. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	38

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Leadership development was identified as a need by the Wyoming Rural Development Council's Community Assessments. This was later reaffirmed by Area Advisory Committees in 2004-2005 and the Extension Research Needs Assessment in 2004. The Wyoming Business Council has shared their vision of community economic development using a building block model. At the base are three blocks - leadership development, workforce development, and community capacity building.

What has been done

Strong leaders are the foundation of sustainable rural communities and form a base for economic and community development. Attempts have been made to measure the impact of EVOLVE (Extension Volunteer Organization for Leadership, Vitality, and Enterprise) in Wyoming through a study of participants one year after graduation. The

team developed a survey specific to the EVOLVE program. The survey included three themes: leadership in personal skill building and confidence, leadership in community involvement, and leadership in commitment to community building.

Results

Respondents were asked to estimate the number of leadership roles they were involved in before and after participation in the leadership institutes. Prior to the institute, the greatest number of participants (48 respondents) indicated one to two leadership roles. After participation, the largest number of respondents (38) reported three to four leadership roles compared to 19 respondents who reported the same number prior to institute participation. There was also a doubling in the number who reported participating in five to six leadership roles after the institute. Respondents estimated a total of 586 hours in volunteer participation prior to the institute. After institute participation, the estimated hours of volunteering increased to 890 hours - an increase of 304 hours.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #11

1. Outcome Measures

Increased rural economic diversification. Target is number of participants implementing change.

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

Enhanced incomes and jobs through business expansion or new businesses. Target is participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

Long term changes in action documented through follow-up surveys of program participants regarding planning, improved management of risk, insurance, and labor. Improved confidence and ability to market, produce and finance, and promote products from new enterprises. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

Short term outcome of research efforts include increased grant funding and increased involvement on regional and multi-state projects. Target is number of projects reporting outcome.

Not Reporting on this Outcome Measure

Outcome #15**1. Outcome Measures**

Development of impact models which will improve community economic analysis as well as mitigate unwanted consequences. Target is number of impact models developed.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	3

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Documentation of the need for the evaluation of the influence of land-use patterns on the provision of local government services dates back to the 1950s. The literature indicates low-density developments distant from centers of service provision are more expensive to serve than more proximate and high-density developments. Inefficiencies occur due to average cost user charges which undercharge outlying low-density areas while overcharging interior or high-density areas.

What has been done

The research extends previous production modeling of public services to include a spatial index representing pattern of development as an explanatory variable in the production function. Results suggest the pattern of residential land use is a statistically significant driver of local government spending on policing services. This research contributes to both a more richly specified production function and may contribute to the development of the next step in fiscal impacts modeling, spatially precise evaluation.

Results

Products derived from these methods will be a useful addition in evaluations of community development and service provision as well as discussions concerning the costs of growth. An AES competitive grant has been received to study the impacts of ex-urban sprawl on county costs and revenues. GIS technology and economic models have provided insights as to why disperse residential development brings greater cost per unit tax revenue when law enforcement resources are used to achieve public safety. These results are being shared with county planning groups.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

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.)
- Other (changes in technology)

Brief Explanation

UW CES had a long tenured educator retire; the position was refilled at the end of summer. Training to build capacity in two new educators is on going in this program area.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)**Program # 3****1. Name of the Planned Program**

Nutrition and Health

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	70%		70%	
724	Healthy Lifestyle	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	15.0	0.0	3.5	0.0
Actual	10.2	0.0	1.5	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
137929	0	53805	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
823786	0	192896	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**

EFNEP adult curriculum taught in a series of lessons; adult one-time lessons; youth curricula taught in a series of lessons and day camps; displays and demonstrations; state and community partnerships with agencies serving the low-income; training for educators ; evaluation of program; ongoing- updating of curricula and materials.

Other nutrition efforts will focus on educational programs; media outreach; health fairs; training; assessment/data collection; and research in human health and metabolic diseases and their interaction with diet.

Since skeletal muscle is the main site for utilization of glucose and fatty acids in the body and insulin resistance in skeletal muscle is the key step in the incidence of type 2 diabetes, we hypothesize that impaired fetal skeletal muscle growth due to nutrient deficiency plays an important role. Our goal is to understand how the development of fetal skeletal muscle affects the

properties of skeletal muscle of adulthood, and to develop effective strategies to mitigate or avoid incidence of diabetes and obesity caused by impaired skeletal muscle development due to fetal nutrient deficiency.

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.

Dining with Diabetes program targets the general public (youth and adults) with Type 2 Diabetes. All other nutrition efforts targeted audience includes: general public, both adults and youth and policy makers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	1000	4000	1500	3000
Actual	3890	6000	3319	3207

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

Patent Applications Submitted

Year: 2009

Plan: 1

Actual: 3

Patents listed

Curcumin-Containing Polymers and Water-Soluble Curcumin Derivatives as Prodrugs or Prodrug Carriers;
Differentiation of Leukotriene Based Asthmatics;
Individualized Treatment for Leukotriene Asthma Subtypes;

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	4	
Actual	0	6	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Dining with Diabetes, food safety and programs which promote healthier food choices and lifestyles offered in Wyoming communities. Target is number of programs.

Year	Target	Actual
2009	35	53

Output #2**Output Measure**

- Number of participants in educational programs offered in NFS initiative. Target is number of participants.

Year	Target	Actual
2009	800	1018

Output #3**Output Measure**

- Number of partnerships formed with environmental health specialists (food safety); public health of other agencies, and Diabetes coordinators. Target is number of partnerships.

Year	Target	Actual
2009	10	10

Output #4**Output Measure**

- Increased adoption of healthy food practices and participation in regular physical activities. Target is number of participants reporting outcome.

Year	Target	Actual
2009	100	455

Output #5**Output Measure**

- Effectiveness of research programs will be based on integration into extension programs, patents, grant dollars, and publications. The ultimate research goal is to provide tools for detection of food contaminated products. (target is number of research projects in NRI)

Year	Target	Actual
2009	3	5

Output #6**Output Measure**

- Improve ability to detect and analyze for the presence of food borne pathogens. Target is number of research projects.
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improved attitude related to diabetes self care, food, and physical activity. Targets are number of participants reporting outcome.
2	Increased knowledge of healthy food choices for optimal diabetes management, and health. Targets are number of participants reporting outcome.
3	Improved skill in selection of healthy foods. Targets are number of participants reporting outcome.
4	Improved eating behavior practices, food choices , and lifestyle habits. Targets are number of participants reporting outcome.
5	Individuals participating in Dining with Diabetes programs will have improved blood glucose control which will improve health and diabetes management resulting in decreased chronic disease risk factors. Targets are number of participants reporting outcome.
6	Nutrition programs will result in decreased medical costs. Targets are number of participants reporting outcome.
7	Using a variety of food resources to reduce food costs. Providing culturally acceptable meals that are balances for cost as well as for nutritional value. Target is number of participants reporting outcome.
8	Improved personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is number of participants reporting outcome.
9	Increased availability of personal/family food resources. Target is number of participants reporting outcome.
10	Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.
11	Individuals incorporate skills and change behaviors related to: increased participation in physical activity; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.
12	Individuals and families experience: improved nutritional health; reduced medical costs; health improved through improved community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.
13	Increased awareness and knowledge of food safety practices. Target is number of participants reporting outcome.
14	Behavior or practice changes that improve food safety. Target is number of participants reporting outcome.
15	Reduced health care cost and economic loss to restaurants as a result of food-borne outbreaks. Target is number of participants reporting outcome.
16	Decreased incidence of food-borne illness outbreaks in food service establishments. Target is number of food service establishments reporting outcome.
17	The short term goal of research efforts is to increase grant funding and to patent detective process. Target is number of projects.
18	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 number of projects with results that demonstrate outcome.

Outcome #1**1. Outcome Measures**

Improved attitude related to diabetes self care, food, and physical activity. Targets are number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	523

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Nearly 21 million Americans - about 7 percent of the population - have diabetes. The Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System reports for Wyoming that the rate of diabetes in adults has more than doubled from 1997 (3 percent) to 2007 (7 percent). This percentage represents about 28,000 Wyoming adults. Estimated economic costs of diabetes in 2002 were \$132 billion; on a per-capita basis, that translates to an economic burden in Wyoming of \$22 million.

What has been done

In response, University of Wyoming Cooperative Extension Service (UW CES) nutrition and food safety educators, with support from the Wyoming Diabetes Prevention and Control Program, teamed with local diabetes educators to conduct Dining with Diabetes in Wyoming. This five-session program combines education on diabetes self-care with recipe demonstrations, food tasting, nutrition information, and low-impact physical activity for people of all fitness levels. Participants complete questionnaires at the beginning of the first class (pre), at the end of the fourth class (post), and at the beginning of the fifth class (follow-up - two to four months after the fourth class).

Results

Shorter term (by the end of the program)

Better understanding of . . . the plate method for portioning their food; Feeling more strongly . . . that they can eat their favorite foods; Longer term (at three-month follow-up)

Decreasing the proportion of participants . . .

who drink whole or 2% milk

who are never physically active

Feeling more strongly . . . that physical activity comes more easily to them.

Selected comments:

I have definitely made changes in serving sizes.

I have changed my cooking style, modifying recipes to be more healthy.

I realize I need to be more serious about what I'm eating - not just once in awhile but all the time.

I have really learned a lot about how to cook for my husband (and) how important exercise is. (I also) understand more about how he feels with higher and lower blood sugars.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Increased knowledge of healthy food choices for optimal diabetes management, and health. Targets are number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	523

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nearly 21 million Americans - about 7 percent of the population - have diabetes. The Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System reports for Wyoming that the rate of diabetes in adults has more than doubled from 1997 (3 percent) to 2007 (7 percent). This percentage represents about 28,000 Wyoming adults. Estimated economic costs of diabetes in 2002 were \$132 billion; on a per-capita basis, that translates to an economic burden in Wyoming of \$22 million.

What has been done

In response, University of Wyoming Cooperative Extension Service (UW CES) nutrition and food safety educators, with support from the Wyoming Diabetes Prevention and Control Program, teamed with local diabetes educators to conduct Dining with Diabetes in Wyoming. This five-session program combines education on diabetes self-care with recipe demonstrations, food tasting, nutrition information, and low-impact physical activity for people of all fitness levels. Participants complete questionnaires at the beginning of the first class (pre), at the end of the fourth class (post), and at the beginning of the fifth class (follow-up - two to four months after the fourth class). Eight programs were completed in 2009, an additional 20 programs were held since inception in 2006. Over the four-year period, 447 individuals took the course. Additionally educators participated in health fairs and one time sessions to promote diabetes prevention.

Results

One hundred percent of participants reported increasing knowledge as a result of educational efforts. Over half of evaluation respondents indicated they had changed at least one dietary behavior.

Shorter term impacts included participants reporting they feel strongly that:

*what people do can make a big difference in the control of their diabetes

*healthy food can taste good

*physical activity comes more easily to them

Longer term (at two- to four-month follow-up)

- *Better understanding of the Plate Method for portioning their food
- *Increasing the proportion of participants...who eat high-fiber cereal

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

Improved skill in selection of healthy foods. Targets are number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	537

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Wyoming has more than 30,398 food stamp recipients living in 12,337 households. This represents an increase of 34.6% in recipients and 31% in household members from September 2008. Due to Wyoming's large geographic size and low population, food security is a challenge for those with limited resources making nutrition education, including food resource management, very important.

What has been done

The University of Wyoming's CES's Cent\$ible Nutrition Program, which is the umbrella title for the Expanded Food and Nutrition Extension Program had the following outputs over the past year:

- 115 adults participated in a series of lessons, averaging 8.1 lessons per person (931 teaching contacts).
- 422 adults participated in one-time lessons with 80 percent reporting intended behavior change.

