V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Animal Production Systems

2. Brief summary about Planned Program

AES will focus on fundamental and applied research in breeding, nutrition, physiology, behavior, integrated resource management systems, economics, health, and range/forage management. Extension outreach will span the breadth of the topics of research to assure that industry participants have practical knowledge in modern beef, dairy, and sheep production systems, biosecurity, economic and risk management, and response to policy and consumer changes.

Extension Work Teams (WT) planning under this Planned Program include Agriculture Business Management (ABM); Livestock and Range (LR), and Small Acreage Management (SAM).

3. Program existence :  Mature (More then five years)

4. Program duration :  Long-Term (More than five years)

5. Expending formula funds or state-matching funds :  Yes

6. Expending other than formula funds or state-matching funds :  Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
<th>%1862 Extension</th>
<th>%1890 Extension</th>
<th>%1862 Research</th>
<th>%1890 Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
<td>5%</td>
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<td>0%</td>
<td></td>
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<td>111</td>
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<td>121</td>
<td>Management of Range Resources</td>
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<td></td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Reproductive Performance of Animals</td>
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<td>10%</td>
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<tr>
<td>302</td>
<td>Nutrient Utilization in Animals</td>
<td>10%</td>
<td>10%</td>
<td></td>
<td></td>
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<tr>
<td>303</td>
<td>Genetic Improvement of Animals</td>
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<td></td>
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<tr>
<td>307</td>
<td>Animal Management Systems</td>
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<td>30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>Animal Diseases</td>
<td>10%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>315</td>
<td>Animal Welfare/Well-Being and Protection</td>
<td>10%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>601</td>
<td>Economics of Agricultural Production and Farm Management</td>
<td>10%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>602</td>
<td>Business Management, Finance, and Taxation</td>
<td>5%</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>603</td>
<td>Market Economics</td>
<td>5%</td>
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<td></td>
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</tr>
<tr>
<td>604</td>
<td>Marketing and Distribution Practices</td>
<td>5%</td>
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<td></td>
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</tr>
</tbody>
</table>

Total 100% 100%
V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Animal agriculture is a major economic sector in the United States and the leading agricultural activity in Colorado. In 2011, live meat animal sales were valued at $4.15 billion and the value of dairy production was $594 million. Livestock and livestock products accounted for 60% of crop and livestock sales in Colorado. Remaining competitive requires that the industry produce with the most technically sophisticated systems available while considering environmental and animal welfare dimensions to maintain confidence of the consuming public. Ruminant agriculture on range is the only significant agricultural enterprise which is ubiquitous in Colorado. In addition to novel and economic production practices, today's livestock producers must be knowledgeable of alternative supply chains to select a lucrative market, be aware of animal identification and trace-back requirements, understand the effects of emerging animal public health conditions, and understand the international and domestic trade environment and trends and how to respond with risk management strategies.

LR: Colorado ranks 5th in the nation for value of cattle and calves ($3.2 billion) which is over half of the total market value of agricultural products sold in Colorado. There were 2.6 million cattle and calves in Colorado (livestock and dairy) on January 1, 2009. The contribution from livestock cattle is greater than 3 times that of grains, oilseeds, dry beans and dry peas ($1.0 billion). According to the 2007 Census of Agriculture, the number of farms in Colorado with livestock cows decreased 6.4% from 1997 to 2007 and the number of farms with all cattle and calves decreased 28.1% during the same 10-year period. There are over 30,000 farms and ranches in Colorado consisting of over 30,000,000 acres of agricultural land (land in farms and ranches), 46% of the state's total land area of 66.3 million acres. Colorado's agricultural industry has lost nearly 2 million acres of agricultural land over the last ten years. Agricultural land in Colorado is being converted in three primary ways: urban and built up lands, low density non-agricultural rural land, and public open lands. As we continue to lose acres of agricultural land, we also continue to have fewer days spent working on the farm or ranch. 38.5% of operators worked 200 days or more off the farm or ranch. Agriculture land represents more than 85% of the private, undeveloped land in Colorado. Another ~35% is federally owned, of which a large percentage is leased for agricultural production (Source: http://csfs.colostate.edu/pages/land-use-ownership.html).

