

2008 Alabama A&M University and Tuskegee University and Auburn University Combined Research Annual Report of Accomplishments and Results

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Accomplishments and Results

I. Report Overview

1. Executive Summary

This report covers all three land grant universities of Alabama, i.e., Alabama A&M University, Auburn University, and Tuskegee University for the research activities, results, and accomplishments during the 2008 fiscal year. The three universities have distinct programs at each institution based on clientele needs, but the administrators of the Alabama Agricultural Research Program (AARP) work closely and cooperatively to enhance partnerships among our universities in all areas of research, education, and extension. The agricultural research programs of these universities have formed a partnership, the Alabama Agricultural Land Grant Alliance (AALGA), to better address critical issues in food, agriculture, and natural resources in the state, region, and nation through multidisciplinary, multi-institutional, science-based teams that focus on the opportunities and the challenges facing farmers, consumers and agribusinesses. Working together, we have developed the priorities of AARP that included the following six areas of critical importance: (1) Enhancing agricultural production systems and value-added processing; (2) food, nutrition, health and well-being, and agricultural biosecurity; (3) environment, ecosystems, and natural resources; (4) bioenergy and bio-based economy; (5) agricultural genomics and other basic agricultural research; and (6) Industry-wide emerging issues. In recognition of the importance of international agriculture programs in promoting the competitiveness of U.S. agriculture in the global market place, AARP supports and participates in the efforts of international program offices in the three institutions. AALGA also seeks to provide quality education that prepares professionals for career opportunities in food, agriculture, environment, bioenergy, and natural resources in the state, region, and nation. Alabama's three land-grant universities have played key roles in the development of agricultural enterprises in Alabama. In 2008, good progress has been made. In particular, major progress was made in the development of new varieties and crops. Nine patent applications were made with developed new varieties/crops, seven of which was with chestnut to include varieties of chestnut named 'AU Buck I', 'AU Buck II', 'AU Buck III', 'AU Buck IV', 'AU Gobbler I', 'AU Gobbler II', and 'AU Premier'. Two varieties of kiwifruit were developed named 'AU Fitzgerald' and 'AU Authur'. Release of these special crop varieties will have a major impact to the producers and consumers as they are superior in production and performance traits. Major achievements were also made in the area of new herbicide and pesticide developments that lead to the application of several patents. Three patents were filed in 2008 from Auburn University on the development of new food products and food safety areas including Micromanipulator Mount for Microscope, the Method for Measuring Yolk Contamination of Egg Albumen, and Smoked Catfish Product and Process for Manufacture. Major research achievements were made in the area of bioenergy to allow application of two patents including Treated Biodiesel Glycerin for fungicide use, and Power Generation Via Thermoelectric Fabric Interlayer. In the area of aquatic environment, method has been developed to control catfish disease through the use of biological control with bacteriophages.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	1890	1862	1890
Plan	6.9	0.0	92.5	56.3
Actual	0.0	0.0	97.0	59.3

II. Merit Review Process

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

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

2. Brief Explanation

Internal merit evaluations were conducted on all existing projects by a panel of faculty, department heads/chairs and administrators as appropriate. Programs that encompass several projects, particularly those with identified funding sources (i.e., the AAES Hatch/Multistate Funding Program) were evaluated by an administrative panel to allocate continued funding.

Merits of new projects were evaluated by an expert panel composed of professionals from both within and out of state. In particular, experts from nearby universities such as University of Georgia and Mississippi State University were selected to cover professional areas of all six research priorities. A balanced representation was considered for various internal units, basic sciences, applied sciences, and extension. The research proposals were reviewed by all expert panelists, and a panel meeting of two days was conducted at Auburn University. The combined internal/external expert panel ranked the proposals into categories of outstanding/highest priority for funding, excellent/high priority for funding, very good/high priority for funding, good/medium priority for funding, fair/low priority for funding, and poor/do not fund. The panel made its recommendations to the Director of AAES, and funding decisions were made based on the recommendations and the availability of funds.

III. Stakeholder Input

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

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

Brief Explanation

A number of stakeholder groups have previously been identified, and input was collected through regular meetings with discussion and feedback. In particular, AARP works closely with the 18 commodity groups through the Alabama Farmers Federation, the Alabama Cattlemen's Association, the Alabama Poultry and Egg Association, and other agricultural organizations. Commodity group committees were used to evaluate on-going research and new research proposals. Direct feedback to researchers and AARP administration was through projects that were funded and through discussion about new and emerging issues. Semi-annual meetings were held with various commodity groups. Administrators and faculty members regularly participate in commodity committee meetings and their semi-annual meetings.

