

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Pasture Based Dairy 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
205	Plant Management Systems	20%			
301	Reproductive Performance of Animals	10%			
302	Nutrient Utilization in Animals	10%			
303	Genetic Improvement of Animals	10%			
307	Animal Management Systems	20%			
315	Animal Welfare/Well-Being and Protection	10%			
601	Economics of Agricultural Production and Farm Management	10%			
801	Individual and Family Resource Management	10%			
	Total	100%			

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	4.8	0.0	0.0	0.0
Actual	5.0	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
210622	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
218802	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

Extension specialists will teach "expert producers" who in turn will teach other producers. Methods will include monthly meetings, newsletters, pasture walks, helping producers learn how to use the web (A webpage has already been established from the ODF project.), provide annual Ag. Lenders workshop, establish forage demonstration plots, and hold annual dairy grazing symposium at the University of Missouri Agricultural Experiment Station in Mt. Vernon, Missouri, which has an established grass-based dairy research and demonstration program.

2. Brief description of the target audience

Young families seeking a livelihood in agriculture and to live in the rural areas of Missouri. Existing dairy producers who seek a less stressful farm management lifestyle. Foreign investors who seek to establish profitable investments as grass-based dairies in Missouri.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	350	500	600	750
Actual	653	875	525	375

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

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Provide in-service training session(s) for regional Extension specialists on an annual basis.

Year	Target	Actual
2010	2	1

Output #2

Output Measure

- Develop or revise guide sheets a year for regional Extension specialists to use in producer meetings.

Year	Target	Actual
2010	4	3

Output #3

Output Measure

- Revise the pasture-based dairy manual on a semiannual basis for regional Extension specialists to use in producer meetings.

Year	Target	Actual
2010	1	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clientele gaining knowledge of forages and grazing systems management.
2	Increase the number of MO dairy farms that adopt the Missouri Pasture-based model resulting in increased profitability.
3	Quality of life as expressed by family farm operators.

Outcome #1

1. Outcome Measures

Number of clientele gaining knowledge of forages and grazing systems management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Historically low milk prices in 2009 generated renewed interest of evaluating alternative systems of dairying that could lower costs of production. Analysis of data from dairy farms has clearly demonstrated that 55 percent of the variation in profit on a dairy operation relates to the cost of production and management, and the use of pasture systems has been shown to dramatically reduce the cost of production. A critical component of pasture utilization is weekly measurement and evaluation of paddocks if efficiency of the dairy is to improve.

What has been done

Two existing discussion groups met monthly in 2010, and a third group was formed in the fall of 2010, to discuss pasture-based dairy systems, forages and grazing management. In addition, University of Missouri Extension has developed a Web-based grazing wedge calculator and made it available for any user. Participants input weekly paddock dry matter measurement to calculate average dry matter growth as well as average cover for the farm.

Results

The monthly discussion groups have increased the knowledge and understanding of how to make more efficient use of pastures. When the project was initiated, about 30 percent of the total dry matter intake in these systems came from pasture, and now one producer has been able to increase dry matter intake to 74 percent. The goal is to reach about 50 percent. Adoption of the grazing wedge has been a major factor in increasing pasture use. This tool, which also generates daily dry matter growth allows producers to make adjustments in sources of dry matter intake and not only increases efficiency, but also affects economic returns by being able to achieve optimum, economical milk production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
302	Nutrient Utilization in Animals
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Increase the number of MO dairy farms that adopt the Missouri Pasture-based model resulting in increased profitability.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The total economic impact of one dairy animal is about \$14,000, which includes the ripple effects from the milk being produced on the farm through the creation of a product for human consumption. Hence, a viable dairy industry in the state has significant impact on the overall economy.

What has been done

University of Missouri Extension provides ongoing educational programs to increase knowledge and understanding of pasture-based dairy systems. Methods used include classroom and on-farm workshops, discussion groups and mass media. Further, expert producers participating in the program serve as mentors and give presentations both statewide and nationally.