ABM: There are currently three primary circumstances for farmers and ranchers in Colorado that will drive the ABM Team's focus over the next year. First, Colorado has experienced dramatic demographic and economic transformations during the past decade. The makeup of farm operators has changed significantly, and enterprises increasingly face greater production, financial, marketing, human, and institutional risks. There are 36,700 farms in Colorado (2012 Colorado Agricultural Statistics) which is a 17 percent decrease from the number of Colorado farms in 2007. Net farm income, for the same period, increased by 32 percent - from a per farm average of $34,557 to $45,496. Colorado continues to have most of its farms and ranches considered as small with 31,200 (85%) having annual economic sales of less than $100,000. Wheat, forage, and corn are the major crops grown in Colorado, while the sale of cattle and calves dominates "value of sales" for all commodities produced in the state. A survey conducted by Extension specialists and researchers at Colorado State University and the Universities of Arizona and Wyoming attempted to gain a better understanding of the changing role of farm operators and the behavioral and institutional factors that promote or impede agricultural growth in the West (Tranel, 2007). The results of the study can be found at www.ruralfamilyventures.org. A second study by the same researchers was conducted with those agricultural operators having annual farm and ranch sales of $50,000 or more. The results are not yet available, but they will become available at the same web address. The second issue is that Colorado producers are facing a time of great financial uncertainty and volatility. Prices for many commodities are at all-time highs, but can vary significantly within very short periods of time. Prices for inputs, especially petro-based inputs, are extremely volatile. Higher interest rates and inflation could cause further pressures on profitability in agriculture. The current general national economy is causing investors to look more closely at agriculture lands for investment. These factors are forcing farm and ranch managers to be increasingly more vigilant about their finances and to consider new management and investment strategies. The third issue is the increasing average age of farmers and ranchers and the concerns related to succession. Farmers and ranchers in Colorado are growing older. The average age of Colorado producers was 54.5 in 2002 and 57.0 in 2007, according to the Census of Agriculture. Furthermore, those farm operators aged 55 and older own 44 percent of the land in Colorado.
Given the advancing age of producers in Colorado and the amount of land and value of machinery and equipment they own, inter-generational transfer issues are becoming ever more important.

**SAM**: The program addresses the needs of small acreage landowners who own one to 100 acres of land. These individuals live on small acreage properties because they embrace the rural lifestyle but do not necessarily intend to derive income from the property. According to the USDA ERS (Economic Research Service) 2007 census data, 48.5% of Colorado farms are 1-99 acres in size. The number of small farms (1-99 acres in size) has increased by 7.7% since 1997. The 2007 US Census of Agriculture classifies 36.4% of small farms (1-100 acres) as Residential/Lifestyle properties in which operators report major non-farming occupations. Placing rural agricultural land into the hands of many diverse owners has created a new educational challenge for Extension. Urban sprawl is a phenomenon so pervasive in our society today that it was featured in the July 2001 issue of the National Geographic magazine as the offshoot of the American dream. As communities grow, land on the urban fringes is being rezoned from large agricultural enterprises to smaller, 1 to 35+ acre parcels that maintain some agricultural uses or at least a sense of the openness that comes with agriculture, while attracting a more diverse population of owners. According to the American Farmland Trust, population growth in Colorado is transforming traditional agricultural landscapes into low-density residential development. (http://www.farmland.org/resources/rockymtn/documents/Strategic%20Ranchland%20in%20the%20Rocky%20Mountain%20West.pdf). Small acreage landowners have a significant impact on the conditions of soil, water, plants, animals, and other natural and man-made resources through their cumulative effects. The large tracts of agricultural lands in Colorado are being subdivided into one to 100 acre tracts of dry land for rural homesteads. Many of these homesteaders move from cities or other states and do not have the land management knowledge base which traditional agricultural landowners hold. Therefore, the demand for information and technical assistance is immense. Weed control, water use, and grazing management are prime examples of the land management skills which many small acreage landowners seek. CSU Extension, along with partners such as the USDA-Natural Resources Conservation Service, Colorado Division of Parks and Wildlife, and local Conservation Districts will lead this educational effort.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Research in beef production management systems and nutrition is conducted on CSU owned facilities at the Agricultural Research, Development, and Education Center (ARDEC), Eastern Colorado Research Center, Southeastern Colorado Research Center, and the Rouse Ranch in Saratoga, Wyoming. An integrated “Beef Alliance” coordinates teaching, research, and outreach in beef across all facilities focused on value-added production systems. Strong relationships exist between animal scientists and agricultural management and market economists. ARDEC hosts seed stock herds for Angus and Hereford. The University has several significant assets, including the Western Center for Integrated Resource Management, the Center for Genetic Evaluation of Livestock, and strength in research and graduate programs in beef nutrition and breeding. Livestock industry outreach includes a team of campus specialists in livestock management systems, economics, trade, policy, manure management, meat science, alternative marketing chain participation, and animal identification system.