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

1. Method to identify individuals and groups

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

Brief Explanation

Several groups have been established and are continuing, such as advisory committees that encompass producers and consumer groups. Surveys were conducted through various AAES newsletters, and input was sought from the general public.

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

1. Methods for collecting Stakeholder Input

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

Brief Explanation

Several groups have been established and are continuing, such as advisory committees that encompass producers and consumer groups. Surveys were conducted through various AAES newsletters, and input was sought from the general public.

3. A statement of how the input was considered

- To Identify Emerging Issues
- Redirect Research Programs
- In the Staff Hiring Process
- To Set Priorities

Brief Explanation

Input from stakeholders was used to set program priorities that are not only used for the distribution of research funds, but also for the hiring of new faculty and staff to meet the long term goals. Their input is also used to identify emerging issues relevant to agricultural needs. In a number of cases, research funds were redirected to address urgent and emerging agricultural issues identified by the agricultural industries.

Brief Explanation of what you learned from your Stakeholders

Water issues are becoming more and more important now, especially with the historically severe drought conditions during the last several years in the southeastern US. Environmental issues in relation to agriculture are critical; energy security and long term supply is vital to the state's economy. The issues related to bioenergy are yet to be settled. The high demands of grains for bioenergy development have resulted in, at least in part, a huge hike in animal feed prices, which put the animal-based agricultural businesses such as the poultry industry, the catfish industry, and the dairy industry at a very difficult situation.

IV. Expenditure Summary

Institution Name: Alabama A&M University

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	2116410

Institution Name: Auburn University

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	4131328	0

Institution Name: Tuskegee University

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	2097277

Institution Name: Alabama A&M University

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	0	2116410
Actual Matching	0	0	0	2116410
Actual All Other	0	0	0	0
Total Actual Expended	0	0	12899998	0

Institution Name: Auburn University

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	6449999	0
Actual Matching	0	0	6449999	0
Actual All Other	0	0	0	0
Total Actual Expended	0	0	12899998	0

Institution Name: Tuskegee University

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	0	2097277
Actual Matching	0	0	0	2097277
Actual All Other	0	0	0	0
Total Actual Expended	0	0	12899998	0

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

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Maintaining agricultural production systems that are highly competitive in the global economy
2	Assuring the safety, security and abundance of our food supply
3	Promoting a healthy, well-nourished population
4	Sustaining greater harmony between agriculture and the environment
5	Supporting and enhancing economic opportunities and self-empowerment for families and communities

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Maintaining agricultural production systems that are highly competitive in the global economy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
125	Agroforestry	4%	4%	4%	4%
202	Plant Genetic Resources	15%	15%	15%	15%
205	Plant Management Systems	19%	19%	19%	19%
216	Integrated Pest Management Systems	20%	20%	20%	20%
302	Nutrient Utilization in Animals	20%	20%	20%	20%
311	Animal Diseases	10%	10%	10%	10%
402	Engineering Systems and Equipment	4%	4%	4%	4%
502	New and Improved Food Products	3%	3%	3%	3%
601	Economics of Agricultural Production and Farm Management	5%	5%	5%	5%
Total		100%	100%	100%	100%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.5	51.1	20.6
Actual	2.0	0.5	53.0	21.5

2. Institution Name: Alabama A&M University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	1019017
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	1019017
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Auburn University

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 3524226	Evans-Allen 0
1862 Matching 0	1890 Matching 0	1862 Matching 3524226	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

2. Institution Name: Tuskegee University

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 0	Evans-Allen 792607
1862 Matching 0	1890 Matching 0	1862 Matching 0	1890 Matching 792607
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Investigations were conducted for the development of new varieties, improved production methods such as new pesticides and cultivars in plant production systems, nutritional strategies in animal production systems, and means to generate energy. Research results were shared with extension personnel for further dissemination, particularly to county agents and producers. Additional dissemination of results were through direct grower contact (such as at field days and demonstrations, and commodity meetings), through publications (experiment station bulletins, on-line reports, press releases, as well as scientific journal articles), and non-traditional efforts such as working through community and faith-based groups.