Results

- 46 percent reported thinking about healthy food choices more often when deciding what to feed their families.
- 57 percent reported using the 'Nutrition Facts' labels more often to make food choices.
- 36 percent reported they or their children more often eat something in the morning within two hours of waking.
- 47 percent reported serving more than one kind of fruit to their families each day more often.
- 42 percent reported serving more than one kind of vegetable to their families each day more often.
- 37 percent reported when eating bread, they eat whole-grain bread more often.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #4**1. Outcome Measures**

Improved eating behavior practices, food choices , and lifestyle habits. Targets are number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	980

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wyoming residents are at risk as reflected by various health-related data: For example, over 20 percent of Wyoming adults report no leisure time physical activity, 47 percent of Wyoming high school students report not being enrolled in a physical education class, and 78 percent of both Wyoming adults and high school students do not eat recommended amounts of fruits and vegetables.

What has been done

UW CES educators conducted over 300 classes which emphasized a holistic approach including proper nutrition, increasing physical activity and healthy food choices. Strong Bones - Strong People, basic nutrition, and Steps to a New You were all programs focused on objectives.

Results

980 individuals participated in 56 classes of which 10 were multi-session with four to eight sessions in length. 400 participants reported improved eating behavior practices, food choices, and lifestyle habits through end of session evaluations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #5**1. Outcome Measures**

Individuals participating in Dining with Diabetes programs will have improved blood glucose control which will improve health and diabetes management resulting in decreased chronic disease risk factors. Targets are number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Nutrition programs will result in decreased medical costs. Targets are number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Using a variety of food resources to reduce food costs. Providing culturally acceptable meals that are balances for cost as well as for nutritional value. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	115

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Wyoming has more than 30,398 food stamp recipients living in 12,337 households. This represents an increase of 34.6% in recipients and 31% in household members from September 2008. Due to Wyoming's large geographic size and low population, food security is a challenge for those with limited resources making nutrition education, including food resource management, very important.

What has been done

The University of Wyoming's CES's Cent\$ible Nutrition Program, which is the umbrella title for the Expanded Food and Nutrition Extension Program had the following outputs over the past year:

115 adults participated in a series of lessons, averaging 8.1 lessons per person (931 teaching contacts).

422 adults participated in one-time lessons with 80 percent reporting intended behavior change.

Results

84 percent showed improvement in one or more food-resource management practices.

46 percent reported planning meals ahead of time more often.

39 percent reported running out of food before the end of the month less often.

Families reported saving an average of \$54.34 per month.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #8

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Increased availability of personal/family food resources. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	630

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The United States Department of Agriculture recently released the Dietary Guidelines for Americans 2005. Tommy G. Thompson, Secretary of Health and Human Services, identified the number one message of the new guidelines as getting the most nutrition out of calories consumed. Number two was finding a balance between food and physical activity. The key recommendations include an emphasis on increased consumption of fruits and vegetables, whole grains, and low-fat dairy and increased physical activity.

What has been done

Nutrition and food safety educators conducted 42 educational programs on basic nutrition, health, and food selection.

Results

End of session evaluations indicated 100 percent of participants gained awareness, knowledge, and skills as result of educational programs. Over 250 individuals indicated they planned to change one nutrition practice for

their family. 90 percent reported they now understand nutrition fact labels.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #11

1. Outcome Measures

Individuals incorporate skills and change behaviors related to: increased participation in physical activity; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	580

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Wyoming residents are at risk as reflected by various health-related data: For example, over 20 percent of Wyoming adults report no leisure time physical activity, 47 percent of Wyoming high school students report not being enrolled in a physical education class, and 78 percent of both Wyoming adults and high school students do not eat recommended amounts of fruits and vegetables. Additionally, research in Wyoming, Montana, and Idaho documented body dissatisfaction as a significant predictor of self-consciousness keeping respondents from participating in physical activity.

What has been done

77 classes (which included over 20 which were multi-session) were held on Steps to a New You, Basic Nutrition, Size Acceptance, Strong Bones -Strong People, Steps to Weight Management, and Healthy Eating Habits. In addition, educators published educational articles in newsletters, newspaper columns, and produced educational displays used at health fairs.

Results

Participants reported incorporating skills and changing behaviors related to: increased participation in physical activity; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image as a result of educational efforts. 100 percent of participants listed at least one behavior change they incorporated to improve their health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

724 Healthy Lifestyle

Outcome #12**1. Outcome Measures**

Individuals and families experience: improved nutritional health; reduced medical costs; health improved through improved community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	136

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wyoming residents are at risk as reflected by various health-related data: For example, over 20 percent of Wyoming adults report no leisure time physical activity, 47 percent of Wyoming high school students report not being enrolled in a physical education class, and 78 percent of both Wyoming adults and high school students do not eat recommended amounts of fruits and vegetables. Additionally, research in Wyoming, Montana, and Idaho documented body dissatisfaction as a significant predictor of self-consciousness keeping respondents from participating in physical activity.

What has been done

A variety of classes (many multi-session) on Steps to a New You, Healthy Eating, Weight Management and basic nutrition were conducted by nutrition educators. Articles were published in newsletters, newspaper columns and educational displays were developed.

Results

36 percent reported being physically active for at least 30 minutes per day, on four or more days per week, more often.

40 percent reported getting a 'super-sized' portion less often. (A 'super-sized' portion of food or beverage is one that is much bigger but costs only a little more money).

92 percent showed improvement in one or more nutrition practices.

25 individuals reported weight loss as a result of changes in eating, meal planning, and increasing physical activity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #13

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

Behavior or practice changes that improve food safety. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

Reduced health care cost and economic loss to restaurants as a result of food-borne outbreaks. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #16

1. Outcome Measures

Decreased incidence of food-borne illness outbreaks in food service establishments. Target is number of food service establishments reporting outcome.

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

The short term goal of research efforts is to increase grant funding and to patent detective process. Target is number of projects.

Not Reporting on this Outcome Measure

Outcome #18

1. Outcome Measures

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

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other ()

Brief Explanation

Note that outputs and outcomes on food safety topics are reported in the new Food Safety planned program.

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

1. Evaluation Studies Planned

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)**Program # 4****1. Name of the Planned Program**

4-H and Youth Development

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	10%		10%	
802	Human Development and Family Well-Being	25%		25%	
806	Youth Development	65%		65%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	29.0	0.0	0.0	0.0
Actual	37.2	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
503034	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
3004395	0	0	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**

Activities include volunteer training on the following topics: Ages and stages of youth; Risk Management; Youth Development Concepts; Non-Profit Management/Coordination; Financial Management/IRS Issues; Project Training; Learning Styles; Club Maintenance; Recruitment and Retention.

Traditional 4-H will focus on project or leadership activities; teach and/or facilitate educational programs; recruitment of new members, training, camps, clinics, contests, media, and assessment.

Non-traditional 4-H activities will include: Cloverbuds (pre 4-H); After school programs; School enrichment; Youth Leadership; Marketing; and Camps.

2. Brief description of the target audience

The University of Wyoming College of Agriculture 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 extension programs regardless of their race, national origin, gender, age, religion, or disability. 4-H Volunteers will be recruited from the following groups: Adults in the Community, Other Agencies, Civic Groups, Youth Groups, and the General Public.

Traditional 4-H youth audiences will target:

- Youth
- Volunteers
- Families
- Community

The target audience for non-traditional 4-H will include: underserved and high risk youth who do not participate in the traditional 4-H Youth program in Wyoming.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	5000	7000	10000
Actual	4967	5000	18261	10000

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

Patent Applications Submitted

Year: 2009
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of youth enrolled in the traditional 4-H program. Target is number of youth enrolled in traditional 4-H club programs.

Year	Target	Actual
2009	7000	8230

Output #2**Output Measure**

- Number of educational events, camps, training workshops, clinics implemented. Target is number of programs and events.

Year	Target	Actual
2009	100	750

Output #3**Output Measure**

- Number of volunteers enrolled as leaders in the 4-H program. Target is number of volunteers enrolled in the 4-H program.

Year	Target	Actual
2009	3000	2694

Output #4**Output Measure**

- Number of volunteers participating in formal training programs. Target is number of volunteers participating in training programs.

Year	Target	Actual
2009	800	4967

Output #5**Output Measure**

- Number of non-traditional programs established. Target is number of non-traditional programs.

Year	Target	Actual
2009	10	11

Output #6**Output Measure**

- Number of youth enrolled in non-traditional youth development programs. Target is number of youth enrolled in non-traditional programs.

Year	Target	Actual
2009	5000	8516

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Increased knowledge, skills, self-esteem, awareness, motivation, belonging, and diversity. Target is number of youth participating.
2	Wyoming youth will acquire knowledge which builds life skills including critical thinking, public speaking, teamwork, self-discipline, responsibility, decision making, self-esteem, communication, and leadership. Target is number of youth reporting outcome.
3	Youth will be empowered to make logical decisions, develop a positive behavior (according to traditional values), effectively communicate, and establish a working relationship with others. Target is number of participants reporting outcome.
4	Wyoming youth build assets and essential life skills to lead productive, responsible, and healthy lifestyles. Target is number of participants reporting outcome.
5	Decreased incidence of youth engaging in high risk behavior. Youth become responsible, productive adults. Target is number of participants reporting outcome.
6	Non-traditional youth participating in programs serve in leadership roles, serve on governing bodies, act as mentors, and teach other youth. Target is number of participants reporting outcome.
7	Volunteers demonstrate increased knowledge in project areas. Target is number of participants reporting outcome.
8	Volunteers become key players in 4-H and youth development programs. Target is number of participants reporting outcome.
9	Volunteers demonstrate knowledge of youth development principles. Target is number of participants reporting outcome.
10	Volunteers will learn and apply the experiential learning model. Target is number of participants reporting outcome.
11	Trained adult volunteers will demonstrate skills and abilities in which they are able to foster youth to become responsible adults. Target is number of participants reporting outcome.

Outcome #1

1. Outcome Measures

Increased knowledge, skills, self-esteem, awareness, motivation, belonging, and diversity. Target is number of youth participating.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	9000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Wyoming there are an estimated 75,000 youth between the ages of 8 and 18 according to the U.S. Census Bureau. According to the Search Institute 'youth who have ten or fewer of the 40 external and internal assets are at high risk of developing at-risk behaviors'. All of the 40 external and internal assets are likely to be developed by youth involved in the 4-H program. Youth in the traditional 4-H program have the opportunity to expand their knowledge base, increase their life skills and develop leadership abilities in order to become responsible, contributing citizens.

What has been done

4-H youth educators working with volunteers conducted 750 educational activities including workshops, camps, clinics, judging contests, and other events which promote increased knowledge, skills, self-esteem, awareness, motivation, belonging, and diversity. In addition educators publish educational articles in 4-H

Results

Youth participating in educational activities reported through both formal and informal evaluations an increase in knowledge, skills, self confidence as a result of belonging to 4-H. County, state, regional and national event participation identifies diversity as one of the benefits. Observation is used to document increased self-esteem, greater motivation, and sense of belonging with youth participants. All 23 counties and the Wind River Indian Reservation report impact in this area.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2**1. Outcome Measures**

Wyoming youth will acquire knowledge which builds life skills including critical thinking, public speaking, teamwork, self-discipline, responsibility, decision making, self-esteem, communication, and leadership. Target is number of youth reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	1626

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In Wyoming there are an estimated 75,000 youth between the ages of 8 and 18 according to the U.S. Census Bureau. According to the Search Institute 'youth who have ten or fewer of the 40 external and internal assets are at high risk of developing at-risk behaviors'. All of the 40 external and internal assets are likely to be developed by youth involved in the 4-H program. Youth in the traditional 4-H program have the opportunity to expand their knowledge base, increase their life skills and develop leadership abilities in order to become responsible, contributing citizens.

What has been done

4-H youth educators conducted 68 educational activities including 4-H camps, Junior Leader programs, leadership retreats and special interest sessions, judging programs, training on public speaking and presentations and implemented Character Counts training statewide.