Livestock & Range (LR): Members of the work team have demonstrated expertise and recognition in areas of livestock and range research and educational efforts. This expertise spans several departments, colleges and disciplines. For example, within the Animal Science Department production
expertise in cattle nutrition, reproduction, genetics and meat science are all represented. In addition, members of the work team represent veterinary medicine, rangeland science as well as agricultural economics. The team also has broad representation from both on-campus and off-campus faculty. Many of the team members have worked together in various efforts in the past and have demonstrated their ability to be effective.

**Agriculture Business Management (ABM):**

- Average age of agricultural producers is increasing.
- Farm sizes are either increasing or getting smaller (mid-sized farms are decreasing in number).
- Commodity and input prices are more volatile than in the past.
- The number of "women" operators is increasing.
- Consumers are demanding specific characteristics of agricultural products.
- Legal and human risks are becoming more problematic in agriculture.

**Small Acreage Management (SAM)**

- With the proper education, tools, and skills, small acreage managers will become better stewards of their properties. They will enhance the sustainability of their parcels as well as their neighbors.
- They will see themselves as an interrelated system instead of a stand-alone entity, and understand that land is best managed as a collective whole because of the residual benefits received by all involved.
- With the knowledge and tools to maintain and manage their land properly, landowners will save substantial time and money.
- These practices will help maintain, or increase property values; control noxious weed spread; conserve water, land, and air quality; and provide continuity of landscape management.

2. **Ultimate goal(s) of this Program**

- Develop improved animal production systems that are economical and environmentally sound including genetics and breeding, nutrition, and management components.
- Develop information and methods to improve reproductive efficiency including increasing pregnancy rate, decreasing embryonic mortality and decreasing prenatal mortality

**LR:** The livestock industry in Colorado is entering into a time of uncertainty that it's never experienced before. With recent record production and feed cost along with the volatility in the livestock industry the Livestock and Range Team will have to stay very pro-active with its programming efforts and dissemination of information.

**ABM:** The ABM Team provides information and education to Colorado’s citizens in order that they can make more informed, goal-oriented decisions about their businesses and their families; Improve the management and communications skills of agricultural and rural business managers and their families so as to increase the competitiveness and sustainability of Colorado farms and ranches.

**SAM:** The primary goal of this program of work is to provide small acreage landowners (1-100 acres) with natural resource management education so that landowners will increase their skills and knowledge base, resulting in adoption of accepted best management practices on small acreage properties across Colorado. The small acreage program work team members will work together to develop and implement high quality educational programs and tools for the small acreage landowners in their communities. Strategies to provide education and technical assistance will include site visits, workshops (single or in a series format), field demonstrations, webinars, educational videos, newsletters, seminars, and technical advising.

**V(E). Planned Program (Inputs)**

1. **Estimated Number of professional FTE/SYs to be budgeted for this Program**

<table>
<thead>
<tr>
<th>Year</th>
<th>Extension</th>
<th>1862</th>
<th>1890</th>
<th>Research</th>
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<th>1890</th>
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<tr>
<td>Year</td>
<td>Extension</td>
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<td></td>
<td>1862</td>
<td>1890</td>
<td>1862</td>
<td>1890</td>
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<tr>
<td>2018</td>
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<td>0.0</td>
<td>5.0</td>
<td>0.0</td>
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<td></td>
</tr>
</tbody>
</table>