2. Brief description of the target audience

Extension specialists, county agents, producers (particularly those that are innovative), all producers in the state, students (both K-12 and at our institutions), all state citizens. 48,000 people are said to be directly involved in farming; while Alabama's agribusiness industries account for 476,000 jobs.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2000	12000	2000	8000
2008	3000	15000	4000	10000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	19

Patents listed

1. Safening of Carotenoid-inhibiting Herbicides and Mixtures of Carotenoid-inhibiting and photosynthesis-inhibiting Herbicides with Flucarbazone on Turfgrass
2. Safening of Carotenoid-inhibiting Herbicides and Mixtures of Carotenoid-inhibiting and photosynthesis-inhibiting Herbicides with Flucarbazone on Turfgrass
3. Safening of Carotenoid Biosynthesis-inhibiting Herbicides on Cool-season Turfgrass Species with Triazolopyrimidine Herbicides
4. Chestnut Plant Named 'AU Buck I'
5. Chestnut Plant Named 'AU Gobbler I'
6. Chestnut Plant Named 'AU Gobbler II'
7. Chestnut Plant Named 'AU Buck IV'
8. Chestnut Plant Named 'AU Buck II'
9. Chestnut Plant Named 'AU Premier'
10. Chesnut Plant Named 'AU Buck III'
11. Safening of Carotenoid-inhibiting Herbicides and Mixtures on Turfgrass Species and Grass Crops
12. Kiwi Plant Named 'AU Fitzgerald'
13. Kiwi Plant Named 'AU Authur'
14. Nematicidal Properties of Sodium Azide in Combination with Propionic Acid
15. Azide and Pesticide Mixture for Controlling a Population of a Deleterious Soil Organism
16. 2-Propenal and Related Enal Compounds for Controlling Plant Pests and Weeds in Soil
17. Methods and Formulations of Sodium Azide
18. Combinations of Herbicides and Safeners
19. Compositions and Methods of Controlling Weeds and Nematodes Using EPTC and Related Compounds

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	80	80

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Publications

Year	Target	Actual
2008	80	80

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Market value of agricultural products (\$ billion) (2002 = \$3.26 bil). Program success will be indicated if market value of AL ag products stay level or increase. (Medium term outcome)
2	Number of producers (ALFA cites 48,000, Apr. 2006). Program success will be reflected by little or no change in size of the population of producers. (Long-term)
3	Average producer age (2002 = 56.6). Program success will be indicated by declining or no change in the average producer age. (Long-term)

Outcome #1

1. Outcome Measures

Market value of agricultural products (\$ billion) (2002 = \$3.26 bil). Program success will be indicated if market value of AL ag products stay level or increase. (Medium term outcome)

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Number of producers (ALFA cites 48,000, Apr. 2006). Program success will be reflected by little or no change in size of the population of producers. (Long-term)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	47900	47900

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Average producer age (2002 = 56.6). Program success will be indicated by declining or no change in the average producer age. (Long-term)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	56	56

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
205	Plant Management Systems
302	Nutrient Utilization in Animals

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

2008 was another extremely dry year following the previous drought years of 2006 and 2007 in the southeastern US. Such historical drought certainly contributed to lower agricultural production. The change in the energy sector of the economy has had a large impact on agriculture. While crop-based agriculture was affected by drought, crop growers were largely ahead as the prices of grains and other crops increased drastically in the last year. However, the increase in prices of corn, soybean, and other crops led to major increases in the cost of animal feed, which adversely affected the poultry, beef, dairy, egg, and aquaculture industries. On the other hand, the historically high fuel and energy cost in the last year has led to increases in prices of fertilizers and production costs, which add much stress to agriculture as a whole.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Evaluation Results

Specific projects that comprise the Planned Program were evaluated by departmental leaders. Overview of programs was evaluated by institution leaders. For the most part, excellent results were achieved. For exceptionally few projects, further funding was terminated if the results were found not satisfactory.

Key Items of Evaluation

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Assuring the safety, security and abundance of our food supply

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	18%		18%	18%
503	Quality Maintenance in Storing and Marketing Food Products	15%		15%	15%
601	Economics of Agricultural Production and Farm Management	25%		25%	25%
603	Market Economics	14%		14%	14%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	28%		28%	28%
	Total	100%		100%	100%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	1.9	0.0	6.8	10.4
Actual	1.9	0.0	7.0	11.5

2. Institution Name: Alabama A&M University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	377315
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	377315
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Auburn University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	465464	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	465464	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Tuskegee University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	229151
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	229151
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This planned program includes two major objectives: first, to assure food security in terms of its supply and abundance, and second, to assure food safety to human health.

Activities related to assuring food production included development of technologies and management practices for food crops, food animals, pest and disease management of plants and animals.

Activities related to assuring food safety included technology development to monitor food contaminants and evaluate means to manage food quality from the farm through processing to markets.

Results are shared with extension personnel for further dissemination, particularly to county agents, processors and consumers. Additional dissemination of results are through direct contact (such as demonstrations and commodity meetings), through publications (experiment station bulletins, on-line reports, press releases, as well as scientific journal articles), and may include non-traditional efforts, such as working through community and faith-based groups.