Results

Over 1626 youth participating in 4-H judging programs reported increased confidence and skills in decision making and communication. Junior leaders (youth age 13 - 18) reported through formal and informal evaluations increased awareness and skills in teamwork, decision making, self-discipline, leadership, communication, and responsibility. Youth participating in educational programs, camps, and other activities demonstrate increased knowledge and skills.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3**1. Outcome Measures**

Youth will be empowered to make logical decisions, develop a positive behavior (according to traditional values), effectively communicate, and establish a working relationship with others. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	1626

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In Wyoming there are an estimated 75,000 youth between the ages of 8 and 18 according to the U.S. Census Bureau. According to the Search Institute 'youth who have ten or fewer of the 40 external and internal assets are at high risk of developing at-risk behaviors'. All of the 40 external and internal assets are likely to be developed by youth involved in the 4-H program. Youth in the traditional 4-H program have the opportunity to expand their knowledge base, increase their life skills and develop leadership abilities in order to become responsible, contributing citizens.

What has been done

40 external and internal assets identified by the Search Institute are utilized in all 4-H curriculum used in Wyoming. Educators had in-depth training in 2008 on Character Counts which has been implemented statewide. 4-H camps, clinics, judging programs, junior leader programs including WYLE - Wyoming Youth Leadership Education are conducted. In 2009 Wyoming 4-H implemented the Youth Ventures contest which teaches youth about entrepreneurship and workforce preparedness. Educators write educational articles for 4-H newsletters.

Results

100 percent of youth participating in educational programs report an increase in being empowered to make logical decisions, develop a positive behavior, effectively communicate, and have skills to establish a working relationship with others.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

Outcome #4**1. Outcome Measures**

Wyoming youth build assets and essential life skills to lead productive, responsible, and healthy lifestyles. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	542

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In Wyoming there are an estimated 75,000 youth between the ages of 8 and 18 according to the U.S. Census Bureau. According to the Search Institute 'youth who have ten or fewer of the 40 external and internal assets are at high risk of developing at-risk behaviors'. All of the 40 external and internal assets are likely to be developed by youth involved in the 4-H program. Youth in the traditional 4-H program have the opportunity to expand their knowledge base, increase their life skills and develop leadership abilities in order to become responsible, contributing citizens.

What has been done

4-H educators work with youth ages 13 - 18 in Junior Leader programs which target development of assets. A variety of methods are used including training, camps, workshops, leadership retreats, and on-going monthly junior leader meetings. WYLE curriculum, Wyoming Youth Leadership Education program, funded through the Daniels Fund, was held in all areas in the state with 2 to 3 day retreats for junior leader age youth. Focusing on developing assets in youth is an objective of all educational activities.

Results

Junior leader age youth (13 - 18) report through formal and informal evaluation increased skills, knowledge, and assets such as self esteem, communication, responsibility, and decision making. Wyoming Youth Leadership Education retreats had the following impact: daily evaluations as well as a final overall evaluation were used to evaluate the overall impact of the program. The evaluations showed that 72 percent of youth said that their knowledge was improved or greatly improved by the True Colors assessment, 61 percent for learning styles, 89 percent for body language, and 94 percent for extreme leadership, 42 percent for youth in governance, 58 percent for business etiquette, 90 percent for senior sensitivity, 65 percent for Character Counts, and 90 percent for communication.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

Outcome #5

1. Outcome Measures

Decreased incidence of youth engaging in high risk behavior. Youth become responsible, productive adults. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Non-traditional youth participating in programs serve in leadership roles, serve on governing bodies, act as mentors, and teach other youth. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Volunteers demonstrate increased knowledge in project areas. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	790

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adult volunteers are the mainstay of the 4-H program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. These leaders can directly accomplish the goals the program has for positive youth development of all youth participants. In the 2008-2009 program year in Wyoming there were 2694 active leaders at all stages of experience and expertise. Over one-third of these leaders joined the 4-H program within the last three years. Program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H. New and experienced leaders identified the following topics as essential for success within their clubs: behavioral management of youth, teaching youth of different ages within the same club, record books, and making meetings fun for all.

What has been done

With topics identified by the current 4-H leaders, curriculum was created to match these needs as well as incorporate the essential elements of 4-H and positive youth development theories. A variety of training classes, workshops, on-line training were offered. In addition educators wrote educational articles in 4-H newsletters. All county 4-H programs conducted training for volunteers.

Results

After completing the Leader Training Workshops, 100 percent of participants said the training was beneficial in helping them in their role as a 4-H Leader. Some of their testimonials included:

'The information about conducting meetings was most helpful to me.'

'I will use the Record Book as a structure to plan my year - set goals, plan community service, set a schedule.'

'I learned a lot about the 4-H structure and what is expected of leaders as well as members.'

'I have never thought about planning for different age groups, the ages and stages information was most helpful.'

'This training reinforced the notion that the 4-H members are all different and I need to be thoughtful in various ways to teach them.'

Over 200 leaders completed on line certification training. 100 percent reported increased awareness and knowledge of risk management in working with youth. 26 leaders completed intensive master volunteer training.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being

Outcome #8

1. Outcome Measures

Volunteers become key players in 4-H and youth development programs. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	26

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adult volunteers are the mainstay of the 4-H Program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. Leaders can directly accomplish goals of the program for positive youth development of all participants. In the 2008-2009 program year in Wyoming there were 2694 leaders at all stages of experience and expertise. Area advisory meetings, 4-H councils, program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H.

What has been done

Five 4-H educators and the State 4-H volunteer development specialist teamed to design and implement the Master 4-H Volunteer Training. Resources included curriculum and activities developed to provide hands-on, experiential learning opportunities for volunteers. The first Master 4-H Volunteer training was held in conjunction with the 2009 State 4-H Leaders Conference. The program consisted of 11 hours of intensive training.

Results

100 percent (26) of the volunteer leaders rated the overall Master Volunteer training as good or very good. Many leaders indicated an intent to use the information to help train other leaders in their home county. Following is a sample of how leaders plan to use what they learned:

- *I intend to go back to my county and help our agent.
- *Going back to my county and working as a resource for community club leaders, and the county 4-H council.
- *I have decided to take on Jr. Leaders; I'm very excited to use all this information.
- *Training volunteers and encouraging leaders. Build strong clubs

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being

Outcome #9

1. Outcome Measures

Volunteers demonstrate knowledge of youth development principles. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	540

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adult volunteers are the mainstay of the 4-H Program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. These leaders can directly accomplish the goals the program has for positive youth development of all youth participants. Area advisory meetings, 4-H expansion and review committees and program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H.

What has been done

4-H Youth Educators conducted 78 training sessions for 4-H volunteers. Wyoming hosts a state 4-H leaders conference annually which provides training and support to volunteers. Youth development principles are incorporated into all training sessions to provide tools to volunteers to meet needs of youth enrolled in the 4-H program. In 2009 a master volunteer program was implemented with 26 volunteers completing training.

Results

Formal end of session evaluations report that volunteers participating in leader training sessions have increased knowledge and awareness of youth development principles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #10

1. Outcome Measures

Volunteers will learn and apply the experiential learning model. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	1600

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adult volunteers are the mainstay of the 4-H Program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. These leaders can directly accomplish the goals our program has for positive youth development of all youth participants. Area advisory meetings, 4-H Expansion and Review committees, and program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H. New and experienced leaders identified the understanding the experiential learning model as essential for success within their clubs.

What has been done

4-H youth educators in all 23 counties and the Wind River Indian Reservation conducted targeted training for volunteers. Emphasis is placed on developing competency in the experiential training model.

Results

100 percent of volunteers demonstrated understanding of the model. Over 1600 volunteers participated in training and 1000 completed formal end of session evaluations which reported an increase in knowledge and skills in implementing 4-H project training using the experiential learning model. Retention in the 4-H program has increased due to positive learning environments created by volunteer leaders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

Outcome #11**1. Outcome Measures**

Trained adult volunteers will demonstrate skills and abilities in which they are able to foster youth to become responsible adults. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	790

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Adult volunteers are the mainstay of the 4-H Program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. Leaders can directly accomplish goals of the program for positive youth development of all participants. In the 2008-2009 program year in Wyoming there were 2694 leaders at all stages of experience and expertise. Area advisory meetings, 4-H councils, program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H.

What has been done

4-H youth educators conducted 78 training activities including state 4-H leaders conference, project and general leader training. Objectives and goals of 4-H youth development principles are incorporated into all training sessions.

Results

Volunteers stated increased understanding of youth development principles which foster youth to become productive adults. Testimonials from 4-H leaders and youth indicate the positive influence adult volunteers have on the life of 4-H members.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

High staff turnover in the 4-H program also impacts continuity of youth development programs.

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)
- Case Study

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 5****1. Name of the Planned Program**

Sustainable Management of Rangeland Resources (SMRR)

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	5%		5%	
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
103	Management of Saline and Sodic Soils and Salinity	5%		5%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	5%		5%	
121	Management of Range Resources	5%		5%	
123	Management and Sustainability of Forest Resources	5%		5%	
131	Alternative Uses of Land	5%		5%	
132	Weather and Climate	5%		5%	
135	Aquatic and Terrestrial Wildlife	5%		5%	
136	Conservation of Biological Diversity	5%		5%	
205	Plant Management Systems	5%		5%	
206	Basic Plant Biology	5%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
306	Environmental Stress in Animals	5%		5%	
311	Animal Diseases	5%		5%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%		5%	
605	Natural Resource and Environmental Economics	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	12.0	0.0
Actual	16.5	0.0	12.0	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
223120	0	430445	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1332595	0	1543165	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**

Natural resource programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of sources. Workshops on sustainable rangeland and animal management principles will be offered within each extension area within the state. Provide professional development opportunities for rangeland professionals. Develop written educational materials on rangeland and animal management practices and principles (fact sheets, bulletins, media, presentations, Web). Conduct technical consultation on rangeland and animal management, and monitoring of rangelands. Develop media on rangeland management principles (radio, TV, press). Conduct research and demonstrations on sustainable natural resource management principles. Work with individual rangeland managers on developing, implementing, and evaluating sustainable management practices.

Develop and/or present programs on natural resources at youth activities. Produce, or update currently produced educational materials targeted to youth on natural resource education. Produce information/education modules emphasizing natural resource topics for 4-H leader use in 4-H project with large enrollment.

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 programs regardless of their race, national origin, gender, age, religion, or disability. The College of Agriculture is committed to transmitting unbiased scientific-based information to solve local and regional natural resource conflicts involving state, Federal, and private resources. All efforts will be made to provide information through direct contact and through publications, newsletters, Web sites and other methods. The general public and exurban landowners, agricultural producers and federal and state land management agency personnel.

General youth and traditional 4-H are among the target audiences for natural resource youth programs.

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	100	2000	50	500
Actual	2578	14435	628	1000

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

Year: 2009

Plan: 1

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	8	
Actual	2	11	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs implemented. Target is number of programs.

Year	Target	Actual
2009	5	106

Output #2

Output Measure

- Documented media efforts implemented. Target is number of media efforts such as magazines, TV, radio, newspaper inserts.

Year	Target	Actual
2009	5	6

Output #3

Output Measure

- Number of individuals participating in educational programs or activities. Target is number of participants.

Year	Target	Actual
2009	100	3206

Output #4

Output Measure

- Number of agency personnel, range professionals, and general public participating in training. Target is number of participants.

Year	Target	Actual
2009	100	2578

Output #5

Output Measure

- Number of youth related natural resource programs implemented. Target is number of programs.

Year	Target	Actual
2009	1	4

Output #6

Output Measure

- Number of youth participating in natural resource educational programs or activities. Target is number of participants.

Year	Target	Actual
2009	100	628

Output #7

Output Measure

- Research: The ability of producers to adopt economically and environmentally sustainable production practices in the face of persistent drought will improve the economic viability while reducing potential resource damage. The long term goal will be to model scenarios of long term drought on economic viability of rural communities. Target is number of producers implementing practices.

Year	Target	Actual
2009	1	2

Output #8

Output Measure

- Research - Impacts of natural resource development on long term rural water quality. Long term goals will be to integrate knowledge gained into environmental regulations and improved water quality. Target is number of projects.

