

**2005 Missouri Annual Report  
University of Missouri and Lincoln University  
Cooperative Extension and Research  
Table of Contents**

<b>I.</b>	<b>Planned Programs Overview.....</b>	<b>1</b>
	1862 University of Missouri Extension .....	1
	1890 Lincoln University Research and Extension .....	1
	Continuous Improvement of Planned Programs and Critical Issues of Strategic Importance to Missourians.....	2
	Programs Addressing Underserved Learners.....	3
	Diversity Accomplishments.....	3
	Stewardship of Resources .....	4
<b>II.</b>	<b>Report of Accomplishments</b>	
	<b>Goal 1 – An Agricultural System that is Highly Competitive in the     Global Economy .....</b>	<b>16</b>
	1862 Agricultural Experiment Station Research – University of Missouri –Columbia .....	17
	Key Themes	
	Adding Value .....	17
	Animal Production Efficiency.....	18
	Aquaculture .....	19
	Grazing.....	19
	Plant Genomics .....	20
	Plant Health.....	20
	Plant Production Efficiency .....	21
	1890 Cooperative Research Program – Lincoln University .....	22
	Key Themes	
	Alternative Crops .....	22
	Aquaculture .....	23
	Grazing Animal Health .....	23
	1862 University of Missouri Extension .....	24
	Key Themes	
	Adding Value to New and Old Agricultural Products.....	24
	Animal Production Efficiency .....	26
	Plant Production Efficiency.....	30
	Rangeline/Pasture Management .....	34
	1890 Cooperative Extension Service — Lincoln University .....	36
	Key Themes	
	Small Farm Viability .....	36
	<b>Goal 2 – A Safe and Secure Food and Fiber System .....</b>	<b>38</b>
	1862 Agricultural Experiment Station Research – University of Missouri –Columbia .....	38
	Key Themes	
	Food Safety.....	38
	1862 University of Missouri Extension .....	39
	Key Themes	
	Human Nutrition – Food Safety and Food-Borne Illness.....	39
	1890 Cooperative Extension Service — Lincoln University .....	40
	Key Themes	

Food Accessibility and Affordability .....	40
Food Safety .....	40
<b>Goal 3 – Health and Well-Nourished Population.....</b>	<b>42</b>
1862 Agricultural Experiment Station Research – University of Missouri-Columbia .....	43
Key Themes	
Human Health.....	43
1890 Cooperative Research Programs — Lincoln University .....	43
Key Themes	
Human Nutrition.....	43
1862 University of Missouri Extension .....	44
Key Themes	
Human Health.....	44
Human Nutrition.....	47
1890 Cooperative Extension Service — Lincoln University .....	50
Key Themes	
Human Health.....	50
<b>Goal 4 — Harmony Between Agriculture and Environment .....</b>	<b>51</b>
1862 Agricultural Experiment Station Research – University of Missouri-Columbia .....	52
Key Themes	
Forestry .....	52
Weather and Climate .....	52
Wildlife Management .....	52
1890 Cooperative Research Program — Lincoln University.....	53
Key Themes	
Air Quality .....	53
Biological Control of Pests.....	53
Geographic Information Systems/Global Positioning was goal 1 .....	55
Organic Waste Reduction.....	55
Soil Management, Greenhouse Gases, Carbon Emissions .....	56
Soil Quality and Human Health and Well-Being .....	56
1862 University of Missouri Extension .....	57
Key Themes	
Agricultural Waste Management.....	57
Hazardous Materials, Water Quality .....	60
Land Use, Natural Resource Management, Water Quality .....	61
Natural Resources.....	63
Pesticide Application .....	64
Water Quality .....	66
<b>Goal 5 — Enhanced Opportunity and Quality of Life for Americans.....</b>	<b>69</b>
1862 University of Missouri Extension .....	74
Key Themes	
Aging .....	74
Childcare/Dependent Care.....	75
Children, Youth and Families at Risk.....	76
Community Development.....	82
Community Development, Conflict Resolution .....	83
Community Development, Farm Safety, Fire Safety, Workforce Safety.....	84
Community Development, Impact of Change on Rural Communities.....	86

Community Development, Youth Development, Leadership .....	94
Community Development, Managing Change in Agriculture.....	95
Family Resource Management .....	96
Leadership Training and Development, Youth Development .....	98
Parenting.....	101
Promoting Housing Programs .....	103
Volunteer Development.....	105
Workforce Preparation .....	106
Youth Leadership Development .....	108
1890 Cooperative Extension Service — Lincoln University .....	112
Key Themes	
Aging .....	112
Children, Youth and Families at Risk.....	113
Communications Skills.....	116
Community Development.....	116
<b>III. Stakeholder Input Process .....</b>	<b>117</b>
<b>IV. Program Review Process .....</b>	<b>118</b>
<b>V. Evaluation of Success of Multi- and Joint Activities .....</b>	<b>119</b>
Appendix C	
Multi-State Extension Activities .....	122
Integrated Activities (Smith-Lever Act Funds).....	123
Integrated Activities (Hatch Act Funds).....	124

# **I. Planned Programs - Overview**

## **1862 University of Missouri Extension**

University of Missouri Extension is positioning itself to meet unprecedented opportunities and challenges in the 21st century. It is a time of technological revolution and shifting demographics; constrained resources and increased demand for access; new issues facing our learners; and renewed demands for accountability. University of Missouri Extension is poised to meet these challenges and opportunities and to provide a level of excellence in programming that is recognized nationally as well as in Missouri. Guiding programming and performance is the University of Missouri Extension 21<sup>st</sup> Century Strategic Direction, <http://outreach.missouri.edu/about/21stcentury/index.html>.

University of Missouri Extension, in its “Design for the Future,” set priorities to focus on improving student learning and achievement; increasing research and scholarship capacity and productivity; ensuring program access and quality; and broadening outreach capabilities.

University of Missouri Extension programs are designed to serve diverse populations, including people of all ages as co-learners. Current program areas include:

- Agriculture, Food and Natural Resources
- Business and Industry
- Community Development
- Human Environmental Sciences
- 4-H Youth Development.

These programs are congruent with the USDA Cooperative State Research, Education and Extension Service goal areas.

## **1890 Lincoln University Cooperative Research and Extension**

In the over-25-year history of Lincoln University’s Cooperative Research and Extension (LUCRE) programs, one goal continues to serve as the driving force for program development and implementation. That goal is reaching out to hard-to-reach Missouri citizens: rural and urban residents with limited social and economic resources. A significant sector of the state’s population still falls into this under-served group. Southeast Missouri, St. Louis and Kansas City are some specific areas of the state with higher percentages of underserved populations. In addition to this group, Missouri ranks very high in the nation in the percentage of older adults residing in the state. Minority individuals within this group have a much lower standard of living and have poor access to quality healthcare professionals. There is the need to provide necessary education to this audience, to ensure a healthy and productive life. In rural areas of the state the number of minority-owned farms has decreased significantly in the past decade. This has resulted in the migration of African Americans to urban areas around the country. This migration is believed to be a contributing factor to urban blight. There is a continuing need to provide educational programs on profitable farming methods and the benefits of a farming lifestyle to minority farmers to help stem the exodus of minority landowners from farming. This array of stakeholder needs among others, has helped shape the direction of Lincoln University’s Cooperative Research and Extension Programs.

As research and extension programs continue to be implemented under our current Plan of Work, we are integrating distance-learning technology to facilitate workshops and information dissemination when applicable. The increased use of this technology is measured in terms of cost and time savings as it

relates to travel and reaching a broader audience. This new technology coupled with geographic information systems applications and our emphasis on collaborative research team efforts in the areas of animal science, human nutrition, plant and soil science and environmental science is helping our programs improve and grow to meet the unique needs of our stakeholders.

The 2004-2005 year was a time when many new research and extension projects and programs were initiated and old projects and programs were either terminated or expanded to meet evolving and new stakeholder needs. Our primary focus is to reach more stakeholders than ever before with quality, life changing research results and applied programs.

### **Continuous Improvement of Planned Programs and Critical Issues of Strategic Importance to Missourians**

University of Missouri Extension programming is based on the needs, aspirations and issues identified by the people in communities throughout the state. University of Missouri Extension program priorities are based on substantial stakeholder input. During 1998-99, a deliberative group process involved 7,012 citizens in 275 sessions in each of Missouri's 114 counties. This process resulted in identification of issues, concerns and educational aspirations of Missourians.

In addition, ongoing annual stakeholder listening occurs through the County Extension Council infrastructure, 4-H councils, partnership program teams, as well as through priority program evaluations and survey information collected in program content areas. Continuous listening to learners and stakeholders creates an environment of continuous improvement. These data are correlated with the information gleaned from the Office of Social and Economic Data Analysis related to each county, region and issue area. See <http://oseda.missouri.edu/>. University of Missouri Extension faculty and staff work with County Extension Councils to annually update county, regional and state Plans of Work to address the highest priorities for Missouri learners, partners and communities. In 2002, this process led to revised planning at all levels, including a revision of the expected outcomes and performance indicators for the critical success factors in the University of Missouri Extension Strategic Direction.

Within the context of University priorities, University of Missouri Extension is focusing resources on three overall priorities:

- Economic Viability
- Strong Individuals, Families and Communities
- Healthy Environments

Implementation strategies to support program priorities include: internal and external public and private partnerships; effective extension councils; a flexible, diverse faculty reaching diverse audiences; finance and resource development; and the integration of information technology.

University of Missouri Extension helps improve people's lives through research-based education in high-priority areas. Federal Smith-Lever 3b & c resources have been essential to provide ongoing community-based non-formal education meeting local needs. These funds have been leveraged and integrated into priority programs in the five AREERA goal areas; therefore, this report includes program performance in the planned areas inclusive of federal, state, local and external funds.

## **Programs Addressing Underserved Learners**

Several programs addressed the needs of underserved and under-represented populations of Missouri. A few examples include:

- The Family Nutrition Education Program provides low-income citizens with the latest nutrition information. Programs include EFNEP, FNP, School-enrichment programs, Food Power, Health for Every Body, etc.
- The 4-H/Youth Development activities describe a variety of programs, including those working with “Adolescents at Risk.” Many programs are scheduled out of school, including those focusing on workforce preparedness.
- Alianzas: Building Inclusive Communities program, under the Community Development umbrella, describes education to assist immigrants in meeting the challenges they face (e.g., discrimination, low pay, inadequate health insurance).

## **Diversity Accomplishments**

Since Missouri is a member of the Change Agent States for Diversity and Engagement, the Diversity Catalyst Team serves as a steering committee for diversity efforts. To guide diversity decisions, the team uses the Strategic Plan for Diversity developed last year to guide diversity work. This Plan is based upon a systemic approach to organizational change.

We continue to focus on the following seven areas:

- Workforce Diversity
- Climate
- Programs and Services
- Audience
- Professional Development
- Recognition and Awards
- Compliance

### **Successful Programs**

A number of programs may be highlighted as we determine accomplishments in 2005 in the area of diversity.

The 4-H Living Interactive Family Education (LIFE) Program provides enhanced visitation for children of offenders and their families. It also provides educational and social support for parents and caregivers. This program received the Family Strengthening Award from the Annie Casey Foundation for programs that demonstrate positive outcomes for rural, disadvantaged youth. It was also featured in the National Collaboration on Youth’s publication, “Making a Difference in the Lives of Youth.” Since its inception, 133 children and teens, 54 incarcerated fathers and 96 caregivers participated in the program. Children in the program have shown significant increases in social skills, while fathers report stronger parent-child relationships and improved behavior and academic performance by their children.

The Alianzas Program is another outstanding program. It focuses on the growing Hispanic population in Missouri. Among its accomplishments are instituting the annual National Cambio de Colores Conference and organizing health programs to overcome health disparities. In addition, a sixteen week

home buying academy and debt reduction program are also of assistance to the community. A number of programs are offered in Spanish.

A statewide program titled “Dining with Diabetes” has been very successful this year. 67 percent of the attendees indicated they were confident about their food choices prior to the session, this number increased to 88 percent after the session. Likewise, prior to the session, 76 percent indicated they used herbs and spices instead of salt. This number increased to 91 percent after the session. Finally, 68 percent indicated they read nutrition labels prior to the session. After the session this percentage increased to 97 percent.

The Missouri AgrAbility Program impacted individuals with disabilities or their family members by providing information or referral assistance to promote their return to farming or to a farm related profession. This year the Missouri AgrAbility program impacted approximately 150 individuals with disabilities or their family members.

### **Stewardship of Resources**

Table 1 and Chart 1 show the expenditures of University of Missouri Extension for the 2004-2005 programming year to be \$30,846,067 with \$8.1 million in federal Smith-Lever 3b & 3c funds. These dollars are critical to the core mission of University of Missouri Extension. This funding permits the flexibility to address emerging community issues, learner needs and to continue a relevant statewide community-based presence. The following report does not reflect the contributions of more than 16,000 volunteers involved in priority program development, implementation and evaluation.

PROGRAMS	TOTAL
<b>Smith-Lever 3b&amp;c</b>	
Regular 3(b) and 3(c)	7,419,896
CSRS Retirement	314,975
Expanded 4-H	217,504
Expanded Part-Time Farmer	29,395
Rural Development	73,116
<b>Total 3b&amp;c</b>	<b>8,054,886</b>
<b>Smith-Lever 3d</b>	
Expanded Food and Nutrition	1,393,456
Farm Safety	15,767
Food Safety & Quality (Carryover only)	0
Cotton Pest Management	11,281
Integrated Pest Management	249,380
Urban Home Gardening	0
Pesticide Impact Assessment	0
Water Quality (Carryover only)	0
<b>Total 3d</b>	<b>1,669,884</b>
<b>OTHER PROGRAM FUNDS:</b>	
STATE	<b>14,001,543</b>
COUNTY	4,696,804
NON-TAX	2,422,950
<b>LOCAL</b>	<b>7,119,754</b>
FEDERAL (Other than Extension Administered)	0
<b>TOTAL OTHER PROGRAM FUNDS</b>	<b>21,121,297</b>
<b>TOTAL ALL PROGRAMS</b>	<b>30,846,067</b>

Table 1: Cooperative Extension Expenditures of University of Missouri Extension for 2005

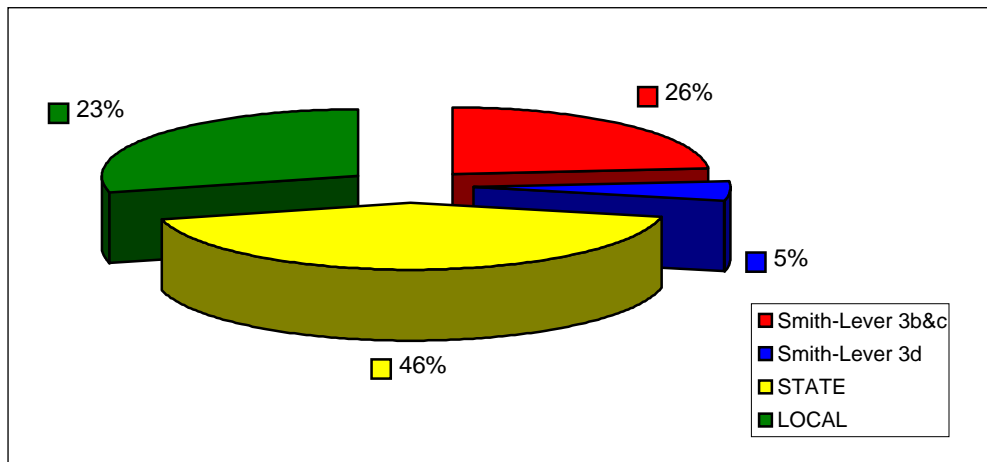


Chart 1: Cooperative Extension Expenditures of University of Missouri Extension for 2005 by Funding Source



Table 2 and Chart 2 show the overall expenditures of University of Missouri Agricultural Experiment Station for the 2005 programming year to be \$54,586,787 with \$3.7 million in federal Hatch funds.

<b>PROGRAMS (1862 Research)</b>	<b>TOTALS</b>
<b>FEDERAL</b>	
CSREES	
Hatch	3,680,755
MRF	773,457
M-S	436,597
Grants	5,539,028
Other	48,933
<b>Total CSREES</b>	<b>10,478,770</b>
USDA	7,132,442
Other Federal	5,940,376
<b>Total Other Federal</b>	<b>13,072,818</b>
<b>OTHER PROGRAM FUNDS:</b>	
STATE	19,639,568
<b>OTHER</b>	
Income (fees)	2,881,202
Industry	2,481,572
Other Non-Federal	6,032,857
<b>TOTAL OTHER PROGRAM FUNDS</b>	<b>31,035,199</b>
<b>TOTAL ALL PROGRAMS</b>	<b>54,586,787</b>

Table 2: Overall Expenditures of University of Missouri Agricultural Experiment Station for 2005

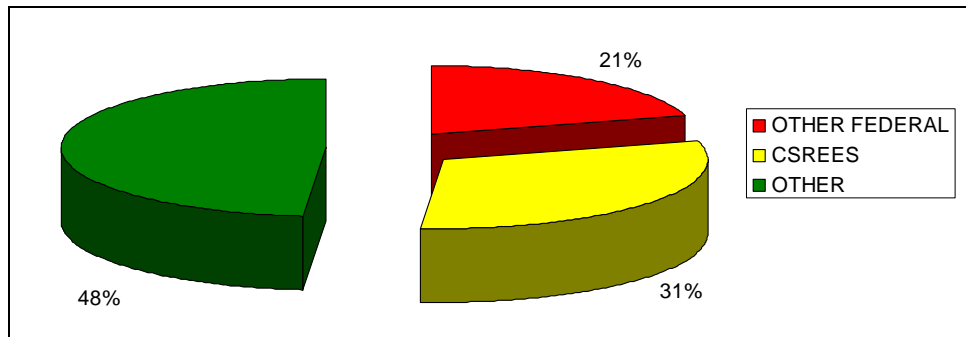


Chart 2: Overall Expenditure of University of Missouri Agricultural Experiment Station for 2005 by Funding Source

Table 3 and Chart 3 show University of Missouri Extension expenditures by Goal Area for 2005.

	<i>2005 Planned</i>	<i>2005 Actual</i>
<b>Goal 1</b>		
Integrated Cropping Systems	\$3,035,540	\$3,145,995
Forages	\$1,517,770	\$1,572,997
Prof Livestock Prod.	\$3,035,540	\$3,145,995
<b>Total - Goal 1</b>	<b>\$7,588,850</b>	<b>\$7,864,986</b>
<b>Goal 3</b>		
Nutrition and Diet	\$988,500	\$1,024,469
Food Safety	\$131,800	\$136,596
Consumer Health	\$329,500	\$341,490
<b>Total - Goal 3</b>	<b>\$1,449,800</b>	<b>\$1,502,554</b>
<b>Goal 4</b>		
Watersheds	\$461,930	\$478,738
Animal Waste	\$989,850	\$1,025,868
Nutrient Management	\$989,850	\$1,025,868
<b>Total - Goal 4</b>	<b>\$2,441,630</b>	<b>\$2,530,474</b>
<b>Goal 5</b>		
Total Families programs	\$2,639,600	\$2,735,647
Total Youth and Vol. Leadership	\$3,035,540	\$3,145,995
<b>Total - Goal 5</b>	<b>\$5,675,140</b>	<b>\$5,881,642</b>
<b>TOTAL</b>	<b>\$17,155,420</b>	<b>\$17,779,656</b>

Table 3: University of Missouri Extension Expenditures by Goal Area for 2005  
(This table represents expenditures of Smith Lever 3(b), 3(c), 3(d) and state match only.)

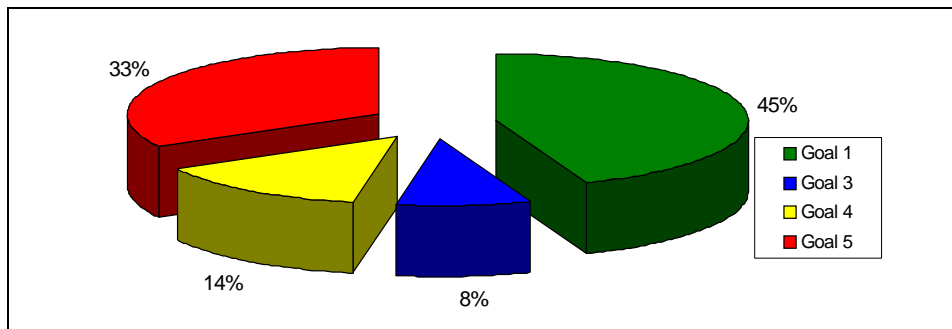


Chart 3: University of Missouri Extension Expenditures by Goal Area for 2005  
(This table represents expenditures of Smith Lever 3(b), 3(c), 3(d) and state match only.)

Table 4 and Chart 4 show University of Missouri Agricultural Experiment Station expenditures by Goal Area for 2005.

1862 Research Expenditures by Goal Area	
Goal 1	32,097,032
Goal 2	1,037,149
Goal 3	1,583,017
Goal 4	9,989,382
Goal 5	9,880,209
	\$54,586,788

Table 4: University of Missouri Agricultural Experiment Station Expenditures by Goal Area for 2005

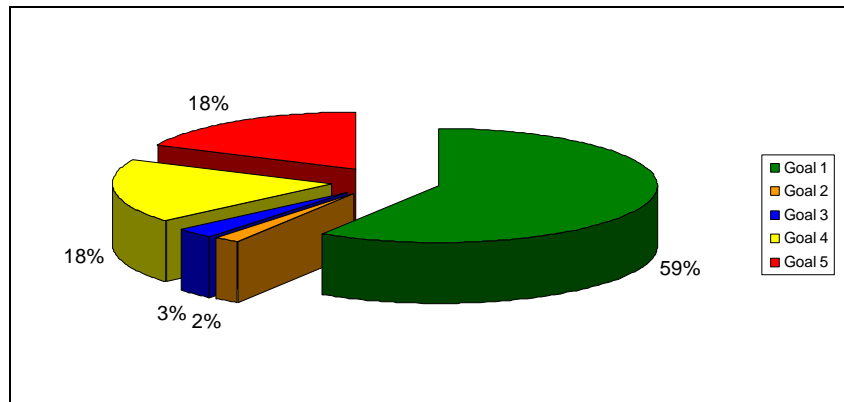


Chart 4: University of Missouri Agricultural Experiment Station Expenditures by Goal Area for 2005

Chart 5 shows the number and percentage of University of Missouri Extension faculty FTEs in each Goal Area for 2005.

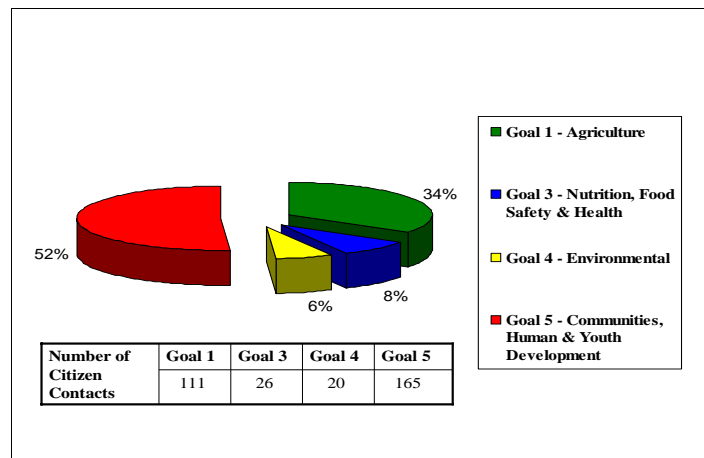


Chart 5: Percentage of FTEs by Goal

Chart 6 shows the total number of contacts with Missouri learners by Goal Area in 2005. Over 1.5 million contacts were documented. These contacts range from informational issues to major educational programs with sequenced learning over time. University of Missouri Extension has information, fact sheets and web-based series learning available on the web that are not reflected in this chart for 2005. In 2005, University of Missouri Extension distributed 904,388 printed publications and web views of publications exceeded 9 million. Page views of other University of Missouri Extension web pages exceeded an additional 10 million.

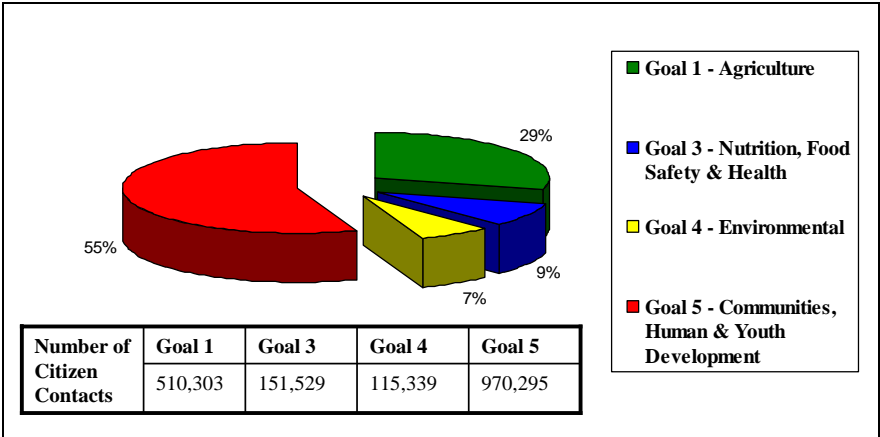


Chart 6: Percentage of Contacts by Goal

Chart 7 shows the total number of Missourians by Goal Area who were engaged in sequenced educational programming during 2005. The 353,276 learners represent more than 6 percent of the state’s total population of 5.8 million. University of Missouri Extension has information, fact sheets and web-based series learning available on the web that are not reflected in this chart for 2005.

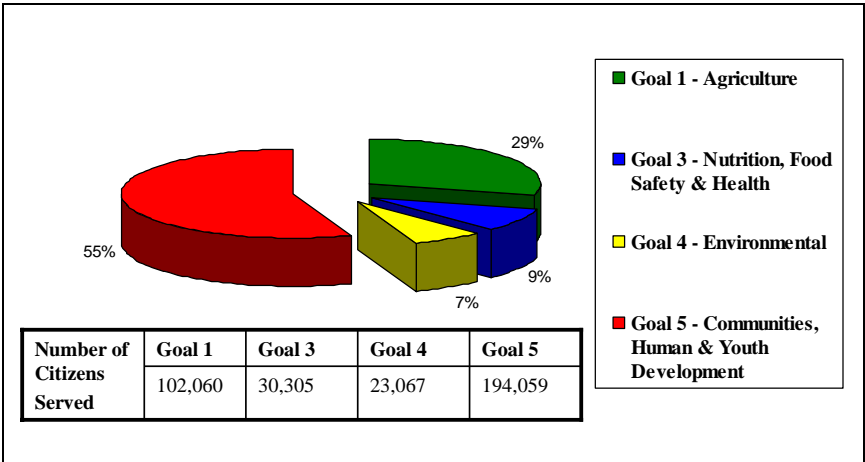


Chart 7: Percentage of Missourians Engaged in Sequential Learning by Goal

Table 8 and Chart 8 show Lincoln University 2005 Cooperative Extension funding by source.

**Lincoln University Cooperative Extension FY2005 Financial Report  
Extension Funding by Source**

Programs		Total
Administration	Administration	\$142,611
Goal 1:	Alternative Crops	\$927,066
Goal 2:	Safe & Secure Food	\$21,652
Goal 3:	Health & Well Nourished Population	\$0
Goal 4:	Environmental Science	\$0
Goal 5:	Quality of Life	\$1,257,309
	Federal Extension Funds	\$2,348,638
	State	\$859,996
	Grant Funds	\$368,272
Total all Programs/all Funds		\$3,576,906

Table 8

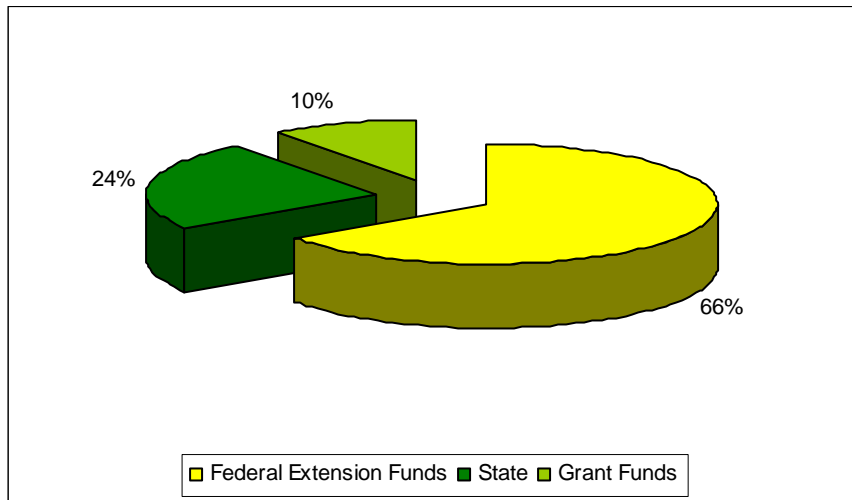


Chart 8: Lincoln University 2005 Cooperative Extension funding by source

Table 9 and Chart 9 show Lincoln University 2005 Cooperative Research funding by source.

**Lincoln University Cooperative Research FY2005 Financial Report  
Research Funding by Source**

Programs		Total
Evans-Allen Funding		
Administration	Administration	\$123,620
Goal 1:	Alternative Crops	\$520,948
Goal 2:	Safe & Secure Food	\$0
Goal 3:	Health & Well Nourished Population	\$161,742
Goal 4:	Environmental Science	\$1,146,131
Goal 5:	Quality of Life	\$0
	Evans-Allen	\$1,952,441
	State	\$717,285
	Grant Funds	\$13,493
Total all Programs/all Funds		\$2,683,219

Table 9

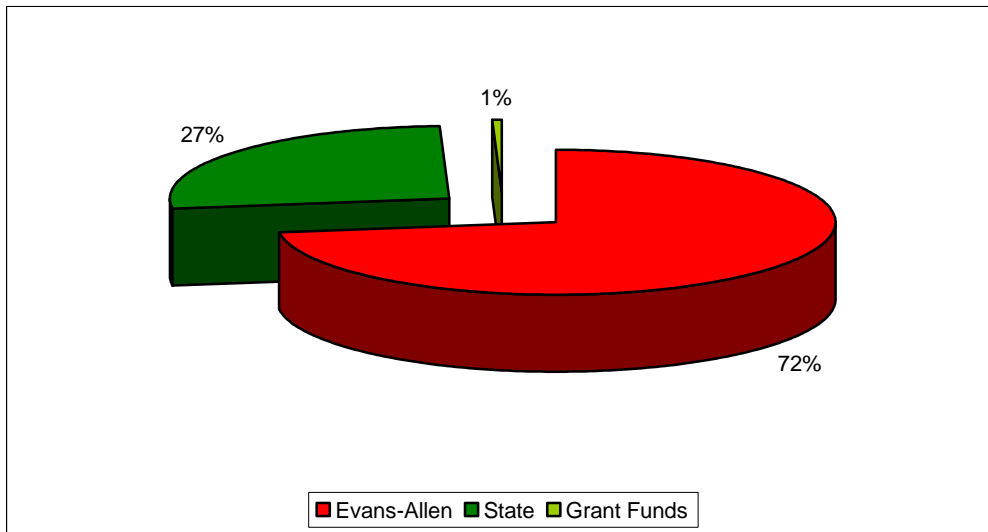


Chart 9: Lincoln University 2005 Cooperative Research funding by source.

Lincoln University receives \$2,348,638 for Cooperative Extension and \$1,952,441 for Cooperative Research. In Cooperative Extension, these resources are allocated to Goals 1, 2 and 5. See Chart 10.

**Lincoln University Cooperative Extension FY2005 Financial Report  
Extension Funding by Goal Area**

Programs		Total
Federal Extension Funding		
Administration	Administration	\$142,611
Goal 1:	Alternative Crops	\$927,066
Goal 2:	Safe & Secure Food	\$21,652
Goal 3:	Health & Well Nourished Population	\$0
Goal 4:	Environmental Science	\$0
Goal 5:	Quality of Life	\$1,257,309
		<b>\$2,348,638</b>
Other Programs		
State		\$859,996
Grant Funds		\$368,272
		<b>\$1,228,268</b>
Total all Programs/all Funds		<b>\$3,576,906</b>

Table 10: Lincoln University Cooperative Extension Allocated Resources by Goal

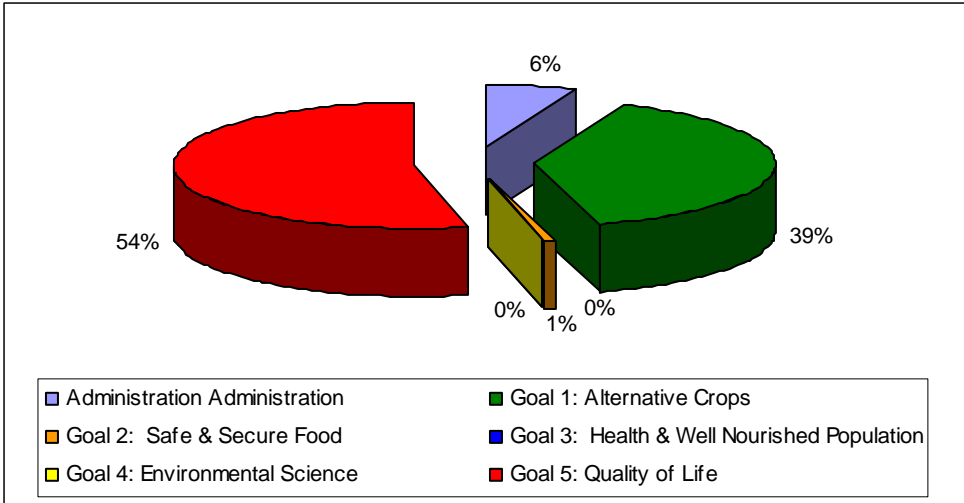


Chart 10: Lincoln University Cooperative Extension Allocated Resources by Goal

**Lincoln University Cooperative Research FY2005 Financial Report  
Research Funding by Goal Area**

Programs		Total
Evans-Allen Funds		
Administration	Administration	\$123,620
Goal 1:	Alternative Crops	\$520,948
Goal 2:	Safe & Secure Food	\$0
Goal 3:	Health & Well Nourished Population	\$161,742
Goal 4:	Environmental Science	\$1,146,131
Goal 5:	Quality of Life	\$0
		<b>\$1,952,441</b>
Other Programs		
State		\$717,285
Grant Funds		\$13,493
		<b>\$730,778</b>
Total all Programs/all Funds		<b>\$2,683,219</b>

Table 11: Lincoln University Cooperative Research Allocated Resources by Goal

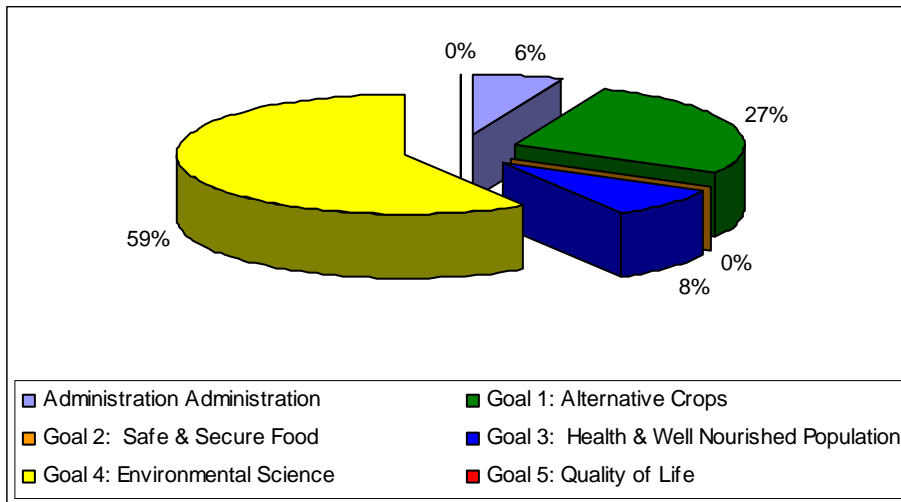


Chart 11: Lincoln University Cooperative Research Allocated Resources by Goal



Table 12 and Chart 12 show the percentage of FTEs of faculty in each Goal for 2005.

**Lincoln University Cooperative Extension FY2005 Financial Report  
Extension FTE % by Goal**

Programs		FTE%
Extension		
Administration	Administration	13.04%
Goal 1:	Alternative Crops	21.74%
Goal 2:	Safe & Secure Food	4.35%
Goal 3:	Health & Well Nourished Population	0.00%
Goal 4:	Environmental Science	0.00%
Goal 5:	Quality of Life	60.87%

Table 12: Lincoln University Cooperative Extension Percentage of FTEs by Goal

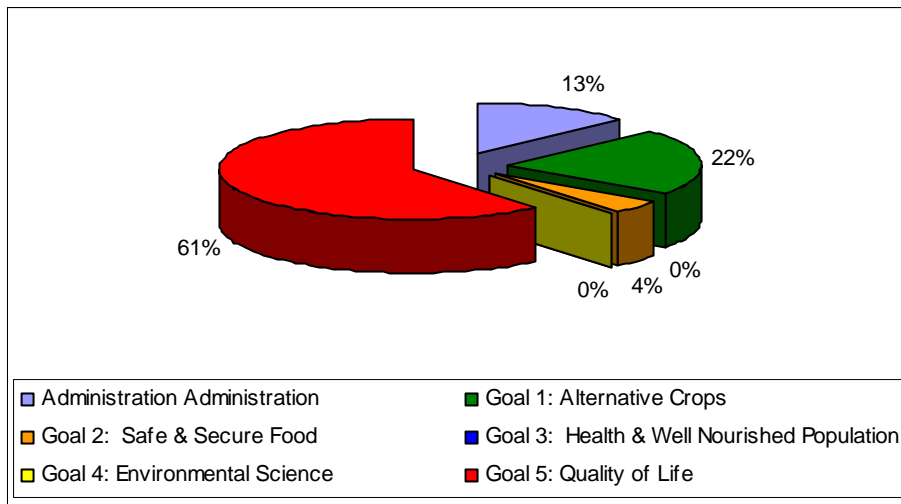


Chart 12: Lincoln University Cooperative Extension Percentage of FTEs by Goal

**Lincoln University Cooperative Research FY2005 Financial Report  
Research FTE % by Goal**

Programs		FTE%
Evans-Allen		
Administration	Administration	6.90%
Goal 1:	Alternative Crops	44.83%
Goal 2:	Safe & Secure Food	0.00%
Goal 3:	Health & Well Nourished Population	6.90%
Goal 4:	Environmental Science	41.38%
Goal 5:	Quality of Life	0.00%

Table 13: Lincoln University Cooperative Research Percentage of FTEs by Goal

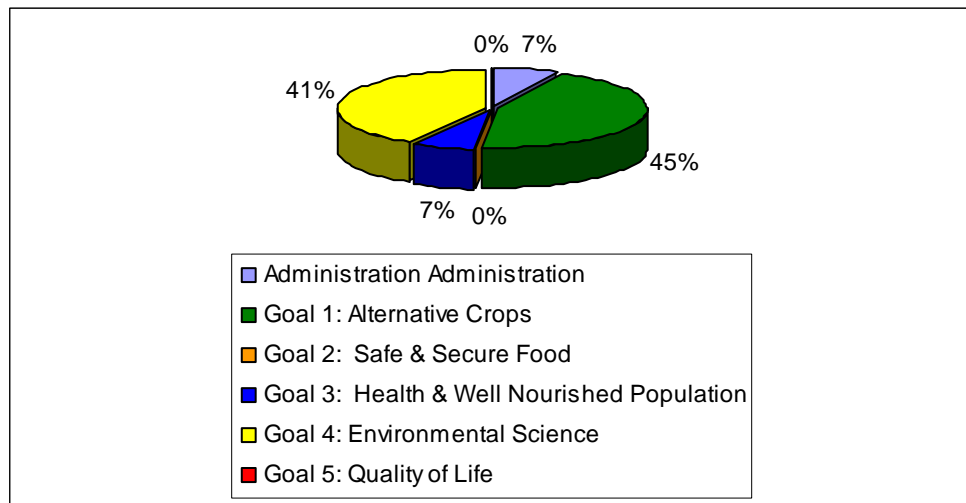


Chart 13: Lincoln University Cooperative Research Percentage of FTEs by Goal

## **II. Report of Accomplishments**

### **Goal 1: An Agricultural System that is Highly Competitive in the Global Economy**

#### **1862 Agricultural Experiment Station Research Overview**

Scientists at MU work in animal and plant research to improve production possibilities in the agricultural sector. In the area of animal production efficiency, investigators conduct research to discover genes that effect bovine reproduction. Knowledge gained can improve the management of reproduction cycles in livestock. In applied research, investigators evaluate management practices that can significantly improve the feasibility of using artificial insemination as a reproductive management tool. Scientists working to improve cattle genetics develop quantitative methods for genetic evaluation and selection schemes.