V(F). Planned Program (Activity)

1. Activity for the Program

- Workshops and educational classes for producers
- Demonstration field days to showcase the results
- Individual counseling on producers’ specific problems
- Conduct basic and applied research on livestock, primarily beef, dairy, sheep, and horses

2. Type(s) of methods to be used to reach direct and indirect contacts

<table>
<thead>
<tr>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Methods</td>
</tr>
<tr>
<td>● Education Class</td>
</tr>
<tr>
<td>● Workshop</td>
</tr>
<tr>
<td>● Group Discussion</td>
</tr>
<tr>
<td>● One-on-One Intervention</td>
</tr>
<tr>
<td>● Demonstrations</td>
</tr>
<tr>
<td>● Other 1 (Field Days)</td>
</tr>
<tr>
<td>● Other 2 (Workshop)</td>
</tr>
</tbody>
</table>

3. Description of targeted audience

Individual agricultural producers, commodity groups, agri-business partners
V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑️ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.
V(H). State Defined Outputs

1. Output Measure

- LR 1) Trainings/Classes/Workshops, Field Days, Activity Days
- LR 3) Trainings for Extension Staff
- LR 4) Community Meetings Facilitated [examples: Focus Group, Citizen Forum, Round Table Dialogue, Strategic Planning Process].
- LR 6) Newsletters (This is number of newsletters, not number mailed or number of Coloradoans who received them.)
- LR 7) Websites (number of Websites).
- LR 8) Websites (number of hits).
- LR 9) Press/News Release or Column (number submitted).
- LR 10) New Technologies Expected to be Adopted by Producers.
- LR 12) Emergency/Disaster Response(group).
- ABM 1: Trainings/Classes/Workshops, Field Days, Activity Days.
- SAM 1) Trainings/Classes/Workshops, Field Days, Activity Days, and/or Field Visits.
- SAM 2) Direct Communication/Education by telephone and/or e-mail.
- SAM 3) Newsletters (number of newsletters, not number mailed or number of Coloradoans who received them).
- SAM 4) Websites (number of websites maintained related to small acreages. Report only once per year).
- SAM 6) The number of acres on which small acreage landowners are implementing weed management and monitoring.
- SAM 7) The number of acres seeded in grass/legumes/forbs.
- SAM 8) The number of acres on which small acreage landowners have implemented proper grazing and pasture management.
- SAM 10) Peer Reviewed Publications, including Fact Sheets, Curricula, and Bulletins.
- SAM 5) Websites (average number of hits per month. Report once at end of year).
- SAM 9) The number of acres on which small acreage landowners have implemented a forest management plan which includes insect/disease issues, proper stand health, and/or creating defensible space.
- ABM 2: Trainings for Extension Staff.
- ABM 4: Direct Communication/Education by telephone and/or e-mail.
● ABM 5: Websites (number of Websites).

● ABM 6: Websites (number of hits).

● ABM 7: Press/News Release or Column (number submitted).

● ABM 3: Community Coalitions, Collaborations, Alliances Formed to Address a Specific Issue [list specific groups/issue].

● ABM 9: Peer Reviewed Publications, including Fact Sheets & Curricula.

● ABM 8: External Grant Dollars.

● LR 2) Trainings for Volunteers.

● LR 5) Direct Communication/Education by telephone and/or e-mail.

● LR 11) External Grant Dollars.

● LR 13) Emergency/Disaster Response. (one-on-one).

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.
### V(I). State Defined Outcome