Year	Target	Actual
2009	1	4

Output #9

Output Measure

- Research - One of the major environmental controversies is rising CO2 levels. There is a large potential to increase C storage in disturbed and reclaimed land. Long term goals will be to develop improved soil properties on these sites. Target is number of projects.

Year	Target	Actual
2009	1	3

Output #10

Output Measure

- Research - Matching animal productivity to actual resources available rather than modifying resources to match animal nutrient needs. The long term goal is to develop more sustainable grazing systems. Target is number of projects.

Year	Target	Actual
2009	1	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase public knowledge and appreciation of natural resources and public awareness of sustainable resources. Target is number of participants reporting outcome.
2	General public understands the impact of resource use and management on the quality and quantity of the resources. (i.e. water, rangeland, wildlife, viewsheds). Target is number of participants reporting outcome.
3	Raise the understanding of the general public on the interaction of natural resource use in Wyoming's economy. Citizens will make better informed decisions on natural resource issues and topics. Target is number of participants reporting outcome.
4	Greater public consensus of management of private and public lands resulting in less litigation and burden on the system, through unbiased information that will reduce conflict and contribute to the economic and biological sustainability of Wyoming communities. Target is number of participants reporting outcome.
5	Youth participating in natural resource programs will have increased interest in careers in natural resources. Target is youth participants choosing natural resource careers.
6	Increased enrollment in 4-H natural resource programs (projects, camps, activities). Target is number of increased youth participation in natural resource programs.
7	Increase knowledge, awareness and skills among youth on natural resources, their management and associated issues. Target is number of participants reporting outcome.
8	Raise awareness, knowledge, and skills for development, implementation and evaluation of land management plans that include management of grazing and browsing animals, and adjusting management as to necessary to meet objectives. Target is number of participants reporting outcome.
9	Land managers, public and private, will develop, implement, and evaluate plans for improved management of rangeland resources and associated herbivores. Target is number of participants reporting outcome.
10	Increased profit for range-based agriculture enterprises. Target is number of participants reporting outcome.
11	Improved rangeland health, productivity, and profitability including value of rangeland for multiple use. Target is number of participants reporting outcome.
12	Research - Increased knowledge and appreciation of sustainable production practices. Change in knowledge through publications and integration into extension programs. Target is number of projects which have resulted in publication of results and/or integration into extension programs.
13	Research - Increase knowledge and appreciation of resource development on water quality. Outcomes will be change in knowledge through publications, bulletins, reports and long term to integrate research into extension programs. Target is number of projects which have outcomes that have been documented in publications, bulletins and/or integrated into extension programs.
14	Research - Increase public awareness on long term CO2 levels and integrate findings into extension programs. Target is number of projects in which outcomes have been integrated into extension programs.
15	Research - Increase producers ability to match resources to animal productivity. Target is number of projects which report research outcome. These projects have been integrated into extension programming.

Outcome #1**1. Outcome Measures**

Increase public knowledge and appreciation of natural resources and public awareness of sustainable resources.
Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	2578

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wyoming's tremendous natural resources support an abundance of recreational opportunities but they also provide the basis for a number of industries that are very important to the state's economy. Forty-eight percent of the land area in Wyoming is publicly-owned and is managed by government agencies. Livestock on public rangelands is managed by producers in cooperation with government agencies. Continuing educational opportunities are essential for both agricultural producers and agency personnel to maintain or improve their management skills, to minimize producer-agency conflict and, ultimately, to keep the land healthy and productive, and to maintain or increase the profitability of range livestock production operations.

What has been done

CES educators and specialists in the Sustainable Management of Rangeland Resources initiative team conducted 178 educational programs on topics including range monitoring, Range 101 schools, land management for small acreages, poisonous plants and weed management, tours, mineral content of NE Wyoming upland range grass, and ecosystem management. In addition the SMRR team produces weekly 70 second TV spots 'Exploring the Nature of Wyoming' aired on commercial TV to reach non-agriculture residents with information on natural resources.

Results

Participants indicated that, from attending these classes, they had learned the importance of not allowing grazing in the same place at the same time each year and how to determine proper stocking to improve and/or sustain pasture forage productivity. Attendees stated that changes in management they planned to make included fencing to implement a grazing rotation, monitoring grass growth and residual leaf material so overgrazing does not occur, and include use of their corrals in their grazing plans so pasture forage supply can be balanced with their livestock forage needs.

Rangeland 501 School - level of knowledge pre- and post school - 42% indicated increased knowledge by 1 level. Balancing forage demand with forage - 67% increased knowledge by 1 level and 8% by 2 levels.

Participants in the Beef Production Convention responded that 98% gained moderate to significant knowledge about managing enterprises on the ranch.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources

123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics

Outcome #2**1. Outcome Measures**

General public understands the impact of resource use and management on the quality and quantity of the resources. (i.e. water, rangeland, wildlife, viewsheds). Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	500

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Forty-eight percent of the land area in Wyoming is publicly-owned and is managed by government agencies. Livestock on public rangelands is managed by producers in cooperation with government agencies. Continuing educational opportunities are essential for both agricultural producers and agency personnel to maintain or improve their management skills, to minimize producer-agency conflict and, ultimately, to keep the land healthy and productive, and to maintain or increase the profitability of range livestock production operations.

What has been done

Drought reduces the amount of available forage, irrigation supplies, and drinking water for livestock. Reductions in any of these cause reductions in the number of livestock a producer can raise and could force additional expenditures for supplementary feeds and hauling water. Research shows these problems can be mitigated by implementing a plan before impacts become insurmountable. With a plan in hand, ranchers are better prepared to survive and even thrive through Wyoming's recurring droughts. UW CES SMRR educators conducted 15 educational programs addressing range and natural resource management topics.

Results

Range school participants indicated that 32% had little knowledge (1 or 2 rating) about the topics presented with 23% indicating they were knowledgeable (4 or 5 ranking) about the subject matter prior to participating in the school. After the school 65% of the participants believed they were knowledgeable about the topics presented.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources

Outcome #3**1. Outcome Measures**

Raise the understanding of the general public on the interaction of natural resource use in Wyoming's economy. Citizens will make better informed decisions on natural resource issues and topics. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	30000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Many Wyomingites are not directly tied to natural resources and agriculture. This results in lack of knowledge and experience regarding natural resource systems, their management and the industries they support. Unfortunately, a segment of the general public appears to believe that any use of even renewable resources is damaging. There is often conflict and occasional litigation among interest groups that differ on how resources should be used and managed. Natural resources are important to all segments of the Wyoming population.

What has been done

The Sustainable Management of Rangeland Resources initiative team has produced over 175 seventy second TV spots which air twice weekly on commercial TV station in Casper. The segment titled 'Exploring the Natural Wonders of Wyoming' (ENOW) covers natural resource topics to provide education to the general public. The ENOW spots have also been placed on You-Tube to reach a national audience.

Results

In the forth year of airing these spots, the team receives regular feedback from Wyoming citizens and now national viewers on the positive aspects of the spots. It is difficult to measure impact, though the audience response has generated enough impact that the Wyoming Petroleum Association now provides funding for the segments aired twice weekly.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
135	Aquatic and Terrestrial Wildlife
605	Natural Resource and Environmental Economics

Outcome #4**1. Outcome Measures**

Greater public consensus of management of private and public lands resulting in less litigation and burden on the system, through unbiased information that will reduce conflict and contribute to the economic and biological sustainability of Wyoming communities. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #5**1. Outcome Measures**

Youth participating in natural resource programs will have increased interest in careers in natural resources. Target is youth participants choosing natural resource careers.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	5	7

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension is uniquely positioned in that we have existing volunteer youth development programming infrastructure already built in the 4-H program. These youth present an immediate natural resource education audience and an opportunity to reach the broader youth audience with the educational resources we have. Building stronger natural resource programs, enhancing natural resource teaching opportunities within existing high-interest projects (like market livestock and shooting sports projects) and increasing youth development opportunities are key. This will continue to foster interest in natural resource careers.

What has been done

CES Educators participate in the annual WYORed camp which has a natural resource emphasis sponsored by NRCS. In addition educators have conducted six youth specific programs on natural resources. This topic is also incorporated into 4-H camps held statewide. All area SMRR educators have a 15 percent youth assignment and encourage youth participation in educational events.

Results

Livestock and shooting sports projects have large enrollments in Wyoming 4-H. These projects lend themselves to a 'teachable moment' for natural resource topics. Educators have reported that 3 youth have chosen career or education paths in natural resources as a result of exposure to these topics.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources

123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
132	Weather and Climate
135	Aquatic and Terrestrial Wildlife

Outcome #6**1. Outcome Measures**

Increased enrollment in 4-H natural resource programs (projects, camps, activities). Target is number of increased youth participation in natural resource programs.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension is uniquely positioned in that we have existing volunteer youth development programming infrastructure already built in the 4-H program featuring offices in all of Wyoming's 23 counties, several thousand volunteer staff and thousands of youth already acquainted with the 4-H program. These youth present an immediate natural resource education audience and an opportunity to reach the broader youth audience with the educational resources we have. Building stronger natural resource programs, enhancing natural resource teaching opportunities within existing high-interest projects (like market livestock and shooting sports projects) and increasing youth development opportunities are key. This will continue to foster interest in natural resource careers.

What has been done

Educators conducted 11 educational programs including an ag expo, GPS training, plant anatomy, native plants and noxious weeds, and nature awareness.

Results

Enrollment in 4-H livestock projects continues to increase. Shooting sports which is also closely tied to natural resources is also experiencing increased enrollment. All youth participating in targeted natural resource education programs report increased knowledge and skills.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
132	Weather and Climate
135	Aquatic and Terrestrial Wildlife

Outcome #7**1. Outcome Measures**

Increase knowledge, awareness and skills among youth on natural resources, their management and associated issues. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	628

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Extension is uniquely positioned in that we have existing volunteer youth development programming infrastructure already built in the 4-H program featuring offices in all of Wyoming's 23 counties, several thousand volunteer staff and thousands of youth already acquainted with the 4-H program. These youth present an immediate natural resource education audience and an opportunity to reach the broader youth audience with the educational resources we have. Building stronger natural resource programs, enhancing natural resource teaching opportunities within existing high-interest projects (like market livestock and shooting sports projects) and increasing youth development opportunities are key. This will continue to foster interest in natural resource careers.

What has been done

Educators conducted 11 workshops including an Ag expo, GPS, plant anatomy, native plants and noxious weeds, and nature awareness. In addition natural resources are a component of over 3/4 of all 4-H camps held throughout the state.

Results

100 percent of youth participating in special programs relating to natural resource education report an increase in knowledge, skills, and awareness.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife
306	Environmental Stress in Animals
311	Animal Diseases

Outcome #8**1. Outcome Measures**

Raise awareness, knowledge, and skills for development, implementation and evaluation of land management plans that include management of grazing and browsing animals, and adjusting management as to necessary to meet objectives. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20	72

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Rangelands comprise over 80 percent of Wyoming's land base. Range livestock production, recreation, and wildlife habitat are some of the dominant uses of rangelands. Rangelands also provide water for homes and municipalities, irrigation, industries, fisheries, wildlife and livestock. In semi-arid Wyoming, rangeland uses need to be compatible with maintaining the quality and quantity of water resources. Livestock grazing and wildlife habitat management must also be compatible as both are important for the sustainability of the State's rangeland resources and its economy.

What has been done

Extension educators in the SMRR initiative conducted 33 educational programs, tours, or workshops on range monitoring. Most classes were targeted toward permittees reaching 812 individuals.

Results

100 percent of participants in educational programs reported increased awareness, knowledge, and skills of range monitoring. 72 individuals reported implementing or adjusting management plans as a result of the workshops. One range technician with BLM reported that by having producers understand and implement monitoring, provided one less technician needed in the field.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land

Outcome #9**1. Outcome Measures**

Land managers, public and private, will develop, implement, and evaluate plans for improved management of rangeland resources and associated herbivores. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10	323

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Subdivision of agricultural land, especially rangeland, into small acreages continues to occur within Wyoming counties. Many of these acreages are grazed by horses whose owners have little or no experience in grazing management, especially in a semiarid region, and thus are in need of grazing management information.