In the area of plant production, researchers in plant genomics use advanced proteomic approaches and instrumentation to understand compound accumulation during seed filling. This understanding will be used to improve crop production in oilseed plants, such as soybean and canola. In plant health, researchers use a systematic approach to pest management that takes the overall agroecosystem into consideration, which helps minimize unintended consequences. In the area of plant production efficiency, scientists work to improve cotton varieties so Missouri producers can be competitive in a global economy. New technologies, such as high tunnels, are used to improve vegetable production in southeast Missouri. Researchers work in the areas of forage and grazing to help Missouri animal producers get the most out of their resources. Work is done to improve forage quality that enhance animal performance and thereby improve the economic returns in beef cattle production. Fertilizing regimes are analyzed to improve the nutritional value of stockpiled fescue, aimed at reducing costs associated with winter feeding of beef cattle. Research in aquaculture is conducted to improve the economics of producing sunfish in the inland U.S., while reducing negative environmental impacts on surrounding watersheds.

#### **1890 Cooperative Research Overview**

Lincoln University researchers continued work toward the goal of assisting Missouri farmers to compete successfully in the global economy. An ongoing issue for many of our small farm stakeholders is the changing markets in livestock production, economic crop markets and livestock maintenance costs. These issues helped direct the 2005 research projects of our animal and plant science research teams. These research teams are focusing on developing and testing alternative production options for small farms in the areas of aquaculture and alternative crops. They also initiated investigations on ways to help sheep and goat producers lower costs associated with the control of internal parasites by using herbs instead of traditional and more expensive commercial dewormers.

Trends over the past ten years reveal U.S. hog operations are declining steadily as production shifts from individual farmers to a relatively small number of very large firms. The number of swine operations in the United States has declined by about 5.7 percent per year, from over 1 million in 1967 to 157,450 in the last USDA survey conducted in the 1990s. This trend is reflected in the state of Missouri and many swine producers who have closed their operations are looking for alternative production operations. For this reason, Lincoln University Aquaculture research is taking a leadership role in the state in providing information and demonstrations of alternative production options for stakeholders seeking viable alternatives to traditional operations that are no longer economically feasible such as confined swine production. Indoor recirculating systems may be a profitable option for farmers seeking alternative enterprises. This research will aid farmers in

increasing productivity and in improving the economic viability of the small farm with the addition of an alternative crop – fish.

Not only are Lincoln University researchers providing information on fish production but also the diversity of our stakeholders requires additional work toward giving choices to small farm operators as to alternative and nontraditional crop production in Missouri. Our plant science research team focuses on investigating the viability of alternative crops to create niche markets that will aid the economic viability of Missouri's small farms. Results from this ongoing study will help farmers avoid trial and error losses by providing specific economic and production potential and best practices for various crops.

The maintenance of healthy animals is a major concern of small farmers investing in sheep and goat production. High quality meat, not contaminated with drugs and other compounds of concern to the consumer, is beneficial for promoting lamb and kid consumption. Using herbs for a dewormer will give the producer greater confidence in marketing lamb and goat meat that not only contains high quality protein and low fat content, but is also, drug-free.

### **1862 University of Missouri Extension Overview**

Education to cope with the increasingly competitive agriculture and food sector focused on the fundamentals of enterprise development, new crop production systems, new beef and pork production and marketing systems, and increased use and income from forage. The Value-Added Development Center and its network of regional specialists worked to enhance producer profitability and sustain rural community economic vitality through education on business development fundamentals. Animal production was enhanced through targeted educational programs on reproductive efficiency in beef and swine as well as alternative marketing strategies with beef calves. Crop production profitability was improved through educational programs to enhance input-use efficiency and to develop new systems, including identity preservation of higher value grains. Lastly, the forage-based animal agriculture that represents much of Missouri's livestock industry was impacted through educational programs on improving pasture management and further development of smaller, seasonal grass-based dairy operations.

### **1890 Cooperative Extension Overview**

Lincoln University continues its long tradition of programs designed to aid under-served and under-reached agricultural producers of Missouri to enhance and maximize benefits from, and participation in, the global economy. Programming efforts under Goal 2 in 2004-2005 continue to meet Plan of Work performance goals of delivering pertinent, stakeholder requested information, training and participation in activities leading to increased benefits and profit from present and previous activities. In addition, because many Missouri farmers fear venturing into unfamiliar enterprises, efforts continued to emphasize education and the use of new technology to open competitive markets to Missouri farmers.

## **1862 Agricultural Experiment Station Research – University of Missouri-Columbia**

### **Key Theme: Adding Value**

- a. Description: Developing sensing and imaging technologies. New sensing and imaging techniques have a broad range of medical and biological application. Research is directed towards imaging and classification techniques can be developed to use for biological tissue differentiation. Work is also

being done on imaging technologies that include green fluorescent protein-based (GFP) biosensing techniques and visual system modeling.

- b. Impact: The work on imaging and classification methods will lead to new imaging technologies for applications in medicine, agriculture, food and other areas. The GFP-based sensing work will result in new sensing techniques for medical imaging, bioprocessing control and food pathogen detection. The biosystem modeling work will provide a better understanding of the feedback phenomena in biological systems.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Animal Production Efficiency**

- a. Description: Discovering genes that effect bovine reproduction. Reproductive rates are a key factor in the profitability of beef production. Scientists investigate the genes controlling bovine ovarian antral follicle development in order to improve reproduction in cattle.
- b. Impact: Researchers have established the concentration of estradiol, progesterone and androgen in each follicle collected last year (n=65) to identify healthy follicles. A group of 7 preselected and 7 selected follicles were used to extract RNA. A 16,000 cDNA bovine microarray was set up for purification and amplification. Preliminary printing of approximately 2,000 clones showed acceptable DNA quality. This research will further the understanding of the molecular mechanisms involved in development and differentiation of these reproductive structures. Such understanding may ultimately lead to new ways to manage reproductive cycles in livestock and help solve some fertility problems in women.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Animal Production Efficiency**

- a. Description: Evaluating reproductive management practices. Improving reproductive management on beef cow-calf farming and ranching operations will translate into better economic outcomes for producers. Scientists conduct applied research to discover management protocols aimed at improving pregnancy rates. Synchronizing estrus in postpartum beef cows and replacement beef heifers allows producers to enjoy the advantages of artificial insemination (AI) while maintaining high pregnancy rates.
- b. Impact: Two progestin-based protocols to synchronize estrus were evaluated for fixed-time artificial insemination. Results demonstrate comparable pregnancy rates are achieved when either the CO-Synch + CIDR or MGA Select protocols are used in conjunction with AI performed on the basis of observed heat or at predetermined fixed times. The result translates into highly effective and economical protocols that can be used to synchronize esturs. These positive outcomes greatly improve the feasibility of using AI as a reproductive management tool.
- c. Source of Funds: Hatch, Grants

- d. Scope of Impact: Multi State

**Key Theme: Animal Production Efficiency**

- a. Description: Genetic evaluation of beef cattle. Genetic improvement is an important factor for enhancing the economic viability in beef cattle production. Scientists at MU develop quantitative methods for genetic evaluation and selection schemes that would be useful in large commercial operations.
- b. Impact: A computer program has been developed to simulate an alternative Monte Carlo method for constructing a matrix used to create mixed model equations. These equations describe the relationship between sire and progeny. Results from this modeling can be used to develop better genetic selection schemes, thereby improving profitability in the beef cattle industry. Further improvements using these quantitative methods include modeling genetic selection aimed at improving product quality attributes (such as fat content in beef) or traits that improve production efficiency, such as reduced disease susceptibility or improved reproductive traits.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Aquaculture**

- a. Description: Developing inland aquaculture. The U.S. currently has a multi-billion dollar international trade deficit for fish and fish products. Aquaculture represents an opportunity for inland producers to take advantage of the domestic demand for fish. Researchers work to improve growth rates, feed conversion, and size uniformity of fishes reared in aquaculture. At the same time, these scientists seek ways to reduce negative environmental impacts of aquaculture on surrounding watersheds.
- b. Impact: Using sex-separation techniques to acquire male fish, MU scientists are evaluating the growth benefits of rearing mostly-male bluegill in ponds. Results indicate male bluegill can be grown more rapidly in indoor tanks. If this outcome can be extended to pond reared fish, it would be particularly helpful for rearing large, food-size bluegill. This work holds potential to increase aquaculture production of sunfish in Missouri and the inland U.S.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Grazing**

- a. Description: Stockpiled pasture for winter feed. Stockpiled tall fescue represents a potential alternative to hay reserves as a winter feed in Missouri. Decreasing the amount of hay needed as winter feed can significantly reduce beef cattle production costs. Researchers investigate the effect of various levels of fertilizer on the nutrition content of stockpiled fescue.
- b. Impact: Research was conducted to determine if applications of both phosphorus and boron would increase leaf magnesium concentrations of stockpiled tall fescue more than either element applied alone. Results show that mobile macronutrient element concentrations in tall fescue leaves drop

during late fall and early winter. Nitrogen reached its lowest concentration in January, while P and Mg reached their lowest levels in February. The high rates of phosphorus fertilizer caused a tremendous increase in fall leaf growth, but did not maintain high enough levels of P, Mg and Ca concentrations during late winter. Continued investigation can lead to optimum fertilization and grazing schedules to utilize the economic potential of stockpiled tall fescue as a winter feed.

- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

### **Key Theme: Plant Genomics**

- a. Description: Understanding compound accumulation during seed-filling in oilseed crops. Plant seeds are important renewable sources of biosynthetic polymers including protein, starch, oil and fiber. The amount of these natural products in seed varies among plants, from negligible amounts in some plants, to a majority of the seed's total mass in other plants. In order to ultimately improve plant characteristics, researchers work to understand the development of oilseeds during the period when various storage compounds accumulate. They use advanced proteomic approaches and instrumentation to investigate global protein and phosphoprotein expression networks during seed-filling in crop oilseeds.
- b. Impact: Two-dimensional gel based separation methods are currently being used to anonymously profile protein expression trends in developing seed of Arabidopsis, canola, soybean and castor. This technique allows scientists to rapidly and reproducibly profile 1000 of the most abundant proteins in any developing seed. These comparative studies will allow the researchers to develop models for carbon flow and protein accumulation that can then be tested using Arabidopsis as a molecular genetic model plant for oilseeds. A better understanding of the protein expression networks operating during this phase of development may reveal the differences between high and low oil accumulating plants for future crop improvement.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

### **Key Theme: Plant Health**

- a. Description: Developing pest management strategies within agroecosystems. Pest management techniques that address pests unilaterally, without consideration of the interaction of good and bad actors in an agroecosystem, can result in unintended consequences. Researchers work to determine the effects that specific weed management practices have on the incidence and severity of other pests and agronomic factors in corn and soybean agroecosystems.
- b. Impact: Research trials are being conducted to investigate the effects of fall versus spring herbicide applications on insect pests and beneficials, soybean cyst nematode incidence and severity, and on other agronomic factors. Results will be used to determine optimal herbicide rates in Missouri, and determine the prevalence of specific weed species and/or biotypes in Missouri's crops, forages and pastures. Results should encourage producers to consider the beneficial and detrimental effects of each management practice on the entire agroecosystem rather than on one selected pest or agronomic factor.

- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Plant Production Efficiency**

- a. Description: Improving cotton production. Competition in cotton on the world market is becoming increasingly more competitive. Domestic cotton milling is decreasing dramatically and foreign mills require a higher quality cotton than domestic mills. The effective transfer of scientific technical information about cotton production is essential for the Missouri cotton producer to remain competitive in a global market.
- b. Impact: Production techniques are being evaluated under the unique growing conditions found in Missouri. Variety evaluation is an important part of cotton production because the short growing season in Missouri does not allow many of the longer maturing varieties to be produced profitably. Control of vegetative growth and good defoliation in a low temperature regime are necessary in the short season environment. Variety trials were conducted in six locations. Yield stability of varieties is being studied and irrigation timing on clay is also being investigated. Results of these trials provide the technical information producers need to remain competitive in the highly competitive cotton market.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Plant Production Efficiency**

- a. Description: Improving vegetable crop production. The shorter growing season in southeastern Missouri, compared to more southern latitudes, presents challenges to vegetable crop production. High tunnels are unheated, passive solar greenhouses that offer an economical method to effectively lengthen the growing season. Investigators evaluate vegetable crops grown within a high tunnel system.
- b. Impact: Research in high tunnels was conducted on potatoes, “galia” melons, organic tomatoes, and strawberries as a rotation with tomatoes, and bell peppers. The high tunnels significantly lengthened the growing season for galia, a specialty melon. Tomatoes were harvested 5 weeks earlier than field-grown tomatoes with less disease and ripening disorders than typically occurring in field-grown tomatoes. Row covers, used in concert with high tunnels, significantly increased average temperatures by as much as 10C without reducing fruit quality. This technology is being transferred to producers through off-site research with growers, publications and field days.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

**Key Theme: Plant Production Efficiency**

- a. Description: Improving forage quality. Forage quality is a key component to cattle production in Missouri. Researchers evaluate forages for constituents that affect animal performance. The primary research area includes analysis of ergot-like alkaloids and lysergic acid derivatives



associated with tall fescue toxicosis. Other areas include analysis of pasture plants for other antiquality constituents and forage quality parameters. Most of the procedures involve near-infrared spectroscopy.

- b. Impact: Results of this research can significantly enhance the economic returns to beef cattle production. The largest increases would come from understanding endophyte toxins--how they are affected by genetics, environment, and management. Understanding these factors will help producers develop management schemes to reduce toxin accumulation in livestock. Cattlemen are “paid by the pound” of steer gain, and those gains are reduced by almost half as a result of endophyte toxins. Other increases in cattle gains and producer profits would occur as pastures are managed to improve digestibility and reduce antiquality components.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

## **1890 Cooperative Research Programs — Lincoln University**

### **Key Theme: Alternative Crops**

- a. Description: An evaluation of the potential for the production of alternative and nontraditional crops in Missouri. The ongoing research by the Lincoln University Plant Science team is focused on increasing the viability of the limited resource farmer and the profitability of the small farmer who relies on the sales of horticultural crops as economic sources. Horticultural crops are most attractive to the small-scale producer because they produce high returns per unit land area. Basic research data in regard to management strategies for sweet potato production in Missouri is compiled annually and is shared with our small-farm stakeholders. Background investigations of irrigation and fertilization regimens at various stages of growth for more than fifteen varieties of sweet potato have been conducted. Results revealed a sweet potato variety known as *Beauregard* performed superior to all other varieties including the commonly grown varieties of *Jewel* and *Centennial* under Missouri conditions. In addition to our sweet potato studies, growing season investigations of the growth potential for selected medicinal plants were initiated and will continue to determine the potential growth and adaptation to central Missouri climatic conditions. Preliminary results indicate fifty percent of the plants studied showed some positive adaptation to Central Missouri.
- b. Impact: Research data revealed continuous irrigation during the growth cycle of any tested variety had no significant effect on yield. However, irrigation started at least 90 days into the growth cycle promoted better yield when compared with the economic investment. This finding is significant because continuous irrigation of any crop can have negative economic impacts for the small farmer. Irrigating later in the growth cycle had a positive impact on yields resulting in more positive economic returns in terms of cost savings for water usage and decreased crop loss from root rot. Results of this research were presented to more than one hundred stakeholders at state and regional conferences and workshops. Small farmers adopting the recommended irrigation regimen conserve considerable amounts of water and reduce associated utility costs.

Medicinal herbs when marketed in niche markets will provide small farmers with information on herbs suitable to cultivate in Missouri, potential for developing into health food supplement with medicinal values, and cultivation and processing tips. This project will impact small farmers on the decisions made on the alternative crops and potential incomes.

- c. Source of Federal Funds: Evans-Allen, State
- d. Scope of Impact: Statewide and Regional

**Key Theme: Aquaculture**

- a. Description: Investigating an indoor water recirculating aquaculture system for the production of bluegill sunfish, *Lepomis* species. Re-circulating aquaculture systems have low water requirements, low land requirements and provide the ability to control water temperature and water quality. Because the system is indoors it provides independence from adverse weather conditions. The initial work of the aquaculture research team was to design and test the most economic and efficient indoor recirculating system that will provide an environment that will promote production of bluegill at an optimum rate. Factors studied include: water quality and fate throughout a re-circulating system; relationship of water quality to fish production and consumption rates as a basis for quantifying efficiency of feed utilization by selected fish populations. Results of this study have been compiled for dissemination at conferences and stakeholder workshops. The aquaculture facility is open for stakeholder demonstrations. Comparative studies of how an indoor system can be utilized to compliment or increase production in pond aquaculture systems have been initiated.
- b. Impact: Demonstrations and workshops have provided new and useful information to small-farm stakeholders in central and southeast Missouri and more than fifteen (15) Cole County, Missouri students participating in a high school agriculture technical program. Small farmers who have abandoned indoor swine production operations as a result of economic losses are now considering alternative utilizations for their swine facilities. Demonstrations and guidance by the Lincoln University aquaculture team can help these farmers save up to 50 percent of the initial start-up cost which can range from as low as \$25,000 for small systems to more than \$100,000 for larger systems. This research has shown such high start-up cost and associated fish loss risks can be reduced by incorporating the methods and technologies developed by the Lincoln University aquaculture research team. Our research has shown low-input recirculating systems can be economically and efficiently designed for minimal fish loss and maximum production to serve as new economic sources for small farmers desiring to enter niche fish markets.
- c. Source of Funds: Evans-Allen and State Funds
- d. Scope of Impact: State Specific

**Key Theme: Grazing Animal Health**

- a. Description: A study of the control of internal parasites and coccidia in small ruminants through the use of herbs and natural plants treatments. Sheep, goats, wool, mohair and the associated industries are growing agricultural enterprises in Missouri and many stakeholders are looking for ways to increase economic returns for their investments in small ruminants. Sheep and goats are great foragers of browse plants that grow all over the state of Missouri and in some cases are considered a nuisance by farmers. Sheep prefer forbs (weeds) to grass and they can clean up weeds in areas that then allow grass to grow effectively, making the small farmers more money. That leaves acreages for cattle to come in and graze grass and graze comfortably with the sheep and goats with the farmer benefiting and ultimately the consumer getting high quality meat on the table. Unfortunately, internal parasites are a big problem in sheep and goats. Parasites can cause death and they are expensive to control because of the high costs of commercial dewormers. Internal parasites are especially serious problems in sheep and goats during the summer months when temperature and

humidity is high. To address the health concerns and cost associated with parasites in small ruminants a novel investigation has been initiated to determine if selected herbal treatments could have deworming abilities. The effectiveness of selected herbs, a blend of wormwood (*Artemisia* sp.), fennel (*Foeniculum vulgare*), gentian (*Gentian* sp.), psyllium (*Plantago* sp.), and quassia (*quassia* sp.) were compared to the commercial dewormer, avermectin (Ivomec).

- b. Impact: Internal parasites pose a real threat to sheep and goat producers in the Midwest, especially in the summer months. The strongylid parasite worm *Hoemonchus contortus* is the big killer due to its blood sucking in the abomasum that results in anemic animals that are then victims to many diseases. Stakeholders have interest in this research because of the potential to improve animal health and produce high quality meat without the use of commercial dewormers. Some commercial dewormers reduce reproductive rates and many require one to two week withdrawal periods prior to the butchering of animals. Natural herbs may not have these associated effects and could be very economical when farmers raise their own herbal crops. Early results of the investigations indicate that different breeds of sheep and goats are reacting differently to the commercial Ivomec and herbs over time with the herbal blend showing some positive deworming results. Many goat producers in Missouri have started growing herbs and feeding them to their animals for the purpose of deworming. In some cases the expense associated with the cost of commercial dewormers has been cut 50 percent thus, providing savings to the producer. Additionally, the labor (catching, and restraining animals; injection of drugs) required to administer commercial dewormers is eliminated because herbs can be fed directly to the animals.
- c. Source of Funds: Evans-Allen and State Funds
- d. Scope of Impact: State Specific

## **1862 University of Missouri Extension**

### **Key Theme: Adding Value to New and Old Agricultural Products**

- a. Description: Two trends have dominated agriculture over the past decade. First, the number of farms has decreased substantially. Second, the value of price received on the farm has declined relative to the consumer price paid. In an effort to combat these trends, agricultural producers are seeking innovative and profitable means to enhance their portion of the end-user dollar. The Missouri value-added effort was established to help producers with the business aspects of value-added ventures. Though the statistics indicate 80 percent of start-up businesses fail, attempting to do something is better than doing nothing. Thus, the Missouri value-added effort is concentrated on helping Missouri and national constituents with the business aspects of planning, organizing and operating the value-added business to increase the success rate.

Missouri Value Added Development Center is (<http://valueadded.missouri.edu/index.htm>) unique in its structure. Although headquartered in Columbia, its efforts extend throughout the state via approximately six Agricultural Business Counselors (ABCs), who maintain local connections with producers. Once contact is made, ABCs assist individual producers or producer groups by facilitating the business development process.

Value added is globally defined to be the process of agriculture producers capturing a greater portion of the end-user dollar. The purpose of the Center and Agricultural Business Counselors is to enhance Missouri agri-producer profitability and sustain rural community economic viability by assisting agricultural entities in the business development and economics of value-added ventures.

The mission of the Center and Agricultural Business Counselors is met through:

- Value-added producer educational programs delivered through the ABCs
- Value-added professional development programs delivered through the Center
- Put-to-action applied research directly applicable to value added
- Collaboration with research faculty to produce high-quality, relevant information
- Assistance to entrepreneurs and entrepreneurial groups in start-up, marketing and distribution of agricultural products
- Assessment of potential and actual impact of value-added ventures at the farm, community and regional levels.

b. Impact: During the past year, the Missouri Value Added Development Center has played a critical role in the following business start-up activities throughout the state:

- USDA value-added grants awarded to Missouri agricultural producers decreased in 2004 to \$1 million from \$3.7 million in 2003.
- With completion of Mid-Missouri Energy's fund drive, a 40-million-gallon-per-year, producer-owned ethanol plant is under construction in central Missouri. The potential annual economic impact to the state by the Mid-Missouri Energy Ethanol Plant is estimated to be \$154 million.
- The Mississippi Valley Processors are using a USDA value-added grant to analyze the feasibility of processing soybeans into soybean meal, biodiesel and vegetable oil.
- East Central Ag Products, a joint producer effort, received a USDA grant for working capital and nearly completed their capital fund drive for construction of a 20-million-gallon-per-year, producer-owned ethanol plant in east central Missouri.
- Farm Foods Inc., a new-generation beef-canning cooperative, completed plant construction and began operations in 2003.
- Seven west central Missouri producer-investors started "Missouri Pecan Growers" in 2000. This business cleans, processes and merchandises locally produced pecans. In 2002, the cooperative began selling these pecans in Schnucks and Hy-Vee grocery stores. The organization is now producing certified organic pecans and is proceeding with expansion plans to include additional growers in central Missouri.
- Beef cow/calf producers are assuming ownership of a statewide Show-Me-Select Heifer program (reputation brand replacement heifers), demonstrated to return price premiums of \$100 per head relative to standard replacement heifers.
- Livestock producer groups (Alma Meats, Ozark Mountain Pork) are using USDA value-added grant funds to develop and expand producer-owned meat processing and marketing facilities.
- Construction has begun on Mid-America Biofuels plant in Mexico, Missouri. The plant will be capitalization at \$35 million and will create 20 new jobs.
- Investors are exploring the potential of constructing a paddlefish processing facility in mid-Missouri. It is estimated the net return on the facility will be \$1.22 million over an eight-year period.
- The Puerto Rico Rice Project, funded by the Federal State Market Improvement Program, is studying the potential of establishing Puerto Rico markets for Missouri-grown medium grain rice. This market could facilitate an additional 20,000 acres of medium grain rice production in southeast Missouri. This market expansion is projected to generate an additional \$1 million in sales annually.

c. Source of Funds: Smith-Lever, NRI, State, USDA-Rural Development, Kellogg Foundation

d. Scope of Impact: Missouri

## Key Theme: Animal Production Efficiency

- a. Description: Profitable and Sustainable Livestock Production Utilization System. Several factors have influenced the type of livestock production systems currently practiced in Missouri. Climate; soil types and terrain; location; availability of markets; environmental regulations; renewable resources such as grain, forages and water; governmental policies; and its people have all contributed to structure and viability of animal agriculture in the state.

Missouri ranks sixth in the United States in swine production with nearly 4,000 operations producing a total of 6.3 million pigs. The total number of Missouri swine enterprises has declined rapidly from 10,500 operations in 1994 to 5,000 operations in 1998. Another 20 percent were lost by 2000. However, total average inventory of pigs has changed very little.

Missouri ranks second in the nation in total number of beef cows in production, with 2,062,000 cows on nearly 60,000 farms. Revenue generated from cattle production in 1999 contributed \$890 million to Missouri's economy. Over a 10-year period, the value of Missouri cattle production is nearly tied with the value of Missouri soybean production as the number one commodity in the state. Beef enterprises are finding it increasingly difficult to compete in a global marketplace where large producers use economies of scale to be more profitable. This is especially true for producers in Missouri, given the average herd size of 34 cows.

Some major factors impacting the livestock industry are lack of quality labor; greater demands from consumers for a wholesome product; biosecurity and air quality issues; waste management and water quality; business management; and new technology. To address these trends and issues, the Livestock Production Systems program has focused on three major program thrusts:

- Improved/Enhanced Production Efficiency of Beef Herds in Missouri: This program educates beef producers about breeding strategies, genetic predictions, EPD (Expected Progeny Differences), AI (artificial insemination), economics, animal health and the selection of replacement heifers. The educational methods used include workshops, livestock seminars, demonstrations, field days, producer tours, computer programs, websites, mass media, guide sheets, and individual consultation. The major named program related to this thrust is the Show-Me Select Heifer Program (<http://agebb.missouri.edu/select/>).
- Improved Marketing and Financial Strategies for Beef Cattle Producers in Missouri: This program educates beef producers about retaining ownership; production and nutritional management; animal health record keeping; operational assessment; alternative marketing; and feedlot management. The major educational methods used include feedlot tours, marketing programs, distance learning, ultrasound demonstrations, stocker seminars, workshops, producer tours, guide sheets and the mass media. The major named program related to this thrust is the Premier Beef Marketing Program (<http://agebb.missouri.edu/commag/beef/premierbeef/index.htm>).
- MO-Pork: Increasing Pork Production in Missouri: This program educates pork producers about current production practices to improve productivity and profitability. Focus of the program is on genetics, nutrition, herd health, reproductive performance and environmental management. The major educational method used involves individual consultation, seminars, workshops, guide sheets and mass media.

Missouri is a member of the Livestock Marketing Information Center, which is a collaborative effort among USDA, state extension specialists and industry cooperators. This program involves a coalition of 24 states including Missouri. (see: <http://www.lmic.info/>)

- b. Impact: The Profitable and Sustainable Livestock Production Utilization System is a multistate extension program. The following impacts of the program are specific to Missouri:
- Ten Premier Beef marketing cooperatives are active in Missouri, representing 150 farms and 7,000 feeder cattle annually. Marketing feeder calves through the cooperatives has added \$45 per head to the value of those feeder calves. The total net economic impact of the program is estimated at more than \$315,000 annually. A website has been developed for beef producers interested in learning about Premier Beef:  
[http://agebbfp.missouri.edu/commag/beefanddairy/pb\\_index.htm](http://agebbfp.missouri.edu/commag/beefanddairy/pb_index.htm).
  - A comprehensive audit of the Missouri beef industry was completed in 2005. The primary purpose of the audit was to identify competitive advantages and challenges facing the beef industry and beef producers in Missouri: (<http://agebb.missouri.edu/commag/beef/audit/index.htm>).
  - The Missouri Ration Balancing System for Beef Cattle is Windows-based ration-balancing software for beef cattle producers. Two computer programs, “Grower” and “Balancer,” were developed for use by the regional extension specialists to train producers to balance feed rations. To date, 50 regional meetings have been conducted, through which 400 Missouri beef producers have acquired the software and have become proficient in its use. Regional livestock extension specialists indicate that they are spending significantly less time balancing rations for beef cattle clients since the software and training were offered.
  - Forage Systems Research Center (FSRC) Grazing Schools teach curricula related to livestock nutrition on pasture, pasture management and herd health. Each three-day school reached a broad target audience of 40 to 60 people, including beef, sheep, and dairy producers; extension specialists; conservation agents; and veterinarians. This educational event is internationally recognized, with participants from 43 states and 9 foreign countries.
  - The Byproduct Feed List is a weekly compendium of prices and delivery options provided by approximately 40 retailers of byproduct livestock feeds from Missouri and neighboring states. It was created to assist livestock producers in locating and exploiting low-cost feed ingredients. Associated with the Byproduct Feed List is a downloadable spreadsheet - Comparative Feed Value Calculator - that compares the monetary value of byproduct feeds with standard reference feedstuffs (corn, soybean meal, limestone and dicalcium phosphate). This allows beef and dairy producers to calculate the economic value of a byproduct feed purchase in relation to current market prices and the nutrient content of the standard reference feedstuffs. Both the feed list and the feed value calculator are available online at <http://agebb.missouri.edu/dairy/index.htm>.
  - The MO-Pork program provided educational programs and on-farm consulting to more than 210 Missouri family swine operations, representing nearly 80 percent of Missouri’s pork production. The MO-Pork program resulted in an estimated feed savings of more than \$1.00 per pig marketed, resulting in an estimated economic boost of \$5 million to the Missouri economy.
  - A comprehensive audit of the Missouri swine industry was completed in 2005. The primary purpose of the audit was to identify competitive advantages and challenges facing the swine industry and pork producers in Missouri:  
<http://agebb.missouri.edu/commag/swine/audit/index.htm>).
  - For the first time, more than 70 Missouri pork producers and young people attended a short course on “In the Show Ring: Topics for Youth 4-H and FFA Exhibitors” about Quality Assurance, Showmanship, Nutrition, Genetic Selection/Evaluation and Health during the Missouri Pork Expo.
  - More than 1,000 young people participated in swine educational programs, including the Pork Institute, Youth Pork Quality Assurance, MO Pork Expo Quiz Bowl and the Swine Skillathon.
  - The Missouri Show Me Quality Assurance Program has been developed to educate all Missouri youths (4-H and FFA) who exhibit food-producing animals (beef, swine, dairy, sheep, goats, poultry, and rabbits) about raising a high-quality, safe food product for consumers. More than

50 University of Missouri Extension specialists and 400 career and technical agriculture instructors have been trained to provide the educational training to Missouri young people. The estimated audience will exceed 10,000 in 2006.

- The 2005 Missouri State Fair Growth and Quality Barrow Classic added a new component of pork quality to lean gain per day and live placing components to the contest. The Classic combines aspects of pork production to ensure profitability for producers and a high-quality food product for consumers. The Classic is for both youth and adult pork producers. Participation increased by 49 percent from last year (2004), and eight different purebred breeds were exhibited (one more than last year). Growth performance of the pigs has improved by 12 percent, and carcass merit has improved by 23 percent from last year (2004).
- The Nutrient Management Program is a farm-level, systems-based model incorporating engineering, animal production, nutrition, agronomy and economics. This program has allowed more than 500 Missouri producers to gain knowledge about the benefits of having a comprehensive nutrient management plan (CNMP). Through education and development of individual CNMPs for operations, producers are adopting better management strategies, such as using manure as a fertilizer, alternative storage and manure application practices, and further refinement of nutrient concentrations in the diet.
- Those Missouri pork producers who have developed and implemented a CNMP for their operations are optimizing feed efficiency and avoiding over-formulation of diets. These changes have resulted in a nutrient savings valued in excess of \$1 million dollars. Additional savings of nearly \$9 to \$10 per acre are due to improving application rates to meet crop nutrient requirements by using manure rather than a commercial fertilizer.
- Producers who implement a CNMP are eligible to receive cost-share dollars from the Environmental Quality Incentives Program (EQIP) administered by the Natural Resources Conservation Service. In 2005, Missouri allocated more than \$15 million to producers to incorporate enhanced environmental stewardship.
- It is estimated well over 80 percent of Missouri farms use artificial insemination. Missouri is ahead of the national average. This procedure has become common on the majority of commercial farms, but still remains problematic for small farms. Nearly all pigs representing rare breeds are on small farms, many with only one boar. Additionally, many of the noncommercial breeds have become rare enough that finding other breeders at all, much less in the same state, can prove difficult. A two-day workshop was offered in the collection and processing of semen for small farms with one to ten boars and only one full-time pig farmer. As payment for the two-day workshop, participants agreed to take the practical experience they gained and use it to collect semen to send to the USDA National Animal Germplasm Preservation laboratory in Fort Collins, Colorado. Additionally, they learned to collect, extend and ship swine semen among themselves, facilitating artificial insemination among breeders.
- The University of Missouri Integrated Project (research and extension) is exploring the “development and application of precise methods of boar semen evaluation” methods. The extension component is focused on development of a comprehensive educational program for veterinarians, AI staff, veterinary students and animal science students in boar semen evaluation. The U.S. pork industry will be the major benefactor of this project, as the increase of average litter size by one piglet can generate an additional revenue of \$135 million for producers annually. Additionally, the reduction of seasonal losses in reproductive performance due to heat stress can save the same producers an additional \$41 million annually.
- University of Missouri Veterinary Extension was funded by USDA-APHIS to collect samples from 12 participating pork production units in Missouri as part of the Collaboration in Animal Health and Food Safety Epidemiology (CAHFSE) study. The objective of the study is to monitor pathogen resistance patterns and their changes in the presence of approved antimicrobial compounds over the course of time. Traditionally, the state veterinarian’s office in

each state has participated in these studies. This is a unique opportunity for the Missouri extension program to partner with swine practitioners in Missouri and to educate the 30 participating producers on the principles of epidemiology and pathogen surveillance.

- The goal for the Show-Me-Select (SMS) program is to raise genetically superior animals that bring higher prices and create a reliable source of replacement heifers. Since the beginning of the program in 1996, extension specialists have worked with a total of 179 veterinarians, 66,526 heifers and 554 producers. During this time, 15,725 heifers have been sold through Show-Me-Select replacement heifer sales across Missouri, with gross sales of \$16,393,797. In addition, 5,189 producers have registered to buy heifers at the SMS replacement heifer sales.
- Producers from 98 of the 114 (86%) counties in Missouri have enrolled heifers in the Show-Me-Select Program. Producers from 104 of the 114 (97%) Missouri counties have purchased heifers from Show-Me-Select Replacement Heifer Program sales.
- 60% of the participants in SMS replacement heifer sales indicated they were willing to pay a \$100-per-head premium for SMS heifers relative to standard pregnant heifers.
- At the 2005 Show-Me-Select replacement heifer sales, 1,856 heifers sold for an average of \$1,347 per heifer.
- The cost of producing the 66,526 SMS heifers enrolled in the program to date is around \$50 million. Because this money flows back to input suppliers, rural businesses and sale barns, the program stimulates economic activity on farms and in rural communities through multiple venues. The overall economic impact of the program exceeds \$3.5 million annually.
- During 2004, SMS participants selected board members from their respective regions; an official slate of officers was elected; and articles of incorporation were filed for Show-Me-Select Replacement Heifers Inc. as a not-for-profit organization in Missouri.
- Reproductive management workshops were held during the winter of 2005 at Mount Vernon, Maryville, Palmyra, the University of Missouri Forage Systems Research Center at Linneus, the MU Thompson Farm at Spickard, and the Greenley Center at Novelty. These workshops reviewed newly developed protocols to synchronize estrus before artificial insemination for replacement beef heifers and postpartum cows. In addition, a fall workshop was held at the Joplin Regional Stockyards in October. This workshop reviewed newly developed protocols that can be used to facilitate fixed-time AI for postpartum beef cows. Attendance at the four regional workshops exceeded 800 and in total more than 1,000 producers, veterinarians and allied industry representatives participated.
- D. J. Patterson and M. F. Smith were the recipients of the first USDA-NRI competitive grant in Reproductive Efficiency (\$367,806) with a proposal entitled “An integrated approach to development and application of precise methods of estrous cycle control for beef heifers and cows.” This proposal integrates research, outreach, and education objectives to augment current understanding of reproductive biology and manipulation of the estrous cycle in the beef heifer, concomitant with the transfer of existing methods that precisely control the time of ovulation relative to fixed-time AI in postpartum beef cows. The specific aims of the proposal facilitate implementation of integrated animal production systems that will contribute to sustainability of the animal production unit and are key to future application of biotechnologies in the beef cattle sector.
- The Show-Me Buying Cooperative consists of 54 independent pork producers who market more than 300,000 pigs annually. The cooperative’s members implemented the use of dietary phytase and decreased the inorganic phosphorus content in all premixes and diets purchased. The use of phytase and lower phosphorus inclusion rates has resulted in more than a 30 percent reduction in phosphorus concentrations of manure. By buying in economy-size batches and competitive bidding, the group realized additional feed savings of more than \$1 million annually, or nearly \$20,000 per operation. For example, vitamin and trace mineral premix costs have decreased from \$0.80 to \$0.50 over the past 10 years.