<table>
<thead>
<tr>
<th>O. No</th>
<th>Outcome Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SAM 1.1a) - Water-related - Small acreage landowners report implementation of water-related conservation practices (such as having their septic system checked/pumped, well water tested, excluding livestock from a stream, drought tolerant landscaping, or increasing irrigation efficiency).</td>
</tr>
<tr>
<td>2</td>
<td>SAM 2.1a) - Animals, livestock, wildlife - Small acreage landowners report implementation of animal/wildlife-related conservation practices (such as improved manure management, livestock emergency preparedness, attracting pollinators or other desired wildlife, or deterring unwanted wildlife).</td>
</tr>
<tr>
<td>3</td>
<td>SAM 3.1a) - Soils - Small acreage landowners report implementation of soil-related conservation practices (such as composting and soil testing).</td>
</tr>
<tr>
<td>4</td>
<td>SAM 4.1a) - Plant-related - Small acreage landowners report implementation of plant-related conservation practices (such as active weed management, pasture management techniques, grass stand establishment, planting windbreaks, and active forest management).</td>
</tr>
<tr>
<td>5</td>
<td>ABM 1.1: Participants intend to develop formal plans regarding the succession of their farms and ranches.</td>
</tr>
<tr>
<td>6</td>
<td>ABM 2.1: Participants intend to investigate strategies for increasing the profitability, including changing enterprise mixes, leasing, and use of crop insurance.</td>
</tr>
<tr>
<td>7</td>
<td>ABM 2.2: Participants intend to implement management strategies for making more informed decisions to sustain profitability and/or manage risk.</td>
</tr>
<tr>
<td>8</td>
<td>ABM 2.3: Participants will apply leasing principles and increase their use of written, appropriate, and equitable lease arrangements.</td>
</tr>
<tr>
<td>9</td>
<td>ABM 2.4: Participants will access new direct markets for their agricultural products and services.</td>
</tr>
<tr>
<td>10</td>
<td>LR 1.1: Producers use rangeland monitoring documentation.</td>
</tr>
<tr>
<td>11</td>
<td>LR 1.2: Adult and youth livestock producers gain proficiency in producing profitable animal products.</td>
</tr>
<tr>
<td>12</td>
<td>ABM 1.2: Participants have improved intra-family communications.</td>
</tr>
<tr>
<td>13</td>
<td>LR 1.2a: Livestock producers, adult and youth will report an increased use of animal quality assurance practices and techniques.</td>
</tr>
</tbody>
</table>
Outcome # 1

1. Outcome Target

SAM 1.1a) Water-related - Small acreage landowners report implementation of water-related conservation practices (such as having their septic system checked/pumped, well water tested, excluding livestock from a stream, drought tolerant landscaping, or increasing irrigation efficiency).

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
   - 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)
   - 1862 Extension

Outcome # 2

1. Outcome Target

SAM 2.1a) Animals, livestock, wildlife - Small acreage landowners report implementation of animal/wildlife-related conservation practices (such as improved manure management, livestock emergency preparedness, attracting pollinators or other desired wildlife, or deterring unwanted wildlife).

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
   - 307 - Animal Management Systems
   - 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)
   - 1862 Extension

Outcome # 3

1. Outcome Target

SAM 3.1a) Soils - Small acreage landowners report implementation of soil-related conservation practices (such as composting and soil testing).

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
   - 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)
   - 1862 Extension
### Outcome # 4

1. **Outcome Target**

SAM 4.1a) - Small acreage landowners report implementation of plant-related conservation practices (such as active weed management, pasture management techniques, grass stand establishment, planting windbreaks, and active forest management).

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**
   - 121 - Management of Range Resources

4. **Associated Institute Type(s)**
   - 1862 Extension

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### Outcome # 5

1. **Outcome Target**

ABM 1.1: Participants intend to develop formal plans regarding the succession of their farms and ranches.

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**
   - 602 - Business Management, Finance, and Taxation

4. **Associated Institute Type(s)**
   - 1862 Extension

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### Outcome # 6

1. **Outcome Target**

ABM 2.1: Participants intend to investigate strategies for increasing the profitability, including changing enterprise mixes, leasing, and use of crop insurance.

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**
   - 601 - Economics of Agricultural Production and Farm Management
   - 602 - Business Management, Finance, and Taxation

4. **Associated Institute Type(s)**
   - 1862 Extension
**Outcome # 7**

1. **Outcome Target**

ABM 2.2: Participants intend to implement management strategies for making more informed decisions to sustain profitability and/or manage risk.

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**
   - 601 - Economics of Agricultural Production and Farm Management
   - 602 - Business Management, Finance, and Taxation

4. **Associated Institute Type(s)**
   - 1862 Extension

**Outcome # 8**

1. **Outcome Target**

ABM 2.3: Participants will apply leasing principles and increase their use of written, appropriate, and equitable lease arrangements.