What has been done

CES educators conducted classes which were approximately two hours long, and topics presented were: Class 1) Grass growth and regrowth; Class 2) Time and timing of grazing; and Class 3) Balancing forage demand with forage supply.

Results

Participants indicated that they had learned the importance of not allowing grazing in the same place at the same time each year and how to determine proper stocking to improve and/or sustain pasture forage productivity. Attendees stated that changes in management they planned to make included fencing to implement a grazing rotation, monitoring grass growth and residual leaf material so overgrazing does not occur, and include use of their corrals in their grazing plans so pasture forage supply can be balanced with their horses' forage needs. Knowledge level of participants prior to the grass growth and re-growth class averaged 2.9 and afterward 4.2; for the time and timing class, 2.5 prior and 4.3 afterward. More than 97 percent of the participants indicated the workshops met their expectations. With regard to their questions being effectively answered and using what they learned on their property, the average response for both was 4 out of a possible score of 5.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife
306	Environmental Stress in Animals
311	Animal Diseases
605	Natural Resource and Environmental Economics

Outcome #10**1. Outcome Measures**

Increased profit for range-based agriculture enterprises. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	22

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Drought is a normal part of Wyoming's climate. While not occurring every year, droughts should be considered a recurring theme in Wyoming and not an exception to the rule. Planning for drought is important to livestock producers. Drought reduces the amount of available forage, irrigation supplies, and drinking water for livestock. Reductions in any of these cause reductions in the number of livestock a producer can raise and could force additional expenditures for supplementary feeds and hauling water. This reduces revenues and profits. Research shows these problems with drought can be mitigated by implementing a plan before impacts become insurmountable. With a drought plan in hand, ranchers are better prepared to survive and even thrive through Wyoming's recurring droughts.

What has been done

Agricultural economic and rangeland ecology research from the University of Wyoming and other entities were drawn upon to create the information for a range management course. The educational material was presented at Range Management 101 and 301 schools in four locations in Wyoming. The information was also given through personal contacts with ranchers and landowners.

Results

22 students in the High Plains Ranch Practicum reported they had influence over 117 people, the management and decision-making for 7,800 beef cattle, and 170,000 acres of native range, planted pasture and hay land. Suvery respondents indicated knowledge gained would on average net an additional \$25 per head of cattle managed. The total estimated economic impact for producers would be \$195,000.

100% reported they were likely or very likely to improve range management and natural resource planning.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
605	Natural Resource and Environmental Economics

Outcome #11

1. Outcome Measures

Improved rangeland health, productivity, and profitability including value of rangeland for multiple use. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

Research - Increased knowledge and appreciation of sustainable production practices. Change in knowledge through publications and integration into extension programs. Target is number of projects which have resulted in publication of results and/or integration into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Producers, farmers, ranchers, and policy makers are interested in the the economic and environmental sustainability of conventional, reduced-input or organic approaches on western crop-range-livestock farms.

What has been done

The experiment was established at the Sustainable Agriculture Research and Extension Center (SAREC) near Lingle, Wyoming. Data collection was initiated in fall 2009.

Results

Local producers were provided with alternatives for integrated crop-range-livestock production in a semi-arid environment. The environmental and socio-economic impact of these three practices were evaluated. Extension materials were generated and demonstration fields were established for outreach and education at SAREC.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
121	Management of Range Resources
132	Weather and Climate

213	Weeds Affecting Plants
605	Natural Resource and Environmental Economics

Outcome #13**1. Outcome Measures**

Research - Increase knowledge and appreciation of resource development on water quality. Outcomes will be change in knowledge through publications, bulletins, reports and long term to integrate research into extension programs. Target is number of projects which have outcomes that have been documented in publications, bulletins and/or integrated into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	6

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Coalbed methane natural gas extraction from coal deposits of Wyoming, Montana, Colorado, and New Mexico is occurring rapidly to meet the Nation's energy demand. It is estimated that Wyoming coal deposits contain approximately 31.7 trillion cubic feet of recoverable natural gas. In Wyoming, the Powder River Basin contains the majority of coalbed methane natural gas and it is in the forefront of development in North America.

What has been done

Our research group is monitoring and analyzing the coalbed methane outfall water, disposal pond water, and sediment samples from five sub-basins of the Powder River Basin. Long-term monitoring studies are useful for developing optimum uses for coalbed methane produced water and protecting natural resources in the Powder River Basin.

Results

Our research findings are helping landowners, industry, regulatory agencies and bordering states make informed decisions regarding water chemistry, salinity, sodium adsorption ratio, and trace element impacts on soils, plants, channel sediment, aquatic life, livestock, and wildlife. Our research findings are also helping clientele develop optimum or beneficial uses for coalbed methane produced water (e.g., irrigation, livestock and wildlife watering, and aquaculture) in the Powder River Basin. Our findings have also resulted in six journal publications.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources
123	Management and Sustainability of Forest Resources

Outcome #14**1. Outcome Measures**

Research - Increase public awareness on long term CO2 levels and integrate findings into extension programs.
Target is number of projects in which outcomes have been integrated into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	5

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Increasing anthropogenic CO2 levels in the atmosphere are raising concerns over climate change and global warming. Flue gas emissions from many industrial processes, including coal-fired power plants, cement plants, paper mills, steel plants, oil shale incinerators, and municipal and medical solid waste incinerators, are a major source for anthropogenic CO2 to the atmosphere.

What has been done

Our research group is conducting accelerated mineral carbonation pilot-scale demonstration studies at a 2120 MW coal-fired power plant to capture and mineralize flue gas CO2. Flue gas and fly ash, typical by-products of coal combustion process, were reacted simultaneously in a flow-through fluidized-bed reactor for two hours under actual field conditions. Significant amounts of flue gas CO2 can be directly captured (without separation) and mineralized by the fly ash involving short reaction times.

Results

Preliminary results suggest that the proposed process is rapid, less energy intensive, and environmentally acceptable. The CO2 capture and storage technologies should also explore simultaneous capture and mineralization of point source flue gas CO2 with solid residues resulting from industrial processes, which could help reduce the input of anthropogenic CO2 to the atmosphere.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
103	Management of Saline and Sodic Soils and Salinity
121	Management of Range Resources
131	Alternative Uses of Land
132	Weather and Climate

Outcome #15**1. Outcome Measures**

Research - Increase producers ability to match resources to animal productivity. Target is number of projects which report research outcome. These projects have been integrated into extension programming.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	4

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Beef production efficiency is critical to farmers, ranchers, and consumers.

What has been done

Cattle and sheep studies were conducted to elucidate the impact of maternal nutrition during mid to late gestation on the growth performance and meat quality of offspring. Our data showed that maternal nutrition affects marbling (intramuscular fat) and overall lean/fat ratio in the offspring. We found that mid to late gestation is important for fetal lean growth, but late gestation is crucial for the formation of marbling.

Results

Our data showed that mid to late gestation nutritional supplementation to cows are important for the production efficiency of offspring. Wyoming and surrounding Rocky Mountain states frequently experience drought, and cows and sheeps commonly experience nutrient deficiency during gestation. Our research provides a guideline for producers to supplement their cows and sheeps during mid to late gestation to improve the profitability of farm operation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
132	Weather and Climate
306	Environmental Stress in Animals
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
605	Natural Resource and Environmental Economics

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
- Other (Technology changes)

Brief Explanation

Drought continues to be an issue in Wyoming.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Time series (multiple points before and after program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
204	Plant Product Quality and Utility (Preharvest)	20%		20%	
307	Animal Management Systems	20%		20%	
502	New and Improved Food Products	20%		20%	
703	Nutrition Education and Behavior	20%		20%	
704	Nutrition and Hunger in the Population	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	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

An issue team on sustainable agriculture and nutrition has been implemented.

Fostering development of local food systems, which includes promoting use of local foods, can improve energy efficiency of the food system while yielding many other benefits. Indeed, a one-year project "Wyoming Specialty Crops and Local Foods Project: Supporting Sustainable Lifestyles" was approved by the Wyoming Department of Agriculture to enhance efficiency within local food systems by improving relationships among local food producers and consumers in Wyoming. The resulting increased awareness and consumption of locally grown foods has many potential benefits, including more efficient use of natural resources

related to the energy cost of food transportation, processing, and packaging. This project as part of Global Food Security and Hunger program will achieve its purposes through three primary components:

- 1) Development and distribution of the *Wyoming Local Foods Guide* (print and electronic versions); which will include a directory of specialty crops and other local food products, nutrition and food safety resources, recipes for using local foods, fact sheets related to local foods in Wyoming, and tips on sustainable living. The *Foods Guide* will be uniquely Wyoming but will draw from several existing examples.
- 2) Development and pilot-testing of *Wyoming Local Food Expos* in at least two communities;
- 3) Development and implementation of a training module to provide UW CES educators statewide with the knowledge and skills to successfully promote local foods.

Nutrition educators, including those working in the EFNEP program as part of Cent\$ible Nutrition which reaches limited resource individuals, and families teach concepts which help families in meal planning, preparation, and maximize resources to provide nutritious meals.

Research is ongoing at the University of Wyoming regarding new crop varieties and livestock practices which produce optimum food supplies while increasing profitability and sustainability of agriculture producers.

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.

Targeted audiences for Global Food Security and Hunger programs include: General public (Youth and Adults) Agriculture producers, both large and small farms and ranches Individuals who sell at farmer's markets Policy makers

All nutrition efforts targeted audience includes: general public, both adults and youth and policy makers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs focusing on global food security and hunger. Target is the number of programs
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of participants attending programs focusing on global food security and hunger. Target is the number of individual participants.
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of partnerships formed with other nutrition/health/farmers market agencies or organizations. Target is the number of partnerships.
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Increased adoption of sustainable agriculture methods and practices which result in increased production of the food supply. Target is number of participants reporting outcome.
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Effectiveness off research programs will be based on integration of extension programs, patents, grant dollars, and publications. Target is number of research projects focusing on global food security and hunger.
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Increased knowledge of agriculture producers on sustainable cropping and livestock systems. Target is number of producers reporting outcome.
2	Improved sustainable agriculture production practices resulting in an increased food supply. Outcome is number of producers reporting outcome.
3	Increased availability of personal/family food resources. Target is number of participants reporting outcome.
4	Individuals gain awareness, knowledge, and skills related to: increased knowledge of healthy food choices; improved selection of healthy foods; improved food resource management. Target is the number of participants reporting outcome.
5	The short term goal of research efforts is to increase grant funding. Target is number of projects which show positive outcomes in regard to additional funding.

Outcome #1

1. Outcome Measures

Increased knowledge of agriculture producers on sustainable cropping and livestock systems. Target is number of producers reporting outcome.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Improved sustainable agriculture production practices resulting in an increased food supply. Outcome is number of producers reporting outcome.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Increased availability of personal/family food resources. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Individuals gain awareness, knowledge, and skills related to: increased knowledge of healthy food choices; improved selection of healthy foods; improved food resource management. Target is the number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

The short term goal of research efforts is to increase grant funding. Target is number of projects which show positive outcomes in regard to additional funding.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

As a new program, educational efforts by CES are in beginning stages. Though a new title; research efforts at the University of Wyoming College of Agriculture and Natural Resources are ongoing in development of new crop varieties; value added products, and livestock production practices which address the objective of this

planned program. Meeting global demand for food is integral to all efforts at the University of Wyoming. Research and extension efforts in human nutrition, particularly those that target limited resource individuals and families are critical to our mission. For FY 09 many reported outputs and outcomes will be found in profitable and sustainable agriculture systems and nutrition and food safety.

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

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)**Program # 7****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
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 professional FTE/SYs expended this Program

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	2.0	0.0	2.0	0.0

Actual	2.0	0.0	2.0	0.0
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2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
27045	0	71741	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
161528	0	257194	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

The Wyoming Food Safety Coalition (WFSC) is a multi-agency, multi-disciplinary partnership that has become the primary source of food-safety education throughout Wyoming. The heart of WFSC is a core of local trained teams, most of which include a county-based UW Cooperative Extension Service educator and a health inspector from either the Wyoming Department of Agriculture or a local city/county health department or both. These teams plan and conduct a wide variety of educational programs.