- The Commercial Agriculture Dairy Focus Team conducted a Competitive Dairy Audit of the dairy industry in Missouri. The audit was developed to analyze historical trends, Missouri's competitive position and economic opportunities for the industry. The audit identified two basic strategies for developing a more profitable and sustainable dairy industry in Missouri: 1) Retool and reinvest in existing on-farm infrastructure. 2) Increase the scale of new and existing dairies. The focus team will use the audit as the basis for developing a strategic program plan. The complete audit report is available on the web at: <http://agebb.missouri.edu/commag/dairy/audit/index.htm>.
  - The Southwest Missouri Family Dairy Farm Program has enabled 70 family dairies to remain in business by lowering production costs while improving their financial skills in a pasture-based system. The producers are organized into four core groups of 12 to 20 members per group. A group learning style has helped producers to develop a written business plan, use a computerized record system and adopt management-intensive grazing techniques. Data indicates producers who adopt the program techniques have increased profit per cow by \$279 per year; this represented a \$23,157 increase in net income per participating program dairy.
  - More than half of the 1,600 family dairies in Missouri access current dairy information through the Internet. Dairy information transfer for Missouri dairy producers has been enhanced with the building of two dairy web pages: <http://agebb.missouri.edu/modbu/index.htm> and <http://agebb.missouri.edu/dairy/>.
  - With the leadership and assistance of the University of Missouri Extension Pasture Based Dairy Team, during the last three years, 25 new pasture-based dairies were established in southwest Missouri. The estimated economic impact of these new operations is estimated to be \$5.3 million, or \$17.2 million total economic impact on the region.
- c. Source of Funds: Smith-Lever, State
- d. Scope of Impact: Arkansas, Colorado, Georgia, Idaho, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Utah, Virginia, Washington and Wyoming.

**Key Theme: Plant Production Efficiency**

- a. Description: Integrated Cropping System. Production agriculture in Missouri and the entire U.S. is undergoing structural changes that challenge the viability of many rural communities. Increased production efficiency and global competition have given rise to a marketplace where profit margins are paper thin, favoring consolidation of smaller farms into larger operations that can benefit from efficiencies of scale. Often these larger farm managers own only a portion of the land in their operation, renting additional acres from owners who often are absent. Thus, farmers often know little about the management history of the fields they are farming. Added to this constraint is the fact that time is at a premium for farmers who often manage 2,000 or more acres. So, at a time when accurate, timely information is needed more than ever, many farmers are in a poor position to capture that information.

The economic well being of all Missourians depends on a healthy and vibrant agriculture. Nearly 80 percent of Missouri's 29 million acres are devoted to crop and rangeland. In addition, crop sales account for nearly 50 percent of total agricultural cash receipts (nearly \$5 billion). The science and technology associated with crop management change at an increasingly rapid pace. Identified trends, issues and concerns include increased environmental awareness; crop management in the information age; biotechnology; identity preserved and niche marketing; unintended consequences of technology adoption; consolidation in the input industry; small profit margins and global

economy; and competition among information sources.

The major program priorities for the Integrated Crop Program (ICM) are enhanced profitability of grain, fiber and forage production and reduced negative impacts of grain, fiber, and forage production on the environment. During this reporting period, the major program thrusts for these Integrated Crop Program (ICM) priorities have focused on:

Enhanced profitability of grain, fiber and forage production.

- Management of seven major or emerging crops (soybean, corn, wheat, forages for grazing, alfalfa, cotton, rice)
- Comparative cropping systems that incorporate transgenic cultivars with those that use traditional cultivars
- Precision agriculture and remote sensing
- Improved marketing that incorporates global and consumer perspectives
- Alternatives to traditional cropping systems; improved profitability and income stability
- Value-added, niche markets, including organic crop production.

Reduced negative impacts of grain, fiber and forage production on the environment.

- Integrated pest management
- Pesticide applicator training
- Alternatives to traditional pest and nutrient management practices
- Soil management programs, including soil conservation
- Best management practices for nutrients, including appropriate development of nutrient management plans
- Role of GMO cultivars in pest management.

For additional program information, see Getting There From Here - Strategic Directions to Guide Missouri's Agriculture and Natural Resource Outreach and Extension Effort!  
(<http://www.cafnr.missouri.edu/outreach/statewideplan.asp> ).

- b. Impact: Integrated Cropping Systems is a multistate, integrated research and extension program. The following impacts are specific to Missouri:
- Two hundred twenty (220) crop advisers attended the three-day Crop Management Conference. Presentations were made in one general session and 14 concurrent sessions. Session topics included life sciences, nitrogen management, energy savings, soybean rust, herbicide injuries, biofuels, sunflowers, soybean management, and weather information sources. These crop advisers influence decisions on more than 8 million acres and will have an impact on production efficiency, economic development and environmental quality.
  - During the reporting period, 7,500 Missouri agricultural producers attended programs on new production practices and technology. As a result of these efforts, the use of no-till or reduced-till technology to conserve soil and water has increased over the past 10 years.
  - About 45 percent of Missouri soybean producers use no-till technology at present, compared with 6 percent in 1990.
  - A similar shift has occurred among Missouri corn producers, 41 percent of whom currently use no-till, compared with 14 percent in 1990.
  - In the early 1990s, Missouri cotton producers began adopting weed control programs with newer technology that reduces costs per acre by \$5 to \$10. During 2003, more than 1,000 of Missouri's cotton producers used the new technologies to reduce their use of herbicides by two

to five pounds per acre. This decline in herbicide use per acre resulted in two million pounds less herbicide used by Missouri cotton producers.

- A survey of Missouri cotton producers found that, as a result of University of Missouri Extension scouting programs, 83 percent of the cotton producers hired professionals to scout 92 percent Missouri cotton acres for pests during 2005 compared with 5 percent scouted in 1982 and the 78 percent scouted in 1996.
- The use of this pest control decision tool increased production by 50 pounds of lint per acre. Cotton production was 21.8 million pounds of lint greater during 2005 because of scouting for pests than if the acres were not scouted. At a price of \$.65 per pound of cotton, this increase in yield was worth \$14.1 million.
- About 75 percent of Missouri's rice producers have adopted the new technologies as presented in the University of Missouri Integrated Crop Management Program.
- In the 1990s a team of extension specialists from the cotton-producing states was established to develop a program that would educate U.S. cotton producers about nematode identification and control. A survey of Missouri cotton producers found 80 percent of the farmers were "knowledgeable about the identification of nematode infested fields and nematode management," an increase from 20 percent in 1990.
- Five hundred copies of "Economics of Specialty Corn Production," a publication developed by members of the agricultural economics faculty, were distributed to interested producers.
- Forty programs on the economics of identity-preserved (IP) production were conducted with a total attendance of 1,165.
- Extension and Natural Resources Conservation Service (NRCS) staff members worked with minority farmers in the southeast region to establish a minority farmer-owned cooperative. The team producer training and technical assistance focused on production, business planning, decision-making, organizational structure, marketing and governmental assistance.
- A survey of Missouri rice producers showed that 93 percent of their acreage was treated for pests based on weekly pest scouting results; 54 percent of acres were scouted by the producer, and 39 percent were scouted by a professional. The percentage of Missouri rice acres treated on the basis of weekly scouting reports has grown from 88 percent in 1999.
- The percentage of rice acres scouted for pests by a professional increased dramatically from 11 percent in 1999 to 39 percent in 2004. This increase is largely due to efforts begun in 1996 to educate producers about the benefits of scouting reports. This increase in pest management decisions based on weekly pest surveys resulted in less wasteful use of all agriculture chemicals and an increase in yield.
- Glyphosate systems currently account for more than 95 percent of soybean and cotton weed control and more than 50 percent of the corn weed control programs. During 2005, extension efforts were initiated to develop alternative weed control programs which addressed glyphosate-resistant horseweed control. Missouri growers adopted the use of new, alternative burn down programs on approximately 85 percent of the conservation tillage acres.
- Palmer amaranth is an extremely difficult weed problem in southeast Missouri. Glyphosate-resistant Palmer amaranth has been reported in Georgia. In 2005 new educational efforts were made to educate Missouri growers about weed control programs that would prevent the development of resistance. Approximately 40 percent of the Missouri growers who attended the educational programs have made plans to use the alternative chemistry in 2006.
- One hundred professional crop advisers from Missouri, Arkansas, Tennessee and Mississippi attended a 16-contact-hour continuing education seminar on weed identification and herbicide symptomatology at the Delta Center. These advisers were responsible for providing advice and technical assistance to a client base ranging from 50 to 1,000 farmers, who managed a total of 25,000 to 10 million acres.

- University of Missouri Extension has taken a multi-faceted approach to informing producers of the risks and interventions associated with a potential outbreak of soybean rust in Missouri. Extension agronomy faculty members have developed a soybean rust guide sheet (<http://muextension.missouri.edu/explore/agguides/crops/g04442.htm>), conducted a train-the-trainer in-service workshop for regional extension specialists, developed an IPM website on soybean rust, (<http://www.psu.missouri.edu/agronx/index.html>) and conducted a number of educational workshops for producers. The vast majority (98%) of soybean producers attending these workshops indicated their knowledge about this pest and its management increased because of the educational information presented.
- A new publication in 2004 entitled “Missouri Pest Management Guide” (M171) represents a collaborative effort among weed scientists, entomologists, and plant pathologists at the University of Missouri. This publication provides current recommendations for controlling the most problematic weeds, insects and diseases encountered in Missouri corn, soybean and winter wheat cropping systems. This information is based on research conducted at the University of Missouri and elsewhere. This publication will be revised annually to reflect label updates, name changes and the entry of new herbicide, insecticide, or fungicide active ingredients into the marketplace.
- One hundred fifty young people successfully completed the Garden & Grow (GnG) program at seven locations in Missouri and Arkansas, GnG participants grew 7,000 pounds of fresh produce and donated half of it to food donation agencies. The GnG program provided educational opportunities for at-risk youths in Jasper County and home-schooled youths in St. Francis and Washington Counties.
- During 2005 Master Gardeners provided 93,665 hours of volunteer service. The average number of volunteer hours per Master Gardener was 47 hours. Fifteen counties have reported the average number of volunteer hours exceeds 50 hours per Master Gardener.
- During 2005 the average number of contacts per Master Gardener was 194. The average number of contacts per county is 1,937. Jasper County reported 10,168 contacts in 2005. Five individual Master Gardeners reported more than 500 contact hours.
- Specific activities on a per county basis vary from location to location. Reported as an average per county, the number of volunteer hours submitted per activity in 2005 were:
  - Phone answer service/hotline: 205 hours
  - City beautification: 536 hours
  - Working with youth: 40 hours
  - Teaching classes or short courses: 128 hours
  - Staffing booths at fairs/shows: 69 hours
  - Continuing education: 406 hours
  - Working with the elderly: 98 hours
- During 2005 University of Missouri Extension trained 608 new Master Gardeners.
- The University of Missouri Extension faculty, with support from USDA, developed for the Extension Disaster Education Network (EDEN) a new train-the-trainer course for extension educators. The eight-hour online course is entitled “Plant Biosecurity Management – Resources to Engage Agricultural Producers in U.S. Biosecurity Efforts.” Through five lessons, the course enables extension educators to teach agricultural producers:
  - about the threat of both intentional and unintentional introduction of pests and pathogens to crops;
  - how to mitigate plant biosecurity hazards and security risks to farm operations and agribusinesses;
  - how to prepare for a rapid and appropriate response to a suspected plant biosecurity problem;
  - what recovery activities to expect in the event a plant biosecurity problem is confirmed; and

- how to reduce the impact of a biosecurity event on humans, crops, property, and the environment.

Access to this course is through the EDEN homepage at <http://www.agctr.lsu.edu/eden>.

- Two hundred seventy-five (275) sports turf managers attended the Sports Turf AdvanTage (STAT) educational programs during 2005. The summary of STAT participants evaluations were:
    - Overall quality of the program had 100 percent reported good/outstanding.
    - Program provided new knowledge that can be used - 96 percent reported good/outstanding
    - Program provided new skills, which can be used - 95 percent reported good/outstanding.
    - Plan to adopt new practices - 98 percent reported yes.
    - Would be interested in attending another session of this type - 95 percent reported yes.
- c. Source of Funds: Smith-Lever, State, Grants
- d. Scope of Impact: Missouri, National

### **Key Theme: Rangeland/Pasture Management**

- a. Description: Forages for the 21<sup>st</sup> Century. Forages represent a significant renewable natural resource for Missouri with more than 9.7 million acres in pastures and harvested forages. This represents approximately 33.5 percent of the total land in farms in Missouri. Missouri produces 7.1 million tons of hay (including alfalfa hay) or 4.7 percent of the total hay produced in the United States. This ranks Missouri fourth nationally for total hay production. The agronomic practices associated with the Forages for the 21<sup>st</sup> Century program will enhance water quality, reduce soil loss and produce wildlife habitat while feeding Missouri's livestock industry.

Missouri ranks second in the nation for the total number of beef cows with over two million head on 60,000 operations. Nearly half of the beef producer's production cost is for livestock feed during January, February and March. Forages represent about 90 percent of that cost for winter feed.

Missouri's dairy producers are struggling. Since 1991, almost 30 percent of Missouri's family dairies have gone bankrupt because of high feed costs, expensive capital investment and low profit margins. To respond to this trend, dairy producers are adopting the grass-based dairy model so they can lower feed costs, minimize capital investments, increase profit and protect the environment.

Forages for the 21<sup>st</sup> Century has focused on three major program thrusts:

- Winter Feeding and Stored Forages for Beef Cattle. This program educates producers about stockpiling tall fescue, adapting winter annuals in Missouri, grazing residues, winter grazing management, lowering feeding losses, ammoniation of low-quality hay, forage quality and prudent use of supplemental feed. The methods used include workshops, livestock seminars and demonstrations at the regional research centers. In addition, mass media, Internet and guide sheets are effective.
- Grazing Systems and Pasture Management. This program educates producers about management intensive grazing, new forages for grazing, nutrient cycling, forage quality, summer forages, legume persistence, warm-season grass establishment, tall fescue endophyte and legume establishment into pastures. The methods used include regional grazing schools, special field days, guides and mass media.
- Grass-Based Dairies. This program educates dairy producers about grazing management, forage quality for dairies, balancing rations on pasture versus dry lot, low-cost system design, record

keeping, seasonal versus year-round dairies, fencing and watering systems, fertilization of pastures, improving soil resources and improving the families' quality of life. Methods used include pasture walks, dairy schools, cow colleges, lender meetings, "core-groups," manuals, guides, demonstrations, seminars and mass media.

- b. Impact: Forages for the 21<sup>st</sup> Century is a multistate, integrated research and extension program. The following impacts are specific to Missouri.
- More than 4,000 producers attended educational programming on "Winter Feeding Systems for Beef Cattle." The adoption rate of practices outlined in these programs was about 45 percent. From 1998 to 2005, the percentage of producers using stockpiled tall fescue for winter feeding has doubled, from 26 percent to more than 52 percent. The increased use of stockpiled tall fescue saves the state's beef producers \$19 million dollars annually.
  - Another outcome of the "Winter Feeding Systems for Beef Cattle" program is the increased use of winter annual pastures in Missouri. Based on seed sales of annual ryegrass, acreage of winter pastures in Missouri has increased more than a thousand fold since 1998. Economic analyses show producers using annual ryegrass were able to reduce the cost to winter a beef cow by \$36 per year. If adopted by just half of the beef operations in Missouri, producers could save more than \$36 million dollars annually.
  - More than 1,000 producers attended the grazing schools taught at Linneus and throughout the eight regions of the state; in 2005 alone, 30 multi-day regional grazing workshops were held in Missouri. More than 80 percent of the producers who attended these workshops indicated they plan to adopt fencing, watering and pasture management changes as presented in the schools. 50 percent of those producers implemented these changes without cost-share assistance. From 1997 to 2004, Missouri producers spent \$42 implementing new grazing systems.
  - The curriculum for the "Tall Fescue Toxicosis and Management" workshop was developed in 2003, and workshops were held in 2004 and 2005. If a few simple practices of this workshop are adopted, the net income of a typical beef farm will increase by 10 percent each of the following 10 years.
  - During 2005, the pasture-based dairy team made more than 2,000 audience contacts. The pasture-based dairy curriculum was "customized" for the four core dairy pasture-based core groups. The core group method was based on the highly successful New Zealand educational model.
  - During 2005, several next-generation, larger-scale grazing dairies began development and operation in Missouri. The largest of these dairies contains more than 3,000 cows. Several more grazing dairies larger than 500 cows were developed in 2005. These dairies were attracted to Missouri by the on-going dairy grazing research and extension efforts being conducted by the University of Missouri.
  - Pasture-based dairy farmers produced milk for less than \$10.00/cwt in operating expenses, 20 percent less than conventional dairies in Missouri.
  - More than 60 percent of the core group producers adopted accounting practices that split their personal finances from the dairy's finances.
  - 40 percent of participating producers reported they renovated or expanded their dairy facilities.
  - More than 90 percent of the participating producers report using their business plans has helped them to make better financial decisions.
  - Almost 60 percent of participating producers indicate they have more leisure time and a better quality of life.
  - "Pasture-based Dairy" educational programs have been conducted by the Missouri team in Iowa, Texas, Oklahoma, Arkansas, Kansas, Tennessee, Illinois, and Kentucky.

- Financial data from the Missouri pasture-based dairies participating in the financial summaries showed the average farm is expanding in cow numbers. In 2004 the average farm in the group marketed \$2,111 of milk per cow, had total income of \$2,345 per cow, with operating expenses averaging \$1,367 per cow. Operating margins per cow in 2004 were \$978.
- c. Source of Funds: Smith-Lever, State
- d. Scope of Impact: Iowa, Texas, Oklahoma, Arkansas, Kansas, Tennessee, Illinois, Kentucky and Missouri

## **1890 Cooperative Extension Service — Lincoln University**

### **Key Theme: Small Farm Viability**

- a. Description: Small farmers in Missouri are in desperate need of alternative cropping opportunities. These alternative opportunities will enable them to obtain a profit from their farms. Small farmers in general and limited resource minority farmers in Missouri have seen little or no relief from the farm crisis of the 1990s. To maintain economic profitability limited-resource farmers in Missouri must diversify their product base. Traditional farming methods have a high dependence on chemical inputs. The concerns over health and environmental issues related to pesticide use and genetically modified organisms have caused a re-examination of traditional production techniques. The use of horticultural crops; new vegetables cultivars, exotic vegetables and specialty herbs (medicinal and culinary) is one such method by which product base may be widened. The primary objective of this program is to render Missouri's small limited resource farmers in general, and minority farmers in particular, better information about the benefits associated with the production of specialty horticulture crops.
- b. Impact: The Small Farm Family Program staff conducted at least 30 workshops during the year. One of the workshop topic areas focused on Beekeeping. A series of five workshops on Beekeeping were presented to 15 individuals, some of whom are experienced beekeepers. As a result of these activities, honey production in Douglas County has increased 131 percent in just one year, from 3,500 lbs. in 2001 to 8,090 lbs. in 2002 (which translates into an increase in gross sales from \$4,375 to \$10,112).

Another example of program implementation was in Laclede County. The Educational Assistant in Laclede County helped one small farm family launch a goat dairy farm. With the assistance of the SFFP staff, this venture has proven profitable and the family started making goat milk cheese and selling the product at a local farmers' market.

Additional assistance from the SFFP staff enabled one farmer to start a fresh water shrimp farm, and had a successful harvest last summer. The entire harvest of 200 lb at \$8.00 per lb. (12-14 count per lb.) was sold right at the pond site.

Work in the Value-Added Fiber Program assists farmers in obtaining a profit from raising their sheep and goats. Participants learn to shear sheep, spin wool, dye with natural dyes, and weave cloth. Goat producers learn how to wash wool and mohair from goats, spin, weave, dye colors from acid and natural dyes, knit and crochet. Classes teach participants to use fibers to make products to sell in the value-added program.

Over 150,000 attendees from all 50 states participated in the value-added program over a twenty day period. Thirty classes were presented in washing wool and mohair from goats, spinning, weaving, dyeing, knitting and crocheting. Over 500 students participated in making products from wool. Over 300 FFA students participated in judging sheep at the Carver Farm. Over 250 entries from junior and senior exhibitors at the Missouri State Fair featured natural colored wool. The “Sheep to Shawl” program involved five teams spinning, weaving, and making a shawl on a loom in a four hour period with over 1,000 in attendance. Goat Day provided workshops for over 100 participants who may use what they learn to start home-based businesses.

- c. Source of Funds: Smith-Lever
- d. Scope of Impact: State Specific



## **Goal 2: A Safe and Secure Food and Fiber System**

### **1862 Agricultural Experiment Station Research Overview**

Researchers work in food safety to develop new ways of using beneficial microbes to improve food nutrition and safety. Health benefits include improved nutritional value in food, such as reducing cholesterol, as well as food safety benefits such as reducing bacterial contamination in raw beef.

### **1862 University of Missouri Extension Overview**

Annually the media report thousands of cases of food-borne illnesses from around the globe. Each year thousands of Missourians are exposed to potentially harmful organisms. Proper selection, preparation, storage and handling can reduce the threat to human health. Beginning with one of the most basic of skills, hand washing, regional nutrition specialists and paraprofessional educators work with clients each day to ensure their food supply continues to be safe.

Food safety affects everyone from producer to consumer. University of Missouri Extension faculty provide education to each targeted audience. Livestock and Veterinary Medicine faculty address this producer issue. Food Science faculty assist those in the food processing and retail industries. Human Environmental Sciences faculty address the consumer issues of food safety.

### **1890 Cooperative Extension Overview**

Even though the U.S. food supply is among the most plentiful in the world, it is neither equally distributed nor equally available to all Missourians. Sadly, for a percentage of Missourians, reliable access to safe, affordable, culturally relevant food is not always a reality. According to the 2000 census, 11.7 percent of Missourians are living below the poverty level. While poverty is prevalent throughout the state's population, it is more predominant among minorities, people living in rural areas; children, the elderly and female-headed single parent households. Twenty-five percent of children 18 and under are food stamp recipients. Food, Nutrition and Health programming within LU Cooperative Extension can be divided into three broad areas: Nutrition education of food stamp recipients; Food safety education in two distinct programs; and general nutrition and health programming statewide. A description and evaluation of each follows.

Lincoln University provides nutrition, food safety and food resource management education to food stamp recipients using a curriculum developed by a consortium of 1890 institutions, including Lincoln University.

## **1862 Agricultural Experiment Station Research – University of Missouri-Columbia**

### **Key Theme: Food Safety**

- a. Description: Using beneficial organisms for food nutrition and safety. In the area of food science, probiotics is a growing field that employs new ways to utilize beneficial microbes to improve food nutrition and safety. Scientists work to optimize the survival of beneficial organisms in fermented and unfermented dairy and soy products and during passage through the gastrointestinal tract. In the area of food safety, researchers investigate the efficacy of feeding beef cattle microencapsulated probiotic bacteria to analyze the effect on fecal shedding of E. coli O157:7.
- b. Impact: In vivo studies using mice have been completed to investigate the effects of probiotic-fortified soymilk on specific health aspects, including reducing undesirable microbes in the GI tract,

reducing cholesterol and specific fecal enzymes. Consumers are becoming more aware of the benefits of consuming functional foods containing beneficial bacteria. Research in this area will provide much needed information about the viability of probiotics, delivered in various foods, and the health benefits they provide. Regarding food safety, finding ways to decrease the prevalence of E. coli O157:H7 in cattle, prior to slaughter may provide a new tool for reducing the likelihood of bacterial contamination in raw beef.

c. Source of Funds: Hatch, Grants

d. Scope of Impact: Multi State

## **1862 University of Missouri Extension**

### **Key Theme: Human Nutrition - Food Safety and Food-Borne Illness**

- a. Description: Food Safety. Food safety affects everyone from producer to consumer. University of Missouri Extension faculty provide education to each targeted audience. Livestock and Veterinary Medicine faculty address this producer issue. Food Science faculty assist those in the food processing and retail industries. Human Environmental Sciences faculty (namely Nutritional Sciences faculty) address the consumer issues of food safety.

The following paragraphs focus on the consumer and food service educational efforts.

Twenty regional specialists conducted Food Safety programming during 2004. These specialists provided educational programs, newsletters, radio interviews, television interviews, newspaper interviews, Internet-based programming and individual consultations. These specialists reached 24,973 direct educational contacts throughout the state. This does not include impressions from a weekly radio segment which airs in northeast Missouri. These specialists logged over 1,800 hours in addressing this issue so critical to human health and well being.

Approximately 120 paraprofessionals in the Family Nutrition Education Programs also address the issues of food safety. This program reaches over 230,000 people in all 114 counties and the city of St. Louis. From pre-school, paraprofessionals begin to teach young people the proper techniques for hand washing through adulthood where individuals are taught food preparation techniques to ensure a safe food supply.

- b. Impact: Education about proper selection, preparation, storage and handling does lead to behavior change among program participants. The following statements are just a few examples of how education leads to positive behavior change. Some examples of education leading to positive behavior change are below:
- In the Northeast Region, 49 childcare providers attended in-service education which included food-safety training. Following the course, one provider stated "...anti-bacterial soap is not needed and that regular soap and water are just as effective. This will save me money." Of the 49 participants, 22 (45%) indicated they increased their awareness for preventing food borne illness in their daycare.
  - In Northwest Missouri, 29 Senior Center foodservice workers, representing 17 counties, attended a food-safety in-service. The participants, who must wash their hands regularly, learned how they could improve their hand washing technique when they participated in a demonstration using a black light and fluorescing lotion. Participants said they were going to share this information with volunteers in their centers who also assist with food preparation and

service. Eight participants indicated they would purchase nail brushes to increase the effectiveness of hand washing in their center.

Children, too, are learning at a young age about the importance of hand washing and food safety. Each child who participates in the Show-Me Nutrition Curriculum, grades pre-K- grade 8, receives a minimum of one lesson on food safety. In 2005, 171,855 children pre-K- grade 8 received information on hand washing, and among 2,753 reporting teachers, 82 percent reported students improved their frequency and/or skills in hand washing.

- c. Source of Funds: Smith-Lever, Grants
- d. Scope of Impact: Missouri

## **1890 Cooperative Extension Service — Lincoln University**

### **Key Theme: Food Accessibility and Affordability**

- a. Description: In St. Louis, two nutrition paraprofessionals conduct nutrition education with groups of senior citizens in low-income residential sites around the city. One paraprofessional conducts some home visits. One paraprofessional conducts programs with low-income youth.

In Southeast Missouri, nutrition paraprofessionals, one in each of five Bootheel counties – Dunklin, Mississippi, New Madrid, Pemiscot and Scott Counties, conduct home visits and work with groups of senior citizens, especially with grandparents providing childcare for grandchildren. Some of the paraprofessionals work with youth in LUCE’s Kid’s Beat program and other after school programs, as well.

- b. Impact: Of the 2,546 contacts made. 46 percent reported they moved closer to the recommended number of servings of the Food Guide Pyramid; 22 percent increased their level of physical activity; 38 percent moved closer to the recommendations of the Dietary Guidelines for Americans; 41 percent indicated that they used a spending plan more often; 33 percent indicated they shopped from a list more often; 58 percent indicated they less often let food sit out more than 2 hours; 61 percent indicated they washed their hands more often before touching food; 28 percent indicated they kept raw meat separate from other foods more often.
- c. Source of Funds: Smith –Lever, USDA Food and Nutrition Service
- d. Scope of Impact: State specific

### **Key Theme: Food Safety**

- a. Description: Very highly publicized outbreaks of food borne illness over the past 10 years have been attributed to microbial contamination of eggs, beef and fresh fruits and vegetables. Both restaurants and catered meals have also been implicated in cases of food borne illness affecting large numbers of people. In addition, food that may be uncontaminated when brought into the home can be handled, stored or prepared in ways as to allow the development of dangerous levels of illness-causing pathogens. Extension has a very important role to play in helping achieve the goals of the President’s 1997 Food Safety Initiative.

- b. Impact: One approach that proved successful in developing food safety concepts among our young people was their participation in one of our Outdoor Cooking exhibitions. In this program, young people learn various food safety and sanitation rules and concepts. More importantly these practices are exhibited when they participate in the actual outdoor cookery exhibitions. During one such exhibition, ninety percent (90%) of youth who participated in the Outdoor Cookery exhibited behaviors revealing awareness and practice of food safety and sanitation rules. More specifically, participants washed their hands before and after handling raw meat, and they washed their hands each time they touched something not related to cooking. They cooked the meats until they were well done and they made sure they cleaned their workspaces before and after cooking.
- c. Source of Funds: FSIS/USDA
- d. Scope of Impact: State Specific

## **Goal 3: Healthy and Well-Nourished Population**

### **1862 Agricultural Experiment Station Research Overview**

In the area of human health, scientists conduct basic molecular biophysics research that may ultimately improve therapeutic strategies to fight disease such as cancer and arthritis.

### **1890 Cooperative Research Program Overview**

During the past 20 years there has been a dramatic increase in obesity in the United States. Centers for Disease Control statistics over the past twenty years show an increase in obesity rates in the U.S. from below 20 percent in most states to thirty-five states having obesity rates ranging from 20 to 25 percent in 2003. It is known that overweight and obesity and their associated health problems such as hypertension, non-insulin-dependent diabetes mellitus, atherosclerosis and cardiovascular disease have significant economic impacts on the U.S. healthcare system. Medical costs associated with obesity and associated health problems may involve direct and indirect costs. In response to these observations, the Surgeon General of the United States recently issued a challenge in [The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity](#) (U.S. Department of Health and Human Services, 2001). A significant component of this challenge is to increase research efforts to improve our understanding of the causes, prevention and treatment of overweight and obesity.

Why has there been such a dramatic increase in obesity? Are there specific dietary factors and levels of exercise associated with risks for obesity and coronary heart disease, hypertension, non-insulin-dependent diabetes mellitus and atherosclerosis? One possible answer to these questions has been observed in epidemiological studies which suggest a disproportionate consumption of foods containing high levels of fat at the expense of foods containing complex carbohydrates, fiber, and trace essential nutrients can be correlated with obesity, cardiovascular health and exercise.

The long-term goal of the Human Nutrition Research Program is to examine how dietary factors such as dietary fat, energy level, fiber, antioxidants and other nutrients, and physical exercise contribute to development and prevention of cardiovascular diseases. This work is significant for our stakeholders since cardiovascular health problems are more prevalent in under-served populations. Research conducted by the Human Nutrition team is providing information for the under-served populations in the state of Missouri to help prevent diet-related cardiovascular diseases and promote better health.

### **1862 University of Missouri Extension Overview**

Chronic diseases such as cancer, diabetes, heart disease and strokes continue to be major health problems in Missouri. In the most recent report by the Missouri Department of Health and Senior Services (2000), more than 56 percent of deaths of Missourians were caused by chronic disease. Despite major advances in healthcare and the development of new treatment procedures, Missourians continue to face a high-risk of dying from one of these diseases. Increasingly, scientists and health professionals are interested in addressing the prevention of these diseases rather than simply trying to stop their deadly progress at the end.

University of Missouri Extension faculty address the major nutrition, health and sedentary lifestyle issues through a variety of educational programs. These programs have a broad scope ranging from basic nutrition, physical activity, health education to chronic disease prevention. Faculty provide education across the lifespan in every county throughout the state.

## **1890 Cooperative Extension Service Overview**

Substantial improvements have been made in the nation's health profile in the last twenty years. However, not all groups have benefited equally from these improvements. Because of this inequity, many nutrition and health programs in Missouri are now emphasizing the need to assist minority populations that have been impacted by these inequities that affect the quality of life.

In light of these disparities a scientific consensus on the relationship between diet and chronic disease has emerged that shows an increase in risk for these diseases within these communities. To reduce disease risk, scientific panels emphasize the importance of a low-fat and low-cholesterol diet that can be achieved through an increase in the intake of fruits and vegetables, complex carbohydrates and fiber and a decrease in the intake of fatty foods. Recommendations for the public also include limiting sugar, alcohol and salt intake.

## **1862 Agricultural Experiment Station Research — University of Missouri – Columbia**

### **Key Theme: Human Health**

- a. Description: Improving therapeutic strategies to fight disease. Scientists analyze proteins important in tissue remodeling in diseases such as cancer, arthritis and cardiovascular disease. Basic molecular biophysics research is used to investigate mechanisms of protein-protein interactions. Thermodynamics, bioinformatics, and site-directed mutagenesis are used.
- b. Impact: This basic molecular biophysics research may help to enhance understanding of molecular details of origins of certain aspects of cancer and of damage to lungs and arteries. Such information is relevant to refining therapeutic strategies to fight disease.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

## **1890 Cooperative Research Programs — Lincoln University**

### **Key Theme: Human Nutrition**

- a. Description: Nutrition, exercise and health risks are associated with overweight and obesity. The primary objectives of this project are: 1) to study the effects of race, obesity and weight reduction on risk factors of cardiovascular disease such as plasma leptin levels, and C-reactive protein levels, insulin resistance and lipid profiles; and 2) to study the effects of diet energy levels and exercise on energy balance and biomarkers of cardiovascular health in diet-induced obese rats.

Basic research data revealed exercise treatments significantly reduced the weight gain in the diet-induced obese (DIO) rats. They gained only half as much weight compared with the non-exercised DIO rats. Exercise did not significantly affect the weight gain of the diet-resistant (DR) rats. There was a significant interaction between the effects of diet and exercise on energy intake. Exercise increased the energy intake of rats fed the low-fat diet. In contrast, exercise decreased the energy intake of rats fed the high-fat diet. This interaction was more pronounced in the DIO rats than in the DR rats. As shown in other studies, these early results indicate an interesting relationship between diet, and exercise.

In addition to conducting basic research, the Human Nutrition Research team is updating and providing information and guidance to the local campus community.

- b. Impact: The present project will produce information leading to recommendations for diet and exercise modifications to reduce obesity-related cardiovascular diseases in the United States. Recent data indicate the economic cost of obesity in the United States was about \$117 billion in 2000. Dietary factors and obesity are associated with 5 of 10 leading causes of death: coronary heart disease, some types of cancer, stroke, type II diabetes, and atherosclerosis. Preventive interventions will improve the general health of the population and reduce costs of medical treatments in the United States.
- c. Source of Funds: Evans-Allen
- d. Scope of Impact: State Specific

## **1862 University of Missouri Extension**

### **Key Theme: Human Health**

- a. Description: Dining with Diabetes. As Missouri's population ages it is becoming increasingly important to address issues related to chronic disease prevention and management. Individuals and families affected by diabetes regularly struggle with understanding complicated diet recommendations and separating them from myths and outdated advice. Dining with Diabetes is a three-session series which provides nutrition education, food demonstrations and tasting of foods for individuals with diabetes and their families. Participants learn how to better choose and prepare tasty, nutritious foods that are low in sugar, fat and sodium. Guest diabetes educators are invited to provide additional information and answer participants' questions during at least one of the three sessions. The long-term intended outcome of this series is improved quality of life and health for those with diabetes. The series' comprehensive approach, which includes dietary factors for heart disease and high blood pressure, is consistent with current recommendations from diabetes experts. The series was evaluated using a pre and post session survey and a 3-month follow-up survey. The process was approved by the Institutional Review Board and participants were informed they did not have to participate in the evaluation and they could skip questions they did not want to answer. As a result, the N varies for each question.

- b. Impact:

Outputs: Based on available data 500 Missourians were reached through Dining with Diabetes workshops; 20 workshops were conducted.

Short-term outcomes: The intended short term outcome for this program was increased knowledge about healthy foods and about diabetes and nutrition. Participants were quite knowledgeable prior to taking the series. The data below reflects some of the most notable changes.

Participants reported they knew:	Survey I %	Survey II %
Sugar and Sweets do not raise blood glucose more than other foods that are rich in carbohydrates (Survey I N = 173, Survey II N= 167)	48.1	53.4
Dividing carbohydrate servings between three or more meals will help to keep blood sugar at a constant level throughout the day (Survey I N = 308, Survey II N= 281)	85.6	89.8
Monounsaturated oils may lower LDL (bad) cholesterol (Survey I N = 165, Survey II N=191)	49.8	63.5
Fiber helped the body get rid of some cholesterol (Survey I N = 271, Survey II N=261)	72.8	85.6

Intermediate outcomes: The intended intermediate outcomes were increased confidence about one's ability to prepare healthy meals for someone with diabetes and improved food preparation practices.

- Prior to taking the series, 66.0 percent of participants reported they were confident about their ability to prepare healthy meals; after completing the series 89.8 percent reported being confident (Survey I N = 396, Survey II N=316).
- Participants also reported improved food preparation practices:
  - 66.7 percent reported use of nutrition labels on package foods to prepare healthy meals for people with diabetes prior to the workshop; this increased to 88.4 percent by the end of the series and to 96.9 percent at 3-month follow up. (Survey I N= 394, Survey II N = 318, Survey III N= 98).
  - 65.3 percent reported use of herbs and spices instead of salt in cooking prior to the series; this increased to 83.2 percent by the end of the series and to 84.5 percent at 3-month follow up. (Survey I N= 386, Survey II N = 310, Survey III N= 97).
  - 84.8 percent reported use of canola oil or olive oil in cooking prior to the series; this increased to 92.4 percent by the end of the series and to 94.0 percent at 3 month follow-up. (Survey I N= 394, Survey II N = 314, Survey III N=99).

Other indicators of behavior change resulting from this workshop series include the fact that 3-months after the class 96.8 percent reported use of the information provided to prepare healthy meals (Survey III N = 96) and the provided recipes had been used an average of 5 times by each participant (Survey III N=85). Participants also reported a decrease in the hassle factor. Prior to taking Dining with Diabetes, 33.6 percent reported preparing healthy meals for someone with diabetes was a major hassle or a hassle. This dropped to 24.3 percent by the end of the series. Three months later 18.8 percent considered food preparation a major hassle or a hassle (Survey I N= 345, Survey II N=292, Survey III N = 96).

Some of the real impact is reflected in the words of the participants:

- “You can still lead a normal life with diabetes. You just have to cook more healthy...”
- “Have been able to lower hypertension to normal.”
- “I have a lot more variety in my meals. I used to be leery of new recipes...I try new things more.”
- “This [series] inspired me to do different things after being a diabetic for 26 years.”
- “Feel more confident about the way I cook...”
- “Awareness of nutrition facts is greatly increased – also more careful about food preparation.”
- “I am much more aware of what I should and should not be eating. I have started an exercise program...”
- “I watch labels, bake food and walk everyday.”