2. Brief description of the target audience

Extension specialists, county agents, producers (particularly those that are innovative), processors, food industry personnel, students (both K-12 and at our institutions), all state citizens.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	700	1100	120	700
2008	1000	2000	200	1000

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	3

Patents listed

1. Micromanipulator Mount for Microscope
2. Method for Measuring Yolk Contamination of Egg Albumen.
3. Smoked Catfish Product and Process for Manufacture

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	8	
2008	0	40	40

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- publications

Year	Target	Actual
2008	10	40

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Decreased incidence of cases of food poisoning (AL state stats, % deaths from Salmonella and other intestinal infections in 2004 = 1.6%). Program success will be indicated by a decline or no change in this incidence. (Short-term outcome)
2	New technology(-ies) developed to monitor microbial contaminants. (Medium term outcome)
3	New professionals in workforce with training in food safety and security. (Long-term)

Outcome #1

1. Outcome Measures

Decreased incidence of cases of food poisoning (AL state stats, % deaths from Salmonella and other intestinal infections in 2004 = 1.6%). Program success will be indicated by a decline or no change in this incidence. (Short-term outcome)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food safety is still a serious concern for the consuming public. Contaminations, in particular those of bacterial origin, can cause major and devastating consequences.

What has been done

Food safety research programs have been in place for the detection of foodborne pathogens such as E. coli and Salmonella species.

Results

The very safe food and the confidence of the public in food safety comes directly from the food safety research programs in the land grant universities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #2

1. Outcome Measures

New technology(-ies) developed to monitor microbial contaminants. (Medium term outcome)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Salmonella contamination is a great concern for poultry industry.
Foodborne pathogens and toxins in food products causes serious illness.
The presence of Campylobacter jejuni in Poultry Products is a problem.

What has been done

Existing technologies of competitive exclusion with bacteriophage were combined to reduce Salmonella in poultry. A new type of wireless biosensor, the magnetostrictive particle (MSP) biosensor, has been designed, fabricated and tested.
Four commercial antibodies were tested for the detection of Campylobacter jejuni by a surface plasmon resonance (SPR) sensor.
Surface-enhanced Raman spectroscopy (SERS) was performed to investigate the feasibility and reliability of SERS spectra for rapid detection of both S. typhimurium and E. coli.
Various nanoliter fluidic arrays were refined (i.e., designed and fabricated) to detect a single cell of important food-borne pathogen L. monocytogenes with real-time PCR.

Results

When bacteriophage was combined with competitive exclusion, the treatment resulted in a 2-log reduction in Salmonella infected chicks. These results are significant as this treatment could be used to reduce the Salmonella load entering the poultry processing facilities.
A new type of wireless biosensor, the magnetostrictive particle (MSP) biosensor, has allowed rapid and more sensitive test of foodborne pathogens and related toxins.
Surface plasmon resonance may be a better sensor system for DNA capturing, and ssDNA produces a better noise-to-signal ratio than whole genome extraction of C. jejuni.
Surface-enhanced Raman spectroscopy (SERS) method can be used for rapid detection for S. typhimurium and E. coli, additional analytical technique should be further developed to resolve the ambiguous discrimination of current SERS method.
Different nanoliter fluidic arrays were refined (i.e., designed and fabricated) to be able to detect a single cell of important food-borne pathogen L. monocytogenes with a real-time PCR. When validated, this technology should allow unprecedented sensitivity in bacterial detection on fully-cooked meat products and provide for safer food supply.

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

New professionals in workforce with training in food safety and security.
(Long-term)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	13	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Labor force with sufficient knowledge base and technology skills are needed to maintain sustained food safety for the public.

What has been done

Training was provided to both graduate and undergraduate students, as well as postdoctoral fellows in the area of food safety, foodborne diseases, and detection.

Results

Highly qualified and skilled students and postdoctoral fellows were trained, ready to take on the real world problems in food safety-related fields.

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
503	Quality Maintenance in Storing and Marketing Food Products
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (catastrophic food poisoning)

Brief Explanation

The drought had much impact on fresh vegetable quality.

The financial crisis has caused shortage of funds for certain programs including those for food safety.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Evaluation Results

Satisfactory results were achieved.

Key Items of Evaluation

Food safety and detection program at Auburn University is a peak of excellence program. Development of detection sensors at Auburn has gained much of the national attention. This particular program involves multi-college efforts including those of the College of Agriculture, Human Sciences, and Engineering.