In fiscal year 2009 (10/1/08 - 9/30/09),

Coalition team members trained **1570 food handlers** in the following **workshops**:

Basic:154; Intermediate: 237; Advanced: 23; ServSafe®: 278; Day Care: 447; Food Preservation:190; Other (i.e., temporary food permits, other sanitation training, "Food Safety Works" programs, etc.): 241.

In-house trainings reached 379 individuals.

Consumer programs and displays reached 1,488 individuals.

News releases and public service announcements distributed via **print and other media** avenues reached **thousands of readers and listeners statewide** on a regular basis.

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 food safety programs include: General Public (Youth and Adults)

Food Handlers: Commercial and Temporary Food Service In-Home and Child Care Center Providers Food Processors Agriculture Producers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	3437	10000	2124	5000

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Research;Improve ability to detect and analyze for the presence of food-borne pathogens. Target is number of research projects.

Year	Target	Actual
2009	{No Data Entered}	1

Output #2

Output Measure

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

Year	Target	Actual
2009	{No Data Entered}	56

Output #3

Output Measure

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

Year	Target	Actual
2009	{No Data Entered}	1949

Output #4

Output Measure

- Effectiveness of research programs will be based on integration into extension programs, patents, grant dollars, and publications. The ultimate research goal is to provide tools for detection of food contaminated products. Target is the number of research projects in NRI.

Year	Target	Actual
2009	{No Data Entered}	1

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	The short term goal of research efforts is to increase grant funding and to patent detective processes. Target is the number of projects which show positive outcomes in regard to additional funding and patents.
4	Research will result in easier, more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately delineate genes that promote survival in the environment and result in disease contamination of food. Target is the number of projects with results that demonstrate outcome.
5	Behavior or practice changes that improve food safety. Target is number of participants reporting outcome.
6	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	Quantitative Target	Actual
2009	{No Data Entered}	1526

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 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths. 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

56 classes ranging from school handwashing lessons to consumer food safety, beginning, intermediate food safety for food service workers and ServSafe food safety certification classes were conducted.

Results

100 percent of participants reported learning at least one new concept. Youth were able to demonstrate proper hand washing techniques. 97 percent (500) of food service workers and consumers made at least one change related to cleanliness, for example wash their hands more often. 78 percent (402) reported understanding cross-contamination and indicated they planned to change at least one food handling practice as a result of classes.

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	Quantitative Target	Actual
2009	{No Data Entered}	3437

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food-borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths. 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

56 classes ranging from ServSafe certification courses, Going for the Gold food safety classes for food service handlers, consumer food safety classes and school workshops on proper handwashing methods were conducted.

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.

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

The short term goal of research efforts is to increase grant funding and to patent detective processes. Target is the number of projects which show positive outcomes in regard to additional funding and patents.

Not Reporting on this Outcome Measure

Outcome #4**1. Outcome Measures**

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

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

E. coli O157:H7 is a major safety threat for beef and its associated products. Frequent recalls due to E. coli O157:H7 contamination cause huge economic losses to the beef industry. Because fecal shedding of E. coli O157:H7 is the major source of contamination in beef, it is extremely important to reduce E. coli O157:H7 colonization in the gastrointestinal tract of beef cattle. In addition, E. coli O157:H7 biofilms on surfaces in slaughter/processing facilities is a sustained source of E. coli O157:H7 contamination in meat products.

What has been done

We are studying the role of c-di-GMP in E. coli O157:H7 gut colonization and biofilm formation. Our data show that c-di-GMP regulates E. coli O157:H7 gut colonization and biofilm formation.

Results

Knowledge obtained will provide molecular targets for the reduction or elimination of E. coli O157:H7 biofilm formation and colonization in cattle GI tracts, providing safer beef. These applications will not only be limited to E. coli O157:H7, but will deepen the understanding of food-borne pathogens and their pathogenesis in general, facilitating efforts to provide consumers with safer foods.

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**

Behavior or practice changes that improve food safety. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	912

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 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths. 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

56 educational classes ranging from school hand washing programs to food safety classes for food service workers, ServSafe certification classes and food safety for consumers were conducted.

Results

Follow-up evaluations were conducted for food service worker classes and ServSafe. 100 percent reported adapting at least one behavior change that would positively impact food safety in their establishment. Youth and consumers reported learning new skills and youth demonstrated proper hand washing techniques.

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.

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 #6

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	270

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food-borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths. 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

278 individuals participated in 16 ServeSafe(r) courses, a curriculum of the National Restaurant Association Foundation. Courses are team taught with CES educators and food safety coalition partners from the Department of Agriculture, Health, and local environmental health offices. Two of the classes were taught in Spanish. At the conclusion of the course, a certification exam is administered.

Results

270 individuals or 97% of participants passed the certification test. With increased knowledge and skills we assume food handling behaviors increase the likelihood that food served in Wyoming is safe and, therefore, that lives have been saved, illnesses avoided, health-care cost 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

- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Turnover of personnel offers challenges in Wyoming; recruitment of three new nutrition educators required training specifically in ServSafe® to allow eligibility to teach that course. Food Preservation as part of food safety also requires specialized training to provide competency in that issue.

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)
- Case Study

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 8****1. Name of the Planned Program**

Sustainable Energy

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	20%		20%	
121	Management of Range Resources	20%		20%	
401	Structures, Facilities, and General Purpose Farm Supplies	10%		10%	
402	Engineering Systems and Equipment	20%		20%	
608	Community Resource Planning and Development	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	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**

The University of Wyoming College of Agriculture and Natural Resources research and extension efforts in sustainable energy focus on efficiency and conservation specifically in relation to farm and agriculture production. In addition, residential and public conservation education is targeted toward the general public and businesses. In 2009, UW CES partnered with the School of Energy Resources at UW to fund an Energy Extension Coordinator who provides leadership and coordination for extension energy programs in the College. Initial training for field extension educators is planned; a Western SARE grant was obtained by

Montana State University in collaboration with the UW CES Energy Extension Coordinator to implement a Western Region training on energy issues. In addition to educational programs to raise awareness and knowledge, CES plans development of a Web site for information, publications, and a set of educational videos. To maximize outreach efforts, partnerships are being developed with the College of Engineering and Applied Science, School of Energy Resources, the Wyoming State Energy Office, Wind Energy Resource Center, USDA Rural Development, Natural Resource Conservation Service, and the Wyoming Business Council.

The State of Wyoming is well known for being a critical source of the nation's supply of natural resources. For example, 37 different states utilize Wyoming's coal to generate electricity. Wyoming also has experienced significant economic growth over the last decade due to revenue generated from taxes and royalties paid by the gas, oil, and coal industries. Because fossil fuels are essentially an irreplaceable base for Wyoming's vibrant energy industry, the University of Wyoming's College of Agriculture and Natural Resources conducts research and directs extension programming efforts to help ensure prudent use of the state's precious resources. Development of renewable technologies such as specific systems that can be used in agriculture production and/or farmsteads and small-scale power generation where power can be sold such as wind energy are being addressed. UW currently has on going research in biomass processing and transportation. As an energy rich state, conservation and preservation of our natural resources, both land and water is an on going effort for both extension and research.

UW has the following research efforts: carbon capture technologies (reducing CO2 emissions from utilization of fossil fuels). Other projects include photosynthetic bacteria hydrogen production as a source of renewable energy; various oilseed crops as potential feedstock for biodiesel production. UW CES, through an internal energy grant program, purchased an oilseed press which will be utilized in demonstrations. UW is involved in a multistate research project that is evaluating various forage crops for cellulosic biofuel production (ethanol). The College of Agriculture and Natural Resources participates heavily in projects of the Reclamation and Restoration Center for projects focusing on evaluation of natural resource management related to energy development, reclamation of mined sites and wind energy development. Many investigators in Agriculture and Applied Economics are involved in evaluating energy development and rural communities, as well as the value of natural resources (helping federal agencies make informed decisions about utilization of public lands and water).

Report Date

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. Participants will include policy makers for County, State, and Federal government agencies, crop producers, livestock producers, energy companies, general public, and the scientific community. An existing secondary audience will be the media, general public, and interest groups not directly involved in production agriculture (i.e., environmental groups). Energy conservation methods will be targeted at both agriculture and general public audiences.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	427	9000	0	0

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	0	0

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

- Number of individuals participating in sustainable energy programs. Target is the number of contacts.

Year	Target	Actual
2009	{No Data Entered}	427

Output #2**Output Measure**

- Research: Measures of AES success will be tied to grant dollars, publication and adoption of renewable energy; reclamation and restoration techniques. The ultimate goal is to provide increased energy sustainability. Target numbers include projects focusing on energy sustainability. Not reporting on this Output for this Annual Report

Output #3**Output Measure**

- Develop systems for renewable energy utilizing Wyoming's natural resources. Targets included new systems developed. Not reporting on this Output for this Annual Report

Output #4**Output Measure**

- Number of educational programs or activities focusing on sustainable energy by CES. Target is the number of educational programs implemented.

Year	Target	Actual
2009	{No Data Entered}	15

Output #5**Output Measure**

- Number of collaborative partnerships formed to address sustainable energy in Wyoming. Target is the number of partnerships.

Year	Target	Actual
2009	{No Data Entered}	4

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Awareness created focusing on sustainable energy topics. Target is the number of individuals reporting this outcome.
2	Partnerships will be developed with agencies and organizations to expand sustainable energy efforts. Target is the number of partnerships formed.
3	New technologies or devices used in ag production systems and/or farmsteads. Target is the number of new technologies developed.
4	Community development to sustain energy impacted communities. Target is the number of projects reported successful in community development in energy impacted communities.
5	Short term outcome of research efforts include increased grant funding and increased involvement on regional and multistate projects. Target is number of projects.

Outcome #1**1. Outcome Measures**

Awareness created focusing on sustainable energy topics. Target is the number of individuals reporting this outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	427

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The State of Wyoming is well known for being a critical source of the nation's supply of natural resources. Because fossil fuels are essentially an irreplaceable base for Wyoming's vibrant energy industry, the College of Agriculture and Natural Resources conducts research and direct extension programming efforts to help ensure prudent use of the state's precious resources. In addition to fossil fuel resources, Wyoming also possesses abundant renewable energy resources including wind, solar, hydroelectric, geothermal, and biomass. Both small-scale, such solar photovoltaics or geothermal heat pumps, and utility-scale, primarily wind energy, are important issues. Development of renewable technologies such as specific systems that can be used in agriculture production and/or farmsteads and smallscale power generation where power can be sold such as wind energy are also important issues. Conservation and preservation of our natural resources, both land and water is an on going effort for both extension and research.

What has been done

The University of Wyoming College of Agriculture and Natural Resources research and extension efforts in sustainable energy focus on efficiency and conservation specifically in relation to farm and agriculture production. In addition, residential and public conservation education is targeted toward the general public and businesses. In 2009, UW CES partnered with the School of Energy Resources at UW to fund an Energy Extension Coordinator who provides leadership and coordination for extension energy programs in the College. Initial training for field extension educators is planned; a Western SARE grant (\$110,000) was obtained by Montana State University in collaboration with the UW CES Energy Extension Coordinator to implement a Western Region training on energy issues. In addition to educational programs to raise awareness and knowledge, CES is in development of a Web site for information, publications, and a set of educational videos. To maximize outreach efforts, partnerships are being developed with the College of Engineering and Applied Science, School of Energy Resources, the Wyoming State Energy Office, Wind Energy Research Center, USDA Rural Development, Natural Resource Conservation Service, and the Wyoming Business Council.