- “I used the new recipes and felt sure I had prepared a healthy meal for my husband, the diabetic, and myself.”
  - “Been able to prepare tasty meals now. Have been able to change eating habits.”
  - “I have been getting more exercise and eating less sweets and carbs.”
- c. Source of Funds: Smith-Lever, Grants
- d. Scope of Impact: Southeast, South Central, Southwest, East Central and West Central Missouri

**Key Theme: Human Health**

a. Description: A New You: Health for Every Body. This multi-session workshop is designed to move participants away from diets to a non-diet or health promotion approach to living in a healthy body. The health promotion approach to weight management is one that is appropriate for most audiences. The program focuses on three factors -- appreciating self and others, healthful eating, and active living. Using a variety of educational strategies such as small group discussion, lectures, journaling, worksheets and goal setting, individuals gain new attitudes, learn new information and develop new skills for healthy living. Concepts taught in the workshops are reinforced and marketed through a series of newsletters. The program is evaluated using an IRB approved process and a new evaluation strategy was implemented in 2004-05, as a result minimal evaluation data is available.

b. Impact: Three workshops were conducted reaching, 53 individuals. Pre/post evaluation data was available for 32 participants. Based on this small amount of data, it appears participants had more positive attitudes about physical activity and were more physically active (defined as actively moving 30 minutes or more per day).

- Prior to the start of the series:
  - 85% of participants reported they enjoyed being physically active. (N=32).
  - 13% reported they were getting as much physical activity as they needed. (N=32).
  - 16% reported being physically active 5 or more times per week. (N=31).
- By the end of the series:
  - 100% of participants reported they enjoyed being physically active. (N=19).
  - 37% reported they were getting as much physical activity as they needed. (N=19).
  - 39% report being physically active 5 or more times per week. (N=18).

Participants also reported changes in their attitudes and behaviors related to food and eating.

- Prior to the start of the series:
  - 59% reported they did not quit eating when they were full. (N=32).
  - 82% reported they seldom or never super-sized portions when eating out. (N=32).
- By the end of the series:
  - Only 17% reported they did not quit eating when they were full. (N= 18).
  - 94% reported they seldom or never super-sized portions when eating out. (N= 19).

Participants report having more positive attitudes about themselves and placed less importance on body size and shape.

- Prior to taking the series:
  - 73% believed body size and shape influenced their happiness and success. (N=30).
  - 13% reported they were comfortable with how they looked. (N=31).
  - 69% believed their abilities, skills and strengths were more important than their body shape and size. (N=32).
- By the end of the series:
  - Only 28 percent believed body shape and size influenced their happiness and success. (N=18).

- 48% reported they were comfortable with how they looked. (N= 19).
  - 100% believed their abilities, skills and strengths were more important than their body shape and size. (N=18).
  - Some of the impact is reflected in the words of the participants:
    - “I benefited from this class. There were a lot of things I knew, but it was very helpful to get a ‘shot in the arm’ to refocus on being healthy.”
    - “I learned to plan, accept myself and get physically active.”
- c. Source of Funds: Smith Lever
- d. Scope of Impact: Missouri, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Colorado, Utah, Montana, and Wisconsin

**Key Theme: Human Nutrition**

- a. Description: Nutrition and Health—Family Nutrition Education Program. The Family Nutrition Education Programs (FNEP) are an important part of University of Missouri Extension, bringing the latest nutrition information to low-income Missourians. FNEP helps clients achieve lifelong health and fitness. Paraprofessional nutrition educators work with clients individually and in groups in their homes, schools and at agencies. The primary goal of this program is to help program participants to achieve lifelong health and fitness. Programs include EFNEP (Expanded Food and Nutrition Education Program) and FNP (Family Nutrition Program).

In May 2004, 702,657 Missourians in 281,467 households received food stamps.<sup>1</sup> In 2000, about 15 percent of Missouri’s youths were in poverty, and in 2003, about 39 percent of students were enrolled in free/reduced price lunch.<sup>2</sup> Research has shown families in poverty often have difficulty with the following:

- Securing an adequate amount of food for their families;
- Preparing and storing foods safely, and
- Purchasing a diet rich in whole grains, fruits and vegetables.

FNEP addresses all of these areas for low-income Missourians by teaching food resource management, food safety, and healthy food choices balanced with physical activity. Each participant attends an average of six sessions with a nutrition educator. Sessions vary from 30-60 minutes in length. In FY 2004, FNEP educators enrolled 218,067 participants, resulting in approximately one million direct educational contacts. The FNP program also made 393,858 indirect contacts through parent newsletters that went home with children who were taught in the classroom setting. Total educational contacts for FNEP in FY04 exceeded 1.4 million.

FNEP provides nutrition programming that meets learners’ needs considering their abilities, age, culture, and reading level. Lessons with hands-on activities are designed for youth and the adults who support them, pregnant teens, adults, and immigrant populations.

---

<sup>1</sup> Missouri Department of Social Services website. Available at: <http://www.dss.state.mo.us/mis/clcounter/history.htm> Accessed 1-19-05.

<sup>2</sup> Office of Social and Economic Data Analysis website. Available at: <http://osedata.missouri.edu/kidscount/04/index.html> Accessed 1-19-05.

FNP uses the newly developed Show-Me Nutrition curricula, which include lessons for Pre-K through grade 8. Lessons address healthy food choices balanced with physical activity, food safety, and food resource management. Each grade level has up to 12 lessons with an average of seven lessons taught during a series.

EFNEP is designed for adults, and clients who may participate in up to 20 lessons. Lessons address healthy food choices balanced with physical activity, food safety and food resource management. Additional topics include nutrition during teen and adult pregnancy, breastfeeding, feeding infants and children, and food preservation. Programming is collaborative with North Central Region states.

- b. Impact: The Family Nutrition Education Program includes both the Expanded Food and Nutrition Education Program (EFNEP) and the Family Nutrition Program (FNP)—or the Food Stamp Nutrition Education Program (FSNEP), as it is known nationally. Both programs are targeted to limited-income audiences. In Missouri, EFNEP focuses on the adult population, and FNP focuses on youths. Evaluation data from both programs are represented below.

FNP reached 211,048 youth and adult participants in FY 2004. Following the FNP program in their school classrooms, teachers were asked to fill out program feedback forms and return them to nutrition educators. Two thousand six hundred thirty-four (2,634) forms were returned. Ninety-eight percent (98%) of teachers reported one or more changes among students after FNP. Ninety-four percent (94%) reported students were more aware of nutrition. Fifty-eight percent (58%) reported students were making healthier meal and/or snack choices. Eighty-two percent (82%) reported students improved their hand washing. Eighty-three percent (83%) of teachers reported they were more aware of nutrition themselves. Seventy-seven percent (77%) of teachers made healthier meal and/or snack choices, and among those teachers, 47 percent talked about or modeled those changes in front of students. Ninety-eight percent (98%) of teachers wanted FNP in their classrooms again.

EFNEP adult participants filled out a behavior checklist prior to receiving lessons, and again after the last lesson. Results for FY 2004 revealed after the program, 74 percent of participants more often thought about healthy food choices when deciding what to feed their families. Eighty-two percent (82%) more often used the food label to make food choices. Seventy-eight percent (78%) more often planned meals in advance. Fifty percent (50%) more often followed the practice of not thawing foods at room temperature. Seventy-six percent (76%) more often compared food prices.

Testimonial about a youth FNP participant from Eva Gaskins, Nutrition Program Assistant: “I’ve worked with a student for five years. She used to hide candy under her pillow and eat it during the night—and ate very few fruits and veggies. This year she informed me she ate very few sweets, and more fruits and veggies. She looks better, makes better grades, and is more active. I am so proud of her.”

- c. Source of Funds: Smith-Lever and USDA Food Stamp Program
- d. Scope of Impact: State of Missouri

### **Key Theme: Human Nutrition**

- a. Description: Nutrition and Health—Food Power. In 2005, this program was delivered to 62,685 elementary students at 220 schools. It involved 3,712 classroom teachers and 3,595 volunteers.

Teachers commenting on the impact of this program on elementary children have reported that approximately 95 percent of participants are making healthier meal and/or snack selections, and approximately 82 percent of participants are increasing their physical activity level.

- b. Impact: “All the teachers who went through the Food Power Adventure said the stations are age appropriate and the props helped the students to understand how to eat the correct foods,” reported one school administrator. A teacher stated, “We had a great discussion after the students went through the Food Power Adventure. The kids loved going through the Food Power Digest. I liked the fact the Digest reinforced what was stressed at each station.” This program is one example of how the University of Missouri is focusing its efforts on the lifelong health and fitness of Missouri citizens and combating the recent increase in childhood overweight and obesity.
- c. Source of Funds: Smith Lever, USDA Food Stamp Program, Program Fees
- d. Scope of Impact: State of Missouri

### **Key Theme: Human Nutrition**

- a. Description: Nutrition and Health—Health for Every Body. Health for Every Body *beyond* Scales and Mirrors is a multi-session workshop designed to move participants away from diets to a non-diet or health promotion approach to living in a healthy body. The health promotion approach to weight management is one that is appropriate for most audiences. The program focuses on three factors — appreciating self and others, healthful eating and active living. Using a variety of educational strategies such as small group discussion, lectures, journaling, worksheets and goal setting, individuals gain new attitudes, learn new information and develop new skills for healthy living. Concepts taught in the workshops are reinforced and marketed through a series of newsletters.
- b. Impact: According to University of Missouri Extension’s monthly statistical reports, 5,711 individuals were reached through presentations, workshops, and the media. Programs were conducted in collaboration with 3 partners. Evaluation data was available for 62 participants. Sixty-two program participants have increased their awareness of strategies for promoting health and reducing health risk factors, 59 reported they had learned new information and 41 adopted new practices. The real impact is reflected in the words of the participants:
  - “I have learned to take better care of ME!”
  - “[New goal] Y membership – Use it at least 3 times per week.”
  - “Articles on foods low in cholesterol and fat have helped me stay off of medications.”
  - “For the first time in my life I am taking every opportunity for movement (basketball, dancing, tag, etc. and it is fun!”
  - “I have years of diet information that was all confused in my head. This class helped me get in touch with basic nutrition/health information.”
  - “I feel more sane and okay with my body and healthful eating instead of buying into social messages.”
  - “I have been exercising and eating nutritiously. I’ve lost 20 lbs so far this year and hope to lose more. I have a positive attitude.”
- c. Source of Funds: Smith-Lever
- d. Scope of Impact: Missouri, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Colorado, Utah, Montana, and Wisconsin

## **1890 Cooperative Extension Service — Lincoln University**

### **Key Theme: Human Health**

- a. Description: This area of programming involves developing and disseminating nutrition and diet-related health information to underserved and underrepresented targeted populations in Missouri. Programming efforts include the production of a quarterly newsletter on nutrition issues and a series of fact sheets on nutrition, food safety and various health topics related to diet. These pieces of information are disseminated at a variety of venues such as health fairs, churches and at other events where individuals within the targeted communities might meet. Additionally, a public service announcement for radio listeners was developed and heard on various radio stations within the state.
- b. Impact: Approximately 128 people, 80 percent of whom were African American ages 18-20, received health and nutrition education on various topics and through workshops and published materials.
- c. Source of Funds: Smith Lever
- d. Scope of Impact: State Specific

## **Goal 4: Harmony Between Agriculture and Environment**

### **1862 Agricultural Experiment Station Research Overview**

University of Missouri researchers in wildlife management analyze urban ecology to develop improved management practices of urban species in cities and metropolitan areas. Scientists in weather and climate develop statistical models to improve short-period forecasts. Researchers use geographic information systems in combination with socioeconomic data to link social and ecological factors to landscapes.

### **1890 Cooperative Research Programs Overview**

Links between agriculture and the environment, especially with regard to weather variability, climate change, vectors and pollutants and health impacts is the focus for Lincoln University's research under goal four; "Greater Harmony between Agriculture and the Environment." Agriculture is the backbone of many rural communities in Missouri and it plays an important role in the quality of life of all Missourians. The impact of agricultural practices and its associated industries on the environment can, not only affect future agricultural sustainability, but also human health and well-being. This research focus is in line with issues recognized by USDA such as: the need to evaluate impacts of agricultural chemicals and wastes at multiple geographic sites, developing pest-control alternatives and managing growing crops that use nutrients more efficiently, and detailing the science behind land-use management policies for reducing agricultural runoff, controlling carbon emissions and conserving biodiversity.

Several research projects were developed based on stakeholder input and overall USDA goals. In regard to environmental pollutants and contaminants, Lincoln researchers are investigating greenhouse gas emissions and absorption from corn and soybean crop fields and forest areas. Lincoln's commitment to responding to public needs is also seen in the development and support of the only Cole county allergen monitoring system. Research data is being compiled on seasonal pollen and mold counts and distributed to doctors and the public. This information is needed in an area that has a reported emergency room rate of respiratory cases of 59.3 percent during 2002. Data has also been generated on the occurrence of toxic trace elements in drinking water and soil samples collected from rural communities in southeast Missouri. These same communities are also the sites of very high mosquito counts and residents have asked for assistance in mosquito control. This request is being addressed by researchers investigating alternative biological strategies for mosquito control.

### **1862 University of Missouri Extension Overview**

The extension educational approach to enhancing environmental quality in Missouri focused on several themes, but all used an interagency, problem-solving approach to guide policy and educate citizens. State departments of Natural Resources, Conservation, Agriculture as well as federal agencies located in Missouri worked together on the educational effort. Coping with animal wastes from confined animal feeding operations dealt with both point and watershed-based tracking and management of nutrients. Also, hands-on education of planning, installation and operation of individual home sewage treatment systems was an important component in maintaining the overall state program to improve water quality. Public events, such as water festivals, were the forum to educate the public on the complex water cycles found across the state. Lastly, pesticides used in agricultural, industry, home and roadside environments are an ongoing focus of the statewide pesticide applicator training program.

## **1862 Agricultural Experiment Station Research — University of Missouri-Columbia**

### **Key Theme: Forestry**

- a. Description: Linking social and ecological factors in landscapes. There is a need to tie or overlay human, socioeconomic factors on the natural landscape to get a comprehensive view of land use patterns. More specifically, place becomes its own dimension in characterizing the people and activities in a region, just as location names Bordeaux and Champagne invoke meaning to the regions they represent. Investigators are exploring the relationships between ecological characteristics of landscapes and the socioeconomic characteristics of people in those landscapes.
- b. Impact: Surveys were developed and administered in research study areas in northern and southeastern Missouri, and results were analyzed. With respect to spatial linkages of social and ecological variables, a range of demographic data were linked via GIS (geographic information system) techniques to ecological data for Missouri from the National Hierarchy of Ecological Units. Results improve the understanding between possible associations between demographic groups and certain ecological landscapes in terms of how people and places are related to ecological settings that characterize such places. Results may also help in analysis of data at different levels of geographic scale.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

### **Key Theme: Weather and Climate**

- a. Description: Developing better short-period forecasts. Scientists use radar and satellite remote sensing to improve the observation and prediction of heavy rainfall and floods. Several procedures are being developed. A statistical nowcast scheme is developed for short-period forecasts of heavy rain. A simple rainfall duration prediction procedure is being developed to forecasting total rainfalls, as well as forecasting when rain will end – a useful application in agriculture, transportation and outdoor event organization.
- b. Impact: The impacts of the nowcasting research will be felt in improvements in the forecasts of the onset, intensity, duration and accumulation of rain over periods of a couple of hours. These forecasts are important in flash flood warning, as well as other water management tasks.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

### **Key Theme: Wildlife Management**

- a. Description: Managing urban ecology. Research on urban ecosystems has gained importance with the increased interest in creating and maintaining cities and metropolitan regions that are ecologically sustainable. Urban wildlife conservation is central to a new emphasis in ecology on the study of urban ecosystems. Ecologists recognize cities and the agricultural and forested areas that surround them as unique ecological places. Furthermore, urban greenspaces within 1 km of home

are part of the day-to-day experience of most urban residents. Research on urban ecology involves collaborative efforts by ecologists, physical and social scientists.

- b. Impact: Researchers analyze the relationship between habitat patch size and landscape setting on small mammal species composition and abundance. The effects of management and restoration projects on breeding bird species composition and abundance are evaluated. A better understanding of urban ecology, combined with a better understanding of the social values attached to habitat patches will help in developing a more participatory and inclusionary approach to conservation.
- c. Source of Funds: Hatch, Grants
- d. Scope of Impact: Multi State

## **1890 Cooperative Research Programs — Lincoln University**

### **Key Theme: Air Quality**

- a. Description: There was no official aeroallergen related air quality monitoring data collected for Jefferson City Missouri before 2003. The closest pollen counting station to Jefferson City locates in Columbia, Missouri, 30 miles north of Jefferson City. Compared to Columbia, Jefferson City is surrounded by rural farming communities. Therefore, there is a higher degree of vegetation in and around Jefferson City. Seasonal pollen quantity is potentially higher in Jefferson City than that in Columbia. The aeroallergen counting station at Lincoln University (LU) is the first certified pollen counting station among Missouri universities and colleges. This station functions as a facility providing air quality related educational materials for LU environmental program majors as well as providing allergy related health resource and services to the public. Rotorod air sampler, a popular air sampling device used by many allergists across the country, is used at LU aeroallergen ID and counting station for monitoring local aeroallergens. LU contributes aeroallergen ID and counting data to national pollen reports and forecast (data are available at <http://www.pollen.com>) mediated by Multidata Inc.
- b. Impact: Over 30,000 area residents received information regarding pollen counts as a result of the daily data submitted to Multidata Inc. for national pollen forecasts and reports. In addition, the data are shared daily with the Jefferson City Allergy and Asthma Clinic to serve the local community with current pollen counts. Lincoln University personnel participated in a pollen and mold ID training workshop organized by Aerobiology Laboratory at Harvard University in August 2004. At least 4 pollen warning statements alerting LU families and the community were issued. This work is providing a resource for physicians and the public that is assisting them in developing preventive strategies and treatments to lower the severity of seasonal allergies.
- c. Source of Funds: State
- d. Scope of Impact: State Specific

### **Key Theme: Biological Control of Pests**

- a. Description: A special plant collection of *Pelargonium* cultivars exhibiting various insect resistance and growth characteristics has been maintained at LU Dickinson greenhouse to support research on identifying natural compounds of insect deterrent potential. Some *Pelargonium* cultivars resist and repel insects at the whole plant level. Leaf extracts produced by crushing leaves of a resistant



cultivar also demonstrated potent insect deterrent properties against greenhouse insects, mosquitoes (*Aedes aegypti*), and paper wasps (*Polistes fuscatus*) in the preliminary studies. Based on these results, the research during 2003-2004 focused on examining morphological and biochemical characteristics of *Pelargonium* cultivars and identifying traits for grouping cultivars with insect resistance.

- b. Impact: A collection of over 20 scented geranium cultivars are being maintained in Dickinson greenhouse and observations have begun concerning their resistance and susceptibility to insect infestation and damage. A collaborative project with Dr. Agnes Rimando at USDA ARS Natural Product Utilization Research Lab has been initiated to analyze chemicals present in one scented geranium cultivar of known insect resistance. Preliminary observations were shared with stakeholders at Lincoln's 2004 Small Farm Family Conference in Sikeston, Missouri during a workshop presentation of Lincoln's research programs. Ten of the workshop participants reported they would purchase scented geraniums to use as mosquito repellants around their homes. Future studies will focus on developing formulations and educational information for stakeholders who are interested in controlling a variety of pests, including mosquitoes, using natural or biological control methods.
- c. Source of Funds: State
- d. Scope of Impact: State-wide, Regional and National

### **Key Theme: Biological Control of Pests**

- a. Description: A second project under the theme of biological control of pests is concerned with evaluating the effectiveness of a mixed formulation of *Bacillus thuringiensis* and *Bacillus sphaericus* in the control of mosquitoes in New Madrid county Missouri. The formulation consisted of a 5:1 ratio of *Bacillus thuringiensis* to *Bacillus sphaericus*. In preliminary trials mosquito counts have been made and a small area was treated with the formulation. Results of the trials are being used to direct procedures that will be effective in lowering mosquito counts in the area. These include providing sufficient formulations to be distributed at major mosquito breeding sites; identifying geographical obstacles to breeding sites and synchronizing initial spraying with mosquito breeding cycles to obtain accurate mosquito counts before and after spraying. Interviews with residents of the target area indicate that the majority of the population are seriously concerned about the high mosquito population and are looking forward to some relief in future seasons for mosquito infestations.
- b. Impact: The immediate impact of this work has generated an increased level of optimism among the residents of New Madrid County, Missouri as documented during individual interviews. This work has also led to strengthening collaborative agreements between the New Madrid County Health Department, county volunteers and the Lincoln research team. The New Madrid County Health Department provided help in mobilizing its human resources to assist in the trial sprayings and is looking forward to continuation of the alternative control effort. This cooperation shows that the local health department understood the need for alternatives to chemical control of insect vectors and was willing to use alternative control methods. Long-term impacts will result in a substantial reduction in mosquito populations in the area and a proportional reduction in the human risks of contracting mosquito vector diseases. Because of the global nature of mosquito vector diseases, the impact of this study will not be restricted to the local community in Missouri and the United States, but also to the global community at large especially areas where mosquitoes are posing serious human threats.

- c. Source of Funds: State
- d. Scope of Impact: County

**Key Theme: Geographic Information Systems/Global Positioning Satellite Systems**

- a. Description: The geographic information team plays a major role in collaborating with all research teams. They have assisted in generating maps and compiling data to be used by our researchers to more effectively provide information to our stakeholders in the Bootheel area of Missouri. The GIS/Remote sensing team is creating a geospatially referenced, digital database for the Bootheel region of southeastern Missouri. This area is the region targeted for a large percentage of Lincoln's Cooperative Research and Extension programs. This data bank will be used to provide data for environmental monitoring, modeling, and natural resource management activities in the region.
- b. Impact: Seventy-five percent (75%) of the project as outlined in the original proposal has been completed. Various geospatial data layers for 11 counties in the Bootheel region of Southeast Missouri have been assembled. The data layers include agriculture, census, wetlands, DEM (both at 10m and 30m resolution), satellite images (Thematic Mapper), Land use/Land cover, soils, etc. Depending on availability, additional data layers, such as TERRA satellite images, drinking water sources for the various urban areas in the region, etc. will also be compiled.
- c. Source of Funds: State
- d. Scope of Impact: Statewide

**Key Theme: Organic Waste Reduction**

- a. Description: Implementation and evaluation of an in-vessel composter for managing organic waste. The traditional means of disposing food waste by cafeterias and large restaurants have been through garbage disposals or through discharge as part of the solid waste stream. These practices are known to contribute to increased organic loads for waste water treatment systems and increased and offensive odors in landfills. This research focused on designing, constructing and evaluating an in-vessel composting facility that would effectively process food waste generated by the campus cafeteria into a usable less offensive product. An in-vessel composter facility has been constructed at the Busby farm and was fully operational by August of 2004. This facility will serve as a model for the area communities and the state.
- b. Impact: This work has had a local impact by reducing the volume of organic waste from the campus cafeteria. The facility and outlined waste handling procedures are serving as a model for the development of similar efforts by restaurants, other college campuses and local communities. The compost generated by the facility is an odorless organic product that is being used to enrich landscape areas on Lincoln's campus and farms and therefore reducing costs for commercial fertilizers. There has been a 100 percent reduction in the amount of food waste entering the public wastewater sewer system of Jefferson City, Missouri from Lincoln University's cafeteria. Prior to the implementation of this project a large percentage of food waste generated (108 tons/year) from Lincoln's cafeteria was discarded in garbage disposals which emptied into the wastewater system of the city.
- c. Source of Funds: Evans Allen and State Grant- Missouri Department of Natural Resources

- d. Scope of Impact: State Specific

**Key Theme: Soil Management, Greenhouse Gases, Carbon Emissions**

- a. Description: Soil management practices and greenhouse gases emissions from Agricultural Fields. In our attempt to understand how many greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O) are being emitted from soils in our farms; how these emissions vary throughout the year; how soil management practices such as tillage, crop and vegetation type and fertilization affect these emissions and finally what soil chemical, physical and thermal properties are the main controlling factors for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O emissions from soils, we are presently involved in intensive campaigns of monitoring greenhouse gases emissions at Lincoln University's Carver, Busby and Freeman farms. We are also monitoring physical, chemical and thermal changes in soil properties at all of these research farms. For 2004, intensive samplings were conducted from May to December in a grassland site at Carver farm, in corn and soybean fields at Freeman farms and in two forest sites at the Busby farm. Sampling for greenhouse gases and soil properties monitoring will continue through 2005. We have found the following interesting trends: Firstly, there are emissions (positive fluxes) of CO<sub>2</sub> and N<sub>2</sub>O and uptake (negative fluxes) of CH<sub>4</sub> from soils at all of our experimental sites. The highest emission rates were 238.02 mg CO<sub>2</sub>-C m<sup>-2</sup> h<sup>-1</sup> for CO<sub>2</sub> in the soybean field and 57.23 ug N<sub>2</sub>O-N m<sup>-2</sup> h<sup>-1</sup> for NO<sub>2</sub> in the cornfield. The highest soil uptake for CH<sub>4</sub> (-97.02 ug CH<sub>4</sub>-C m<sup>-2</sup> h<sup>-1</sup>) was observed in the forest site at Busby farm. Secondly, we expected to see a decrease in emissions or uptake as soil temperature decreased from May to December. Unfortunately, this was only true for CO<sub>2</sub> emissions in the corn and soybean fields and for both CO<sub>2</sub> and CH<sub>4</sub> in the grassland site at Carver farm, which decreased with decreasing soil temperature. In opposite, NO<sub>2</sub> emissions increased with decreasing soil temperature in the cornfield, soybean field and grassland. We also found strong linear relationship between CO<sub>2</sub>, CH<sub>4</sub>, NO<sub>2</sub> and soil thermal resistance, conductivity and diffusivity especially in the forest site.
- b. Impact: This work shows stakeholders that many factors can be involved in the emission and absorption of greenhouse gases (GHG) in agriculture. The type of crops, the soil's physical, chemical and thermal properties are all factors related to GHG emissions and removal from the air. This work also shows agricultural practices can contribute to the reduction of GHG emissions and that gases such as carbon dioxide can be removed from the air and stored in the soil. Recorded changes in various soils' physical, chemical and thermal properties as it relates to crops and greenhouse gas absorption or emission provides information that is used to direct tillage practices and crop selections that will either result in lowered GHG emissions or increased absorption of GHS from the air.
- c. Source of Funds: State
- d. Scope of Impact: State Specific

**Key Theme: Soil Quality and Human Health and Well-Being**

- a. Description: In situ lead immobilization in contaminated urban soil by phosphates in Jasper County Superfund site. The study site is a historic mill tailings impoundment located northwest of Joplin City within the Jasper County Superfund Site, Missouri. The experiment consisted of 2- by 4-m plots in randomized complete block design with four replicates of three levels of H<sub>3</sub>PO<sub>4</sub> treatments at rate of 0 (control), 7,500 and 10,000 mg P kg<sup>-1</sup>. Each plot was bounded by installing 25-cm tall plastic edging to prevent cross-contamination between plots. Predetermined amounts of 85 percent

H<sub>3</sub>PO<sub>4</sub> that treated 15-cm soil depth were applied to the surface of soil and then rototilled into the soil. Soil samples at each plot were collected from the treated zone 90 and 180 days after treatment and analyzed for in vitro bioavailability, leachability, and chemical speciation of soil Pb.

- b. Impact: The H<sub>3</sub>PO<sub>4</sub> treatment substantially reduced in vitro Pb bioavailability and leachability in contaminated mining waste. The reductions increased with increasing amounts of added and treatment time. Transformation of exchangeable-Pb, carbonate-Pb and Fe-Mn oxide-Pb to residual-Pb induced by P treatment was primarily responsible for the reductions of Pb bioavailability and leachability. This study demonstrates that in situ immobilization through H<sub>3</sub>PO<sub>4</sub> application would effectively stabilize Pb and reduce the health risk of contaminated mining wastes, which may be used as a cost-effective remedial alternative to safeguard human health and the ecosystem from the environmental contamination in mining areas.
- c. Source of Funds: U.S. Environmental Protection Agency (USEPA), Region VII, Missouri Department of Natural Resources (MDNR)
- d. Scope of Impact: State Specific

## **1862 University of Missouri Extension**

### **Key Theme: Agricultural Waste Management**

- a. Description: Animal Waste Management. Livestock manure management covers a variety of approaches for working with water and air quality concerns created by livestock manure. Programming efforts for extension specialists and other agency personnel has become a major component of developing a holistic approach to proper livestock manure management. The concept of private individual consultations is still very important, but interagency cooperation and education are mandatory if livestock manure management is to have statewide success.

In Missouri, livestock production represents approximately 50 percent (\$2.4 billion) of the income from agricultural commodity sales. A major producer of livestock, Missouri ranks seventh in swine, eleventh in poultry, and second in cattle production. The number of confinement operations and Missouri's diverse topography can create water quality concerns from over-application of livestock manure.

The Missouri Department of Natural Resources (MoDNR) has several water bodies listed on the state 303(d) list as being impaired because of nutrient overloading from livestock manure. The 303(d) list also has identified several water bodies with nutrient loading from unknown sources. This influx of nutrients, such as phosphorus and nitrogen, comes from many sources -- livestock production and land application of manure being critical sources.

The Interagency Technical Working Group (ITWG) was formed with personnel from University of Missouri Extension, Natural Resources Conservation Service and the Missouri Department of Natural Resources. The group reviews literature and information on manure management issues so the agencies are presenting approved information that meets the state's environmental goals for conservative manure use.

The economic viability of Missouri's livestock industry is at stake if social and environmental issues are not addressed. Confined livestock operations have been listed as a major environmental and health concern from odor and mishandling of manure. Many operations are highly concentrated and

located in areas where soil conditions are not suitable for heavy land application of livestock manure. University of Missouri Extension understands the importance of protecting the economic viability of Missouri agriculture, but also understands the need for maintaining a safe and healthy environment.

University of Missouri Extension provides partnering agencies and producers with information on land use management, application equipment and approved management practices for maximum manure utilization and reduced environmental degradation.

The “Comprehensive Nutrient Management Planning” and “Livestock and Poultry Environmental Stewardship” curricula have been developed.

Training courses provided agency personnel and extension specialists with information on comprehensive nutrient management planning procedures for producers. The program has been delivered to 900 producers.

An analysis by University engineers assisted the EPA in re-evaluating cost estimates for manure management on farms; proposed regulations on confined animal feeding operations now reflect the average costs for full compliance.

For additional program information see: Environmental Quality (<http://www.eq.missouri.edu/>).

b. Impact:

- University of Missouri Extension representatives reviewed and provided extensive comments to MDNR in cooperation with the USDA Natural Resources Conservation Service in Missouri on the proposed general permit released in December 2005.
- Through a grant from the Missouri Department of Agriculture, University of Missouri Extension Commercial Agriculture Program members developed a report comparing regulatory requirements for animal feeding operations in Missouri with regulations from Iowa, Indiana and Oklahoma. The report allowed the group to develop recommendations for improving the competitiveness of Missouri agriculture with the aforementioned states.
- Members of the University of Missouri Extension Commercial Agriculture Program’s Manure Management Team, in collaboration with the Missouri Department of Agriculture and the Missouri Department of Natural Resources, developed a guidance document to assist producers with making decisions regarding potential lagoon overflows during the period of excessively wet weather in early 2005.
- The southeast Missouri Quality Dairy Management Group (QDM) – the 10-member producer cooperative group established in 2003 – met every six weeks during 2005 to share information related to dairy production systems. The group met at the farms of its members, when weather permitted, to view management practices producers used on their farms. The meetings encouraged discussion of successes and concerns about all aspects of dairy production. As a result of the meetings, producers from the group have made a number of improvements, such as constructing a concrete manure catchment basin for a free-stall barn and open lot area, improving manure collection and storage systems, and working with extension specialists to improve the operation of a settling basin.
- Forty professionals representing NRCS, MDNR and private vendors attended the 2005 Nutrient Management Planner Training Courses. The intensive five-day course included a three-day classroom course followed by a two-day field exercise. Completion of the course is a requirement for certification as a technical service provider (TSP) in Missouri. Participants who complete the course are eligible to write portions of a nutrient management plan.

- University of Missouri Extension representatives joined university, state regulatory, and Natural Resources Conservation Service representatives from Missouri, Iowa, Kansas and Nebraska, as well as representatives from EPA Region 7, for numerous Heartland Animal Manure Management Meetings to discuss nutrient management planning (NMP) efforts, NMP software and technologies, and experiences in developing Comprehensive Nutrient Management Plans (CNMP). The core goal of this group is to facilitate a more uniform regulatory approach across the region and facilitate transfer of innovative solutions and successful programs among the states. University of Missouri faculty members serve on the coordinating committee.
- The Missouri Manure Management Action Group (MoMMAG) <http://outreach.missouri.edu/mommag> and the Agricultural Electronic Bulletin Board (AgEbb)/Commercial Agriculture website provide updated information on management practices, laws and regulations, as well as links to websites in other states with similar livestock manure issues.
- The Nutrient Management Resources website (<http://nmplanner.missouri.edu>) serves as a central clearing house for information needed by planners, including links to web-based land assessment tools, nutrient management software, decision support tools, and related information and references. The site has been maintained and updated over a two-year period.
- Faculty members in University of Missouri Extension in cooperation with the Center for Agricultural Resources and Environmental Systems (CARES) developed a web-based site assessment tool that allows users to find their land on a map accessible on the web and then to generate a report on many factors affecting the suitability of the site for an animal feeding operation. The website is a unique Missouri resource available at [www.cares.missouri.edu/snmp/](http://www.cares.missouri.edu/snmp/).
- A \$10,000 Environmental Education grant was obtained from National Pork Board to conduct a “Swine Production School” that is currently being planned.
- The USDA Water Quality Heartland project hosted a four-state meeting on nutrient management planning tools. More than 50 individuals, including representatives from the University of Missouri, attended the meeting and discussed current and prospective tools to assist with nutrient management planning.
- A series of grants from the U.S. Environmental Protection Agency (EPA) and other sources and in cooperation with Purdue University resulted in the development of a software system for writing a nutrient management plan. University of Missouri has developed the spatial component of the program that generates maps and makes spatial calculations and is supported nationally. This information is then passed automatically into Purdue’s manure management planner supported in 31 states. Faculty members from University of Missouri meet regularly with national NRCS and EPA staff to further the development of an effective nationally available software program.
- Through an EPA grant, the University of Missouri has been cooperating with MDNR and NRCS to develop a nutrient management plan template that meets the needs of regulators and NRCS and is accessible to farmers. The grant has supported writing software code so the template plan is automatically generated once the farm information has been entered into Purdue’s Manure Management Planner.
- University of Missouri Extension is cooperating with national NRCS, EPA and Purdue University to develop a national streamlined template for a nutrient management plan.
- Through an EPA grant under Section 319 of the Clean Water Act, University of Missouri Extension has been working with NRCS to train people how to use computer software to write a nutrient management plan. During the two-day course participants complete a nutrient management plan using computers in University of Missouri’s mobile computer lab. The course was piloted in southwest Missouri where more than 100 nutrient management planners received

training. In the end of 2005 University of Missouri Extension started a statewide effort to train nutrient management planners.

- Through an EPA Section 319 grant, University of Missouri Extension has been working with farmers in southwest Missouri and nutrient management planners to complete nutrient management plans for poultry farms or farms that receive poultry litter. The effort has resulted in at least 60 plans being written in southwest Missouri.
- Thirty professionals from 15 land-grant universities -- including the University of Missouri -- USDA, MWPS and the EPA Ag Center planned, authored and pilot tested a Livestock and Poultry Environmental Stewardship (LPES) Curriculum. The curriculum, nationally developed and regionally piloted, includes 26 lesson plans grouped into six modules. Each lesson includes teaching outlines, environmental stewardship or regulatory compliance assessment tools and PowerPoint presentations. The curriculum was funded by EPA.
- A team of eight faculty members from the four states in EPA Region 7 completed a comprehensive publication detailing the role of phosphorus in water quality concerns and outlining the phosphorus indices used in each state.

c. Source of Funds: Smith-Lever, EPA, Natural Resource Conservation Service, State

d. Scope of Impact: Missouri, Indiana, Minnesota, Iowa, Ohio, Oklahoma, Illinois

### **Key Theme: Hazardous Materials, Water Quality**

- a. Description: On-site Sewage and Solid/Household Waste. With increasing population and changing land-use trends, waste disposal practices associated with private property can be a source of pollution problems. Private landowners, rural residents and county officials need assistance in making management decisions about on-site sewage construction and maintenance and proper solid and household waste disposal to insure water quality. Recent changes in the Missouri Department of Health regulations for on-site sewage set new limits on private landowners. Additionally, individual county health codes, which surpass state regulations for on-site sewage, accelerated the need for educational programs that meet the diverse land cover.

Through a series of programming efforts, University of Missouri Extension trained on-site sewage installers to identify correct ways to perform soil percolation tests for on-site sewage systems. State and regional specialists have sole responsibility for offering this training to private and commercial on-site sewage installers. Since 1998, more than 1,600 installers have attended the two-day course for soil percolation testing. Class participants must pass a certification test with a score of 80 percent or better to obtain certification. In four years, more than 1,500 installers completed the course and passed the certification test.

In Warren County, University of Missouri Extension offered a series of classes on farm pesticide and household hazardous waste. Participants were motivated to write a grant to conduct farm pesticide collection.

In Jefferson, Texas, Hickory and Webster counties, University of Missouri Extension held classes for on-site sewage systems and disposal of solid and household waste. In Saline and Cooper counties, educational programs were conducted using the Farmstead Assessment System (Farm-A-Syst) to help local landowners and rural residents identify potential water quality problems associated with on-site sewage systems, on-site solid waste disposal, drinking water well condition and hazardous waste management; 100 percent of participants indicated they would make changes on their personal property.

Through the educational programming efforts, participants indicate they will do the following:

- Adopt disposal practices that are environmentally safe and protect human health.
- Make decisions based on the information learned to meet new regulatory standards.
- Implement practices that are economically and environmentally sound.
- Control, reduce or eliminate on-site solid waste disposal.

For additional program information see: Water Resource Information (<http://www.fse.missouri.edu/waterquality/>) and Missouri Watershed Information Network (<http://outreach.missouri.edu/mowin/>)

b. Impact:

- In the last three years more than 500 real estate professionals attended the course “On-Site Sewage For Real Estate Professionals.” The course offers six hours of continued education units for real estate professionals and covers the functions of a septic tank, inspection, maintenance and repair, regulations concerning on-site sewage, alternative on-site sewage systems, and how on-site sewage systems can affect property transactions. Participants evaluated the course as follows:
  - 95 percent of the participants reported the information learned was above average and were very satisfied with the training and materials.
  - 94 percent increased their ability to understand and communicate information to clientele.
  - 100 percent would use the information in their work.
  - 100 percent would share information with others.
- Home inspectors, on-site sewage installers and wastewater treatment professionals attended a course sponsored cooperatively by the Marion County Health Department and University of Missouri Extension. The course focused on on-site sewage systems, new technologies for on-site sewage systems, maintenance of on-site systems and the role of soils in selection of a site for an on-site sewage system.
- The “Creating a Healthier Home” program was offered to county nurses, day-care providers and private citizens to help people identify possible asthma triggers and hazards that may be found in the home. The program focused on identification of the triggers and what could be done to reduce, control or eliminate them. Mold and other hazards associated with water, moisture and air movement were identified as high-priority areas affecting human health.

c. Source of Funds: Smith-Lever, State, EPA/DNR 319 Water Quality

d. Scope of Impact: Missouri

**Key Theme: Land Use, Natural Resource Management, Water Quality**

- a. Description: Water Festivals – Water and Natural Resources Education for Youth and Educators. A 1999 University of Missouri Extension needs assessment in Missouri’s 114 counties revealed a strong need for programs and tools to protect water resources and provide environmental education. Ninety counties listed environmental quality, watershed management or natural resource conservation as a program theme, and 104 counties listed environmental issues education as a local need.