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Promoting a healthy, well-nourished population

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food			29%	29%
702	Requirements and Function of Nutrients and Other Food Components			25%	25%
703	Nutrition Education and Behavior			19%	19%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.			2%	2%
721	Insects and Other Pests Affecting Humans			17%	17%
724	Healthy Lifestyle			8%	8%
Total				100%	100%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	6.7	6.5
Actual	0.0	0.0	7.0	7.5

2. Institution Name: Alabama A&M University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	309795
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	309795
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Auburn University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	465464	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	465464	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Tuskegee University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	260170
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	260170
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Surveys on lifestyle habits (food choice, exercise, etc.) of citizens were conducted to evaluate underlying reasons for these habits, program development for improvement, and measuring adoption of improved diets and activity levels. Research was also conducted on, for example, animal production such that meat products are more healthy. In addition, research activities will explore non-traditional means of delivery of nutritive components. Research results are shared with extension personnel for further dissemination, particularly to county agents, consumers, and community leaders. Additional dissemination of results are through direct contact (such as survey participants and community gatherings), through publications (experiment station bulletins, on-line reports, press releases, as well as scientific journal articles), and may include non-traditional efforts, such as working through community and faith-based groups.

2. Brief description of the target audience

All state citizens, particularly targeted groups of high-risk citizens. Students (K through 12; college groups). Food producers and marketers.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	2000	18000	3000	7000
2008	2000	20000	3000	8000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	5	
2008	0	27	27

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- publications

Year	Target	Actual
2008	6	27

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	New professionals in the workforce with training in nutrition and in areas related to healthful lifestyle choices. (Medium term outcome)
2	Incidence of hypertension and obesity in teenagers (AL Dept Public Health Stats--incidence of death due to heart disease in 10 - 19 yr olds, 2004 = 6.3%) (Medium term outcome)
3	Life expectancy (AL Dept Public Health special report-- 1998, 74 yrs). Program success will be indicated by maintenance or increase in life expectancy in AL. (Long-term outcome)
4	New and enhanced product(s) with improved nutritional value. (Medium term outcome)

Outcome #1

1. Outcome Measures

New professionals in the workforce with training in nutrition and in areas related to healthful lifestyle choices. (Medium term outcome)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

life style can affect health status seriously. As a matter of fact, preventive measures through nutritious food, healthy food, and proper life styles are more important than therapeutic measures to public health.

What has been done

Graduate students, undergraduate students, and postdoctoral fellows are trained in the area of nutrition, health, and wellbeing.

Results

Highly skilled labor forces are made available to work in the areas of food, nutrition, wellbeing, and public health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
702	Requirements and Function of Nutrients and Other Food Components
701	Nutrient Composition of Food
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
724	Healthy Lifestyle
703	Nutrition Education and Behavior

Outcome #2

1. Outcome Measures

Incidence of hypertension and obesity in teenagers (AL Dept Public Health Stats--incidence of death due to heart disease in 10 - 19 yr olds, 2004 = 6.3%) (Medium term outcome)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	6	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Hypertension and obesity is a huge threat to Alabamians.

What has been done

Research was conducted to understand nutrition, food, lifestyle in relation to hypertension and obesity.

Results

Better understanding of the relationship between lifestyles and obesity has allowed us to make recommendations to youth concerning food intake, food choices, and lifestyles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior
701	Nutrient Composition of Food

Outcome #3

1. Outcome Measures

Life expectancy (AL Dept Public Health special report-- 1998, 74 yrs).
Program success will be indicated by maintenance or increase in life expectancy in AL. (Long-term outcome)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	75	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Long life span is desired by all.

What has been done

Research was conducted to understand the relationships of food, nutrition, exercise and health status.

Results

A set of 'healthy' lifestyles, food, and nutritional recommendations were generated to provide a guide to the public.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
724	Healthy Lifestyle
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
701	Nutrient Composition of Food

Outcome #4

1. Outcome Measures

New and enhanced product(s) with improved nutritional value. (Medium term outcome)

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

The economic crisis has affected the choice of food, and perhaps also the lifestyles of many, which poses new challenges to public health and wellbeing.

Climate change and the major drought had much impact on the prevalence of insects that may affect disease spread.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Evaluation Results

Research results were satisfactory

Key Items of Evaluation

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustaining greater harmony between agriculture and the environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources			5%	5%
102	Soil, Plant, Water, Nutrient Relationships			6%	6%
112	Watershed Protection and Management			16%	16%
125	Agroforestry			4%	4%
133	Pollution Prevention and Mitigation			15%	15%
135	Aquatic and Terrestrial Wildlife			20%	20%
216	Integrated Pest Management Systems			21%	21%
403	Waste Disposal, Recycling, and Reuse			8%	8%
610	Domestic Policy Analysis			5%	5%
	Total			100%	100%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	22.1	10.0
Actual	0.0	0.0	23.0	10.0

2. Institution Name: Alabama A&M University

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	410283
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	410283
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Auburn University