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**
   - 602 - Business Management, Finance, and Taxation

4. **Associated Institute Type(s)**
   - 1862 Extension

**Outcome # 9**

1. **Outcome Target**

ABM 2.4: Participants will access new direct markets for their agricultural products and services.

2. **Outcome Type**: Change in Knowledge Outcome Measure

3. **Associated Knowledge Area(s)**
   - 604 - Marketing and Distribution Practices

4. **Associated Institute Type(s)**
   - 1862 Extension
Outcome # 10
1. Outcome Target
LR 1.1: Producers use rangeland monitoring documentation.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
   ● 121 - Management of Range Resources

4. Associated Institute Type(s)
   ● 1862 Extension

Outcome # 11
1. Outcome Target
LR 1.2: Adult and youth livestock producers gain proficiency in producing profitable animal products.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
   ● 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)
   ● 1862 Extension

Outcome # 12
1. Outcome Target
ABM 1.2: Participants have improved intra-family communications.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
   ● 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)
   ● 1862 Extension
**Outcome # 13**

1. **Outcome Target**

   LR 1.2.a: Livestock producers, adult and youth will report an increased use of animal quality assurance practices and techniques.

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**
   - 315 - Animal Welfare/Well-Being and Protection

4. **Associated Institute Type(s)**
   - 1862 Extension

**V(J). Planned Program (External Factors)**

1. **External Factors which may affect Outcomes**
   - Natural Disasters (drought, weather extremes, etc.)
   - Economy
   - Appropriations changes
   - Public Policy changes
   - Government Regulations
   - Competing Programmatic Challenges

**Description**

Changes in international regulations for export and import of food animals and products affect production alternatives and economics of trade. Drought and weather extremes affect the availability of water, forage, and other factors of production that may contribute to the availability of food animals in the marketplace.

   **LR**: Livestock and range outcomes are dependent on government regulation, public policy, weather, volatility in the market and increasing input costs. These external factors will be addressed in education and research efforts but will still influence participation.

   **ABM**: ABM programming attempts to meet the needs of farmers, ranchers, and other clientele as they face the risks associated with drought and other natural disasters, changes in market prices, the economy, and agriculturally related policies/legislation. Changes in federal and state financial appropriations and availabilities of grant funds will also affect the ability of the ABM Team to deliver successful educational programs and the outcomes of that education.

   **SAM**: Small acreage team outcomes are dependent on the needs and engagement levels of small acreage landowners. Their needs and level of interest in change can be affected by weather, public policy, economy, and population changes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

Regular pre-post evaluations are used. Formative evaluations are often used during programs to adjust focus and direction. Case studies are used to clearly demonstrate impact through the Integrated Resource Management graduate program.
LR: A state-wide survey has been developed for all Livestock & Range (LR) Team members to use. This survey is divided to represent the 4 quarters of the state, NE, SE, SW, NW allowing an overall summary and area-specific summary for all beef programming needs. This survey also allows participants to list specific programming needs and delivery method. This survey will also allow team leaders to develop an entire state wide programming effort when needed.

- Evaluations will occur immediately following the educational programs (short term).
- Evaluations will occur 6-12 months following the program to determine if changes were incorporated (medium term).
- Evaluations will be conducted 2-5 years following the program to determine the sustainability of the change and the economic return gained as a result of the change (long term).

ABM: The ABM WT actively and continuously solicits input from agents, ag lenders, researchers, legislators and policy makers, colleagues, funders, and other stakeholder to determine future educational and informational needs of clientele. Personal response systems (clickers) and various other methodologies are used to test knowledge and understanding levels and to solicit feedback, knowledge gained, and intended actions by participants before, during, and after educational programs. Responses to inter-program questions are often used to change presentations ‘on the fly’ in order to meet the educational needs of participants. Further, research conducted with colleagues at other universities and anecdotal evidence is used to plan and deliver needed and/or demanded education and information.

SAM: Evaluations are developed using the indicators listed in the Impacts/Outcomes Expected section, to survey program participants about program impacts and long-term behavioral changes. Sample evaluation instruments are available in the "Living on the Land" curriculum. Pre and post evaluations and surveys