Water resources are one of Missouri’s most valuable commodities for industry, tourism and agriculture. The goal of the Water Festivals program is to provide educators with materials and increase awareness of water quality issues.



University of Missouri Extension is part of a multi-agency team providing educators with environmental curricula that can be incorporated into day-to-day teaching activities. Student learning is enhanced by educational/informational lessons to support in-class teaching activities.

University of Missouri Extension worked with 27 partners to create the Missouri Watershed Information Network (MoWIN). MoWIN is a public access program that offers watershed information through a website, toll-free number, email or direct personal contact. MoWIN has continued to grow to provide watershed information.

For additional program information see: Water Resource Information (<http://www.fse.missouri.edu/waterquality/>) and Missouri Watershed Information Network (<http://outreach.missouri.edu/mowin/>)

b. Impact:

- In Missouri more than 6,000 elementary students participated in water quality education events and learned about ecological practices relating to the management of natural resources to improve environment and water quality. Teachers commented water festivals and water quality awareness days are a great educational opportunity enjoyed by students and have been able to use many of the resource materials and activities in their present school curriculum.
- In southwest Missouri, more than 1,200 students participated in water quality educational events (water festivals). The events used representatives from different state agencies and local watershed groups to promote watershed stewardship and increase awareness of local issues with stream bank erosion, nutrient management, groundwater movement and the identification of different sources of contamination in the watershed. The water festival used the “listen – see – do” approach to working with the students and getting them involved in the educational activities. Southwest Missouri is a major tourism and agricultural production area and has a unique set of water quality educational needs.
- Three schools were used as a pilot test group to determine whether the water festivals resulted in improvement in MAP test scores in areas of science and environment. MAP test scores were compared for several years before and after water festivals were held to determine if there was a direct correlation between increased knowledge of water quality issues and science-based education. Topics concerning the hydrologic cycle, groundwater movement, watersheds, and soil erosion were used to help participants learn about water quality and watershed management. The test scores indicated an increase in MAP scores for those students that had participated in a water festival. This increase was due not only to a one- or two-day intensive educational effort for water quality but also to an increase in teacher participation in water quality education and science. Teachers found the activities educational, science based, easy to replicate and of high interest to the students.
- University of Missouri Extension developed a set of web-based environmental programs (<http://extension.missouri.edu/mowin/Project31903/interacmowin.html>) designed to increase awareness and knowledge of nonpoint-source pollution in specific watersheds. The web-based materials cover areas generally taught at the third to seventh grade levels and are based in the student’s home watershed. The project has two basic components: a series of preset educational materials that can be used in all schools and a second component that incorporates information about local watersheds so students feel more connected with their local watershed area and what is happening in it. Math, human health, writing and science skills are incorporated into the learning program. More than 300 teachers have received training with the web-based tools and have expressed positive comments about the integrated approach to web-based education. More

than 5,000 students have used the program, and more than 2,000 CDs of the program have been distributed at conferences and training sessions.

- c. Source of Funds: Smith-Lever, EPA/DNR, State
- d. Scope of Impact: Missouri

### **Key Theme: Natural Resources**

- a. Description: Natural Resources. Citizens own approximately 94 percent of the land in Missouri, 35 percent of which is forested. As a result, they are responsible for the management of most of the natural resource base within the state. Missouri's forests and associated farmlands provide innumerable economic, aesthetic, ecological and recreational resources. These forest and farm landscapes provide for viable ecosystems that support biological diversity and wildlife habitat, contribute significantly to local economies, are fundamental elements of urban and rural communities, and are integral to the quality of life for all the citizens of the state. Missourians expect a safe and healthy environment as well as agricultural and forestry industries that serve as stewards of the natural resource base.

Recent surveys indicate that less than 10 percent of the 300,000 private forest landowners in the state actively manage their woodlands. Approximately 13 million acres of forestland are producing less than half of their potential wood product output. Reduced tree vigor is also reflected in serious outbreaks of widespread oak mortality in the heavily forested areas of the state. In addition, Missouri is losing critical wildlife habitat as a result of increased fragmentation of the rural landscape, where many new landowners have little or no knowledge of natural resource management.

Expanded educational programs are needed to enable landowners to make informed decisions regarding the stewardship of their farms and woodlands. Since 2001, Missouri landowners have had opportunities to learn about forestry and wildlife management through two southern-based distance-learning short courses: Master Tree Farmer and Master Wildlifer.

- b. Impact:
  - A DVD-based "Woodland Steward Short Course" and manual were developed during this reporting period to serve as the curriculum and instructional materials for the new Missouri Woodland Steward Program. The program was developed to meet the following goals:
    - Improve Missouri landowner's level of awareness of the benefits of active forest management.
    - Present science-based information that enables landowners to begin managing their woodland acreage for forest and wildlife objectives.
    - Increase the number of landowners that seek professional assistance as they manage for forest and wildlife objectives.
    - Increase the number of privately owned acres under active forest/wildlife management.

The course was piloted in West Plains, in cooperation with Richard Atkinson, at the University of Missouri Extension Center. The course will be offered statewide in 2006.

- During 2005 the Missouri Master Wildlifer Program (consisting of 24 hours of instruction) was conducted at three MU Extension Centers, with 84 landowners participating. As a result:

- Ninety-five percent of the participants improved their understanding of wildlife ecological principles, learned basic wildlife management concepts and learned to apply techniques to improve habitats for wildlife on their property.
  - Ninety percent of the participants indicated their intention to implement wildlife management practices on their property as a result of this program, positively affecting wildlife habitat on about 25,000 acres.
  - Sixty percent of the participants indicated their intention to develop a wildlife management plan for their property, enabling them to make improved management decisions.
  - During 2005 the Missouri Master Naturalist Program was conducted at five pilot locations in Missouri. One hundred and five (105) volunteers completed the training, resulting in a 75 percent increase in the number of trained Master Naturalist volunteers. Selected program accomplishments include:
    - Five Master Naturalist Chapters were organized
    - Since 2004, 141 volunteers have been trained
    - Volunteers provided about 3,100 hours of community service valued at \$54,405.
    - Preliminary volunteer evaluations indicate participants increased and retained knowledge in natural resource management as a result of Master Naturalist training (Pre-test: 28.73; post-test: 42.23).
  - During 2005 University of Missouri Extension, in partnership with the Missouri Department of Conservation, conducted educational programs and workshops designed to provide science-based information on bobwhite quail ecology and management. Program accomplishments include the following:
    - Eighty-five landowners (85) landowners participated in “bobwhite quail management workshops” conducted at University of Missouri Extension Centers during 2005. Over 90 percent indicated they learned and planned to adopt management practices specifically for improving habitats for bobwhite quail on their property, impacting approximately 10,000 acres.
    - Regional Quail 101 Professional Development Workshops were conducted for over 600 MDC natural resource professionals. 90 percent of the participants improved their knowledge of bobwhite quail ecology and 60 percent of the participants planned to use habitat evaluation techniques to improve bobwhite quail habitat management decisions on private lands.
    - These programs have strengthened the cooperation between University of Missouri Extension and the Missouri Department of Conservation.
    - More than 90 percent of participants said they would recommend these programs to other landowners.
    - This has set the stage for development of a comprehensive Missouri-based natural resource education program more suited for the Midwestern states.
- c. Source of Funds: Smith-Lever, RREA, State
- d. Scope of Impact: Missouri

**Key Theme: Pesticide Application**

- a. Description: Pesticide Applicator Training. Approximately 6,000 commercial and 35,000 private (farmer) pesticide applicators reside in Missouri. Anyone who applies any type of pesticide for commercial purposes must be certified by passing a mandatory initial exam. Missouri statutes require that these applicators be re-certified, by training, before being re-licensed on a three-year cycle for commercial applicators and a five-year cycle for private applicators. Environmental and

health concerns about pesticides, the changing field of pesticide development, new laws and regulations, and registration make a responsive and intensive training program essential. The private applicator training program reaches into essentially all of Missouri's counties.

University of Missouri Extension provides educational programs to help those aspiring to obtain certification for commercial purposes. The program attracts nearly 500 attendees each year. Program attendance figures indicate that nearly 1,000 private applicators attend initial training, and approximately 7,000 attend for re-certification purposes. Public access to the Pesticide Applicator Training Program may be obtained through the web at <http://agebb.missouri.edu/commag/beef/premierbeef/index.htm>.

University of Missouri Extension regional specialists conduct private applicator programs. Commercial applicator training was conducted in five locations during January. Instructors who supported the program represented the Missouri departments of Agriculture, Conservation, Natural Resources and Transportation; University of Missouri Extension; Oklahoma State University; and private industry.

b. Impact:

- More than 2,000 commercial applicators and 6,000 private applicators attended University of Missouri Extension Pesticide Applicator Training sessions during 2004. A survey of commercial applicators who attended certification sessions reported "planned" changes in their behavior as a result of the training:
  - 96 percent of the participants plan to spend more time reading the pesticide label when mixing or using chemicals.
  - 81 percent plan "always" to use personal protective equipment when mixing and applying pesticides.
  - 98 percent plan to familiarize themselves with their company's emergency plan.
  - 95 percent rated the overall training as "excellent or good."

In a survey of the private applicator audience:

- 77 percent of participants indicated that the training heightened their awareness of pesticide laws and regulations.
- 86 percent indicated that the training had improved their comprehension of the pesticide label.
- 75 percent indicated that the training improved their knowledge related to protecting the environment.
- 94 percent indicated that the training improved their knowledge of personal protective equipment selection and use.
- 82 percent indicated that the training improved their calibration skills.
- 91 percent indicated that the training improved their skills and understanding related to proper transportation and storage of pesticides and cleanup of spills.

Society demands a cleaner and safer environment. Pesticide training programs educate producers in making environmentally sound decisions about the use of pesticides.

- As a result of extension programming efforts, Missouri farmers have adopted integrated pest management programs on 80 percent of Missouri's corn, soybean and cotton acreage.
- Five one-day pest management workshops were held in 2004. Tests before and after the workshops indicated that participants significantly increased their knowledge of pests and integrated pest management by attending the training sessions.

- Data from the 2002 Bootheel Irrigation Survey showed that 25 percent of irrigators growing corn under pivots were not applying all of their nitrogen in one or two applications but were using “chemigation” to apply small amounts as needed. The same growers also avoided leaching Nitrogen by applying small irrigation amounts more frequently.
- c. Source of Funds: Smith-Lever, EPA, state
- d. Scope of Impact: Missouri

**Key Theme: Water Quality**

- a. Description: Watersheds Resource Education. In Missouri, private individuals own 93 percent of all land. Potential pollution sources from agriculture, industry, on-site sewage and water-based recreation are assessed for economic, environmental and social impacts relative to the communities involved.

The Missouri Department of Natural Resources is mandated to establish Total Maximum Daily Loads (TMDLs) in areas that have identified water quality degradation. Local watershed communities must look at the social, economic and environmental benefits offered by different management decisions to determine the feasibility of their plans. Watershed committee members need to receive education and instruction on the scientific principles involved and assistance in implementing watershed management strategies. The process takes significant time, but the final product -- the water quality management plan -- is one that is highly useable and acceptable with local watershed citizens.

A Source Water/Watershed Protection and Watershed Design Planning program has been designed to integrate public participation and community capacity building with best management practices implementation for water quality protection. Individual watersheds/communities work directly with local resource agency personnel to develop and implement a watershed plan that reduces potential water quality problems. Science-based assessment and ongoing monitoring projects are being used to provide objective information for locally led decision making. State and regional extension specialists assisted community/watershed leaders in coordinating group meetings to discuss water quality issues and locally agreed upon management practices that could be implemented by area producers. Demonstration/research projects are being used to show local producers how they might benefit from alternative conservation practices.

- b. Impact:
- University of Missouri Extension facilitated development of watershed management plans in 24 communities. Through the facilitation process, a local group is formed to identify the issues, select management strategies and funding possibilities, and propose a time line for implementation. By acting as the facilitator of these meetings, University of Missouri Extension has increased local capacity within the communities, increased awareness and knowledge of environmental concerns and changed behaviors and attitudes about local watershed management practices.
  - The Shoal Creek and Elk River watersheds in southwest Missouri have developed watershed plans to reduce levels of bacteria, sediment and livestock nutrients from local streams and lakes. Both groups have applied for 501(c)(3) status and have demonstrated a change in behavior based on the knowledge and awareness created by working with University of Missouri Extension in watershed planning. Besides acquiring \$1.4 million through local Soil and Water Conservation Districts to implement management practices to improve water quality, the group has applied for

an EPA Water Quality Section 319 grant to provide information/education programming, and address urban and nonfarm issues. The three counties affected in the watersheds produce more than \$4 billion in livestock and poultry revenues yearly. By implementing a watershed management plan that addresses the nutrient and bacteria loading into water bodies, the livestock industry can remain strong and viable for the local economy.

- The Jack's Fork watershed in south central Missouri is a designated national scenic waterway that has more than 1.5 million visitors each year. It is also an area of rolling hills and pasture that supports a \$13.5 million livestock industry. Local leaders in the tourism and agriculture industries worked together with environmental groups to develop a watershed management plan that would reduce bacterial loading in the Jack's Fork River. Based on a locally developed watershed management plan, the watershed group identified sources of bacteria in the watershed and developed a plan of action to reduce, control or eliminate the sources and at the same time protect the viability and productivity of tourism and agriculture in the area.
- University of Missouri Extension has been asked to help facilitate a 12-county watershed planning event that will focus on water quality and quantity. The northwest region of Missouri has deep loess soils but little useable groundwater. Testing in shallow-drilled private wells has shown high levels of bacteria in more than 81 percent of the wells. The water supply in these wells is directly associated with seasonal rainfall and the subsurface soil moisture conditions. A nonprofit wholesale water commission is being discussed as a way of providing water that is of high quality and sufficient quantity. University of Missouri Extension is working cooperatively with the Missouri Department of Natural Resources to facilitate public meetings and get public input concerning the development of the commission.
- The Heartland Water Coordination Initiative is a USDA-CSREES 406 Water Quality grant in which the University of Missouri is collaborating with Kansas State University, Iowa State University, the University of Nebraska and EPA Region 7 on the topics of nutrient pesticide management, animal manure management, and community involvement in watershed management (CIWM). Missouri in particular is providing leadership for Region 7 in aspects of CIWM. Through the project a CIWM workshop was held in March 2004, highlighting community development principles and practices used to assist local watershed communities in organizing a watershed management process. Case studies from area watersheds were used as tools for learning and sharing of experiences and expertise. From this workshop, participants' evaluations identified a clear need for more resources and tools to address conflict mediation and public deliberation associated with local watershed management activities.
- In June 2005 the Heartland CIWM team hosted a training workshop to build capacity for identifying and managing conflict associated with citizen's involvement in watershed management efforts. The workshop was structured for university extension professionals from the four-state region who have worked with local watershed groups. This provided an opportunity to strengthen the regional network of extension professionals involved in local watershed management activities and to facilitate exchange of water quality information, research and activities in the Heartland four-state region. Participants strengthened their community development skills by learning to identify different types and sources of conflict and by learning how to mitigate and address contentious watershed groups. The training also addressed the role of extension professionals in local watershed management activities, as well as the role scientific and technical information plays in the formation and sustainability of local community watershed management groups. Forty-six regional professionals, from four state land grant universities, participated in the conflict management training.
- The next phase of the Heartland CIWM project will be addressing partnership and coalition building among local, state and regional watershed professionals. Case studies and surveys are being continually developed in the four states to document social processes and indicators related to successful watershed management in our area.

- Many of the small communities in Missouri are unincorporated and many are un-sewered communities. Three of these small communities in northeast Missouri worked with University of Missouri Extension to become a 501(c)(3) organization to look at possible solutions to sewerage issues within the communities. The organization received a \$1.5 million grant from USDA Rural Development and the Missouri Department of Economic Development to study the feasibility of creating a rural sewer district and to install “low cost” waste treatment centers in each community. Once completed, the reduction of improper on-site sewage disposal should improve human health and water quality in the region.
- The University of Missouri Watershed Science and Stewardship Center received a grant through the Soil and Water Conservation Program to develop a systematic approach to model watersheds and determine the effectiveness of implemented watershed practices for improving water quality. A computerized modeling tool has been designed and field tested in five pilot watersheds. Through the Missouri Department of Natural Resources, a grant has been received to develop the training courses needed to educate selected agency personnel involved in watershed management planning. The model will assist these watershed managers in the evaluation of practices and help determine cost effectiveness of the practices being installed that improve water quality.

For additional program information see: Water Resource Information (<http://www.fse.missouri.edu/waterquality/>) and Missouri Watershed Information Network (<http://outreach.missouri.edu/mowin/>).

- c. Source of Funds: EPA/DNR; USDA/Missouri Environmental Quality Incentive Program, ARS, State, USDA/CSREES 406 grant
- d. Scope of Impact: Missouri, Kansas, Nebraska, Iowa

## Goal 5: Enhanced Opportunity and Quality of Life for Americans

### 1862 University of Missouri Extension Overview

#### Human Environmental Sciences

The University of Missouri Human Environmental Sciences Extension program is committed to creating educational programs to improve the lives of Missouri families. Through a wide variety of delivery methods, University of Missouri Extension assisted children, youth and adults in learning ways to improve their personal, family and community health and well being. In 2004, faculty continued to address major issues facing Missouri families, including child abuse, adolescent pregnancy, financial problems, poor quality childcare, inadequate housing and divorce. Through these programs faculty reached more than 250,000 Missouri citizens. In addition, over 300,000 unique visitors accessed the MissouriFamilies.org website. The Internet presence averaged **six page views every minute of every day!**

#### 4-H Youth Development

4-H Youth Development faculty from University of Missouri and Lincoln University provided program leadership, training, curricula and technical assistance to 4-H youth specialists and youth program assistants in county University of Missouri Extension offices. Our field faculty collaborated with over 11,422 youth and adult volunteers to plan, implement and evaluate local youth development programs. 4-H Youth Development Programs reached 115,900 Missouri youth in 2004-05.

4-H Youth Development Programs reached young people in every Missouri county. About 25 percent of the youths reached were enrolled in the 4-H club program, a yearlong educational experience that included learning by doing in projects, community service, and family involvement. Others participated in 4-H school programs, seminars, conferences, camps, or childcare programs. In addition, faculty worked with parents, caregivers, educators, and youth professionals to improve the systems that support young people.

4-H Youth Development Programs collaborated with diverse agencies, organizations and partners to expand public and private resources available to meet the needs of Missouri's youth and families. In 2005, 4-H Youth Development Programs generated over \$1,303,695 in grants, contracts and awards in support of outreach programs. In addition, the Missouri 4-H Foundation provided \$933,692 in private support. External support of 4-H Youth Development Programs totaled over \$2.2 million.

4-H Youth Development Programs address the broader developmental needs of youth, in contrast to single issue or deficit-based models that focus solely on youth problems. Programs are grounded in research and based on articulated citizens' needs and concerns. 4-H Youth Development Programs strive to influence the "environments" or multiple systems that impact young people at the family, community, state and national levels. The following are highlights of the 2005 4-H Youth Development Programs.

- Missouri's 11,422 4-H volunteers provided nearly \$42 million in volunteer services in 2005. National studies suggest volunteers donate an average of 208 hours annually, valued at \$17.55 per hour.
- 2,522 youth professionals, human service providers, and volunteers participated in professional development offered by University of Missouri 4-H Youth Development faculty.
- Youth Futures - College Within Reach program impacted 60 adolescents aged 14-19 through an intensive college orientation conference and a mentoring program. The program helped youth



(minority, low-income, first generation college students) view college as an obtainable goal. Of participants who graduated from high school during 2002 to 2004, 63 percent are currently enrolled in college, 7 percent joined the military and 15 percent entered the workforce.

- USDA, CSREES recognized 4-H Living Interactive Family Education Program (LIFE) of the Family and Community Resource Program (FCRP) as a National Program of Distinction. In addition, the Annie E. Casey Foundation designated the 4-H LIFE program as a Family Strengthening Program for improving outcomes for rural, disadvantaged families and awarded a \$15,000 stipend to further efforts <http://extension.missouri.edu/fcrp/lifeevaluation/life.htm>. The National Collaboration for Youth took note and featured the 4-H LIFE program in *Making a Difference in the Lives of Youth*, a compendium of successful programs distributed in hard copy to 3,000 4-H youth and other extension professionals and electronically to over 10,000 youth professionals nationwide <http://www.nsembly.org/nydic/>. Kudos to Tammy Gillespie, Lynna Lawson and Rob Wilkerson.
- A comprehensive volunteer screening process was implemented requiring every applicant to be screened for child abuse and neglect. As of fall 2005, more than 8,600 volunteers successfully completed the process.
- ParentLink's Healthy Parenting Toolkit (HPTK) helped 195 people from 47 communities understand the issues of military deployment, relocation, and reality of dangerous work for military families to begin building systems of support for these families in their communities.
- ParentLink's WarmLine provided a resource for parents, professionals and community groups across the state of Missouri. Individuals contacted the WarmLine seeking research-based information and problem-solving support pertaining to child development and family support systems. WarmLine staff also gave information to callers about local resources. During the past year, 40,000 individuals contacted the WarmLine for parenting resources.
- Through a cooperative agreement with the University of Missouri-Columbia Student Financial Aid office, students are hired as 4-H community service assistants (CSAs) and assigned to county University of Missouri Extension Centers for summer work. Since 1997, the value of the 4-H CSAs work in Missouri communities is nearly \$580,000. During summer 2005, 31 University of Missouri students worked as 4-H CSAs.
- Of the 74,293 4-H'ers involved in the school enrichment program, over 37,000 of these youth in grades 2 through 6 participated in the Agriculture Education project called Hatching Chicks in the Classroom. This school enrichment project uses pre-incubated chicken eggs, brought to the classroom for a week, to teach basic scientific concepts in egg development and life and death cycles.
- 4-H Youth Civic Engagement project, AmeriCorps\*VISTA members started 25 new youth civic engagement programs and expanded 17 existing programs in 29 low-income communities. Of the 1,740 youth who participated, an estimated 58 percent were from low-income families.
- The 4-H Shooting Sports program involved 5,521 youth and 906 adult volunteers. Other environmental stewardship programs reached 7,526 youth, including forestry, soil conservation, sport fishing, wildlife, ecology, environmental science, outdoor skills, water riches, and conservation.
- 20 4-H Camp groups participated in a statewide evaluation. Youth age 10 to 13 agreed most strongly that while having a wealth of fun, 4-H Camp afforded them the opportunities to learn skills to work out differences with others, to complete jobs they were responsible for, to make new friends and to follow directions.
- Volunteer leader development remained a primary focus in the natural resources area. More than 194 adult volunteers received intensive subject matter and youth development training at Shooting Sports, Sportfishing or Wildlife workshops.
- Missouri's 4-H Global Education program objectives are to assist young people, families and communities to learn more about other countries and cultures, develop an appreciation of the social,

economic, political and cultural contributions of all people and better understand how culture influences values, beliefs and attitudes. Exchanges with Japan, Russia, Ukraine, Australia, and Finland were coordinated.

### Community Development

The University of Missouri Community Development Program is focused on creating sustainable and viable communities for healthy families, youth, businesses, governments, and organizations in our urban, suburban, and rural areas. Programs focus on developing community capacity through collaborative learning to broaden inclusion, engender citizen participation, and foster effective local decision making. Skills necessary for effective community dialogue, community decision-making and planning and policy development are actively taught.

Four areas have been especially emphasized this past year. First, leadership development in local communities through the Community Development Academy has demonstrated many positive impacts in communities across the state. Second, creating inclusive communities to particularly address the rapid in-migration of Hispanic families into Missouri has involved outreach to Hispanics and works to foster multicultural communities across the state. Third, community decision making efforts have focused on increasing the number of communities engaging in public dialogue around important issues and on providing sound decision support and planning assistance to communities through collaborative learning. Fourth, community emergency management programs have focused on building resilient communities capable of responding to natural disasters and prepared for homeland security threats.

The Community Development Program draws upon resources from several departments in the four campuses of the University of Missouri and works collaboratively with Lincoln University to reach out to diverse audiences as well as support a number of other extension programs. These programs include grassroots watershed plan development, community gardening and food systems, and community housing programs among others.

### Program Highlights

- The 65 participants in the Community Development Academy in 2005 reported increased knowledge and understanding of community processes and changed their practices in their communities. The interactive courses helped them build relationships with fellow community development practitioners from across the state and around the world. Many comments indicated this was one of the most important assets of the course in both the short-term and long-term. When surveyed at one year or later, 95 percent of CDA participants reported using what they learned, and nearly 50 percent reported using what they learned “a great deal.” Those who completed the program demonstrated engagement in development of new and expanded local leadership training, involvement of citizens in planning and implementation of community-wide programs, adoption of community-based approaches in all aspects of outreach and extension work, cooperative and partnership efforts to achieve community success. New partnerships—both formal and informal—have formed to work on issues of importance to citizens.
- Public deliberation programs in 2005 were conducted with 27 partners and engaged 164 volunteers, reaching approximately 1,400 persons directly.
  - The Missouri Rural Biotechnology Commission is using findings from biotechnology regional forums for analysis and development of public policy recommendations.
  - The Missouri Department of Health and Human Services and the Missouri Area Health Education Centers are using findings from forums on healthcare delivery to the uninsured to inform state public policy development.
- The Community Emergency Management Program in partnership with the Fire Rescue and Training Institute provided 52 classes to 1,668 participants from State Emergency Management, State Fire

Marshal, State Department of Agriculture and local elected officials, police, fire, EMS, health, public works, transportation and emergency management. In addition, programs conducted by regional faculty reached approximately 6,200 persons directly, involved 172 partners and 45 volunteers.

- In the wake of a devastating hurricane season, hundreds of thousands of evacuees fled the gulf coast and over 40,000 came to Missouri. A multidisciplinary community emergency management team, comprised of regional extension specialists and campus-based faculty and staff, moved into action. Team members worked with local relief-agency coalitions called COADs (Community Organizations Active in Disasters) to coordinate recovery efforts among agencies. At the request of Missouri's State Emergency Management Agency (SEMA), team members worked with COADs and FEMA to support recovery efforts, including working directly with SEMA and FEMA. University of Missouri Extension was able to support these local coalitions and provide research-based disaster recovery information from University of Missouri Extension and affiliated EDEN institutions.
- The Fire and Rescue Training Institute and Office of Social and Economic Data Analysis conducted a Statewide Survey of Missouri Fire Districts. This analysis integrated data elements from multiple state sources including the State Fire Marshal and identified key safety and training issues for local districts.
- The Alianzas Program partnered with the Mexican Consulate to host the 2005 Bi-National Health Week, attracting nearly 640 participants and 42 health and human service organizations resulting in increased public awareness, understanding, and knowledge of health services available at the local level for Latino immigrants. More than 25 organizations continue to meet and make available educational offerings and screenings for Hispanics at the Mexican Consulate on a monthly basis.
- Over 150 male inmates participated and graduated the past two years in the inmate placement program (IPP) of the Federal Bureau of Prisons (FBOP) at the Federal Medical Center in Springfield, Missouri. Some were totally Spanish speaking and about half were African American. Its goal is to initiate programs that enhance employment opportunities for federal prisoners about to be released back into their communities.
- The "Cambio de Colores (Change of Colors) – Latinos in Missouri" conference served as a catalyst for the community-at-large conversations with 285 state, university and local attendees from 150 organizations, exploring an array of Latino- and community-based issues and learning best practices for interacting with the Latino community.
- Community decision making programs engaged over 400 partners in programming and involved over 63,000 local contacts.
  - As a result of work with the Department of Natural resources to monitor and map winds in northern Missouri and to provide information on wind energy installations, new statewide wind energy maps were developed as a result of this study. A statewide wind energy task force was formed to provide information about wind energy to investors and citizens. A private firm has expressed interest in the northeast area. In northwest Missouri, a firm has just announced it will build a project in the region. The potential impacts include higher incomes for farmers on whose lands the turbines are located and reduced environmental pollution from energy production.
- Analyses have contributed to policy deliberations at the state level regarding the impact of the August sales tax holiday on state and local revenues, how Missouri's state and local taxes and expenditures compare with others, the contributions of the state-funded Internet backbone (MOREnet) is making to 64 Missouri higher education institutions and estimated the net benefits of public support of the network, the necessary economic and business projections to conduct scenarios helping inform local business decisions, the location and characteristics of Missouri entrepreneurs for local economic development planning, and the relationship between the structure of local economies and the welfare of children stimulating economic development initiatives.

- Community planning processes have resulted in:
  - A joint marketing plan for Holt County, a city and a seasonal business came together to develop a joint marketing plan, expected to result in a 20 percent increase in bookings and increased profitability and employment.
  - A changed local economic development strategy in a northwest Missouri region to focus on entrepreneurship development.
  - Cooperation with Wal-Mart in Fredericktown, Missouri to increase downtown traffic and commerce.
  - The development of a viable master plan for Herculaneum, Missouri, which has suffered serious environmental and health problems from a lead smelter that has operated in the town for over 100 years. The residents indicated they now have a voice in expressing health and environmental concerns created by operation of the smelter.
  - Improved access to healthcare in Johnson County through the opening of a free clinic as a result of a needs assessment and planning.
- The three year planning process with the Missouri Soil and Water Districts Commission resulted in the adoption of the plan which will guide development of program priorities for the next 10 years and serve as an educational tool for the organization as they prepare for a ballot initiative in 2006. In particular, the organization will focus on changing land use and education for future research and program development as a result of the statewide planning process.
- Evaluation of participants of leadership programs continue to indicate participation has resulted in personal growth and self-efficacy, community commitment, a shared future and purpose for the community, community knowledge, and civic engagement. Over the past 20+ years, over 7,190 participants from two-thirds of Missouri's counties in the Experience in Community Enterprise and Leadership (EXCEL) program are actively engaging in local, regional, and state roles to benefit their communities. The fastest growing aspect is the development of specific community youth leadership development programs, with 34 having been conducted this past year.
  - Leadership Northwest Missouri graduates worked to correct income guidelines established by 2000 Census that excluded all of Northwest Missouri for eligibility for Rural Development funds with the result that almost all of the counties and many communities now qualify for Rural Development funds.
  - Maysville City Manager and Leadership Northwest Missouri graduate spearheaded the 2004 Leadership Northwest Missouri class project to help local communities find funding for placing emergency sirens in their communities. The goal is to have early warning systems in all small rural communities. To date, 8 communities received \$57,408 funding for early warning systems.
  - Lafayette County Commissioners use the LEAD roster to aid them in selecting citizens for county boards and county committee appointments.
- The Leadership RAP for At-Risk Youth program has been conducted since 1992 at the Robert L. Perry Juvenile Justice Center (JJC) in Boone County with 537 graduates. In 2005, 17 juveniles participated in the program. A study recently conducted revealed 28 percent fewer participants were referred back to law enforcement agencies following their release from JJC than were similarly referred from an equal number of other JJC residents randomly selected for the same time period. A program participant summed up his feelings about the Leadership RAP program: "It was one of the best things that happened to me."
- In St. Louis, the Old North Neighborhood Partnership served as an effective vehicle to connect the university and the community, engage faculty and students in applied research and community-based learning projects, and create and/or facilitate positive changes in an urban neighborhood.
- Step-Up to Leadership! participant Mary Brown of Florissant, Mo., organized a home weatherization project for elderly residents, using supplies donated by the St. Louis Area Agency on Aging and volunteers from her church. "Step-Up to Leadership! has really pushed me to a lot of

places,” she said. “I feel like I’m being launched.” Brown is among the first graduates of the leadership program, piloted in St. Louis County and City, and central Missouri. As a condition of federal funding, community action agencies are required to include the constituents they serve on their boards of directors.

### **1890 Cooperative Extension Overview**

Lincoln University Cooperative Research and Extension efforts toward accomplishing Goal 5 embraced and implemented programming which addressed such issues as aging, youth citizenship, academic enhancement, youth and community leadership development, military families, communication skills, horticulture and more.

All efforts under this goal were directed toward fulfilling and increasing family participation in parenting programs, increasing the number presented and participation in programs on career and life skills, job training, youth citizenship, enhancing youth academic performance and improving standards of living and quality of life for all Missourians.

### **1862 University of Missouri Extension**

#### **Key Theme: Aging**

- a. Description: Successful Aging. Ranking among the top one-third of states in proportion of the population over age 65 and with 25-30 percent of some rural counties in this age range, the Aging Program has continued its focus this year on Successful Aging and on Grandparents Raising Grandchildren. The Successful Aging project provides programming and resources to help older adults lower their risk of disease and disease-related disability, improve mental and physical function, prepare for social role changes (e.g., retirement), and remain engaged in life. Key materials have been delivered through a comprehensive website—the Center on Aging Without Walls (<http://iml.umkc.edu/casww>), a correlated curriculum on “Aging Well,” the Missouri Families website, and in several other areas critical to successful aging (e.g., “Healthwise for Life” and “Grandma’s Yellow Pie Plate”). A small grant from the Brookdale Foundation has focused on building support groups for grandparents and other relatives raising grandchildren (particularly in rural communities) throughout the state of Missouri, as well as facilitating collaboration through a state-wide network.
- b. Impact: During FY04, regional specialists spent 1,300 hours providing educational support to over 24,000 contacts. Topics included retirement planning, money management, nutrition, disease prevention, strength improvement, chronic disease self-management, memory training, driver safety, preserving family traditions, passing on important possessions, Medicare drug benefits, emergency management training, life histories, spirituality and aging. In general, response of citizens to programs was highly positive, and they asked for more such programs (sometimes in other sites) in their communities. Older adults reported they would use information learned to initiate changes and action steps—e.g., making healthier eating choices, increasing exercise, improving memory, updating wills, selecting a Medicare drug program, and making specific life-style changes to care for or cope with chronic disease. Where follow-up studies (3-12 months) were done, program participants still found value in what they had learned and reported having made relevant changes.

The specific program focus on grandparents and relatives raising grandchildren is achieving its intended purpose. Grant funds made possible nineteen mini-grants of \$250 each to expand or establish programs for relatives as parents in local communities. Projects ranged from starting a library for grandparents to sessions for grandparents and children with appropriate activities for

each. This focus is now a part of program duties of over twenty regional Extension specialists who are facilitating local support groups in their assigned counties and cultivating the program needs of their clients. One example of a resulting successful outcome in a support group in Buchanan County was a grandmother who after a number of failed attempts to gain legal guardianship of her two grandchildren was able to do so as a result of a presentation made by a lawyer to their group. She gave much credit to the group's support and the information provided for a successful outcome with the children's adjustment and improved relations with the children's birth father.

- c. Source of Funds: Smith-Lever, Grants
- d. Scope of Impact: Missouri

### **Key Theme: Childcare/Dependent Care**

- a. Description: Childcare. University of Missouri Extension is striving to relieve Missouri's "silent crisis" in childcare through targeted childcare provider professional development opportunities. Based on the recent Plan of Work process, stakeholders identified several focus areas for ongoing and new program efforts: 1) childcare provider and program improvement, 2) workforce preparation, and 3) the socialization of children's health, nutrition, and physical activity in childcare facilities. Extension faculty will continue offering training opportunities that support current statewide initiatives, such as the MO Department of Elementary and Secondary Education's Pre-Kindergarten Standards, MO Extension's Building Strong Families modules, and specialized workshops (e.g., "Child Observation") while also developing several new programs. To address issues associated with early childhood workforce preparation, Extension faculty will deliver programs designed specifically for entry-level childcare providers (e.g., Penn State's New Staff Orientation) and program administrators (e.g., "Everything but the Children: Childcare Program Administration"). Lastly, in an effort to improve young children's early eating and activity experiences, Extension faculty will provide training to state agency staff and childcare providers. Several programs are already in place (e.g., "Healthy Start", "Socializing Healthy Habits: Children's Nutrition and Physical Activity") and will continue to be offered.

Childcare impacts most aspects of daily life for Missouri citizens. Because 64.5 percent of mothers with children under age 6 and 77.3 percent of mothers with children ages 6 to 17 are members of Missouri's workforce, childcare participation has become the norm for Missouri children and families. Research indicates the quality of children's childcare experiences contributes to their immediate and long-term well being. Moreover, childcare provider preparation and ongoing training are the best predictors of quality early care and education. However, national assessments depict a system of mostly poor to adequate childcare programs. Missouri cannot recruit and retain a well-prepared childcare workforce, support families' workplace success and promote healthy child development without addressing the problem from multiple perspectives.

- b. Impact: During 2005, 13,392 individuals were touched by University of Missouri Extension's efforts to improve the provision of quality early care and education. For instance, childcare providers and other early childhood professionals attended the workshops: Child Observation, Promoting Early Literacy in Young Children, and Socializing Healthy Habits in Young Children: Nutrition and Physical Activity. Although the evaluation results are not quantifiable, anecdotal evidence suggests childcare providers value our educational programs and typically report acquiring new knowledge and skills.
- c. Source of Funds: Smith-Lever, State, Grants

d. Scope of Impact: Missouri

**Key Theme: Children, Youth and Families at Risk**

a. Description: Adolescents At-Risk Program. The troublesome adolescent years have been a source of social concern for decades. The years from puberty to early adulthood have been viewed as risky and problematic. Based on the *Youth Risk Behavior Survey* data for Missouri teens in 2003, 63.3 percent of high school students have smoked tobacco, 77.8 percent have consumed alcohol during their lifetime, 30.5 percent have engaged in binge drinking, and 41.3 percent have smoked marijuana. Large percentages of youth also carry guns and have been involved in fighting.

Sexual activity is another area of significant concern. Although the birthrate for teens has been declining in Missouri for the past decade, the teen birth rate was 23 per thousand aged 15–17 in 2001. When asked about sexual behavior in 2003, 52.2 percent of high school students reported having had sexual intercourse, and 38.4 percent are sexually active on a regular basis.