Results

In 2009, CES initiated an issue team focusing on sustainable energy issues. 100% of participants in the 15 programs held reported gaining awareness of the topic and gaining knowledge. Early partnership efforts have resulted in increasing effectiveness of programs through multiple collaborators.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
121	Management of Range Resources
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Partnerships will be developed with agencies and organizations to expand sustainable energy efforts. Target is the number of partnerships formed.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The State of Wyoming is well known for being a critical source of the nation's supply of natural resources. Because fossil fuels are essentially an irreplaceable base for Wyoming's vibrant energy industry, the College of Agriculture and Natural Resources strives to conduct research and direct extension programming efforts to help ensure prudent use of the state's precious resources. In addition to fossil fuel resources, Wyoming also possesses abundant renewable energy resources including wind, solar, hydroelectric, geothermal, and biomass. Both small-scale, such solar photovoltaics or geothermal heat pumps, and utility-scale, primarily wind energy, are important issues. Development of renewable technologies such as specific systems that can be used in agriculture production and/or farmsteads and small scale power generation where power can be sold such as wind energy are also important issues. As an energy rich state, conservation and preservation of our natural resources, both land and water is an on going effort for both extension and research.

What has been done

To maximize outreach efforts, partnerships are being developed with the College of Engineering and Applied Science, School of Energy Resources, the Wyoming State Energy Office, Wind Energy Resource Center, USDA Rural Development, Natural Resource Conservation Service, and the Wyoming Business Council.

Results

Partnerships have increased resources, both financial and human capital to maximize outreach efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
----------------	-----------------------

- 102 Soil, Plant, Water, Nutrient Relationships
- 121 Management of Range Resources
- 401 Structures, Facilities, and General Purpose Farm Supplies
- 402 Engineering Systems and Equipment
- 608 Community Resource Planning and Development

Outcome #3

1. Outcome Measures

New technologies or devices used in ag production systems and/or farmsteads. Target is the number of new technologies developed.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Community development to sustain energy impacted communities. Target is the number of projects reported successful in community development in energy impacted communities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The State of Wyoming is well known for being a critical source of the nation's supply of natural resources. Wyoming has experienced significant economic growth over the last decade due to revenue generated from taxes and royalties paid by the gas, oil, and coal industries. Communities have been impacted by sudden growth resulting from energy development. Help is needed in building community capacity and infrastructure. This has been identified by local municipalities; the Governor of Wyoming has requested CES take a lead role in assisting communities.

What has been done

CES partnered with local municipalities, energy industry and county government to fund community development educators in two energy impacted areas of Wyoming. Greatest success has been achieved in Wamsutter, a small community in southwest Wyoming. After more than three years of effort by Wamsutter, Sweetwater County, industry, and individuals, progress has been realized. In November 2006, residents at a town meeting determined healthcare as one of the top five needs of the community, along with infrastructure, housing, commercial development, and sewer upgrades.

Results

Wamsutter entered into a partnership with Wamsutter Community Inc., the all-purpose, charitable nonprofit organization established in 2007. The town contributed land and took responsibility for seeking funding to pay for construction; the nonprofit took responsibility for seeking operational and staff funding. In October 2008, Mayor Ken Waldner sent a letter to Gov. Dave Freudenthal detailing the priority needs of the community with estimated costs. Gov. Freudenthal requested, and the Legislature appropriated, \$3.5 million in matching funds for infrastructure improvements. Meanwhile, BP America had pledged to match the state appropriation up to \$3 million and Sweetwater County already had designated \$250,000 for the health center. From the public and private funds, the town had the funding to construct the building, and the nonprofit had the funds to ensure the first two years of start-up operations. CES played an integral role with leadership from the Community Development Educator.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Short term outcome of research efforts include increased grant funding and increased involvement on regional and multi-state projects. Target is number of projects.

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
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

As a new program added after the end of the fiscal year, limited outcomes are available. Funding for this new program is essential in development and implementation of both research and extension efforts. CES has partnered with the School of Energy Resources which has increased the capacity for program development and outreach.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)

Evaluation Results

A variety of evaluation methods will be used for educational programs including end of session evaluations, followup evaluations both by phone, mail, or electronic communication, observation, pre- and post-tests. Data will be gathered to document data for outcomes and outputs.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
104	Protect Soil from Harmful Effects of Natural Elements	10%		10%	
112	Watershed Protection and Management	10%		10%	
132	Weather and Climate	20%		20%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		10%	
205	Plant Management Systems	10%		10%	
306	Environmental Stress in Animals	10%		10%	
307	Animal Management Systems	10%		10%	
605	Natural Resource and Environmental Economics	10%		10%	
608	Community Resource Planning and Development	10%		10%	
Total		100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890

Actual	0.0	0.0	0.0	0.0
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2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	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

UW Research and Extension activities will focus on best species and variety selection as well as effectiveness of production practices as aspects of climate changes. Invasive species, and drought will be addressed through educational programs which enhance strategies to control global warming and will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

Basic work in carbon storage in ecosystems, the implications of agricultural and land management practices on storage, and education related to these questions will be addressed. Plant species and variety adaption to the changing ecosystem will be critical to maintaining the agricultural productivity for the state. Educational programs will help producers and land managers understand the implications of drought for grasslands and cropping ecosystem management. The implications of climate change for invasive species and ecosystem management implications are important opportunities for UW AES and CES.

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 climate change program include agriculture producers, commodity groups, and agriculture agencies. Horticulture and small acreage audiences will also benefit from water conservation and risk management components of the program.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	838	3000	133	200

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	5	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of agriculture producers participating in educational programs. Target is number of program participants.

Year	Target	Actual
2009	{No Data Entered}	702

Output #2

Output Measure

- Number of educational programs conducted targeting climate change. Target is the number of programs.

Year	Target	Actual
2009	{No Data Entered}	35

Output #3

Output Measure

- Number of horticulture or small acreage landowners who participate in programs which focus on climate change. Target is number of program participants from target audience.

Year	Target	Actual
2009	{No Data Entered}	472

Output #4

Output Measure

- Research will develop more sustainable cropping systems which demonstrate best species and variety selection as well as effectiveness of production practices as aspects of climate changes. Target is number of systems developed.

Year	Target	Actual
2009	{No Data Entered}	2

Output #5

Output Measure

- Research on invasive species in the dry cold desert ecosystem while small changes in climate can shift the competitive relationship among plant species. Target is the number of research projects implemented.

Year	Target	Actual
2009	{No Data Entered}	9

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Awareness created through extension and research efforts. Target is the number of participants in extension and research programs reporting that they have gained awareness on topic.
2	Horticulture and small acreage participants will increase awareness of climate change and the impact on horticulture production. Target is number of participants reporting outcome.
3	Producers will gain knowledge and implement carbon credit program in their operation. Target is number of producers who report signing up for carbon credit program.
4	Producers will implement practices in animal and plant production which will mitigate climate change. Target is the number of producers reporting outcome.
5	Agriculture producers will gain awareness and knowledge in risk management issues related to climate change and drought. Target is number of producers reporting outcome.
6	Research - Awareness created in plant systems: change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes integrated into extension programs.
7	Research in animal production - awareness created; change in knowledge through publications and integration into extension activities. Target is number of projects which are on-going that have generated publications or integration into extension programs.

Outcome #1**1. Outcome Measures**

Awareness created through extension and research efforts. Target is the number of participants in extension and research programs reporting that they have gained awareness on topic.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	971

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wyoming is a rangelands state where small changes in temperature and growing season and amount and timing of precipitation can have a dramatic effect on the success of plant communities in the ecosystem. Best species and variety selection as well as effectiveness of production practices will change as aspects of climate changes. Invasive species are a particular problem in the dry cold desert ecosystem as small changes in climate can shift the competitive relationship among plant species. This can have a significant effect on plant community diversity and rangelands productivity. Periodic and sustained drought is another critical factor in the success of agriculture in Wyoming. Some evidence suggests that drought and other climate variability may be more of a factor as the climate warms. In addition, strategies to control global warming will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

What has been done

UW research and extension activities focus on best species and variety selection as well as effectiveness of production practices as aspects of climate changes. Invasive species, and drought were addressed through educational programs which enhance strategies to control global warming and will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate. Basic work in carbon storage in ecosystems, the implications of agricultural and land management practices on storage, and education related to these questions are addressed. Educational programs presented help producers and land managers understand the implications of drought for grasslands and cropping ecosystem management.

Results

Participants in the 35 educational programs conducted by CES reaching 971 youth and adults reported gaining awareness and knowledge on the subject.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
112	Watershed Protection and Management
132	Weather and Climate
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

205	Plant Management Systems
306	Environmental Stress in Animals
307	Animal Management Systems
605	Natural Resource and Environmental Economics

Outcome #2**1. Outcome Measures**

Horticulture and small acreage participants will increase awareness of climate change and the impact on horticulture production. Target is number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	402

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Wyoming is a rangelands state where small changes in temperature and growing season and amount and timing of precipitation can have a dramatic effect on the success of plant communities in the ecosystem. In urban areas, small acreages, and towns, horticulture has become an important component of CES agriculture efforts. Best species and variety selection as well as effectiveness of production practices will change as aspects of climate changes. Invasive species are a particular problem in the dry cold desert ecosystem as small changes in climate can shift the competitive relationship among plant species. This can have a significant effect on plant community diversity and rangelands productivity. Periodic and sustained drought is another critical factor in the success of agriculture including horticulture in Wyoming. Some evidence suggests that drought and other climate variability may be more of a factor as the climate warms. In addition, strategies to control global warming will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

What has been done

UW CES has Master Gardener programs in half the counties in the state. Training includes best species selection, xeriscaping landscape, water conservation and other topics related to climate change. In addition educators have presented programs on water conservation, drought, plant and landscape species selection for the Wyoming ecosystem.

Results

100 percent of participants indicated they had gained awareness and knowledge as a result of educational programs. Over 50 percent of participants in horticulture programs on xeriscape, landscape design, water conservation, and plant selection have made changes in horticulture practices as a result of educational efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements

132	Weather and Climate
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems

Outcome #3**1. Outcome Measures**

Producers will gain knowledge and implement carbon credit program in their operation. Target is number of producers who report signing up for carbon credit program.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	4

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The carbon credit program is open to all ranchers who own their land. Ranchers are able to sell carbon credits to the Chicago Climate Exchange to enhance ranch income. To qualify, ranchers must show proof of having a grazing plan in place.

What has been done

Five workshops were held where 65 participants discussed the carbon credit program, grass growth basics, range monitoring tools, and grazing system alternatives, and participated in hands-on learning about range monitoring techniques and grazing plan development through the use of field and group activities.

Results

Attendees evaluated the carbon credit workshop, with 1 being poor and 5 being excellent. The overall score was 4.6. A sample of comments included:

- **"I will revise my grazing management plan to incorporate some of the techniques learned here."
- * "I plan on implementing photo monitoring and the grazing response index measurements."
- * "I am going to develop a grazing plan and enroll in the carbon credit program."

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate
605	Natural Resource and Environmental Economics

Outcome #4**1. Outcome Measures**

Producers will implement practices in animal and plant production which will mitigate climate change. Target is the number of producers reporting outcome.

Not Reporting on this Outcome Measure

Outcome #5**1. Outcome Measures**

Agriculture producers will gain awareness and knowledge in risk management issues related to climate change and drought. Target is number of producers reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	83

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Plant species and variety adaption to the changing ecosystem will be critical to maintaining the agricultural productivity for the state. Understanding the implications of drought for grasslands and cropping ecosystem management and informing land managers and producers is also a critical challenge. The implications of climate change for invasive species and ecosystem management implications are important opportunities for UW AES and CES as identified by advisory committee members.

What has been done

Educational programs on water conservation, drought, and risk management were conducted. In addition, a newspaper insert, Barnyards & Backyards, on agriculture risk management, including drought, was distributed to 99,200 homes across the state of Wyoming.