Results

The dairy industry is still recovering from the adverse economic conditions experienced in 2009 not only in Missouri, but nationally and internationally. In 2010 one new pasture-based dairy was started, but several other producers have begun work toward establishing systems when the economy improves. Still, during the past five years, expansion and growth by new grazing dairies created \$100 million in new investment, generated \$40 million in annual milk sales, added \$124 million in total output, and added 1,100 additional jobs to the state of Missouri.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection
601	Economics of Agricultural Production and Farm Management
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

Quality of life as expressed by family farm operators.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Data collected following the economic collapse in the 1980s indicated that mental health problems associated with farm failures can lead to increased physical illness, family and animal abuse, divorce and suicide. The social and physiological problems extend to others associated with agribusinesses in the community. Conventional dairy operations, which require families to work 10-14 hours per day for the entire year, creates stressful situations for the families.

What has been done

Discussion groups and workshops have focused not only on management issues related to managing pasture-based dairy systems, but also on alternative and more efficient ways of managing the dairy as a whole. This is strongly related to efficient time management, which affects quality of life for the family.

Results

Surveys consistently demonstrate an increased quality of life, 70 percent, when compared with the system used before converting to a pasture-based dairy system. The differences most often identified were more time with their family and opportunities to take extended vacations instead of day trips between milkings. Since many are seasonal operations, there is increasingly more adaptation to once-a-day milking toward the end of lactation, which further enhances family time,

their primary measure of quality of life. A striking example was the new start-up seasonal, pasture-based dairy in 2010 that had no prior experience in dairying. After evaluating their management practices and recommending changes that would make more effective use of their time, their workdays decreased from almost 14 hours per day to only 10 hours, even during the spring calving season. Their simple response to this change was "I didn't realize how much wasted effort we were expending." As observed with other start-ups, efficiency will increase rapidly in 2011.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Attitude)

Brief Explanation

Input costs and prices received for product affect all agricultural enterprises, but environmental conditions can have particularly adverse effects on pasture-based systems. During 2010 some producers experienced a drought from June until the later part of September. Compared with the previous three years, this reduced grazing time by almost 40 days, reducing pasture intake by about 1,000 pounds of dry matter. This necessitated the purchase of forages at approximately \$0.09 per pound of dry matter, compared with \$0.025 per pound of dry matter pasture (excluding land costs), costing producers \$65 per cow during this period. Conversely, this reduced profit by this amount, or \$13,000 for the average herd of 200 cows.

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

Stressful economic conditions in 2010 resulted in more Missouri dairy producers adopting some level of grazing. Producers implementing grazing, even on a limited scale, experienced savings of about \$0.80 per cow per day, with no impact on production. In most cases, production increased slightly. In addition, the University of Missouri pasture-based dairy team used data from the University of Missouri seasonal, pasture-based research dairy to develop forage system models that result in more intake from pasture. Three operations adopted the model and significantly reduced the quantity of purchased feed during the drought experienced in 2010. Based on discussions at workshops, several other operations will be changing their forage systems to better reflect the environmental conditions experienced in Missouri. This will significantly increase profitability and sustainability of these dairies. Research continues to refine the forage system model that is most efficient in the state.

Key Items of Evaluation

Data has consistently demonstrated that pasture-based dairy systems can produce milk for \$3-4 less per hundred pounds of milk when compared with conventional dairy operations and that they represent a viable system that can have major impacts on the state's economy. This system is particularly important in the southeastern part of the United States, including Missouri, which is a milk-deficit area, but has unlimited potential for pasture-based systems. The development of the Missouri model for pasture-based systems has been adopted and adapted by several other southeastern states. Educational efforts in Missouri have significantly increased investments in these systems statewide, over \$100 million during the past five years. As experienced here, significant progress can be made in educating potential implementers when land grant universities are willing to invest in this system of dairying. University of Missouri administration has recognized the potential economic development to the state from pasture-based dairying and has been willing to invest in personnel and programming to some extent. But during tight budget conditions, the full potential of such programs may not be achievable. Enhanced collaboration among states in educational programs to demonstrate the economic viability, sustainability and profitability of pasture-based dairying will have a significant impact on state economies. Missouri and Georgia have submitted a joint grant application to educate and assist beginning and new pasture-based dairy operations in the two states, but programs created will have direct application to the entire Southeast. If application for the grant is successful, it will have significant impact on the rural economy of this region of the country.