The 4-H Youth Development and Human Development Programs are engaged in a variety of programs designed to prevent youth from becoming involved in risky adolescent behaviors. Providing alternative youth activities and supervised after-school care programs are two important ways in which University of Missouri Extension prevents youth from becoming involved in problem behaviors. In addition to these efforts, the Center on Adolescent Sexuality, Pregnancy and Parenting developed several major programs designed to prevent teen pregnancy and provide support to new adolescent parents. These were:

- Maltreatment and Adolescent Pregnancy and Parenting (MAPP). The purpose of the MAPP Program is to increase professionals' awareness of three issues: 1) the relationship between childhood abuse and adolescent pregnancy, 2) the likelihood of abuse during adolescent pregnancy, and 3) the likelihood of abuse among children of adolescent parents.
- HIV Prevention. University of Missouri Extension regional specialists train teachers and school personnel from around the state in one or more of the Center for Disease Control's HIV-risk reduction curricula. The purpose is to increase the commitment of Missouri school administrators and teachers to implement one or more of the Center for Disease Control's HIV-risk reduction curricula in their schools.
- Missouri Volunteer Resource Mothers Program. Staff have developed a mentoring program for teen parents.
- For additional information see Adolescents (<http://www.missourifamilies.org/adolescents/index.htm>) and Missouri 4-H (<http://mo4h.missouri.edu/>).

b. Impact: Adolescents at Risk is a Multi-State Extension program. The following impacts are state specific and relate to impact in other states.

The success of the Missouri Volunteer Resource Mothers Program, a mentoring program model for pregnant and parenting teens, was demonstrated in a quasi-experimental research study (Pike, 1998) in Boone County.

In addition, regional one-day HIV information workshops were presented around the state. These six-hour workshops reached school teachers, administrators and community service professionals. These workshops provide CDC-approved curricula to professionals in the areas of abstinence, STD

and HIV prevention. The programs are conducted and evaluated in partnership with the Missouri Department of Elementary and Secondary Education.

Past follow-up evaluation results of the mentoring program demonstrated that, compared with a nonmentored group of pregnant and parenting teens, the mentored group had a) decreased child abuse potential, b) no repeat pregnancy within one year, c) decreased parenting stress, and d) increased parenting knowledge. The long-term goal is to help adolescent mothers provide a loving, safe and developmentally appropriate environment for their infants. The Adolescent Mother Journaling Program teaches techniques to use as alternatives to physical or verbal abuse. Since 1998, 38 Resource Mothers programs have been established in Missouri and five states: New York, Hawaii, New Mexico, South Carolina and Georgia. Over 90 teen mothers received mentoring through Missouri MVRM (Missouri Volunteer Resource Mother) programs this past year.

In 2005 over 12,000 educational contacts were made throughout Missouri. Youth and their mentors participated in such programs as the Missouri Volunteer Resource Mothers Program, Adolescent Journaling and Adolescent Pregnancy Prevention programs. These programs have been shown to be highly effective in reducing the risk of child abuse, neglect and repeat unwanted pregnancies.

- c. Source of Funds: Smith-Lever, State
- d. Scope of Impact: Missouri, Georgia, Hawaii, New York, New Mexico, South Carolina

### **Key Theme: Children, Youth and Families at Risk**

- a. Description: Building Strong Families. The program outcomes for Building Strong Families are to help families develop stronger relationships, improve their communication and thrive within their communities. Demographic trends indicate the need for this type of programming is greater than ever before. Recent research has looked at the expanded roles of fathers in the home and shows a new kind of father emerging – a more involved one whose responsibilities reach farther than his career. As women continue to balance work and family responsibilities, they look for ways to alleviate family stress. Children continue to face a number of issues, as well. In Missouri, 15 percent of children live below the poverty line. Over the past thirty years, the obesity rate for children has more than doubled.

In addition, the Missouri Department of Corrections indicates, “ninety-seven percent of all the men and women committed to prison will someday be released from incarceration. During FY2004 more than 18,000 individuals were released from Missouri correctional institutions. 32 percent (of 18,042 individuals committed in FY04) were returning parole violators who failed to transition successfully and were returned to confinement.”

The Building Strong Families: Challenges and Choices Program is designed to help families find their strengths and learn skills to build on those strengths (<http://outreach.missouri.edu/bsf>). The program draws from an interactive, 13-module curriculum to provide a series of life skills workshops for families. Building Strong Families targets working families with children, but it can be and has been adapted to reach many different audiences (e.g., teens, grandparents, and childcare providers).

The curriculum is structured so a series of 3 to 13 sessions can be taught focusing on the particular needs of families. Supplemental materials were developed for lower-level readers, and a parallel curriculum for youth (ages 5-12) is being developed. Individual groups can customize the multi-session program by choosing from the following topics: Family Strengths, Communicating,



Managing Stress, Child Self-Care, Food and Fitness, Working, Setting Goals, Positive Discipline, Money Matters, Balancing Responsibilities, Consumer Beware, Healthy House, and Kids and Self-Esteem.

In 2005, an additional 102 facilitators from Missouri were trained to implement the program in their communities. The Building Strong Families program design team has certified a total of 525 Extension specialists and paraprofessionals and community agency educators from Nebraska, North Dakota, South Dakota, Illinois, and Minnesota. To date, 4,419 family members have participated in the program.

The Missouri Department of Corrections contracted with University of Missouri Extension to implement the Building Strong Families Program in five correctional facilities as part of the Missouri Re-entry Process. This effort works to better prepare offenders to go back to communities with the goal to also lower the recidivism rate. Building Strong Families Facilitators reached 599 offenders.

- b. Impact: Building Strong Families is a Multi-State Extension program. The following impacts are specific to Missouri.

Early findings indicate family members are benefiting from this program. Overall, a large percentage of the adults participating in this program report they are incorporating recommended practices into the daily lives of the families. For example: Overall, 95 percent of participants who complete end-of-session evaluation forms after each workshop session state they have gained new information or learned a new skill. 75 percent say they will try the new skill or use the information with their families.

Most participants who responded to a three-month follow-up survey are making changes as a result of setting goals. Although they may not be making changes in every goal area they set, 54 out of 57 respondents checked “yes” to at least one area in which they were making changes. Many, in fact, mentioned several areas in which they were making changes.

In Cape Girardeau County, 84 percent of participants reported setting up meaningful time with their children, and 70 percent are spending quality time with them. Participants also reported making better discipline decisions (59%) and using better communication skills (79%).

Family members (n=51) shared their experiences with the Building Strong Families Program in five focus groups around the state of Missouri. Participants reported several changes they made after attending Building Strong Families workshop sessions. Many shared they feel better about themselves, they think about situations differently, they positively changed the way they act, and they learned new skills and information.

The change program participants most often brought up was a positive change in their parenting style and an improvement in the way they interact with their children. Their relationships with their children are better now than they were before they attended the program.

A mom talked about the strategies she tried with her young daughter. At the time of the class, her daughter was under 2, and the mom didn't always know what she should and should not do. The mom now feels like her parenting skills have greatly improved. “So if they (kids) don't know that they're not supposed to do that, so you couldn't explain it, and it was really frustrating around wasting my time. But when I used positive reinforcement, when I redirected her attention, she got it

a little bit better and it was easier for both of us, it saved us a lot of time. I felt that my parenting skills were getting better. And I feel that they're a lot better now."

Other comments from focus groups include:

- "I try not to hide my feelings now."
- "I am more likely to ask [for help or ideas from others in the group]. I wouldn't do this before [the program]."
- "I spend more time with my children."
- "We turn the TV off during supper. We talk to each other more."

Feedback from the Department of Corrections about the work in Missouri correctional facilities has been positive. Several inmates are asking for future sessions of Building Strong Families.

Follow-up with a number of the offenders will take place in 2006 to assess the impact of the program. Additional series are being planned in the five correctional facilities as well as in new sites.

Short- and medium-term outcomes would indicate the Building Strong Families curriculum will assist families in making sustainable changes that significantly improve their ability to live safer, healthier and better lives.

For additional program information see: Missouri Families (<http://www.missourifamilies.org/>); Center on Adolescent Sexuality, Pregnancy and Parenting (<http://extension.missouri.edu/hdfs/caspp.htm>) and Family and Community Resource Program (<http://extension.missouri.edu/fcrp/>).

- c. Source of Funds: Smith-Lever, State, Participant Fees
- d. Scope of Impact: Missouri, Nebraska, North Dakota

### **Key Theme: Children, Youth and Families at Risk**

- a. Description: Children of Offenders - Family and Community Resource Program (FCRP) and ParentLink. One of the most challenging issues facing state government in Missouri and across the nation today is the reintegration of adult offenders from prison back into society. 97 percent of all the men and women committed to prison will someday be released from incarceration. During FY2004 more than 18,000 individuals were released from Missouri correctional institutions, returning to live in communities across the state. It is in everyone's best interest that released offenders reenter society safely and live as law-abiding, self-sufficient citizens.

Several studies have shown that continued contact with family members during and following incarceration can reduce recidivism and foster successful integration back into the community. In Missouri, offenders in prison and under community corrections supervision report having 112,246 dependent age children. 70 percent of offenders who received three continuing visitors were arrest-free during their first year of release.

Missouri's correctional system has not historically focused on family relationships or creating social support systems for offenders and their families. Two programs have focused on responding to the needs of children of offenders and their families: Living Interactive Family Education (LIFE) and ParentLink.

The LIFE program was developed jointly in 1999 between incarcerated fathers and local 4-H staff to address the needs of children of incarcerated parents. It is an enhanced visitation program operating at the Potosi Correctional Center (PCC), a maximum-security prison in Missouri. As a partnership between University of Missouri Extension and the Missouri Department of Corrections, the program was funded by a grant from the Children, Youth and Families at Risk (CYFAR) initiative of CSREES-USDA.

The overall objective of the LIFE program is to promote a strong, healthy and nurturing family environment for children of incarcerated fathers, while helping those fathers and grandfathers become positive role models and mentors. The LIFE program provides children and their fathers with a low-stress, child-friendly environment in which they work together on 4-H activities based on youth and family development curricula. All LIFE fathers also attend monthly parenting skills classes.

ParentLink continued to operate Parenting Corners in two Missouri prisons for men: Western Region Diagnostic and Correctional Center in St. Joseph (Buchanan County), and Boonville Correctional Center (Cooper County). These sites have the potential to reach thousands of inmate fathers and their families with high-quality, research-based parenting information via the following delivery methods:

- Parenting Corner in each prison library
- Parenting Corner in each visiting room
- Parenting Corner in the lobby at WRDCC to reach staff and visitors to the prison
- Enhanced library at each facility with parenting resources: books, audiotapes and videotapes
- ParentLink WarmLine to address inmates' parenting questions.

ParentLink also operated a Parenting Corner in the recreation area of the Women's Eastern Region Diagnostic and Correctional Center in Vandalia (Audrain County). WERDCC is one of two state-run prisons for women in Missouri and all female inmates are processed through this facility.

- b. Impact: The program at the Potosi Correctional Center has positively impacted a total of 65 fathers or father figures, 65 youth and 90 children since it was started in 2000. In November 2005 the LIFE Program was recognized as a National 4-H Program of Distinction by USDA, CSREES. That honor led to the 4-H LIFE Program being selected as one of the five programs receiving the Family Strengthening Award from the Anne E. Casey Foundation for improving outcomes for rural, disadvantaged families.

At the encouragement of the Missouri Department of Corrections and University Extension staff, LIFE Program staff applied for and received seed funds from the Missouri 4-H Foundation to expand the LIFE program to three additional Missouri correctional facilities in the following communities: Farmington, Charleston and Vandalia. To facilitate this LIFE staff created a LIFE volunteer/staff manual to be used nationwide. 4-H LIFE has been successfully implemented monthly with approximately 150 youth and their families at the women's correctional facility in Vandalia.

ParentLink staff showcased the Parenting Corner and other ParentLink resources at a WERDCC parenting fair, reaching approximately 1,000 inmates. An additional 42 incarcerated parents made contacts with ParentLink's WarmLine staff to obtain further information on child development, parenting and parenting resources.

- c. Source of Funds: Smith-Lever, CYFAR/NCP, Grants
- d. Scope of Impact: State and National (CYFAR project)

**Key Theme: Children, Youth and Families at Risk**

- a. Description: Children of Deployed Military Personnel. 4-H is responding to the needs created by the deployment of soldiers from active military, National Guard and Reserves by developing programs and partnerships to support youth of these military families. In 2005 Missouri 4-H continued to work with staff, children and families at our two military installations – Whiteman Air Force Base and Fort Leonard Wood – by organizing clubs, enrolling members, training leaders and integrating military 4-H clubs into 4-H/Extension programming. Clubs are being organized and military youth are participating in county and state educational events and leadership roles.

Missouri’s Operation: Military Kids (O:MK) program serves the widely distributed National Guard and reserve families. The state partnership team has grown to more than 15 statewide organizations. In addition to the Missouri National Guard and Reserve, 4-H is partnering with veteran’s groups, other youth serving organizations, service clubs, and schools. The partners play an active role in creating awareness, training, fundraising, and reaching families who may not self-identify as military and find their lives are seriously disrupted through prolonged deployment.

- b. Impact: The programs of O:MK provided opportunities for National Guard and Reserve families through several methods:
  - 900 Hero Packs from Department of Defense were distributed to youth and deemed so successful that additional packs were provided by our partners and Missouri 4-H’ers.
  - Ambassadors for Speak Out for Military Kids were trained and made presentations at several statewide conferences. They have reached more than 750 “suddenly military” youth through trainings at Family Readiness Group meetings.
  - Since August of 2005, the Mobile Technology Lab has been used to keep young people in touch with Missouri soldiers who are serving away from home. The lab has been used at county fairs, the Missouri State Fair and County training events.
  - Specific information to help military families work with their children on deployment, relocation and dangerous work are part of the Healthy Parenting Tool Kit (HPTK) originally developed by U.S. Department of Defense, ParentLink of the University of Missouri 4-H Center for Youth Development and College of Human Environmental Sciences, Lincoln University, and Virginia Polytechnic Institute and State University. In 2005, USDA, CSREES funded Missouri 4-H to distribute these materials to military families through community and family trainings throughout the state. A total of 195 people from 47 communities have been reached through 7 community workshops.
  - The USDA Military funding also facilitated the ParentLink WarmLine to reach military families and their support networks with research-based information for problem-solving through an 800 phone line and website. Military as well as all Missouri families have come to use this service for their wide range of complex parenting issues, from coping with parent depression, disciplining children to addressing children’s educational needs.

Testimonials

“This opportunity to develop a partnership with WAFB and Johnson County 4-H has allowed the 4-H program to meet the needs of youth at WAFB while giving Johnson County youth a chance to better understand the life of those serving our country.”

“[the HPTK training] raised awareness of many concerns that families have when someone is in the military and what community members can do to help.”

“I’ve been so tired I haven’t been thinking straight. It helps so much having someone listen & help me make a plan as well as provide resources.” [ParentLink Warmline]

- c. Source of Funds: Smith-Lever, CYFAR/NCP, Grants
- d. Scope of Impact: State and National (CYFAR project)

### **Key Theme: Community Development**

- a. Description: Community Development Academy (CDA). The Community Development Academy provided a state-of-the-art, hands-on curriculum to prepare participants to assist communities effectively using democratic processes that give people voice and efficacy in determining and creating the future of their community.

Built on the Principles of Good Practice adopted by the Community Development Society, the Academy provides a framework for approaching work in communities that maximizes human interaction to the benefit of all and ensures the highest likelihood that the results of community development will benefit the broadest spectrum of the community. These Principles of Good Practice are:

- Promote active and representative participation toward enabling all community members to meaningfully influence the decisions that affect their lives.
- Engage community members in learning about and understanding community issues, and the economic, social, environmental, political, psychological, and other impacts associated with alternative courses of action.
- Incorporate the diverse interests and cultures of the community in the community development process; and disengage from support of any effort that is likely to adversely affect the disadvantaged members of a community.
- Work actively to enhance the leadership capacity of community members, leaders, and groups within the community.
- Be open to using the full range of action strategies to work toward the long-term sustainability and well-being of the community.

The CDA provides participants the opportunity to prepare themselves to be more effective working in community settings based on a shared set of principles and values that build on the Principles of Good Practice. The program provides opportunities for participants to try out new ideas, relate the work they do to current research in community development, and create learning networks among peers.

For additional program information on the Community Development Academy:

<http://www.communitydevelopment.missouri.edu/commdev/cda/cda.htm>

- b. Impact: The Community Development Academy is a Multi-State Extension program and this impact recognizes examples of accomplishment. The CDA attracts from across the nation and around the world. Of the 65 participants in 2005, 11 were internationals from Kenya, Australia, and Thailand. The international component has grown in importance to CDA. Participants report having the ability to relate their experiences to those of people from different cultures as a result of the course as they encounter more diversity in the communities in which they work. In order to sustain international involvement, programs have been conducted in South Africa, Brazil, Guyana, and Canada based on

the CDA. In 2005 a collaborative agreement, was developed between the University of Missouri and Charles Stuart University in Australia to develop an ongoing exchange program in community development based in part on the CDA curriculum with faculty from Charles Stuart University traveling to Missouri to participate in the CDA in 2005. Additional exchanges are scheduled for 2006. Thirteen people from Kenya have completed at least two of the three CDA courses. Plans are being developed to assist universities and nongovernmental organizations in Kenya with the development of a support system that would make it possible for them to have a CDA program in Kenya.

In exit and follow-up evaluations, participants in the 2005 CDA reported increased knowledge and understanding of community processes and changed their practices in their communities. The interactive courses helped them build relationships with fellow community development practitioners from across the state and around the world. Many comments indicated this was one of the most important assets of the course in both short-term and long-term.

When surveyed at one year or later, 95 percent CDA participants reported using what they learned, and nearly 50 percent reported using what they learned “a great deal.” Those who completed the program demonstrated engagement in development of new and expanded local leadership training, involvement of citizens in planning and implementation of community-wide programs, adoption of community-based approaches in all aspects of outreach and extension work, cooperative and partnership efforts to achieve community success. New partnerships—both formal and informal—have formed to work on issues of importance to citizens.

Participants reported applying skills and “internalizing” what they learned, using specific planning techniques and group process skills. Participants also reported positive organizational and community change and impact, attributed to applying skills learned through the Academy. These included organizing effective local groups, development of local plans, generation and leverage of funding for community projects, establishment of a variety of local programs to address community issues and improve the local economy.

- c. Source of Funds: Smith-Lever, State, Fees
- d. Scope of Impact: Missouri, Pennsylvania, Michigan, Louisiana, New Hampshire, Washington, Ohio, Illinois, California, Connecticut, Minnesota, Colorado and International

### **Key Theme: Community Development, Conflict Resolution**

- a. Description: Community Deliberation Program. The Discovering Common Ground: Missouri Communities Deliberate program provides communities with collaborative support as they identify and make decisions about high-priority and controversial public issues. It yields increased local knowledge, communication, leadership and citizen engagement for community empowerment and enhancement. Through public deliberation, people learn more about each other’s viewpoint and discover they have things in common—“common ground.” They weigh the pros and cons, trade-offs and consequences of their choices. This leads to a collective effort to address the issue—even though people do not necessarily agree with each other.

Programs in 2005 were conducted with 27 partners and engaged 164 volunteers, reaching approximately 1,400 persons directly.

- b. **Impact: Discovering Common Ground: Missouri Communities Deliberate** is part of a Multi-State Extension program in conflict resolution. The following impacts are state specific to Missouri:
- University of Missouri has leveraged at least \$89,000 and nearly \$2,000 in in-kind.
    - **Biotechnology in Rural Missouri**—The life sciences are estimated to have the potential to contribute far more than the current \$1.6 billion spent annually within the state on research and development to boost the Missouri rural economy. University of Missouri Extension provided training and facilitation for five biotech public deliberative forums, where approximately 100 local and regional leaders discussed how Missouri plans to cope with the life sciences and drafted recommendations to assist in regional and state development of the life sciences for economic development. The Missouri Rural Biotechnology Commission is using findings from these meetings for analysis and development of public policy recommendations.
    - **Healthcare for the Uninsured**—Effective delivery of healthcare to those who cannot afford it is a concern for public and private consumers alike. University of Missouri Extension provided training and facilitation on 21 local and regional public deliberative forums involving 350 persons on the topic of healthcare for the medically uninsured. This was done in partnership with the Missouri Department of Health and Human Services and the Missouri Area Health Education Centers. The findings will be used to inform state public policy development.
    - **Racial and Ethnic Tensions and Immigration Issues**—Public deliberative forums have also been held in Kansas City, Springfield, Bolivar, and Boonville on racial and ethnic tensions and on immigration issues. The results from these forums have been used to affect the issue of improving engagement of minorities and Hispanics and other immigrants in local communities.
    - **Land Use Policy**—A public deliberative forum in community of Republic engaged 68 residents in an unbiased venue to dialogue and assist public policy decision making on the issue of land use conflicts. As a result, the Soil and Water Conservation District and Natural Resources Conservation Service, along with Extension, met with the county planning and zoning commission to explore a federal program designed to conserve farmland. The developer for a 2,000-acre planned development hired a land-use consultant, sought citizen input and significantly changed development plans as a result of feedback. Other counties in the surrounding area are now holding forums on the same subject.

Deliberation training materials from Missouri’s program have been used nationwide.

- c. **Source of Funds:** Smith-Lever, State, Grant, Contract
- d. **Scope of Impact:** Missouri, Texas, Oklahoma, Arizona, Pennsylvania, Iowa and Maryland, and International (Australia, Thailand)

**Key Theme: Community Development, Farm Safety, Fire Safety, Workforce Safety**

- a. **Description:** Community Emergency Management Program (CEMP). The Community Emergency Management Program provides resources, personnel, educational programs, and materials to support the mission of the Missouri disaster recovery partnership and develop the capability of extension to assist communities and citizens in all areas of emergency management and homeland security. Training is being provided to emergency service providers, government officials, citizens, businesses, and local leaders.

The Community Emergency Management Program serves as the disaster mitigation, preparedness, response, and recovery point of contact for University of Missouri Extension and provides educational programming and technical assistance to federal, state, and local entities, communities, professional organizations, businesses, and educational institutions. The program coordination is a joint venture between community development extension and the University of Missouri's Fire Rescue and Training Institute.

The program made a significant contribution this year to extension professionals, emergency management and allied services. In cooperation with University of Missouri Extension's Fire and Rescue Training Institute the CEMP program coordinator has been teaching the new required courses within the National Incident Management System (NIMS). The CEMP program coordinator has taught or provided 52 classes to 1,668 participants. These participants include representatives from State Emergency Management, State Fire Marshal, State Department of Agriculture and local elected officials, police, fire, EMS, health, public works, transportation and emergency management. In addition, programs conducted by regional faculty reached approximately 6,200 persons directly, involved 172 partners and 45 volunteers.

Local faculty have distributed educational materials and provided training *in individual and family preparedness for disaster*, hazards and risks, daycare facility planning and numerous others have been offered to local audiences. Faculty have played key roles in providing Community Emergency Response Team (Citizen Corps-CERT) training delivered to citizen volunteers to teach them how to respond to support local government disaster operations.

With funding from USDA through EDEN and Purdue University, CEMP worked with a multidisciplinary team to develop a new national web-based *plant bio-security curriculum*, which is now available to extension professionals and the agricultural community at no cost. Access to this course is available on the EDEN homepage at <http://www.agctr.lsu.edu/eden>.

In September 2005, Missouri, like so many other states, began receiving survivors from the gulf coast in the wake of hurricanes Katrina and Rita. Numerous extension personnel joined with local teams to shelter and care for these displaced survivors all across the state. Extension faculty and staff worked to find temporary shelters, apartments, homes and the other basic essentials. Many continue today to serve on long-term unmet needs committees in partnerships with local volunteer and support agencies. To date we don't know how many hundreds or thousands of man hours extension spent to support a disaster hundreds of miles away that showed up on our doorstep.

Builders are learning about incorporating safe rooms into construction. The FEMA Safe Room exhibit has been handed over to University of Missouri Extension for use as a mobile exhibit. The exhibit and new literature is being taken to fairs, county extension council meetings, 4-H youth fairs, safety fairs, county meetings, etc.

The CEMP has become a model across Missouri and many land grant universities that belong to the Extension Disaster Education Network (EDEN). For additional program information see <http://www.mufrti.org> and <http://outreach.missouri.edu/cemp>.

- b. Impact: Community Emergency Management is a Multi-State Extension program. The following impacts are state specific to Missouri.

Disaster Recovery Work - Spring 2004: When a series of tornadoes and severe storms struck Northwest Missouri in the spring of 2004, a multidisciplinary CEMP team, comprised of regional



extension specialists and campus-based faculty and staff, moved into action. Team members worked with local relief-agency coalitions called COADs (Community Organizations Active in Disasters) to coordinate recovery efforts among agencies. At the request of Missouri's State Emergency Management Agency (SEMA), team members worked with COADs and FEMA to support recovery efforts, including working directly with SEMA and FEMA in Disaster Recovery Centers (DRCs) throughout the region in providing research-based disaster recovery information from MU Extension and affiliated EDEN institutions. The team was crucial in supplying agricultural disaster assessment and meeting the needs of victims, and disaster workers. In the first days following the disaster, extension workers went from home to home in rural areas, which had no phone service or power, to check on people, answer questions, and find out what they needed. In the first week, they worked with local farmers and producers to supply SEMA and USDA with information on agricultural impacts of the storm's winds, hail and heavy rains.

CEMP faculty have assisted local and regional fire services in applying for National Fire Grants, resulting in Missouri having a very strong record in receiving these grants.

- c. Source of Funds: Smith-Lever, State, Fees
- d. Scope of Impact U.S.: Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Puerto Rico, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin

Scope of Impact Globally: Indonesia, Australia, Canada

### **Key Theme: Community Development, Impact of Change on Rural Communities**

- a. Description: Alianzas - Building Inclusive Communities. In the past 15 years, Missouri's Latino population increased 92 percent, compared to the total population of Missouri, which increased by only 9 percent. In six Missouri counties (Moniteau, Pettis, Saline, Barry, Lawrence and McDonald), the Latino population increase was either 400 percent or greater. Service providers believe the actual numbers of Latinos to be even greater than the Census reports, especially in those counties with a greater migrant Latino population.

With such rapid growth, immigrants and communities began to face many challenges. For example, immigrants have encountered discrimination, low-pay employment, inadequate health insurance, difficulty in finding adequate, affordable housing, and communication problems. Also, schools have needed to refocus their resources to non-English speakers. Social services must find food and shelter for the new families. Community residents encounter communication and cultural understanding difficulties.

Alianzas is a collaborative program of University of Missouri Extension, the University of Missouri-Kansas City, and the UMKC Institute for Human Development, which strives to enhance the ability of Extension and its partners in accommodating the unmet challenges of both Latino immigrants and the Missouri communities that receive them. This is done through a Latino, university, and community partnership utilizing a community-based, shared-learner approach on a statewide level.

During the past year:

- For its second year Alianzas partnered with the Mexican Consulate and acted as Missouri coordinator for the United States and Mexican Presidential-declared Bi-National Health Week (BHW) of 2005, which annually strives to increase public awareness, understanding, and knowledge of health services available at the local level for Latino immigrants. October events in the Kansas City metropolitan area attracted nearly 640 participants and 42 health and human service organizations.
- In Southwest Missouri, the program has supported English for Speakers of Other Languages (ESOL) programs and worked to provide literacy and job skills in the federal prison. In Northwest Missouri, the program supported Extension and local community leaders in planning for the opening of a meat-processing facility, which was anticipated to attract Latino immigrants to the region. A series of presentations on cultural differences, language challenges, research findings, and diversity for a community group in St. Joseph. Issue forums on immigration and racial and ethnic tensions convened 60 participants. The program supported implementation of Dining with Diabetes in the St. Louis area, a cultural immersion experience for faculty and study guides for Latino students completing their GED in central Missouri, a summer youth program in Sullivan County to enhance efforts to build a climate of cultural awareness and inclusiveness among local youth. In the Kansas City area, Alianzas supported the Northeast Advisory and Access Group (NAAG), which focuses on possible community relationships for new Latino residents in Northeast Kansas City. The NAAG, [www.alianzas.us/naag](http://www.alianzas.us/naag), is an informal coalition of over 100 of Northeast Kansas City's Extension specialists, service providers, and community leaders, which strives to accommodate the unmet challenges of both Latino immigrants and the community that receives them.
- On the campus of the University of Missouri-Columbia in March 2005, the fourth "Cambio de Colores (Change of Colors) – Latinos in Missouri" conference convened 285 state, university and local attendees from 150 organizations who explored an array of Latino- and community-based issues. Alianzas has acted as a leading partner in the planning and implementation of the conferences. As a result, participants have been able to build organizational capacity to better serve Latinos and the communities in which both live and work. Also, Missourians throughout the state are able to continue to learn best practices for interacting with the Latino community.
- Created an on-line "Partnering with Latinos in Missouri: A Guide for University of Missouri Extension Staff" to aid Extension staff in partnering with Latino residents in Missouri. The guide offers clear and comprehensive demographical and cultural information, information related to each Extension specialty area and interactive introductory Spanish CD of more than 500 words and useful Spanish language phrases for Extension staff. The website includes a discussion board for Extension staff to post questions, receive answers, and correspond with other state Extension staff.
- Provided translation of "Important Missouri Laws: A Guide for New Residents," designed for Latinos participating in a court-mandated project.
- In Southwest Missouri festivals highlighting Latino culture fostered multicultural understanding and significant work was accomplished with community emergency management among the Latino population.

In addition to the Cambio conference, Alianzas partnered with 82 partners and reached over 13,000 persons directly through local programs.

For additional program information, visit the Alianzas website: <http://www.alianzas.us>.

- b. Impact: Alianzas: Building Inclusive Communities is a part of the North Central Regional Spanish Speaking Populations effort – a multi-state program. The following impacts are state specific to Missouri:
- Bi-National Health Week:
    - More than 640 BHW participants received health information from 42 healthcare organizations.
    - 50 BHW participants received health screenings for HIV/AIDS, dental and glucose screenings.
    - More than 60 multicultural health organizations held a “healthy habits” festival at the Guadalupe Center with 400 people attending.
    - A week long series of health education displays and screenings were held at the Mexican consulate. Topics included: HIV testing/counseling, domestic violence counseling, neurological screenings, Shriners hospital referrals, immunizations, childhood health, cardiovascular, and parenting and senior citizens health. An estimated 500 individuals were involved as they worked with the Mexican Consulate and INS on establishing legal residency in the United States.
    - 500 bi-lingual packets were distributed throughout the bi-state service community for on-site pickup by individuals.
    - A bi-state Latino Health Career fair was held at Penn Valley Community College in partnership with El Centro, Guadalupe Center and the Coalition of Hispanic Organizations. More than 500 middle school age young from 13 area schools attended the half-day affair.
    - “Dining with Diabetes” was offered in the community in a bi-lingual format to expand the educational effort to FNP participants and others in the community.
    - More than 25 organizations continue to meet and make available educational offerings and screenings for Hispanics at the Mexican Consulate on a monthly basis for 2006.
  - In Kansas City:
    - 84 service and intake coordinators, therapists, and medical professionals and 33 administrators have used the “Cultural Competency and Survival Spanish – For Professionals Serving Individuals with Special Healthcare Needs” curriculum developed by the Alianzas program (for the Department of Health and Senior Services, Special Healthcare Needs Unit ) in their attempt to serve more Latino clients for their organizations.
    - The NAAG: community folks have taken on the leadership reins.
  - In Northeast Missouri, coordination and the building of a significant partnership with Centro Latino has occurred. In the Northwest, a center is now being developed to foster networks between community and new residents.
  - In Southwest Missouri:
    - The Ozarks Regional Alliance obtained its status as a 501(c)(3) status this past year as a result of work with Extension. The Alliance comprises nearly 50 organizations serving the Hispanic and Latino community and working to build a multi-cultural region. The region is also now planning its own mini-Cambio de Colores conference.
    - Over 150 male inmates participated and graduated the past two years in the inmate placement program (IPP) of the Federal Bureau of Prisons (FBOP) at the Federal Medical Center in Springfield, Missouri. Some were totally Spanish speaking and about half were African American. Its goal is to initiate programs that enhance employment opportunities for federal prisoners about to be released back into their communities.

“We appreciate it, and we will do our best.” said an inmate. “It definitely offers a sense of direction and a sense of hope knowing you can get there and have a chance to succeed.”

Especially poignant was working with a young black man who wanted to start his own graphic design business upon his release. He had a straight A high school grade average, and was arrested on drug charges shortly after his high school prom night where he had been crowned prom king. He has been in prison four years and feels starting his own business is his only hope. When I asked him what he had learned from his incarceration, he said, "I learned never to deal with drugs again!" His level of knowledge on self-employment was non-existent, and he was provided with guidelines and contact information for his local Business Specialist in St. Louis. He was released in December 2004.

The participating inmates received a certificate of completion, and the educators and businesses were given a certificate of appreciation and a notepad/pen gift made by inmates at the Medical Center. All participants were happy and proud to be involved in this program.

- c. Source of Funds: Smith Lever, State, Local organizations, Federal Bureau of Prisons
- d. Scope of Impact: Missouri, Iowa, Illinois, Nebraska, Kansas

### **Key Theme: Community Development, Impact of Change on Rural Communities**

- a. Description: Community Decision Support. Community decision support enhances local capacity to make sound policy choices. Rapid changes in technology, economic and social patterns require a greater depth of analysis and understanding if local decision makers are to make sound policy choices. Tools include economic models, demographic analysis, Geographical Information System (GIS) mapping, participatory community action planning, fiscal impact tools, and local government support.

During the past year community decisions support has been offered in a variety of formats ranging from contract work applying data to community issues to training which enabled the community to move forward on a community priority, to direct involvement and facilitation, to finding resources for a community whether it be experts, examples of what other communities have done, or on-line training resulting in a product for use in the community. The decisions for which support was provided included a range of topics such as planning and zoning; services for the aged, low-income, disabled and handicapped; tourism; and economic development. Extension has worked in partnership with the community and with other organizations.

The Community Policy Analysis Center (CPAC) provides research, outreach and training to support improved policy decisions at both the local and state levels. The Show-Me Model provides valuable data and information and facilitates learning among community participants. CPAC conducts community economic baseline analyses, scenario (what if) analyses, and supports training for extension staff. For more information of CPAC's activities see <http://www.cpac.missouri.edu>. During the past year, CPAC:

- Developed a toolkit to aid rural electric cooperatives across the country in making bio-energy decisions (distributed February 2006),
- Worked with several communities in the Upper White River watershed to develop physical and economic data for water quality and watershed planning. CPAC is also developing GIS tools to determine the impact of non-point pollution on water quality and quantify the economic benefits of water quality.
- Provided information to citizens and legislators on how Missouri compares with the other states on state and local taxes and expenditures,

- Investigated the economic and environmental impacts of activities by the Missouri Department of Natural Resources that are funded by a dedicated sales tax,
- Estimated the economic impacts of loss of consumer income due to the tax in order to provide a net estimate. (The project is on-going and will provide useful information when the tax is up for voter renewal.)
- An entrepreneurship readiness self-assessment tool developed by CPAC became part of the Community Economic and Entrepreneurial Development Program being piloted in 5 projects in the state.

State and regional specialists provided information on a variety of topics as input into local decision-making: taxing internet sales and the potential sales loss due to the internet, the IRS home mortgage deduction, tracking a dollar through the local economy, childcare impacts in a community, and multipliers and how to interpret them for a county in Nebraska, cost of living index for a county, data on disability in a county compared with surrounding counties, tourism potential. Local officials ask for the data and what it means for their community when a decision they are making requires the information.

The Office of Social and Economic Data Analysis (OSED) conducts projects, often in conjunction with state agency partners that focus on important public policy issues such as transportation, health and community services, and public education. During the past year, OSED analyzed additional Census data and prepared numerous reports now posted on the web for easy access (<http://www.oseda.missouri.edu>). Users may access demographic information and analysis in many ways including by extension region or by state agency regions. Other activities this past year included the following.

- At the request of the Medicaid Commission, OSED and CPAC produced a report on Medicaid and Medicaid recipients in Missouri. OSED, CPAC and faculty in Montgomery County are producing a video on healthcare in Rural Missouri.
- Together with the Missouri Department of Health and Senior Services and the 10 Missouri Area Agencies on Aging OSED has helped launch the development of *Missouri Senior Report*. To help design the report a state advisory committee was formed and local support and advice gathered. Across Missouri 47 regional meetings were conducted involving 467 local leaders. At these meetings the local issues and indicators of greatest concern to seniors were gathered and analyzed. The first version of the report with county level indicators of the status of seniors will be prepared by May 2006.
- Community Connection (<http://www.communityconnection.org>), an OSED project, is a statewide directory of health and human service resources dynamically linked to the world wide web. Community Connection in partnership with the Missouri Foundation for Health, state agencies, Mid-continental region of the National Network of Libraries of Medicine and the J. Otto Lottes Health Sciences Library are collaborating with the National Library of Medicine/National Institutes of Health in their MedlinePlus "Go Local" project that links their national health topics with local Missouri resources. See (<http://www.nlm.nih.gov/medlineplus/golocal/about.html>).

The Local Government Resource Group was recently formed to provide training and information to officials. Local Governments are also assisted by CPAC, OSED, and state and regional CD specialists to improve decision-making including fiscal management and general management as well as information on where to find legal procedures. While the Local Government Resource Group is new it has assisted local governments in decision-making on:

- Planning and zoning

- Requirements for local government meetings: notice given in advance, closed sessions and the open meetings law
- Changing the classification of a city
- Which officials can be recalled and in which classes of cities this is possible
- Township organized counties and rules about closing roads and annexing roads
- Ordinances to ban fireworks

An analysis comparing Missouri state and local taxes to all other states was condensed into policy briefs for the state legislature, which are currently being used in new legislator orientation provided by University of Missouri Legislative Academy. The analysis is now being updated for 2006 and is part of a multi-state effort, which currently includes Illinois and Tennessee with plans to include Wisconsin and Nevada. This work was undertaken as part of the Regional Project, "NE-1011: Rural Economic Development: Alternatives in the New Competitive Environment," an integrated research and extension regional project.

Assistance with development of comprehensive plans and citizen input, participatory community and organizational planning, and organizational development have been provided in a number of communities.

Local programs engaged over 400 partners in programming and involved over 63,000 local contacts.

- b. Impact: Community Decision Support is a Multi-State Extension program. The following impacts are state specific to Missouri.

Economic analyses are being used to inform local and state decisions.

- As a result of work with the Department of Natural resources to monitor and map winds in northern Missouri and to provide information on wind energy installations, new statewide wind energy maps were developed as a result of this study. A statewide wind energy task force was formed to provide information about wind energy to investors and citizens (see: <http://www.dnr.state.mo.us/energy/renewables/WEWGlocations.rtf>). A private firm has expressed interest in the northeast area. In northwest Missouri, a firm has just announced it will build a project in the region. The potential impacts include higher incomes for farmers on whose lands the turbines are located and reduced environmental pollution from energy production.
- Analysis to estimate the impact of the August sales tax holiday on state and local revenues was picked up by the newspaper media and used by the Missouri Municipal League and the Missouri Association of Counties in their legislative activity.
- A local labor market analysis has been incorporated into marketing by the economic development agency of Boone County.
- Communities continue to use the economic baseline studies developed in collaboration with CPAC. St Francois County uses the projections of county revenues and expenditures in its discussion and decisions about economic development. The City of Chillicothe continues to use the 2001 community housing baseline study for planning.
- CPAC's technical review of an audit by the state auditor is being used by local governments to gain potentially lower interest.
- The Socioeconomic Benefits Assessment System created by CPAC to assess impacts of the Rural Business Services (of USDA) loans, grants and technical assistance programs and project impacts of proposed projects is functioning in five states and is being developed for the rest of the states. Missouri is among the states to which the model is being expanded.