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 1529381	Evans-Allen 0
1862 Matching 0	1890 Matching 0	1862 Matching 1529381	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

2. Institution Name: Tuskegee University

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 0	Evans-Allen 207914
1862 Matching 0	1890 Matching 0	1862 Matching 0	1890 Matching 207914
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research was directed at better ways of: managing agricultural wastes; promoting agro-(or eco-) tourism; and analyzing land and water use patterns and resources. Research results were shared with extension personnel for further dissemination, particularly to county agents, producers, industry leaders, policy-makers, citizens, and related federal agency personnel. Additional dissemination of results was through direct contact (such as demonstrations and community meetings), through publications (experiment station bulletins, on-line reports, press releases, as well as scientific journal articles), and may include non-traditional efforts, such as working through community and faith-based groups.

Research at Tuskegee University continues to focus on the long-term effects of the application of broiler litter with high levels of trace elements to agricultural lands and its effect on ground water contamination.

Scientists at Auburn University are conducting research that focuses on water quality and waste management issues, ozone studies, improved farm management through precision agriculture and remote sensing. A new study was initiated in 2008 to determine the effects of tropospheric ozone and various climate change (precipitation) on a semi-natural grassland characteristic of the Piedmont region of the US.

Alabama A&M University researchers continue to evaluate the utilization of composted poultry litter on the production of alternative crops such as shiitake mushrooms and in agronomic crops such as cotton to improve productivity and find ways of disposal of poultry waste.

The metal loading in selected streams in the lower Tallapoosa basin is being evaluated by researchers at Tuskegee University to determine total trace and heavy metal levels in the water, sediments and fish in the four streams.

DNA fingerprints of fecal bacteria are being obtained by researchers at Auburn University for bacterial source tracking. Sources include wildlife as well as livestock and farm animals. This information can be used to develop effective pollution control strategies and ensure pollution control efforts are directed at the correct source(s).

Scientists at Alabama A&M University have evaluated the impact of poultry waste applied to land. The ultimate goal of this research is to define optimal levels of nutrient concentrations, as well as enteric pathogens for safe disposal and the improvement of soil and water quality.

Auburn researchers are developing methods for evaluating litter volatilization. Such techniques will also attribute to improvements in energy and resource utilization in poultry facilities to increase profitability without degrading air quality or animal well-being.

Research at Auburn University has pinpointed nitrogen rates needed for optimal establishment and maintenance of some of the newer cultivars of hybrid bermudagrass.

Termites are a serious threat to urban building structures. Auburn University researchers are developing measures to counter the rapid spread of termites.

Studies at Tuskegee University show that plastic mulch may reduce skinning of sweetpotatoes and reduce surface rot in storage. Studies also show that thermoplastic polyurethane film improves the soil solarization process better than the low-density polyethylene in Alabama and can be used effectively against soil borne pests of vegetable crop production.

Studies at Auburn University continue to evaluate insecticide use and cultivar selection on the intensity of tomato spotted wilt, the use of which has successfully led to declines in TSW occurrence.

Insect pests continue to be important production constraints on vegetable crops grown by limited resource farmers in many parts of the southern US. Research at Tuskegee University continues to seek improvement in the production and utilization of sweetpotatoes by reducing loss caused by the insects and diseases through an integrated pest management approach.

Auburn University researchers continue to work with forest industries in developing technologies, arising from precision agricultural applications, to assist with seedling counts during planting season.

The Eurasian collared dove is a recent exotic introduction to Alabama that may compete with the native mourning dove. This competition could negatively impact the recreational and economic value of native species. Interactions among Eurasian collared doves, mourning doves, and rock doves were studied to determine if the collared dove is filling an unexploited niche or will detrimentally affect other species.

2. Brief description of the target audience

Producers, industry leaders, policy-makers, citizens, and related federal agency personnel.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1200	9000	300	900
2008	1500	10000	500	1000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	2

Patents listed

1. Treated Biodiesel Glycerin;
2. Biological Control of Channel Catfish Disease in Aquaculture Systems

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	50	
2008	0	150	150

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- publications

Year	Target	Actual
2008	25	150

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Estimated tourism receipts = \$7.6 billion in 2005. Success of this program will result in maintenance or increase in revenue (medium term outcome).
2	Fish consumption advisories in sampled waters = 26 instances in 2004 (ADEM water board). Success of this program will result in decline of water contaminants that accumulate in fish, and consumption advisories will also subsequently decline. (Long-term outcome)
3	Incidence of ground water contamination of ~ 5000 sampled sites = 20% in 2002-2003. Success of this program will result in a decline of contaminant incidence (medium term outcome).