Results

100 percent of participants in educational programs reported gaining awareness and knowledge of risk management topics.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
132	Weather and Climate
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems

306	Environmental Stress in Animals
307	Animal Management Systems
605	Natural Resource and Environmental Economics

Outcome #6**1. Outcome Measures**

Research - Awareness created in plant systems: change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes integrated into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	6

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Silver Spur Ranch, at high elevation (6000-8500 ft) with unpredictable rainfall pattern, had difficulty in establishing legumes, especially alfalfa. Attempts had been made to seed alfalfa in meadows under irrigated conditions, however poor establishment and growth were a concern. Poor growth of alfalfa results in low yield (110 bales/100 acres; approximately 1 ton/acre) in a three-year stand. Low growth and thin stand in hay meadows are also a big concern.

What has been done

Based on situations and soil tests, it was decided to initiate three research/extension projects: 1. Establishment of alfalfa after triticale (irrigated); 2. Establishment of alfalfa after triticale (dryland/limited irrigation); and 3. Hay meadow response to nitrogen and forage legumes. Initial first year data (2009) showed significant triticale yields, alfalfa seedlings counts, and hay meadows yields in relation to imposed treatments.

Results

A protocol is being developed to renovate Silver Spur pastures and rangelands. This is a collaborative project involving contribution from managers, Silver Spur Ranch, a professor and ruminant nutritionist from UW Animal Science, and a CES extension educator. It is expected that the project will have a great impact; the insights obtained from this project will not only increase profitability and sustainability of the Silver Spur Ranch by renovating the pastures and hayfields but also help in developing educational and useful information for neighboring producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
132	Weather and Climate
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems

Outcome #7**1. Outcome Measures**

Research in animal production - awareness created; change in knowledge through publications and integration into extension activities. Target is number of projects which are on-going that have generated publications or integration into extension programs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	4

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Grass-fed beef has been a mainstay of a small number of beef producers for several decades, and more recently the popularity of grass-fed beef has increased due to demand for leaner food products. Grass-fed beef lipids, where the omega-3 fatty acids and CLA would be located, typically is quite low, and claims that the beef from grass-fed cattle contain high amounts of these fatty acids could be misleading to consumers. Consequently, efforts to determine efficacy of enhancing amounts of these fatty acids in grass-fed beef should be made.

What has been done

Research has begun by establishing grazing units in irrigated pastures and developing dietary supplements to insure adequate protein and mineral intakes. Supplement design also has included use of a gastrointestinal tract protected omega-3 fatty acid source to insure a sufficiently high amount of these fatty acids are digested and absorbed. The grazing portion of the trial has been completed and the laboratory analysis is forthcoming.

Results

Harvest of beef at different times during the forage growing season will affect the amounts of omega-3 fatty acids and CLA in meat. In addition, this research will evaluate the effects of supplementation strategies whereby omega-3 fatty acid supplements will be fed during the grazing season. By determining the optimal time on grass to harvest the beef, as well as ascertaining the effectiveness of omega-3 fatty acid supplementation, grass-fed beef producers will have access to alternative production strategies to truly enhance beef with important, healthful fatty acids.

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate
306	Environmental Stress in Animals
307	Animal Management Systems
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Funding is vital to this new program. As a new program added after the end of the fiscal year, limited outputs and outcomes are available for accomplishments.

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)

Evaluation Results

A variety of evaluation methods will be used for educational programs including end of session evaluations, followup evaluations both by phone, mail, or electronic communication, observation, pre- and post-tests. Data will be gathered to document data for outcomes and outputs. As a new planned program there are no evaluation results to report.

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 10****1. Name of the Planned Program**

Childhood Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	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**

This is a new planned program added to the University of Wyoming's efforts. Any outputs and outcomes are reported under Nutrition and Health. As UW CES and AES transition to this new planned program, EFNEP youth curricula will be taught in a series of lessons and day camps; displays and demonstrations; State and community partnerships with agencies serving the youth; training for educators; evaluation of program; Ongoing- updating of curricula and materials.

Other nutrition efforts will focus on educational programs which increase knowledge and skills in nutrition needs of children and incorporate physical activity into lifestyle; media outreach; health fairs; training; assessment/data collection.

Programs which teach body size acceptance will also be targeted to youth.

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 are 4-H youth; groups for the CNP (EFNEP) program: parents, adults, low-income youth, teachers and other professionals in youth serving agencies. All other nutrition efforts targeted audience includes: general public, both adults and youth and policy makers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	1150	2000	4449	1000

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs delivered to youth. Target is number of programs.

Year	Target	Actual
2009	{No Data Entered}	59

Output #2

Output Measure

- Number of youth participating in educational program targeting childhood obesity. Target is number of youth participating.

Year	Target	Actual
2009	{No Data Entered}	4449

Output #3

Output Measure

- Number of teachers or other youth serving professionals trained in childhood obesity issues. Target is number of professionals trained.
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of partnerships formed in local counties of youth professionals to collaborate on childhood obesity issues. Target is number of partnerships formalized.
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Research: Awareness created; change in knowledge through publications and integration into extension programs. Target is number of research projects.
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Improved knowledge of food guide pyramid, serving sizes, and physical activity. Targets are the number of participants reporting outcome.
2	Increased knowledge of healthy food choices including five servings of fruits and vegetables each day. Target is number of youth reporting outcome.
3	Improved eating behavior practices, food choices, and lifestyle habits. Targets are the number of participants reporting outcome.
4	Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skills in selection of healthy foods; improved body image. Target is number of participants reporting outcome
5	Youth incorporate skills and change behaviors related to: increased physical activity; increased knowledge of healthy food choices; improved selection of healthy foods; understanding of serving sizes; improved body image.
6	Youth and families experience: improved nutritional health; reduced medical costs; health improved through community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.
7	Short term outcome of research efforts include increased grant funding, publications, and increased involvement on regional and multi-state projects. Target is number of projects.

Outcome #1**1. Outcome Measures**

Improved knowledge of food guide pyramid, serving sizes, and physical activity. Targets are the number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	2114

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Childhood obesity has more than tripled in the past 30 years. The prevalence of obesity among children aged 6 to 11 years increased from 6.5% in 1980 to 19.6% in 2008. The prevalence of obesity among adolescents aged 12 to 19 years increased from 5.0% to 18.1%. Approximately 13,000 of 57,000 Wyoming children ages 10 to 17 years (22.9%) are considered overweight or obese according to BMI for age standards. Wyoming ranks third among the 50 states and D.C. in overall prevalence.

* Only one in six (16.3%) Wyoming children in higher income families are overweight or obese. The state ranks third in prevalence among higher income children.

* One in five (20.2%) Wyoming children with private health insurance are overweight or obese.

* Wyoming children are more likely than their counterparts nationwide to be physically active for at least 4 days per week, and less likely to spend 2 hours or more in front of a television or computer screen.

What has been done

UW CES utilized EFNEP youth curricula taught in a series of lessons and day camps; displays and demonstrations; Other nutrition efforts focused on educational programs which increase knowledge and skills in nutrition needs of children and incorporate physical activity into lifestyle; educators use media outreach (newspapers, newsletters, radio); health fairs; Programs which teach body size acceptance also are targeted to youth.

Results

Results of the 65 educational programs (several were series of 5 - 8 weeks) reaching 2114 youth included:

27% reported eating a variety of foods;

Over 50% increased their knowledge of MyPyramid food groups;

24% could identify missing food groups in meals;

45% could identify physical activity recommendations for their age;

33% increased their knowledge of body size diversity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #2**1. Outcome Measures**

Increased knowledge of healthy food choices including five servings of fruits and vegetables each day. Target is number of youth reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	942

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Approximately 13,000 of 57,000 Wyoming children ages 10 to 17 years (22.9%) are considered overweight or obese according to BMI for age standards. Wyoming ranks third among the 50 states and D.C. in overall prevalence.

* Only one in six (16.3%) Wyoming children in higher income families are overweight or obese. The state ranks third in prevalence among higher income children.

* One in five (20.2%) Wyoming children with private health insurance are overweight or obese.

* Wyoming children are more likely than their counterparts nationwide to be physically active for at least 4 days per week, and less likely to spend 2 hours or more in front of a television or computer screen.

What has been done

EFNEP curriculum including Grazin' with Marty Moose, WIN Kids, and Eating Your Way through Wyoming History in addition to MyPyramid, and MyPyramid II were taught reaching 942 youth. Additionally adult classes focus on the importance of increasing fruit and vegetable servings for good nutrition.

Results

Over half of the youth participants increased their knowledge of MyPyramid food groups. Over 90 percent of participants tried at least one new fruit or vegetable. Over half of participants reported they planned to eat more fruits and vegetables every day.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #3**1. Outcome Measures**

Improved eating behavior practices, food choices, and lifestyle habits. Targets are the number of participants reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	153

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Approximately 13,000 of 57,000 Wyoming children ages 10 to 17 years (22.9%) are considered overweight or obese according to BMI for age standards. Wyoming ranks third among the 50 states and D.C. in overall prevalence.

* Only one in six (16.3%) Wyoming children in higher income families are overweight or obese. The state ranks third in prevalence among higher income children.

* One in five (20.2%) Wyoming children with private health insurance are overweight or obese.

* Wyoming children are more likely than their counterparts nationwide to be physically active for at least 4 days per week, and less likely to spend 2 hours or more in front of a television or computer screen.

What has been done

Nutrition educators presented programs on Steps to a New You and nutrition for high school wrestlers. Programs emphasized importance of physical exercise in addition to proper nutrition for health and performance (in regard to wrestlers).

Results

100 percent of participants in educational programs reported gaining knowledge on the topic.

A New you: Health for Every Body/Healthy Weight participants took a pre- & post- workshop questionnaire. Pre-test average=64%; Post-test average=90% documenting knowledge gained.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #4**1. Outcome Measures**

Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skills in selection of healthy foods; improved body image. Target is number of participants reporting outcome

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	2114

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Childhood obesity has more than tripled in the past 30 years. The prevalence of obesity among children aged 6 to 11 years increased from 6.5% in 1980 to 19.6% in 2008. The prevalence of obesity among adolescents aged 12 to 19 years increased from 5.0% to 18.1%. Approximately 13,000 of 57,000 Wyoming children ages 10 to 17 years (22.9%) are considered overweight or obese according to BMI for age standards. Wyoming ranks third among the 50 states and D.C. in overall prevalence.

* Only one in six (16.3%) Wyoming children in higher income families are overweight or obese. The state ranks third in prevalence among higher income children.

* One in five (20.2%) Wyoming children with private health insurance are overweight or obese.

* Wyoming children are more likely than their counterparts nationwide to be physically active for at least 4 days per week, and less likely to spend 2 hours or more in front of a television or computer screen.

What has been done

UW CES utilized EFNEP youth curricula taught in a series of lessons and day camps; displays and demonstrations; Other nutrition efforts focused on educational programs which increase knowledge and skills in nutrition needs of children and incorporate physical activity into lifestyle; educators use media outreach (newspapers, newsletters, radio); health fairs; Programs which teach body size acceptance also are targeted to youth.

Results

Results of the 65 educational programs (several were series of 5 - 8 weeks) reaching 2114 youth included:

27% reported eating a variety of foods;

Over 50% increased their knowledge of MyPyramid food groups;

24% could identify missing food groups in meals;

45% could identify physical activity recommendations for their age;

33% increased their knowledge of body size diversity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #5**1. Outcome Measures**

Youth incorporate skills and change behaviors related to: increased physical activity; increased knowledge of healthy food choices; improved selection of healthy foods; understanding of serving sizes; improved body image.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	2114

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

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4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #6

1. Outcome Measures

Youth and families experience: improved nutritional health; reduced medical costs; health improved through community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Short term outcome of research efforts include increased grant funding, publications, and increased involvement on regional and multi-state projects. Target is number of projects.

Not Reporting on this Outcome Measure

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

Brief Explanation

Many conditions and situations that exist in Wyoming are similar to those in other parts of the country, for example, the following: Food choices made available and advertised to consumers by producers; Access to timely and accurate information; Coordination and cooperation of federal agencies and state partners, schools and other youth agencies.; Existence of local collaboration; Level of funding at federal, state and local level; and Willingness of community organizations, to collaborate with Wyoming Cooperative Extension Service.

This is a new planned program. Outcomes are limited.

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

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}