- Publication of Extension reports comparing Missouri's state and local taxes and expenditures with those of the rest of the states led to:
  - Similar reports for Illinois and the data were also sent to Tennessee.
  - Testimony before the Joint Committee on Tax Policy on how Missouri compares with other states on State and Local Taxes. Use in a training offered by the University of Missouri Truman School of Public Affairs.
  - Widespread media attention throughout the state, improving the information available to citizens. Several newspapers wrote articles on the studies. An audio interview was picked up by 46 stations through a phone feed and downloaded from a website by 26 stations.

Planning processes have had the following results:

- In Holt County, a city and a seasonal business came together to develop a joint marketing plan. Extension provided marketing research and planning assistance. New audiences were identified and the business has expanded its facility to serve more clientele. The business expects a 20 percent increase in bookings and because of new audiences will expand its season from 5 to 10 months, increasing profitability and employment.
- Based on information from a community survey, northwest Missouri community has changed its economic development strategy to entrepreneurship based on local resources and is working to improve the three major issue challenges of the survey. Potential long run impact is an increase in jobs and income in the community.
- The City of Fredericktown responded to highway changes and a new Wal-Mart, both of which decreased downtown traffic, by beautifying downtown. The merchants sought and received the cooperation of Wal-Mart, rather than seeing them as the enemy. The potential long-term impact is increased downtown traffic and commerce.
- Other community surveys, candidate forums, local board and government trainings have provided knowledge for investments in community festivals and more effective operations of local government agencies and boards.
- The three year planning process with the Missouri Soil and Water Districts Commission resulted in the adoption of the plan which will guide development of program priorities for the next 10 years and serve as an educational tool for the organization as they prepare for a ballot initiative in 2006. In particular, the organization will focus on changing land use and education for future research and program development as a result of the statewide planning process.
- More than 50 organizations, in various stages of their organizational development were served as they worked to develop effective organizational structures that best suited the purposes of their organizations. At least 12 obtained their 501(c)(3) status successfully.
- The City of Herculaneum, 2,000 people, has serious environmental and health problems from a lead smelter that has operated in the town for over 100 years. EPA contracted with Extension and the extension team worked with the Herculaneum Community Action Group (CAG). Many residents, especially those living in the voluntary property buy-out zone, have had their lives on hold waiting for more information. The residents now have a voice in expressing health and environmental concerns created by operation of the smelter and are working with EPA and other community stakeholders to develop the city's master plan.
- Kimmswick, a small tourist town on the Mississippi River was split after the economic development corporation supported a riverboat casino, which a majority of the citizens fought. The county commission asked the regional community development specialist to survey the residents about public uses of land donated to the county. The specialist went into this hostile environment, made friends, listened to the citizens' opinions on the issue, and based on the information of the Jefferson County Port Authority is developing a public river access for Jefferson County. The county program director points out this could have been accomplished

only by someone with the highest integrity, a genuine concern for the residents, and a certain amount of bravery.

- The City Council of Arnold appointed the Arnold Commission on Aging to determine the needs in the county. The regional CD specialist facilitated the commission's work and assisted in conducting and analyzing a survey. On their survey form, many of the aged and disabled wrote a thank-you to the City Council for caring enough to ask them. Based on the survey results, the Commission recommended a media "blitz" so people will understand how to access the services that already exist. The Commission is also working with the City Council to secure funding for transportation.
- Extension, along with other partners, provided decision-support to Johnson County as it works toward improving access to healthcare in the county. After the conduct of a needs assessment, a free clinic opened in May of 2004 and volunteers provide services to those without healthcare. The clinic is also working to become a Federally Qualified Health Clinic, which would provide federal funds to the clinic. 501(c)(3) status has been applied for.

Results from OSEDA's work includes the following.

- During 2005 OSEDA completed two analyses for the Missouri Research and Education Network (MOREnet). These studies assessed the contributions MOREnet is making to 64 Missouri higher education institutions and estimated the net benefits of public support of the network. [http://osedamissouri.edu/educational\\_reports/final%20epm%20report.pdf](http://osedamissouri.edu/educational_reports/final%20epm%20report.pdf).
- In 2005 working with the Business Research and Information Development Group, OSEDA completed the Business Indicators Analysis Tool which provides accurate and meaningful data for developing marketing or business plans. It organizes data on specific business industries as well as relevant customer demographics. It produces radius maps, tables, and access to additional important resources such as Purchasing Power, Effective Buying Power, and Trade Area Capture. This web tool allows the necessary projections to conduct scenarios helping inform local business decisions. <http://missouribusiness.net/bridg/indicators/index.asp>.
- In 2005 working with the Missouri Department of Economic Development's, Missouri Economic Research Information Center, OSEDA completed an application to showcase the location and characteristics of Missouri Entrepreneurs. This application is being highlighted by the state to help encourage local economic development planning. <http://osedamissouri.edu/meric>.
- As a result of the publication of the annual Kids Count Report (by OSEDA with its partners The Children's Trust Fund and Citizens for Missouri's Children) summarizing the status of children across Missouri and highlighting those communities where children are especially "at risk," economic analysis in Missouri has shown the relationship between the structure of local economies and the welfare of children stimulating economic development initiatives.
- Together with Missouri Department of Elementary and Secondary Education OSEDA plays an integral role in the state system of school district accreditation. The analysis of school improvement data from thousands of Missouri teachers, students and parents is incorporated in the state accreditation decisions and provides a foundation for school improvement planning. Enhancing the quality of Missouri schools and increasing academic achievement is a cornerstone of future economic development in a global economy increasingly rooted in human capital.
- Community Connection provided 365,000 web pages of health and human service resource information. Approximately 190,000 unique visitors sought information from the statewide directory. Every county in the State of Missouri and the City of St. Louis have resources listed in the directory.



On-line training, offered nationwide, on local economic analysis was used by a Regional Council of Governments to compare the Kansas City metro area with its peer metro areas. An economic developer in Colorado used the training to identify target industry clusters. Analysts in the Bureau of Economic Analysis and U.S. Department of Commerce, used the information as background for an intra-industry trade study which will have national and Missouri relevance. Previous participants from across the nation continue to report use of course materials in their daily work. A previous participant from Washington requested assistance on interpreting the results of an input-output analysis. A former student referred the Louisiana Natural Resource Conservation Service to the instructor for information they were seeking. The state specialist was quoted in a newspaper article about rural community population loss.

- c. Source of Funds: Smith-Lever, State, Contracts, Grants, Fees
- d. Scope of Impact: Missouri, Illinois, Louisiana, Nebraska, Washington, National and International. The Community Policy Analysis Center also actively participates in national Community Policy Analysis Network.

### **Key Theme: Community Development, Youth Development, Leadership**

- a. Description: Missouri Local Government CECH-UP. One of the primary goals of the state-wide Local Government CECH-UP Program is to provide middle school students with the opportunity to learn what local government does, to talk to local government officials, to study and make recommendations on local issues, and to take action on local government issues facing communities.

The Local Government CECH-Up handbook was updated along with the website (<http://www.umsl.edu/cech-up>). The CECH-UP handbook provides cross-curricular lessons that are aligned with the Missouri Department of Elementary and Secondary Education Show-Me Standards.

The CECH-Up Program provided access to lesson plans and a variety of government and community resources for teachers of approximately 600 students throughout the state. The program is slated to expand area of coverage in the state and has been adopted for use by 4-H VISTA volunteers working to enhance youth civic engagement. Programs in 2005 involved 266 partners and 890 volunteers locally.

- b. Impact: The CECH-Up Program provided opportunities for students to become familiar with the jobs of local officials as possible career choices. Approximately 500 students participated in the site visit to their local city hall or county courthouse. Students were introduced to various government officials and had the opportunity to learn about the job duties and job requirements of each position. For example, students from Saeger Middle School spent time on the City of St. Peter's computers learning about GIS mapping from planning and zoning officials. Teachers report students are now more familiar with the jobs of local officials as possible career choices.
  - Two teacher workshops were held this year (St. Louis and Douglas County). Both workshops were funded by a grant from State Farm Insurance. Twenty-eight teachers participated. The overwhelming response from teachers is that the teacher workshops were very useful in "jump-starting" the program and should become a routine part of the CECH-Up Program.
  - Examples of student projects included working with city officials on the re-developing of a flood area and researching and designing a plan for a biking/walking trail to be constructed in the city.
- c. Source of Funds: Smith-Lever, State, Grant

d. Scope of Impact: Missouri

**Key Theme: Community Development, Managing Change in Agriculture**

- a. Description: Community Food Systems and Sustainable Agriculture Program (CFSSA). The Community Food Systems and Sustainable Agriculture Program's major objectives are to:
- Enhance opportunities for Missouri communities and citizens to participate in community food systems and consumer-farmer linked programs.
  - Increase the economic viability of farms and communities across Missouri through the integration of sustainable production and marketing practices into current and new farm operations.
  - Conserve and improve Missouri's natural resources through the application of sustainable production practices.

CFSSA has continued being a source of information for farmers and consumers interested in sustainable practices and local food systems. Through its website, emails and phone calls, CFSSA has provided information and referrals to hundreds of producers and consumers. CFSSA also started a new initiative in 2004 to reach out and serve minorities in agriculture, the Food Circles Networking Project as launched with funding support from the W.K. Kellogg Foundation with a focus on the I-70 Corridor.

b. Impact:

Locally produced food is available in greater volume and variety in the St. Louis and Kansas City metro areas because thriving, entrepreneurial businesses, including processors, distributors, grocers, chefs and food services, feature locally produced food products.

- Assisted in establishing the "Buy Fresh, Buy Local" campaign in which Ball's Foods has invested significantly. Approximately \$3 million of locally produced food was sold through Ball's Foods (Kansas City metro area) stores in 2004.
- Leveraged \$36,912 from the USDA Community Food Projects program to increase access to high quality, locally produced food in low-income neighborhoods in St. Louis. The grant is in partnership with Gateway Greening.
- Facilitated the development of a group of producers and chefs seeking more efficient distribution channels. Through our efforts this group received \$48,000 from the Missouri Agriculture and Small Business Development Authority to conduct a feasibility study regarding distribution and co-packing.
- Assisted with the establishment of 4 new farmers' markets in the St. Louis and Kansas City metro areas.

Farmers in the East and West Central extension regions have increased the economic viability and diversity of their farming operations and understand the development of local food systems represents an economic opportunity for the future of their operation.

- Co-sponsored the "Selling Local in Kansas City" conference that attracted 185 farmers, chefs, processors and retailers seeking information and connections.
- Established databases of 54 producers, processors, retailers and restaurants with locally produced food products for sale in the Kansas City metro area and over 54 farmers in the St. Louis area.

- Facilitated new distribution channels between St. Joseph area grocery stores and meat processors in the Kansas City area, connected an organic dairy with three new marketing venues in St. Louis.
- 35 farmers and extension board members learned about selling locally produced food at the Jefferson County Soils and Crops conference.
- Identified 3 inner urban community gardens interested in selling in areas of the city with little access to grocery stores.
- 27 farmers in Lincoln County received information on farm diversification. 9 farmers were directed to farmers' markets. 4 farmers have been directed to chefs looking for local produce. 4 producers were introduced to a local grocery store.

Demand for sustainably produced local food in St. Louis and Kansas City has risen because there is increased knowledge of the benefits of locally produced food among the general public as well as increased access for limited resource eaters.

- Co-sponsored two Kansas City Food Circle's Farmer Expos that attracted 1,125 area consumers who met local producers, attended cooking demonstrations and signed up for community-supported agriculture programs.
- Contacted by 9 restaurants, 1 university food service, 1 distributor and who would like to access locally grown food products. These contacts have resulted in locally produced foods moving through those food providers.
- 10 farmers and chefs have agreed to participate in a trial website for web-based ordering. The site will be posted on the revamped Food Circles Networking Project website.
- Established new contacts with locally owned grocery store in St. Louis that is now sampling locally produced food products. We hope this will become an established marketing channel for farmers next season.
- 45 consumers attended a green drinks panel discussion on local foods.
- In-depth article on local foods groups reached a readership of 685,200 in the Kansas City area.

There is local financial support for and policies that encourage local food systems development, planning and capacity building because St. Louis and Kansas City citizens and policy-makers understand the benefits of locally produced foods.

- Established connections between this local food effort and city planners in Kansas City.
- One community in East Central region incorporated the development of a farmers' market into their master plan.

Due to our efforts, 3 news articles on policy directions for the sustainable agriculture and farmers' market nutrition programs ran in St. Louis, Kansas City and Columbia with a combined readership of 1.3 million.

- c. Sources of Funds: State, Smith-Lever (SARE), Grant
- d. Scope of Impact: Missouri with multi-state collaboration through the North Central Regional SARE Program (Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin)

### **Key Theme: Family Resource Management**

- a. Description: Family Financial Management. According to the 2001 Survey of Consumer Finances, 25 percent of U.S. households have less than \$10,000 in net assets.

The 2005 Retirement Confidence Survey shows more than half (52%) of U.S. workers report the value of their total savings and investments, excluding the value of their home, is less than \$25,000.

The American Bankruptcy Institute reported nearly 1.6 million non-business bankruptcy filings nationwide in 2004, down slightly from just over 1.6 million in 2003.

In Missouri there were more than 37,000 non-business bankruptcy filings in 2004, roughly unchanged from 2003.

According to the Missouri Division of Finance, about 2.6 million payday loans were made in Missouri in 2004, totaling about \$627 million. The average annual percentage rate of interest on such loans was slightly more than 408 percent.

Most financial experts and educators agree people need access to financial management education at a young age in order to develop the skills needed to be successful money managers as adults. Recent studies and surveys indicate young people today have access to and spend a significant amount of money. Having access to money does not translate to the ability to make wise financial and spending decisions.

To meet these needs, educational programming continues to focus on specific financial management topics such as money management, insurance, credit, saving and investing and taxpayer education. Program development continues for very low-income families and for families filing for bankruptcy. Research is underway to target programming to young adults. Other audiences include youth and their teachers, young families, women, individuals who are incarcerated or on probation or parole, parents, and professionals working with low income families.

In FY2005 82,500 educational contacts were made through family financial management programs. This programming involved 241 partners and 276 volunteers. Below are the following outputs and outcomes.

Money Action Plan is a financial management education program targeted at human services and other professionals working with low-to-moderate income families. Program objectives include training participants to be better prepared to assist their clients and increase their personal knowledge and skills in money management. Materials are also used directly in educational programs with low-to-moderate income families. Three thousand seven hundred ninety (3,790) educational contacts resulted from implementation of the Money Action Plan curriculum.

Approximately 470 individuals on probation or parole, mainly for financially related offenses, participated in basic financial management classes conducted by University of Missouri Extension. Participants are often required to attend classes by the judge or their probation officer in an effort to reduce the probability they will be repeat offenders. Programs focus on differentiating between wants and needs, setting financial goals, tracking income and expenses, planning spending to stay within income, developing the savings habit, establishing or rebuilding a credit history, and maintaining a checking account.

- b. Impact: The Money Action Plan program resulted in the following impacts:
- Set financial goals (60%)
  - Started or increased savings (56%)
  - Developed a spending plan (64%)

- Practiced recordkeeping (12%)
- Reduced credit card (62%)
- Reviewed credit reports (36%)

Three to six months after Money Action Plan workshops, the following impacts were documented:

- Made positive changes in spending habits (45%)
- Lived within a spending plan (38%)
- Paid bills on time (38%)
- Established a savings plan (25%)

Participants who attended a six-week women's financial management program reported over the course of the program they:

- Shared some of what they learned with other people (90%)
- Calculated their net worth (64%)
- Said financial records were more organized than before the class (68%)
- Tracked spending for at least 30 days (55%)
- Reviewed their insurance coverage (60%), with 24 percent making changes;
- Increased the amount they were saving (57%)
- Reviewed their beneficiaries and reported they were up to date (80%)
- Discussed their estate plan and their wishes with their heirs (58%)
- Were more confident about saving and investing (93%)
- Wanted to continue to learn more about financial management and would recommend Women and Money to others (100%)

c. Source of Funds: Smith-Lever, State

d. Scope of Impact: Missouri

### **Key Theme: Leadership Training and Development, Youth Development**

- a. Description: Community Leadership Development: EXCEL (Experience in Community Enterprise and Leadership) Neighborhood Leadership Academy; Step-Up to Leadership! Community leaders are the central force in effectively mobilizing people to address local issues. Frequently, community leaders wonder how to achieve the kind of success they dream about and recognize they cannot be successful alone or without greater personal capabilities. Effective citizen leaders translate knowledge and commitment into hands-on action to engage in building community networks, make well-informed community decisions and find real solutions to real problems. Ongoing leadership development ensures communities have the capacity to move forward as current leaders retire from public life.

A handbook, "Community Leadership Development: The EXCEL Approach," extensive website and training for extension specialists provides program guidance. During 2005 norming of the evaluation instrument involved five additional states (MS, LA, AR, WY, IL), and an online version of the survey instrument was developed.

In 2005 the new Step-Up to Leadership! curriculum was completed and made available to the public. Designed for community action agency board members drawn from the population of people served by the agency and for other community-minded people wanting to make a difference the intended audience is people who are willing to assume the responsibilities of board membership;

that seek understanding about group process and the complexities of collaboration; and are ready to take on the challenge of leadership. The curriculum was piloted in 3 locations—St. Louis County (12 participants) by CAASTLC, the City of St. Louis by the Human Development Corporation of Metropolitan St. Louis (23 participants) (HDC), and Columbia by the Central Missouri Counties Human Development Corporation (17 participants). Mini-grants up to \$500 were available to participants by application to support their efforts to take a lead in promoting activities that directly benefit low-income people or help to strengthen their community. Participants focused on working with food pantries, spouse and child abuse, housing policies, weatherization, and a number of critical community issues. Training of facilitators for the final curriculum took place June 2005 for Missouri Community Action Agency staff and University of Missouri Extension faculty. The Step-Up to Leadership! curriculum is now available for sale on the web through Extension Publications. The guide and manual have been sold across the U.S., Canada and Australia.

<http://extension.missouri.edu/explore/guidebks/cb0017.htm>.

Developing community leadership means University of Missouri Extension works collaboratively with the local community and its leaders. In St. Louis, the Neighborhood Leadership Academy is a collaborative training initiative bringing together the unique expertise from across the University of Missouri—the Community and Neighborhood Development unit of the Public Policy Research Center, the Nonprofit Management & Leadership Program and University of Missouri Extension.

For additional program information about Community Leadership Programs, see <http://www.ssu.missouri.edu/commdev/cld/cld.htm>. Information about the Neighborhood Leadership Academy in St. Louis can be found at [http://pprc.umsl.edu/base\\_pages/cnd/programs\\_opportunities.htm](http://pprc.umsl.edu/base_pages/cnd/programs_opportunities.htm).

- b. Impact: EXCEL is a Multi-State Extension program. The following impacts are state specific to Missouri.

Almost two-thirds of Missouri's counties and communities, over 7,190 people, have participated in locally driven leadership programs over the past 22 years. The number of counties expanding to develop a specific community youth leadership development program has grown in the past year to 34 and additional interest is high.

Effective citizen leaders translate the knowledge they've gained and commitment they feel into hands-on action with participation in meeting the challenges facing their communities. They can convert words and ideas into action – instinctively talk the talk and walk the walk. They use insights and skills learned in community leadership programs like EXCEL to engage in building community networks, make well-informed community decisions and find real solutions to real problems while engaging actively in local, regional and state roles to benefit their communities.

In evaluations of the EXCEL program, over 90 percent of participants indicated they considered their participation to have been worth their time and effort. Additionally, over 95 percent of the participants stated they felt their learning experience was worth the resources Extension expended to support the program in the community. Evaluations indicated the elements and successful outcomes of the EXCEL program did not depend on the characteristics of the participants or on the unique features involved in different locations. Outcomes were consistent across gender, ethnic background levels of education and income, and length of residence in the community.

Other specific impacts include:

- A graduate of Leadership Northwest Missouri said: “I feel the most important thing I have gained from Leadership NWMO is the network of professionals/colleagues/friends I now have to work with to help people in our region. Also, I think being a part of Leadership Northwest has helped me direct my focus more on my place in the community as a leader and/or a team member, and has given me inspiration to give my best.”
- Leadership Northwest Missouri graduates worked to correct income guidelines established by the 2000 Census that excluded all of Northwest Missouri for eligibility for Rural Development funds. Through the work of USDA-RD staff, Extension staff, leadership class members and local legislators, these figures were reviewed and found to be incorrect. New guidelines were developed that more correctly reflected income in Northwest Missouri. As a result almost all of the counties and many communities now qualify for Rural Development funds.
- Maysville City Manager and Leadership Northwest Missouri graduate spearheaded the 2004 Leadership Northwest Missouri class project to help local communities find funding for placing emergency sirens in their communities. The goal is to have early warning systems in all small rural communities. To date, 8 communities received \$57,408 funding for early warning systems.
- Chad Nixon, a 2005 graduate of the LEAD 2000 (Lafayette County) program is running for the Mayor of Odessa and has volunteered to be the LEAD 2000 Board Co-Chair for 2006.
- Lafayette County Commissioners use the LEAD roster to aid them in selecting citizens for county boards and county committee appointments.
- The Leadership RAP for At-Risk Youth program has been conducted since 1992 at the Robert L. Perry Juvenile Justice Center (JJC) in Boone County with 537 graduates. In 2005, 17 juveniles participated in the program. A study recently conducted revealed that 28 percent fewer participants were referred back to law enforcement agencies following their release from JJC than were similarly referred from an equal number of other JJC residents randomly selected for the same time period. A program participant summed up their feelings about the Leadership RAP program: “It was one of the best things that happened to me.”
- In St. Louis the Old North Neighborhood Partnership served as an effective vehicle to connect the university and the community, engage faculty and students in applied research and community-based learning projects, and create and/or facilitate positive changes in an urban neighborhood. More information is located at <http://pprc.umsl.edu/onnp/>.
- Step-Up to Leadership! participant Mary Brown of Florissant, MO, was all too familiar with the substandard housing available to low-income people. “The housing stock should be of higher quality and easily accessible,” said the former real estate appraiser. “Sometimes we settle for a lot less than we have to.” Since completing Step-Up to Leadership!, a leadership training program developed by University of Missouri Extension and the Community Action Agency of St. Louis County Inc., Brown is taking action to improve housing in her neighborhood. Brown took the first step, organizing a home weatherization project for elderly residents, using supplies donated by the St. Louis Area Agency on Aging and volunteers from her church. “Step-Up to Leadership! has really pushed me to a lot of places,” she said. “I feel like I'm being launched.” Brown is among the first graduates of the leadership program, piloted in St. Louis County and City, and central Missouri. As a condition of federal funding, community action agencies are required to include the constituents they serve on their boards of directors.
- Graduates in a number of the programs have kept the program going through the formation of 501(c)(3) organizations. In many communities local governmental and non-governmental boards look to EXCEL graduates as a pool of new members.
- EXCEL has been tapped as a resource for development of other leadership programs across the state.

- c. Source of Funds: Smith-Lever, State, Fees, Local sponsors
- d. Scope of Impact: Missouri with multi-state collaboration through the leadership team within the North Central Region (Minnesota, Wisconsin, Iowa, Nebraska, South Dakota, North Dakota, Illinois, Kansas, Michigan, Ohio, and Indiana), Mississippi, Louisiana, Arkansas, and Wyoming.

**Key Theme: Parenting**

- a. Description: Parenting Education Programs. A diverse array of parent education programs and services was offered to meet the needs of Missouri parents in 2005 including: Focus on Kids, Families and Divorce, Anger Management, parenting workshops and information, and ParentLink’s Parenting Services (trainings, conferences, “WarmLine”, Parenting Corners and web). In addition parenting information was provided through extension publications distributed at parent fairs, newsletters and the MissouriFamilies website. In 2005 approximately 21,790 Missouri parents and professionals who work with parents received parenting education or information in some form.

- b. Impact:

Focus on Kids – Focus on Kids is a 2.5-hour educational program for divorcing parents that emphasizes conflict management and co-parenting strategies that will assist children in dealing with their parents’ divorce. The Focus on Kids program is provided in partnership with Missouri circuit courts to meet Missouri’s requirement that divorcing parents with a child under age 18 attend a parent education class. In 2005 approximately 2,700 parents from 32 Missouri counties attended the Focus on Kids program. Evaluation data indicate the success of Focus on Kids in several areas measured on a 5-point scale (5 = strongly agree). Most parents reported they better understand the benefits of cooperating with the other parent in support of their children (4.3); understand more about how children are affected by divorce (4.3); and plan to avoid arguing or fighting with the other parent in front of the children (4.6). Participant comments include: “This class made me think about how what I did and said effected [sic] my kids, I need to think first and then react to what my ex says or does.” “Program is very helpful for understanding how children feel during and after a divorce.” “It helped me see things through my child’s eyes,” and “This class was really good, I wasn’t looking forward to coming to the class but the information was good and helped me a lot.” A follow-up evaluation was conducted to find out if parents who attended the program had made any changes several months later. Of the 45 participants in the follow-up evaluation, a majority of participants agreed or strongly agreed they have made the following changes since attending the program:

- “I have tried harder to work with my child’s other parent for the sake of the children.” (80%)
- “I have avoided arguing/fighting with my children’s other parent in front of the children.” (86%)
- “I have avoided questioning my children about their other parent’s relationships.” (84%)
- “I have avoided saying negative things about my children’s other parent in front of them.” (84%)

Families and Divorce – Families and Divorce is a 2-4 hour workshop that provides parent education indirectly by training teachers and other professionals. Topics include: the effects of divorce on children and families, supporting children through parental divorce and remarriage, and working with divorced and remarried parents. In 2005, 88 professionals participated in the Families and Divorce trainings. Evaluations from 30 participants in northeast Missouri indicate most participants “agreed” or “strongly agreed” the program helped them better understand the needs and reactions of children of various ages to divorce (4.3); and they plan to use at least one suggestion from this program to provide support to children who have experienced parental divorce (4.5). Participants



indicated the handouts, statistics, and classroom resources provided in the program were helpful.

General Parenting Workshops and Information – A variety of general parenting workshops and information were provided to Missouri parents in 2005 with the goals of improving parents’ skills and reducing child abuse and neglect. Two curricula used for parent education workshops were *Basic Parenting* and *Programs for Parents*. *Basic Parenting* is a six-session program that helps parents strengthen their skills in caring for themselves, understanding, guiding, nurturing, motivating and advocating for their children. *Programs for Parents* includes 14 sessions on a variety of topics, such as positive guidance and discipline, children’s ages and stages, and raising responsible children. After attending parenting workshops, parents indicated they “needed to have more patience and take some time to think about how to handle situations with their children” and that it was their responsibility to help their kids make good and safe decisions. One parent said, “It’s important to treat my children with respect so they will treat me and others with respect.” Others said they had made the following changes as a result of attending the program: listening more, giving choices to their children, no longer arguing with their children, following through with discipline instead of giving in, and reading and playing games with their children. One parent said her daughter’s failing grades had gone up to Cs.

ParentLink’s Parenting Services – ParentLink’s Trainings and Conferences for Professionals and other Community Members.

- Fund/Grant Development Training – A 5-hour Fund/Grant Development Training was a problem-solving and resource-sharing meeting about financial resources for organizations. Government programs and resources were discussed. Participants also learned about financial resources that are available to them locally via University of Missouri Extension and local college/university partnership. Ten individuals representing 4 communities attended. Participants:
  - Agreed Strongly “This training has helped me to better understand issues common to developing and maintaining a financial infrastructure for family support programs.” (1.25 to 5-point scale)
  - Agreed “Attending this training has helped me to better understand issues common to developing and maintaining a financial infrastructure for family support programs.” (1.25 on 5-point scale)
- Healthy Parenting Tool Kit – The Healthy Parenting Tool Kit Training is a 4-6 hour workshop that provides parent education indirectly by training professionals and other community members. Military Specific topics are covered and include information related to deployment and dangerous work. In 2005 a total of 195 people from at least 47 communities attended these trainings. In reviewing 25 participant evaluations, 100 percent said they would recommend this training to others. Example of quotes include:
  - “[the training raised] awareness of many concerns that families have when someone is in the military and what community members can do to help.”
  - “There are support groups for military families in my area. Meeting [military personnel] and making contact.”
  - “Other community members have different resources. We can all help each other provide help for military families.”
  - “It is time that my community looks at this issue.”

ParentLink’s WarmLine Phone Assistance – In 2005 ParentLink’s WarmLine Services were provided to over 1,700 parents and community service providers who work with parents.

(Approximately 57 percent of the calls were from parents or other caregivers.) The WarmLine service provides supportive conversation, research-based information, and resource information to callers. Many calls are complex with multiple issues being addressed and range from topics on child tantrums to adult depression as it relates to parenting. Examples of callers' comments follow:

- "I've been so tired I haven't been thinking straight. It helps so much having someone listen and help me make a plan as well as provide resources."
- "People in my community would never believe I have an anger problem. I'm so glad I can call you and work through problems. I usually already know what to do but it helps to have someone to talk it through with. I have all the parenting books, I just needed to talk."
- "Most of the families I serve don't have computer access and many don't have transportation. We are very rural. It's great having access to parenting information." (therapist)

ParentLink's Mass Distribution of Materials and Information.

- Parenting Corners – ParentLink's Parenting corners are available in multiple locations (shopping mall, Head Start Facilities and other agencies). They offer parents direct access to parenting materials via hard copy and in some cases computer kiosks. In 2005 approximately 15,000 materials were distributed through these Corners.
- Web Service – ParentLink's web service is available to parents, providers, and community members seeking parenting information. During 2005 approximately 16,000 hits were received.

For additional program information see ParentLink (<http://outreach.missouri.edu/parentlink/>) and Missouri Families (<http://www.missourifamilies.org/>).

- c. Source of Funds: Smith-Lever, State funds, Charitable Trust
- d. Scope of Impact: Missouri

### **Key Theme: Promoting Housing Programs**

- a. Description: Sustainable Housing and Community Revitalization programming informs consumers about national and statewide financial incentives for homeownership. Post-purchase education is an important aspect of any homeownership program to facilitate home maintenance and retention. Through Extension programs, first-time home buyers of low or moderate income without adequate resources for a down payment are linked with state agencies and lenders who will work with them to find financing to buy or rehabilitate a home. People with disabilities, senior citizens, veterans or any other vulnerable segment of the population also are included in the target audience.

Community revitalization and sustainability is based on a community participatory process training program. Extension specialists work with the community to enable residents to take charge and make decisions about their own communities. This in turn leads to enhanced community sustainability and improved environmental stewardship in both residential and commercial sectors of the community. Community participants typically have the resource materials, skills and experience necessary to plan and execute a sustainable community planning process from conception and diagnosis through implementation. Extension personnel facilitate the sustainable revitalization community assessment process in communities in their respective regions using these resource materials and processes.

University of Missouri Extension sustainable housing and community revitalization programs provide participants with the knowledge and skills necessary to obtain and maintain environmental stability and security, manage human and material resources, while increasing consumer awareness.

This is accomplished through educational programs focusing on home ownership, community revitalization, environmental quality, affordable housing and environmental stewardship. Audiences have ranged from high school students to senior citizens interested in nursing home options. The scale of these programming efforts ranges from the individual interested in buying his/her first home to entire communities interested in identifying and taking inventory of their existing and anticipated housing stock.

- b. Impact: In Fiscal Year 2005, slightly more than 37,000 educational contacts were made through sustainable housing and community revitalization programming efforts. These efforts included 41 partners organizations. The following outputs and outcomes were included:

HomeWorks is a practical course that helps homeowners successfully maintain homeownership through knowledge of basic home care and financial management.

Short-term outcomes: Evaluations completed following the sessions indicated participants felt they had increased their knowledge and skill levels related to the topics covered. 50 percent of participants felt the program exemplified excellent quality. 50 percent of participants felt the value of the program in terms of time, money and energy was of excellent use.

Rent Smart is a program that assists administrators, caseworkers and other social service agency providers, trainers, and landlords in working with renters to obtain and keep rental housing. The program covers all aspects of renting from determining the amount of rent a family can actually afford to keeping housing clean and safe. A portion of the workshop is about legal aspects of rental housing, the rights, and responsibilities of both landlords and tenants.

Short-term outcomes include: Evaluations completed following the sessions indicated participants felt they had increased their knowledge and skill levels related to the topics covered.

Stepping Through the Gateway to Financial Fitness is a collaborative program developed and presented by Architectural Studies and Consumer and Family Economics regional extension specialists, the Catholic Commission on Housing (CCH), Neighborhood Housing Services (NHS), the Federal Deposit Insurance Corporation (FDIC), the Federal Reserve Bank of Saint Louis, Fannie Mae, HUD -- Saint Louis, and banking, financial services and insurance industries. This effort focuses on financial education that leads to improving peoples' housing conditions.

Short-term outcomes include: Participants completed a series of five workshops, set financial goals and developed spending plans. Train-the-trainer materials were developed and volunteer instructors attended workshops to become aware of how adults learn and how to apply that information to teaching this material.

Medium-term outcomes include: Evaluations are completed at the end of each workshop. An evaluation committee that includes University of Missouri Extension, the Catholic Commission on Housing (CCH) and Neighborhood Housing Services (NHS) is developing a long-term evaluation to be completed this summer and again in two years. Information from a questionnaire and individual credit reports that contain income, employment and debt information will be used to determine program effectiveness.

Indoor Air Quality and Healthy Homes programs help consumers improve the environmental quality of the air and rooms in their homes. Information provided during educational programs help people identify common pollutants, how they get into the home, their potential effect on the family's health,

and the steps to take to control or eliminate hazards. Educational offerings include programs on carbon monoxide; asbestos, lead, radon; smoke-free commercial and retail settings; controlling humidity in the home; detecting and removing mold, mildew and other biological hazards; and selecting and using household products and home pesticides wisely.

Short-term outcomes include: Responses to follow-up evaluations indicate most participants in these offerings have made at least one change to improve the air quality and safety in their home.

- c. Source of Funds: Smith-Lever, Federal Grant
- d. Scope of Impact: Missouri

### **Key Theme: Volunteer Development**

- a. Description: A positive relationship with caring adults helps to create connections and a sense of belonging for young people. Missouri's 4-H volunteers provided many of these connections. Missouri's 11,528 4-H volunteers provided an estimated \$42 million (based on Independent Sector hourly volunteer contribution of \$17.55 and an estimated 208 hrs/yr/volunteer) in volunteer services in 2005. 4-H volunteers provide service in a number of ways including teaching skills to children, managing the work of other volunteers, mentoring teens, working with teachers and schools, coordinating county and state events and promoting 4-H.

#### b. Impact:

- **Volunteer Screening:** In fall 2003, volunteer screening became the 4-H standard. All individuals applying to serve as a 4-H volunteer are first screened for child abuse and neglect through the Missouri Department of Social Services and for criminal convictions through Choice Point, a national screening company endorsed by the National Collaboration for Youth. Over 8,600 volunteers for the club program were successfully processed. Less than 0.1 percent of the applicants were rejected.
- The national volunteerism study, *Identifying the Core Competencies Necessary for Volunteers to Deliver 4-H/Youth Development Program*, continued to move forward. The results of this study will: 1) provide guidance in determining appropriate and needed volunteer training and 2) serve as a professional reference of knowledge for specialists working in volunteer development.
- **Volunteer Certification:** Missouri instituted three certification programs to help meet the need of specific subject matter training as well as provide needed safety precautions for these specific project areas.

Shooting Sports – 4-H Shooting Sports program continues to be one of the fastest growing 4-H projects. The success of 4-H Shooting Sports is directly proportional to the effort put into equipping leaders for success. Volunteer leader training and certification in 4-H Shooting program is the foundation for success. Training volunteers are recruited to attend a national workshop. The Training volunteers return to Missouri and serve to conduct statewide certification for other volunteers. Two leader certification workshops are conducted per year at various sites around the state. Local 4-H county and club volunteers are required to successfully complete a leader certification workshop prior to working directly with youth. The workshop consists of more than 20 hours of training in 4-H philosophy, youth development principles, safety, risk management strategies, as well as shooting discipline lesson plans and teaching methods. 168 local volunteers were certified as Missouri 4-H Shooting Sports Leaders in 2005.

Sportfishing – Currently Missouri conducts one leader training workshop per year for volunteers in the 4-H Sportfishing program. In 2005, 26 volunteers were trained.

Horse Bowl – Missouri 4-H began to certify volunteers to conduct Horse Bowl education events in 2004. There are currently 60 certified horse bowl coaches in the state. Missouri 4-H has 3,500 youth enrolled annually in Equine Science projects and an estimated 2,000 youth and adults were impacted this year by the certified horse bowl coaches. The Missouri certification was modeled after the Illinois Horse Bowl certification. In an evaluation survey the certified bowl leaders made the following comments when asked, “How has the 4-H horse project helped my child?”

- “She is better prepared for life. She is learning responsibility.”
- “My child is more confident, trusting, respectful and conscious of her surroundings.”
- “Has learned to accept losing and winning and to be courteous and help other competitors.”
- “Has learned many aspects of horse care especially safety issues.”
- “Has developed skills and knowledge that she will use for the rest of her life.”
- “Are more confident, and interested in learning more, they have both taken interest in finishing things (even if it is just cleaning their room) when they are asked.”

c. Source of Funds: Smith-Lever, Grants, Fees

d. Scope of Impact: State and National

### **Key Theme: Workforce Preparation**

- a. Description: Access to College: Youth Futures – College Within Reach Program. Many colleges and universities are increasing their efforts to recruit and retain non-traditional students such as first-generation college students, ethnic minority groups and students from working-class families (Padron, 1992). Many of these non-traditional students, though, are less prepared for college – academically, psychologically and financially – than students who come from college-educated families. They may have weaker reading and math skills as well as lower degree aspirations (Terenzini et al, 1995). Tinto (1987), however, found only 15 percent of students drop out of college because of academic failure; most leave because of personal, financial, or social problems. The ability to handle these new demands during the first year of college is critical to success in college and to eventual graduation.

The 2005 Youth Futures – College Within Reach Conference, held on the University of Missouri (MU) and Missouri Western University campuses, provided an extensive college orientation for non-traditional students. Lincoln University (LU) and MU Extension 4-H Youth Development staff planned and implemented the conference with a pre/post conference mentoring program. The purpose of the program was to promote college attendance as an obtainable goal for youth and to provide support for youth to stay in college.

During the conference youth became aware of academic and student life activities and programs. They also learned about financial assistance and received resources and information regarding campus life and college attendance. Residing in college dorms, attending workshops, and participating in MU, Missouri Western, and community activities provided youth the experiences needed to prepare for and be successful in college. In addition a practice ACT test was given to prepare youth for this important step toward college enrollment.