Outcome #1

1. Outcome Measures

Estimated tourism receipts = \$7.6 billion in 2005. Success of this program will result in maintenance or increase in revenue (medium term outcome).

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Climate change has led to the changes of ozone concentrations that in turn may affect plant growth. Poultry facilities contribute ammonia emissions to the atmosphere that has adverse impact to the environment and cause problems for poultry production. Poultry waste is a huge environmental problem if not managed properly.

What has been done

A multifactor design with two ozone treatments and 3 water regimes was used to test the effect of ozone under different rainfall conditions on biomass production. The effect of litter amendments on ammonia volatilization and mitigation from poultry was evaluated. Various waste management measures were disseminated to poultry producers.

Results

Visual assessment of the AtDep plant communities suggests that productivity of white clover was more adversely affected by exposure to elevated O₃ than that of the grasses. Results will provide critical information on structure and functioning of managed grassland ecosystems using projected climate scenarios of elevated ozone and differing amounts of rainfall, with emphasis on interspecific relationships among the various processes examined. Use of litter amendments contributes to improving indoor air quality and reducing air pollution emissions from poultry buildings. Better waste management measures helped to reduce environmental impact of poultry production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
610	Domestic Policy Analysis
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
135	Aquatic and Terrestrial Wildlife
102	Soil, Plant, Water, Nutrient Relationships

Outcome #2

1. Outcome Measures

Fish consumption advisories in sampled waters = 26 instances in 2004 (ADEM water board). Success of this program will result in decline of water contaminants that accumulate in fish, and consumption advisories will also subsequently decline. (Long-term outcome)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Aquaculture pond water may have environmental impact.

What has been done

Small impoundments in Alabama were identified from satellite imagery using GIS techniques to determine their specific influence on local hydrology.

Results

Information on the number and sizes of Alabama ponds reveals that they are an important aspect of surface water hydrology in the state. Further studies will be required to estimate storage volume and to determine their specific influence on local hydrology. Findings of the study of saline water ponds suggest that future sites for such ponds should provide a greater distance between ponds and nearby streams than provided in the past.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
135	Aquatic and Terrestrial Wildlife
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management
102	Soil, Plant, Water, Nutrient Relationships

Outcome #3

1. Outcome Measures

Incidence of ground water contamination of ~ 5000 sampled sites = 20% in 2002-2003. Success of this program will result in a decline of contaminant incidence (medium term outcome).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
125	Agroforestry
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Climate change has had a major impact on the environment.
The economic crisis may affect agricultural practices.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Evaluation Results

Satisfactory results were achieved.

Key Items of Evaluation

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Supporting and enhancing economic opportunities and self-empowerment for families and communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources			15%	15%
134	Outdoor Recreation			3%	3%
802	Human Development and Family Well-Being			25%	25%
803	Sociological and Technological Change Affecting Individuals, Families and Communities			19%	19%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures			8%	8%
805	Community Institutions, Health, and Social Services			11%	11%
806	Youth Development			19%	19%
Total				100%	100%

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.8	8.8
Actual	0.0	0.0	7.0	8.8

2. Institution Name: Alabama A&M University

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

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

2. Institution Name: Auburn University

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 465464	Evans-Allen 0
1862 Matching 0	1890 Matching 0	1862 Matching 465464	1890 Matching 0
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

2. Institution Name: Tuskegee University

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

Extension		Research	
Smith-Lever 3b & 3c 0	1890 Extension 0	Hatch 0	Evans-Allen 607435
1862 Matching 0	1890 Matching 0	1862 Matching 0	1890 Matching 607435
1862 All Other 0	1890 All Other 0	1862 All Other 0	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research has assessed such things as the impact of technological and sociological changes on family and communities, family interactions on success of youth, and the availability and accessibility of health and social services to rural families and communities. Research results are shared with extension personnel for further dissemination, particularly to community leaders and educators and through leadership training. Additional dissemination of results are through direct contact (such as at school and community meetings), publications (experiment station bulletins, on-line reports, press releases, as well as scientific journal articles), and may include non-traditional efforts, such as working through community and faith-based groups.

Alabama is 45% rural. The rural Black Belt counties of Alabama pose a unique challenge for the land-grant system due to the demographic, social, and economic distinction of the region. The well-being and societal contributions of this population hinges on having viable communities, businesses and economies. This viability becomes significantly important in rural communities where the majority of the residents are poor. Research at Tuskegee University continues to focus on the assessment of the current measures for economic growth, equity issues and quality of life indicators as elements of sustainable rural development in the Black Belt of Alabama.

At Auburn University, research is being conducted on natural resource and environmental issues that affect the economic opportunities and quality of life in rural areas of Alabama. Another major research area is in the identification of issues that affect marriages and families in Alabama and to better understand the patterns of consistency and change in marriages.