Following the conference, LU and MU staff members served as mentors to youth to provide a

continuous support system. Mentors have contact with youth at least quarterly to discuss college preparation (e.g., grades, study skills, applications and scholarship forms, ACT tests) Youth progress toward preparation for college is tracked via a database. Items such as changes in grades, applications for college and scholarship, ACT preparation and more are updated yearly. Youth activity is tracked from the time the youth attend the conference until their sophomore year in college.

The conference was attended by 48 youth from Kansas City, St. Louis, Jefferson City, Columbia, and Mississippi County. The participants were 55 percent were female and 45 percent male. The mean age was 16. Participants were 91 percent African American, 7 percent Hispanic, and 2 percent Caucasian.

- b. Impact: Before the conference a significant number of youth (34%) reported they had not thought of going to college. These attitudes changed after the conference when all participants (100%) reported having learned:
- They must make their own decisions if they want to go somewhere in life
  - They felt more positive about going to college
  - They will take their school work more seriously

Over 98 percent of participants reported knowing what they need to do to go to college, where to find financial assistance for college and who to consult for help regarding college.

Of the participants graduated from high school, 66 percent are currently enrolled in college. Many parents have reported the conference had a strong impact and their adolescent(s) is more serious about high school, setting goals and improving behavior.

#### Testimonials

“This conference gave me a way to get a feeling about college. I learned and realized that if I think about failure I will fail, but think about success I will succeed. I will use this information when I think about giving up in my everyday life.”

Quotes from participants about what they learned from the conference:

“Believe in yourself, time management and I can do anything I set my mind to do.”

“I learned what I need to work on the ACT and what I can do for school”

“Getting a higher education helps ensure success as an adult.”

“I learned more ways to go to college. I learned how to save up for college and who can help me.”

- c. Source of Funds: Smith-Lever, State, Grant

- d. Scope of Impact: State

### **Key Theme: Workforce Preparation**

- a. Description: College Scholarships. 4-H participation and involvement leads young people to explore various careers and educational options. The Missouri 4-H Foundation offered college scholarships that helped support 4-H members pursue their educational dreams.
- b. Impact: In 2005, thanks to generous donor support, the Missouri 4-H Foundation offered 44 college scholarships totaling more than \$37,000. Of these 44 scholarships

- 16 scholarships were available to 4-H members who resided in any county in the state of Missouri
- Upperclassmen were eligible to apply for 14 of these scholarships
- 20 of these scholarships could be used while attending any public institution in the state of Missouri and 12 could be applied toward a Missouri two year college or technical school

#### Testimonials

“I believe that 4-H has encouraged me to discover who I am and that by understanding myself, I have become a positive and motivational leader.”

- c. Source of Funds: Gifts
- d. Scope of Impact: State

### **Key Theme: Workforce Preparation**

- a. Description: Information Technology - 4-H members put Missouri landmarks on the map. Scientific literacy is rapidly becoming critical to a well-prepared workforce. The U.S. Department of Labor predicts the science, engineering and technology jobs will account for half of the fastest-growing occupations between now and 2014. Jobs in geospatial technology are among the top three in this fast growing science, engineering and technology job category.

4-H youths know where it's at. Last summer 300 4-H members spent part of their time at summer camp brushing up on their geography without using compasses and paper maps. Instead they used handheld Global Positioning System (GPS) units to locate landmarks by longitude and latitude. The coordinates are then used to create computer-generated maps.

Missouri 4-H and the University of Missouri Department of Geography have partnered in these efforts and are creating a community mapping curriculum as a response to the popular demand. The curriculum funded by the U.S. Department of Agriculture and NASA will help youth learn geospatial technology while contributing relevant information to their communities.

- b. Impact: Incorporating technology into 4-H projects helped the 300 4-H youth understand how classroom subjects like science and math are part of the everyday world. Related careers using geospatial technology were explored.

#### Testimonials

“These related technologies are rich with possibilities for 4-H Youth Development,” said Bill Pabst, State 4-H Youth Development Specialist. “GPS, GIS (Global Information System) and remote sensing add new dimensions to traditional 4-H agriculture, community and environmental projects.”

- c. Source of Funds: Smith-Lever, Grants, Gifts
- d. Scope of Impact: State and National

### **Key Theme: Youth Leadership Development**

- a. Description: Civic Engagement - 4-H Community Youth Development VISTA Program. A three-year partnership between University of Missouri Extension, the Corporation for National and Community Service has afforded the 4-H Community Youth Development VISTA Program/Civic

Engagement to connect youth to their communities. AmeriCorps\*VISTA members worked in partnership with county extension offices and with community and faith-based organizations to build local programs.

The 4-H Youth Civic Engagement project teamed middle school/high school age youth with municipal officials and community leaders to identify and solve problems together. While learning about local government, analyzing community issues, and implementing civic projects, youth gained knowledge and skills for becoming active citizens for a lifetime. The program was a three-year partnership between University of Missouri Extension and the Corporation for National and Community Service.

Missouri Cadre of Trainers and Facilitators of Youth-Adult Partnerships is a training partnership between Missouri 4-H and the Innovation Center for Community and Youth Development, Chevy Chase, MD. One state 4-H faculty and two youth co-trainers enrolled in the national train-the-trainer program in November 2003. Missouri 4-H agreed to conduct four workshops in 2004-2005 for extension staff, VISTA members, community volunteers and youth to support local youth-adult partnership development. The goal of the Missouri Cadre is to facilitate positive community change by increasing access to educational tools and curricula for youth-adult partnerships, and expanding the number of youth and adults active in decision-making partnerships at the local level.

- b. Impact: Between the years 2003-2005, the 4-H Youth Civic Engagement Project involved 16.6 AmeriCorps\*VISTA members in developing 25 new youth civic engagement programs and expanding 17 existing programs in 29 low-income communities. VISTA members served as liaisons between youth and city/county officials, promoting youth-adult partnerships, starting youth leadership programs, working with organizations to create spaces for youth at the table, and preparing youth adults to work together effectively on local boards and committees. Seventy-nine (79) youth served as decision-makers with 37 organizations. Over 1,700 middle and high school aged youth participated in programs (duplicates not removed), with approximately 58 percent from low-income families. VISTA members empowered youth and adults in leadership, service and decision-making by leveraging 2,226 community volunteers, 10,000 community volunteer hours, and \$33,153 in in-kind donations and \$38,280 in monetary donations to local programs.

During 2005 the Missouri Cadre trained 42 youth and adults representing 8 community teams through workshops. Whereas last year's workshops were introductory trainings for youth and adult teams, this year's workshops were designed for groups "in motion." The Cadre training team of one state 4-H faculty and four youth co-trainers worked with Beth Tucker, Arizona Cooperative Extension and Innovation Center trainer, to conduct two high quality statewide events. Eight community teams participated in the workshops and created local action plans for youth-adult partnerships.

Workshop participant outcomes surpassed expectations. Most workshop participants had some familiarity with youth-adult partnerships before the trainings. Many youth and adults were involved in local youth-adult partnership work. Some participants commented on how significant it was for them to actually involve youth as opposed to adults just talking about youth participation. After the workshops, 100 percent of participants reported they believe youth can be resources to their communities, and a full 100 percent of participants envision youth and adults can work together effectively in decision-making. Participant outcomes suggest workshops helped participants adopt favorable attitudes toward engaging youth as full participants. The workshops also broadened their awareness of how youth-adult partnership tools can help groups accomplish their goals.



Two communities report specific impact as a result of participating in Missouri Cadre training. The West End Community Center team of St. Louis successfully collaborated with local churches to plan and conduct a community health fair. Over 500 people attended the fair including city aldermen. The team's hope was to use the success of the health fair to expand parental involvement in its afterschool program, which serves a low-income African American community in inner city St. Louis. The team used youth-adult partnership tools during teen council training in September to help increase parent involvement. In rural Perry County the team helped gain acceptance and commitment to involve youth on the board of the Community Task Force. The team wrote and received a \$500 startup grant for a 4-H Leadership Club.

- c. Source of Funds: Smith-Lever, Grants
- d. Scope of Impact: State and National

### **Key Theme: Youth Leadership Development**

- a. Description: 4-H Camp. In the summer of 2005 4-H youth development staff across Missouri assisted in an effort to evaluate 20 different 4-H camps statewide. Youth, ages 10-13 were targeted for evaluation purposes. The evaluation survey sought to identify the role of 4-H Camp in helping youth develop four life skills (Hendricks, 1996). Life skills identified and evaluated were: Learning to Learn, Social Skills, Teamwork, and Self-responsibility. Campers completed a written survey instrument at the conclusion of their camp session. Parents were mailed a similar evaluation form approximately 2 weeks after their child returned from camp.
- b. Impact: Responses from both youth and parents showed a very high number of positive perceptions about the ability of 4-H Camping Programs to develop life skills. Youth agreed most strongly they learned skills to work out differences with others, to complete jobs they were responsible for, to make new friends and to follow directions. Parents reported their child was more confident after attending 4-H camp and strongly agreed they were glad they sent their child to camp. The responses of parents and of youth were very similar and highly correlated. Parents and youth alike feel the 4-H Camp experience provides a wealth of fun and learning experiences for campers.

#### Testimonials

Responses to open-ended questions provide testimonials to 4-H Camp.

The most important thing I learned about myself at 4-H Camp this year is:

- "It was easy to make new friends when you are just being yourself."
- "Respect all people even if they are different."
- "It's okay to make mistakes."
- "Always pay attention in order to do things right."
- "I know I can work in a team if I try hard, even working with people I don't know."
- "I used to think my opinion didn't matter, but now I know it could help my group."
- "How hard it is to take care of myself and picking up after myself."
- "Being late really slows things down and slows others, too."

The most important thing I learned to do at 4-H Camp this year is:

- "Respect others and yourself."
- "To have fun no matter what – even if it rains."
- "Listen to camp leaders, counselors, and all the other leaders."
- "To keep healthy and fit."

- “To have fun and to be careful while you have fun.”
- “Doing more and not complaining.”
- “To set a good example.”
- “To be responsible around younger campers.”

Because of 4-H Camp this year I know I can...

- “Make friends wherever I go.”
- “Just go up to people, talk to Them, and have a good conversation.”
- “Have fun in new environments.”
- “To be myself without being embarrassed or afraid.”
- “Treat others as I want to be treated.”
- “Be a public speaker.”
- “Teach others what I know.”
- “Finish projects with other people without arguing.”
- “Manage time and be ready to go.”
- “Take care of myself on my own and be more responsible.”

- c. Source of Funds: Smith-Lever, Grants, Fees
- d. Scope of Impact: State and National

### **Key Theme: Youth Leadership Development**

- a. Description: 4-H Community Service. An important aspect of 4-H clubs is community service. Activities included not only the typical road clean-up and beautification projects, but writing letters to soldiers in Iraq, assembling Hero Packs, organizing a veterans appreciation event, using GPS devices to collect community data, assisting with the renovation of a downtown building for a youth center, helping launch a children’s center for abused children, making weighted blankets for autistic children, and filling suitcases with personal items for the clients of abused women and children shelters.

Reaching out to others through service is a longstanding 4-H tradition. Each year clubs throughout the state conducted service projects to help others in their communities. Community service-learning couples the knowledge young people have of community issues with hands-on experience to promote civic awareness and responsibility.

- b. Impact: Totals from club service logs show on average every club conducts at least 6 service projects each year with at least 16 members participating in each service project. Using these averages, during the 2005 club year, the 1,650 clubs throughout the state conducted 9,900 service projects with 158,400\* youth participants. (\*Duplicates not removed. Most youth participated in multiple projects.)

The State 4-H (youth) Council began a focused campaign, Kids Helping Kids, where 4-H members collected money to provide to other members who are in need of support due to natural disasters or health conditions. To date the Council has raised about \$36,000 toward the \$60,000 endowment goal. In 2004-05 \$4,500 was distributed to 4-H members in need which results in a net of about \$31,500 in this fund. The 2005-06 State 4-H Council has resumed working toward a goal of \$45,000 which the Foundation will match with a gift of \$15,000 to create a Kids Helping Kids endowment fund. In addition to the endowment campaign, the State 4-H Council is coordinating a

Hurricane Relief campaign in the name of Kids Helping Kids.

Testimonials

“Service projects help teach youth of the community the responsibility they have to improve the place in which they live by caring for it and the people around them. These projects also help them see that they can make a difference. These projects require teamwork to accomplish the tasks at hand. It also requires cooperation between the adults and the youth of the group which provides a family opportunity and a development of respect between adult and youth members. Service projects provide an opportunity to display good citizenship.”

- c. Source of Funds: Smith-Lever, Grants, Gifts
- d. Scope of Impact: State and National

## **1890 Cooperative Extension Service — Lincoln University**

### **Key Theme: Aging**

- a. Description: The mission of the Paula J. Carter Center on Minority Health and Aging (PJCCMHA) is to provide leadership in addressing the health, social, and economic needs of Missouri’s minorities, disabled, and elderly populations through education, training, applied research, policy analysis, and the use of technology as a strategic tool; to disseminate culturally appropriate healthcare information and materials that will empower the minority populations to participate in improving their health. The Center identifies barriers to preventative healthcare and seeks to combat racial and ethnic bias in research and practice. The Center also provides diversity-training programs through conferences, workshops and videoconferences.

- b. Impact: The PJCCMHA improved the delivery of healthcare services and/or quality of life for minorities and minority older adults. The following impacts are due to PJCCMHA:

Missouri Institute on Minority Aging (MIMA): 95 percent of over 30 participants reported they extended their knowledge of the social, economic and health issues impacting older minority individuals as well as resources available in the state for older minorities.

Computer Literacy Training Project formerly (CEST): Since the project’s inception in 1998, the Computer Literacy Training Project formerly Computer Entrepreneurial Skills Training (CEST) has trained over 300 individuals in Mid-Missouri in computer literacy and more than 50 individuals have been trained in entrepreneurial skills development.

Computer Literacy Training Project (CLTP): Seventy individuals completed the ten-week computer literacy training. Confidence using computers increased by 50 percent. Ten individuals who completed the entrepreneurial training wrote a business plan and started their own business.

- c. Source of Funds: State
- d. Scope of Impact: State Specific

### **Key Theme: Children, Youth and Families at Risk**

- a. Description: Central Missouri. In Missouri 19.5 percent of the youth population is from single-parent families; 21.6 percent live at incomes below the federal poverty line. Missouri ranks 23<sup>rd</sup> in the United States for childhood poverty. For Jefferson City, 24.3 percent of the youth live in single parent families. Missouri has a high school drop out rate of approximately 13 percent; the average grade for completion is 11.1 for high school dropouts. For Missourians residing in diverse communities, the statistics are much higher. The percentage of single parents in the Jefferson City Housing Authority is 70.1 percent; 100 percent of the families are considered living below the poverty level.
- b. Impact: 57 percent of the youth participants of the Collaborative Tutoring Program increased their grades by 1-3 letter grades during the 2003-2004 academic school year. Four (4) youth served in leadership roles in their local clubs by serving as trained officers. Youth also learned how to be positive role models for the youth in their community. Ten youth participated in 4-H camp and gained skills in outdoor education, conflict resolution and leisure time management. Eight youth participated in the Missouri State 4-H Congress. Thirty volunteers served as volunteer helpers in identified high-risk communities.
  - 70% of the participants in 4-H camp reported gains in skills in outdoor recreation. If they remained home they reported spending their time watching television or playing.
  - 100% of the participants in the outdoor cookery contest reported gaining skills in food safety and kitchen safety.
  - 80% reported an increase in knowledge regarding biology and micro-organisms as they relate to food-borne illnesses.

Approximately 75 youth participated in the educational workshops associated with the Annual Youth Outdoor Cookery. 60 percent of the parents reporting indicated an increase in their child's self-discipline as a result of participating in the overall youth development program in Central Missouri.

- c. Source of Funds: Smith-Lever, State, National 4-H After-School Alliance Grant
- d. Scope of Impact: State Specific

### **Key Theme: Children, Youth and Families at Risk**

- a. Description: Southeast Missouri. Pemiscot County is located in the lower southeast section of the Bootheel of Missouri. 32.1 percent of the county's 21,220 citizens live below the poverty level. Pemiscot County ranks #108 in the state of Missouri for high school dropouts, and the county ranks #114 in the rate of teen pregnancy out of the 115 counties in the state. The non-white student population in the county's public schools is 49.6 percent. In addition, 43.6 percent youth under age 18 live below the poverty line; 39.4 percent of youth live in single parent households; 15.9 percent of youth between ages 16–19 are high school dropouts; there is a 15 percent unemployment rate in the Caruthersville area.

Lincoln University's Cooperative Extension Programs in southeast Missouri have the following objectives:

- To provide learning educational opportunities to under reached and underserved youth in the Caruthersville area.

- To help youth seek and set goals for their lives.
- To provide life skills, prevention, tutorial assistance, computer lab in the after school program.
- To provide arts and crafts classes, character development, computer lab, physical education/fitness, breakfast and lunch and field trips in the summer enrichment camp.
- To collaborate and advocate with other organizations and schools on behalf of youth at risk.
- To partner with other youth oriented organizations to bring about a greater degree of opportunity and change in the lives of the targeted youth group.

Programs include: The LU Cooperative Extension After School Program that provides life skill training, after school tutoring, reading and Spanish classes; A Summer Enrichment Camp; Character Development Program; and, 4-H.

- b. Impact: 85 percent of parents with participating children reported an increase in their child's leadership ability as a result of participating in the program.
- 40% indicated an increase in their children's self-discipline.
  - 45% of the youth participating increased knowledge of and skill with, food safety and science education.
  - 70% of the parents reported a more positive attitude of their children toward school and work. As indicated by teacher and parent reports, students are doing a "better job" of turning in homework.
  - 60% of those participating in the Collaborative Tutoring Program increased their grades by 2-4 letter grades. Prior to their participation in the program they were experiencing academic failure.

Summer Enrichment Camp: A total of 89 children were enrolled and there was an average daily attendance of 60 children.

After School Program: Programs were made available to all students. A total of 2,520 signatures are on file for the year. 20 students were tracked in partnership with the public schools to monitor progress.

- 18 students showed improvement in one or more subject areas.
- 10 students were reading above grade level, 8 students reading below.
- 14 students showed no unsatisfactory behavior, 3 students showed unsatisfactory in classroom work habits, and 3 showed unsatisfactory in both work habits and social habits.

Student's progress reports reflect there have been improvements in 18 of the 20 students' grades since enrollment in the LUCE After School Program.

- c. Source of Funds: Smith-Lever, State, National 4-H After-School Alliance Grant
- d. Scope of Impact: State specific

### **Key Theme: Children, Youth and Families at Risk**

- a. Description: Kansas City Urban Impact Center (KCUIC) Youth Futures Program. Many colleges and universities are increasing their efforts to recruit and retain nontraditional students such as first-generation college students, ethnic minority groups and students from working-class families. Many nontraditional students though are less prepared for college – academically, psychologically and financially than students who come from college-educated families. They may have weaker reading

and math skills as well as lower degree aspirations.

Research has found only 15 percent of students drop out of college because of academic failure; most leave because of personal, financial or social problems. The ability to handle these new demands during the first year of college is critical to success in college and to eventual graduation. But many nontraditional students must overcome additional obstacles on the path to a college degree. One of the most popular methods used to help all students make a smooth transition to college is an orientation course.

- b. Impact: Survey results indicate there was some level of individual transformation among youth. 25 percent of the youth reported they had not thought of going to college while an overwhelming majority, 58 percent, said they were not sure they could go to college. These attitudes changed after the conference when all participants (100%) reported having learned:
- They MUST make their own decisions if they want to be going somewhere.
  - They felt more positive about going to college.
  - They will be taking their schoolwork very seriously.

A significant percentage (55%) was in agreement that it is hard to make friends one can rely on. Consequently, 31 percent reported they often get in trouble. Combining these two points emphasizes one of the conference goals; to provide an opportunity for making friends on which one can rely. It is hoped this goal will be reached with time.

Over 90 percent of participants reported having learned what they need to do to go to college, where to get college money and who to consult for help regarding college. In addition, 97 percent were in agreement they now had a better understanding about college. The students enjoyed attending the conference. All (100%) reported being satisfied with the overall conference while the majority (77%) indicated they would attend the conference next year. Ten students from KCUIC attended the 2004-2005 Conference. A KCUIC Youth Futures newsletter was developed and distributed in 2004-2005.

- c. Source of Funds: Smith-Lever, State, National 4-H After-School Alliance Grant
- d. Scope of Impact: State specific

### **Key Theme: Children, Youth and Families at Risk**

- a. Description: Urban 4-H Programs. Lincoln University has worked in Kansas City to organize two 4-H clubs over the last year, with an approximate total membership of 40 youth. KCUIC had approximately 200 additional youth participate in 4-H activities through in-school programs and projects. These clubs with their adult volunteers and Lincoln University Urban Impact Center staff meet on a weekly or monthly basis and conduct various programming activities aimed at enhancing and developing youth in various leadership areas. KCUIC 4-H youth participated in 4-H Youth Congress (6 students attended-June 2005); Youth Futures Conference (15 students attended-July-Aug. 2005); Four youth leaders attended National Conference in Washington, D.C. (William Lane was selected to attend and is a regional representative on the 4-H State Council).

The KCUIC implemented 4-H after-school tutorial program with JH Clark Middle School Ace Academy. Fifty youth are enrolled in the after-school program.

- b. Impact: Lincoln University works collaboratively with the Kansas City school district to establish 4-H clubs. Current feedback suggests positive impacts in the following areas:
- Leadership skills improvement;
  - Behavioral improvements;
  - Academic improvements as measured by grade reports, parental reports, and volunteer observations.

The St. Louis Urban Impact Center provides programs for youth in Computer Literacy, Financial Literacy, Science, Arts Education, Communication Skills, Decision-Making, Conflict Resolution, and Health and Nutrition.

Forty-five to fifty students completed the majority of the programs. Discussions and activities taught students to improve the quality of life through their participation.

- c. Source of Funds: Smith-Lever, State, National 4-H After-School Alliance Grant
- d. Scope of Impact: State specific

### **Key Theme: Communications Skills**

- a. Description: The State 4-H Communication Program for Extension has been in existence for over forty-five years with Lincoln University taking the lead for over twenty-two of those years. Youth participate in the program by preparing their speeches at the local level and may be selected to participate at the regional and then the state level. Each county prepares two youth for the Junior Division and two for the Senior Division.
- b. Impact: The Missouri State Communication Program reaches approximately 250 youth from September of last year through September of the current year. Approximately twenty workshops have provided assistance to youth of various economic levels, rural and urban, ages 8 to 19 from all over the State of Missouri. They developed positive life skills in speaking, self-esteem and self-confidence.
- c. Source of Funds: Smith-Lever
- d. Scope of Impact: State Specific

### **Key Theme: Community Development**

- a. Description: Lincoln University Cooperative Research and Extension programming in community development seeks to reduce those factors that can expose youth and their families to potential abuse of alcohol and other drugs while also enhancing protective factors existing in the individual, family unit and community. Programs seek to provide teens with peer-to-peer counseling and mutual support, offer interactive learning activities and strategies for coping with abuse and neglect and offer non-formal education programs for citizens of the state of Missouri.

Communities, Youth and Families at Risk (CYFAR) New Communities Project is a collaborative effort between Lincoln University Cooperative Extension and the University of Missouri Family and Community Resource Program. The Family and Community Resource Team has three community projects. The purpose of the program is to involve the total community with a special focus on the faith based community in programs and activities offered by LU Extension and local partners. The

programs are designed to enhance or improve the quality of life for children and youth in the southeast portion of Missouri.

- b. Impact: In Southeast Missouri, programming efforts reached more than 2,000 people in grades K-12, low-income youth and over 150 adult volunteers participated. Over 125 children and youth had adult supervision in a safe environment.

Approximately 40 youth and adult participants acquired knowledge in the following areas: parenting skills, communication skills, stress management techniques and character identification and development.

Community awareness and community improvement projects were implemented, including the 2<sup>nd</sup> Annual Community Block Party. There were over 150 participants in the community block party. Participants learned organizational and program implementation skills. Families and community residents came together for interaction and educational and recreational programming. The CYFAR partners and volunteers also organized the first Annual Minority Health Fair. 66 people participated in this event.

- c. Source of Funds: Smith-Lever  
d. Scope of Impact: State specific

### **III. Stakeholder Input Process**

University of Missouri Extension programming is based on the needs, aspirations and issues identified by the people in communities throughout the state. University of Missouri Extension program priorities are based on substantial stakeholder input. During 1998, a deliberative group process involved 7,012 citizens in 275 sessions in each of Missouri's 114 counties. This process culminated in 1999 and resulted in identification of issues, concerns and educational aspirations of Missourians.

- 10% of participants were youth under 18.
- Half were men, half women.
- 10% were minorities.
- 40% had little or no experience with extension educational programs.

The county extension council in each county reviewed program status and deliberative group process data. Council members worked with field-based regional extension specialists and drafted a county program plan (<http://outreach.missouri.edu/about/fy00-03/index.html>). These are updated annually with extension specialists and County Extension Council members. This process includes review of program priorities based on county-based listening results with stakeholders and data obtained from the Office of Social and Economic Data Analysis. See <http://osed.missouri.edu/>.

Trend analysis, regional profiles and county-based data were available to faculty, extension councils and stakeholders using the Office of Social and Economic Data Analysis website <http://osed.missouri.edu/>. Place-specific county data are continuously updated to be used for community decision making, program planning and monitoring change. See <http://www.osed.missouri.edu/countypage/>.



Program plans include performance goals, indicators and expected learner outcomes. Each program identified key components, curricula, partnerships and targeted learners. All 114 county outreach and extension councils reviewed new input and revised their annual plans of work as needed.

Campus faculty members review the county plans, identify trends within their areas of expertise and suggest new program direction that addresses the issues identified in the county plans.

Each content-based program area developed a 21<sup>st</sup> century program and resource plan in alignment with the organizational strategic direction and guided by stakeholder input. Each plan defines current priority programs, expected outcomes and indicators. Plans indicate resources needed to fund program priorities as well as revenue generation leveraged funding. Content-based program areas include:

- Agriculture, food and natural resources
- Business and industry
- Community development
- Human environmental sciences
- 4-H youth development

Each of the eight University of Missouri Extension regions worked closely with county and regional extension councils to revise the regional program and resource plans. These plans guide programming, staffing and allocation of resources. All planning was based on stakeholder input, continuous improvement and evaluation of results. Each plan was in organizational alignment with the University of Missouri Extension 21<sup>st</sup> Century Strategic Direction. Relevancy was determined through evaluation of local listening and comparing these data to trends identified through databases and analysis by the Office of Social Economic and Data Analysis (OSED).

Ongoing stakeholder listening continuously occurs through the County Extension Council infrastructure, 4-H councils, advisory groups and partnership program teams as well as through priority program evaluations and survey information collected in program content areas. Efforts are made in all stakeholder input approaches to ensure the stakeholders involved represent the population diversity of the community involved. This includes representation of the total community of learners, ethnicity, geographic representation, family status, income level, age, gender, disability status, and users/nonusers of existing educational programs. Continuous listening to learners and stakeholders creates an environment of continuous improvement and leads to the timely development of new programs to address local priorities.

The Missouri Agriculture Research stakeholder input process continues to be the same as reported in the 1999 Plan of Work (POW). Several advisory committees represent all regions with members from industry, government, academics and producers. They meet regularly and provide input into program needs.

#### **IV. Program Review Process**

Missouri made no significant changes in the merit review processes or scientific peer review program since the Five-Year Plan of Work.

## **V. Evaluation of the Success of Multi and Joint Activities**

### **Did the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?**

Yes, the University of Missouri Extension 21<sup>st</sup> Century Strategic Direction identified and revised the critical success factors (see <http://outreach.missouri.edu/about/21stcentury/factors.html>):

- Access and Learning
- Learning and Achievement
- Innovation
- Human Resources
- Stewardship of Resources

These success factors are based on stakeholder recommendations and input from stakeholders, including public and private partners.

All programming is based on the needs and assumptions identified by stakeholders and the critical success factors. Program planning includes and encourages multi-state program partnerships and joint activities. See Section III, Stakeholder Input Process.

### **Did the planned programs address the needs of underserved and under-represented populations of the state?**

Yes, many programs addressed the needs of underserved and under-represented populations of Missouri. A few examples include:

- The Family Nutrition Education Program provides low-income citizens with the latest nutrition information. Programs include EFNEP, FNP, school-enrichment programs, Body Walk, Health for Every Body, etc.
- The 4-H/Youth Development activities describe a variety of programs, including Adolescents at Risk, Out-of-School Hours and Workforce Preparation.
- The Alianzas: Building Inclusive Communities program under the Community Development theme describes programming to immigrants and the various challenges they face (e.g., discrimination, low-pay, inadequate health insurance).

### **Did the planned programs describe the expected outcomes and impacts?**

Yes, outcome and impact indicators were described in the Missouri Plan of Work and all programs are developed using the program logic model. (example: <http://outreach.missouri.edu/fcrp/irondale/>)

### **Did the planned programs result in improved program effectiveness and/or efficiency?**

Yes, see impacts in Goal Areas under Section II, Report of Accomplishments.

**University of Missouri (1862)**

Agricultural Experiment Station Research and University of Missouri Extension:

**Multi-State and Integrated Activities**

	<b>Key Theme</b>	<b>Program Description</b>	<b>Multi-State Extension (Smith-Lever)</b>	<b>Multi -State Integrated Research &amp; Extension (Smith-Lever)</b>	<b>Multi-State Integrated Research &amp; Extension (Hatch)</b>
<b>Goal 1</b>	Adding Value	Developing sensing and imaging technologies			X
	Animal Production Efficiency	Discovering genes that effect bovine reproduction			X
	Animal Production Efficiency	Evaluating reproductive management practices			X
	Animal Production Efficiency	Genetic evaluation of beef cattle			X
	Animal Production Efficiency	Profitable and Sustainable Livestock Production Utilization System		X	
	Aquaculture	Developing inland aquaculture			X
	Grazing	Stockpiled pasture for winter food			X
	Plant Genomics	Understanding compound accumulation during seed-filling in oil seed crops			X
	Plant Health	Developing pest management strategies within agroecosystems			X
	Plant Production Efficiency	Improving cotton production			X
	Plant Production Efficiency	Improving forage quality			X
	Plant Production Efficiency	Improving vegetable crop production			X
	Plant Production Efficiency	Integrated Cropping System		X	
Rangeland/Pasture Management	Forages for the 21 <sup>st</sup> Century		X		
<b>Goal 2</b>	Food Safety	Using beneficial organisms for food nutrition and safety			X
<b>Goal 3</b>	Human Health	A New You: Health for Every Body	X		
	Human Health	Improving therapeutic strategies to fight disease			X
	Human Nutrition	Nutrition and Health—Health for Every Body	X	X	
<b>Goal 4</b>	Agricultural Waste Management	Animal waste management	X	X	
	Forestry	Linking social and ecological factors in landscapes			X

	<b>Key Theme</b>	<b>Program Description</b>	<b>Multi-State Extension (Smith-Lever)</b>	<b>Multi -State Integrated Research &amp; Extension (Smith-Lever)</b>	<b>Multi-State Integrated Research &amp; Extension (Hatch)</b>
	Water Quality	Watersheds Resource Education	X		
	Weather and Climate	Developing better short-period forecasts			X
	Wildlife Management	Managing urban ecology			X
<b>Goal 5</b>	Children, Youth and Families at Risk	Adolescents at risk program	X		
	Children, Youth and Families at Risk	Building Strong Families	X		
	Children, Youth and Families at Risk	Children of Deployed Military Personnel	X		
	Children, Youth and Families at Risk	Children of Offenders	X		
	Children, Youth and Families at Risk	School-Age Childcare & Out-of-School Time	X		
	Community Development	Community Development Academy	X		
	Community Development, Conflict Resolution	Community Deliberation Program	X		
	Community Development, Farm Safety, Fire Safety, Workforce Safety	Community Emergency Management	X		
	Community Development, Impact of Change on Rural Communities	Alianzas: Building Inclusive Communities	X		
	Community Development, Impact of Change on Rural Communities	Community Decision Support	X		
	Community Development, Managing Change in Agriculture	Community Food Systems and Sustainable Agriculture Program	X		
	Leadership Training and Development, Youth Development	EXCEL	X		
	Volunteer Development	A positive relationship with adults helps create connections and sense of belonging in youth	X		
	Workforce Preparation	Information technology – 4-H members put Missouri landmarks on the map	X		
	Youth Leadership Development	Civic Engagement – 4-H Community Youth Development VISTA program	X		

	<b>Key Theme</b>	<b>Program Description</b>	<b>Multi-State Extension (Smith-Lever)</b>	<b>Multi -State Integrated Research &amp; Extension (Smith-Lever)</b>	<b>Multi-State Integrated Research &amp; Extension (Hatch)</b>
	Youth Leadership Development	4-H Camp	X		
	Youth Leadership Development	4-H Community Service	X		

**U.S. Department of Agriculture  
Cooperative State Research, Education, and Extension Service  
Supplement to the Annual Report of Accomplishments and Results  
Multistate Extension Activities and Integrated Activities  
(Attach Brief Summaries)**

**Institution** University of Missouri  
**State** Missouri

**Check one:**  **Multistate Extension Activities**  
 **Integrated Activities (Hatch Act Funds).**  
 **Integrated Activities (Smith-Lever Act Funds)**

**Actual Expenditures**

<b>Title of Planned Program/Activity</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
<b>Goal 1 (3) Livestock Systems</b>	<u>\$12,500</u>	<u>\$ 11,500</u>	<u>\$ 11,400</u>	<u>\$93,136</u>	<u>\$278,596</u>
<b>Goal 4 (2) Animal Waste Mgmt</b>	<u>\$78,000</u>	<u>\$ 82,000</u>	<u>\$ 79,217</u>	<u>\$74,684</u>	<u>\$ 15,507</u>
<b>Goal 5 (7) Affordable Housing</b>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$10,000</u>	<u>\$ 0</u>
<b>Goal 5 (9) 4-H Youth</b>	<u>\$126,000</u>	<u>\$150,000 *</u>	<u>\$276,250</u>	<u>\$159,441</u>	<u>\$223,949</u>
<b>Goal 5 (12) Leadership Development</b>	<u>\$300,000</u>	<u>\$179,484 **</u>	<u>\$215,052</u>	<u>\$119,764</u>	<u>\$140,978</u>
<b>Goal 3 Nutrition and Health</b>	<u>\$2,000</u>	<u>\$ 2,500 ***</u>	<u>\$ 19,787</u>	<u>\$32,842</u>	<u>\$ 33,229</u>
<b>Goal 5 Adolescents at Risk</b>	<u>\$7,000</u>	<u>\$ 0</u>	<u>\$ 6,500</u>	<u>\$10,756</u>	<u>\$ 11,609</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
<b>Total</b>	<u>\$525,500</u>	<u>\$425,484</u>	<u>\$608,206</u>	<u>\$632,823</u>	<u>\$703,868</u>

\*includes: Adolescents at Risk, School-Age Childcare & Opportunities for Youth During Out-of-School Hours, Workforce Preparation/Information Technology and DESE After-School Computer Labs and Building Character through Community Service Learning

\*\*includes: Community Development Academy, Building Community through Public Deliberation, Building Strong Families, Community Emergency Mgmt., Alianzas, Community Decision Support, EXCEL

\*\*\*includes: Family Nutrition Program

\_\_\_\_\_  
**Director**

\_\_\_\_\_  
**Date**

**Form CSREES-REPT (2/00)**

**Appendix C**

**U.S. Department of Agriculture  
Cooperative State Research, Education, and Extension Service  
Supplement to the Annual Report of Accomplishments and Results  
Multistate Extension Activities and Integrated Activities  
(Attach Brief Summaries)**

**Institution** University of Missouri  
**State** Missouri

**Check one:**  **Multistate Extension Activities**  
 **Integrated Activities (Hatch Act Funds)**  
 **Integrated Activities (Smith-Lever Act Funds)**

**Actual Expenditures**

<b>Title of Planned Program/Activity</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Goal 1 (A) Integrated Cropping Systems	<u>\$553,000</u>	<u>\$525,500</u>	<u>\$533,687</u>	<u>\$420,955</u>	<u>\$421,483</u>
Goal 1 (B) Forages and Livestock	<u>\$170,000</u>	<u>\$157,700</u>	<u>\$126,770</u>	<u>\$173,582</u>	<u>\$171,061</u>
Goal 3 Improving Human Nutrition and Health	<u>\$47,000</u>	<u>\$ 8,716***</u>	<u>\$ 12,500</u>	<u>\$ 36,629</u>	<u>\$ 44,687</u>
Goal 4 Watershed Resource Education	<u>\$42,000</u>	<u>\$ 63,000</u>	<u>\$ 47,185</u>	<u>\$ 42,405</u>	<u>\$ 41,404</u>
Goal 4 (B) Livestock Production Systems**	<u>\$144,000</u>	<u>\$152,000</u>	<u>\$156,425</u>	<u>\$195,974</u>	<u>\$190,507</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
<b>Total</b>	<u>\$956,000</u>	<u>\$906,916</u>	<u>\$876,567</u>	<u>\$868,545</u>	<u>\$870,844</u>

\*\*\*includes: Family Nutrition Program

\*\*formerly Animal Waste Management (changed 2004)

\_\_\_\_\_  
**Director**

\_\_\_\_\_  
**Date**

Form CSREES-REPT (2/00)

Appendix C

**U.S. Department of Agriculture  
Cooperative State Research, Education, and Extension Service  
Supplement to the Annual Report of Accomplishments and Results  
Multistate Extension Activities and Integrated Activities  
(Attach Brief Summaries)**

**Institution** University of Missouri  
**State** Missouri

**Check one:**  **Multistate Extension Activities**  
 **Integrated Activities (Hatch Act Funds)**  
 **Integrated Activities (Smith-Lever Act Funds)**

**Actual Expenditures**

<b>Title of Planned Program/Activity</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Goal 1 Integrated Cropping Systems	\$140,965	\$133,900	\$127,200	\$137,500	\$137,500
Goal 1 Forages and Livestock	\$140,684	\$133,200	\$145,000	\$139,400	\$139,400
Goal 3 Human Nutrition and Health	\$73,212	\$ 69,550***	\$ 72,000	\$ 65,300	\$ 65,300
Goal 4 Water Quality	\$33,929	\$ 32,230	\$ 35,600	\$ 31,630	\$ 31,630
Goal 4 Livestock Production Systems	\$37,340	\$ 35,470	\$ 39,250	\$ 30,520	\$ 30,520
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
<b>Total</b>	<b>\$426,130</b>	<b>\$404,350</b>	<b>\$419,050</b>	<b>\$404,350</b>	<b>\$404,350</b>

\*\*\*includes: Family Nutrition Program  
\*\*\*\*formerly Animal Waste Management (changed 2004)

\_\_\_\_\_  
**Director**

\_\_\_\_\_  
**Date**