Research at Alabama A & M University has been designed to ascertain the impact of technology and sustainable agriculture practices on the well-being of farmers, particularly small and medium-sized farms in Alabama.

Investigations at Tuskegee University focused on critical factors necessary for sustainable rural community development including those that apply to resource development (e.g., land loss and retention), economic development (e.g., small business and micro enterprises), and socio-political development (e.g., access and equity issues). Sustainability of related farm and other small business operations depends on factors and program or policy initiatives that are undertaken by governments (federal, state and local), community-based organizations and engaged institutions such as Tuskegee University. Our programs have led to the development of the farmers markets in Tuskegee and Selma becoming more sustainable, with more produce being sold and receipts reported. There were 11 micro loans secured from out-of-state financial institutions through the SBA Community Express Program as well as 3 farm ownership loans, 17 operating loans, 7 equipment loans, 13 housing loans and 9 livestock loans.

Research at Auburn University is evaluating the unique needs and opportunities associated with timberland owners of 50 acres and less. Appropriate harvesting and wood processing technologies were identified to meet the needs of owners of small timberland tracts, and local farmers, in order that they might sell timber and enhance their economic status.

The Black Belt region in west Alabama is under very serious economic challenges due to strong international competition of imported catfish with the domestic catfish industry. Auburn University researchers are seeking alternative species for aquaculture to address the stiff competition. Bull minnows proved to be a viable alternative species for culture in low salinity water sources of the Alabama Black Belt. They reproduced successfully in several water sources, grew at acceptable rates and could be transported without difficulty. Market studies showed an unfulfilled demand that possibly can be met by production in the Alabama Black Belt.

Working with high schools through Alabama, Auburn University researchers developed and implemented a curriculum ("Relationship Smarts") that addresses healthy relationship development. Results indicate that the adolescents who participated in the curriculum developed more accurate and realistic attitudes about dating relationships, and felt that they had gained skills in communicating and managing conflict in dating relationships.

2. Brief description of the target audience

Extension personnel, community leaders, educators, 4H, youth centers.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1100	33000	900	3300
2008	1500	40000	1000	5000

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

Patent Applications Submitted

Year Target
Plan: 0

Report Date 11/09/2009

2008 : 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	5	
2008	0	8	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- publications

Year	Target	Actual
2008	6	8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	High school graduation rate (88.8% AL Dept. Educ. 2004-2005, from drop-out rate = 11.18%). Improvements in community and family integrity should increase this (medium term outcome).
2	Educational attainment (post secondary) (AL Dept Educ., Fall 2005, 55.8% of all high school graduates were enrolled in AL colleges). Success of this program should increase this (long-term outcome).
3	The number of small businesses should increase with success of this program. In 2001, US Bureau of Labor states that 229.7 (in thousands) 'non-employer' firms were existent in AL (medium term outcome).
4	AL Dept. Health notes that 4 of Alabama's 67 counties have fewer than 3 physicians per 10,000 residents. Success of this program should increase this (medium term outcome).

Outcome #1

1. Outcome Measures

High school graduation rate (88.8% AL Dept. Educ. 2004-2005, from drop-out rate = 11.18%). Improvements in community and family integrity should increase this (medium term outcome).

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	90	90

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
805	Community Institutions, Health, and Social Services
803	Sociological and Technological Change Affecting Individuals, Families and Communities
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

Educational attainment (post secondary) (AL Dept Educ., Fall 2005, 55.8% of all high school graduates were enrolled in AL colleges). Success of this program should increase this (long-term outcome).

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	57	57

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
806	Youth Development
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #3

1. Outcome Measures

The number of small businesses should increase with success of this program. In 2001, US Bureau of Labor states that 229.7 (in thousands) 'non-employer' firms were existent in AL (medium term outcome).

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	230	372

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Number of small business is crucial for employment opportunities.

What has been done

Agricultural research and extension.

Results

Alabama Agriculture related jobs account for about 25% of all state economy. Alabama land grant universities' research and extension activities are directly linked to the agricultural jobs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
123	Management and Sustainability of Forest Resources
803	Sociological and Technological Change Affecting Individuals, Families and Communities

Outcome #4

1. Outcome Measures

AL Dept. Health notes that 4 of Alabama's 67 counties have fewer than 3 physicians per 10,000 residents. Success of this program should increase this (medium term outcome).

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
803	Sociological and Technological Change Affecting Individuals, Families and Communities

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

Climate change and soaring energy costs have had a major impact on the rural economy and self-empowerment, families, and rural communities.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Evaluation Results

Satisfactory results were achieved.

Key Items of Evaluation