

**Annual Report of Accomplishments and Results**

**For The**

**Agricultural Research Program**

**College of Agricultural, Family and Consumer  
Sciences**

**Southern University and A&M College**

**Presented to**

**Cooperative State Research Education and  
Extension Service**

**United States Department of Agriculture**

**Federal Fiscal Year  
1999-2000**

TABLE OF CONTENTS

	Page
I	Introduction .....1
	A. Planned Programs .....1
	B. Stakeholder Impact Process .....3
	C. Program Review Process .....3
II	National Goal 1.....4
	A. Executive Summary .....4
	B. Overview .....6
	1. Research Results (Output Indicators) .....6
	2. Successes (Outcome Indicators).....7
	3. Benefits.....7
	4. Assessment of Accomplishments .....8
	C. Key Themes for National Goal 1 .....11
III	National Goal 3.....11
	A. Executive Summary .....12
	B. Overview .....12
	1. Research Results (Output Indicators) .....12
	2. Successes (Outcome Indicators).....12
	3. Benefits.....13
	4. Assessment of Accomplishment .....13
	C. Key Themes for National Goal 3 .....14
IV	National Goal 4.....16
	A. Executive Summary .....16
	B. Overview .....17
	1. Research Result (Output Indicators) .....17
	2. Successes (Outcome Indicators).....17
	3. Benefits.....17
	4. Assessment of Accomplishments .....17
	C. Key Themes for National Goal 4 .....18

TABLE OF CONTENTS (CONT'D)

	Page
V National Goal 5.....	21
A. Executive Summary.....	21
B. Overview.....	22
1. Research Results (Output Indicators).....	22
2. Successes (Outcome Indicators).....	22
3. Benefits.....	22
4. Assessment of Accomplishments.....	23
C. Key Themes for National Goal 4.....	23

## **THE FY2000 ANNUAL REPORT OF ACCOMPLISHMENT AND RESULTS**

### **SOUTHERN UNIVERSITY AND A&M COLLEGE**

Southern University and A&M College, an 1890 Land-Grant Institution, receives Federal research funds under section 1445 of the National Agriculture Research, Extension and Teaching Policy Act of 1977 as amended. Section 225 of the Agricultural Research, Extension, and Education Reform Act of 1998 required the University to prepare and submit for approval a Plan of Work in order to continuously receive formula funds for its research program. Subsequently, Southern University and A&M College submitted a Plan of Work in 1999 which was approved by the USDA/Cooperative State Research, Extension and Education Service (CSREES) for a period of five-years, October 1, 1999 to September 30, 2004. This document reports accomplishments and results for fiscal year 2000, (October 1, 1999 to September 30, 2000) consistent with the approved Plan of Work.

#### **PLANNED PROGRAMS**

The College's research activities are organized and presented in four broad research program areas: 1) plant and animal production systems, 2) human, nutrition, health, family and consumer sciences, 3) urban forestry, natural resources and environment, and 4) economics, marketing, policy and community development. Related research projects are identified and conducted as part of each research program and are supported for the most part by formula funds.

Research plans for the College were presented in its Five - Year Plan of Work submitted to USDA/CSREES during the 2000 fiscal year. The plans are presented to reflect the research mission of the College and are reflective of four of the five national goals established by CSREES. Efforts we re

made to conduct research to address critical issues in food and agriculture in the state of Louisiana.

Planned research programs and associated national goals are listed below.

**National Goal 1:** To achieve an agricultural production system that is highly competitive in the globaleconomy

**Research Program:** Plant and Animal Production Systems

**Research Projects:**

- I. Utilization of Crawfish Waste
- II. Hormonal control of Rabbits
- III. Value- Added Product Development
- IV. Evaluation of Kenaf Crops

**National Goal 3.** To achieve a healthier, more well nourished population

**Research Program:** Human Nutrition, Health, Family and Consumer Sciences

**Research Projects:**

- I. Obesity Among African - American Women
- II Textile Materials Development (Multi - Institutional)

**National Goal 4:** To achieve Greater Harmony between Agriculture and the Environment

**Research Program:** Urban Forestry, Natural Resources and Environment

**Research Projects:**

- I. Biotechnological Urban Tree Propagation
- II Community Forestry
- II Biological Responses of Selected Urban Tree Species

**National Goal 5:** To enhance opportunities and the quality of life for Americans

**Research Program:** Economics, Marketing, Policy and Community Development

**Research Project:** Consumption Pattern for Goat and Rabbit Enterprises

### **Stakeholder Input Process**

Stakeholder input was sought at various levels as a prerequisite and support for on-going research activities in the college. Individuals engaged in research participated in several forums where critical issues facing the state of Louisiana were identified and discussed. Focus group meetings in selected Louisiana parishes were held with representatives of community groups and other stakeholders in order to obtain their input and recommendations. Input from these groups was critical to the success realized in the research activities in the College. A survey was administered to a sample of county agents. Through this process critical issues in agriculture and natural resources; nutrition, family and consumer sciences; community and youth development; and workforce preparedness were identified. Some critical issues are reflected in the executive sections of this report.

### **Program Review Process**

Program review has not yet been scheduled, but one is being contemplated for the near future. Plans are underway to make the necessary request for a program review by USDA/CSREES

**National Goal 1: To achieve an agricultural production system that is highly competitive in the global economy**

**Executive Summary**

Four research activities were planned and submitted as part of the five year plan of work approved by USDA/CSREES during fiscal year 2000. These research activities were: 1) utilization of crawfish waste, 2) hormonal control of rabbits, 3) value-added product development of goat and rabbit meat, and 4) evaluation of kenaf as forage for small animals. The nature of the research project conducted was guided by stakeholder input.

The Southern University scientists identified critical agricultural and related issues affecting small farms. The most prevalent ones identified were: 1) limited operating capital, and 2) lack of agricultural technical expertise including management and lack of access to competitive markets. Information gathered revealed that many small producers in the state of Louisiana raise beef and swine for the market and maintain some poultry for home consumption. There is also a growing number of small-scale producers who are beginning to rear rabbits and goats as alternative sources of both food and income. This trend suggests that research information is needed on production practices, market alternatives and nutritional value of these and other commodities. Since there is a gradual shift among

small scale producers from agronomic crops to horticultural crop production, there will be need for further stakeholder input in this regard..

Refractionated crawfish meal is being feed to livestock and is being tested as a potential soil amendment. Results reveal good growth performance rates among livestock as measured by parameters such as weight gains and carcass evaluations. It can be concluded that these preliminary results could have broad implications on feeding cost of livestock, and effect on profit margins to agricultural producers. Under greenhouse conditions, the scientists observed that refractionated crawfish meal had an effect on soil fertility. This effect has the potential to enhance plant growth and crop yield and ultimately impact economic development. As a result of these research findings, farmers have started to adopt the use of crawfish waste in their livestock ration formulations. Consequently, there will be a significant reduction in environmental hazards originally posed by the crawfish industry.

Patties, sausages and nuggets have been developed by researchers engaged in value-added product development research at the University. Results reveal that these products are nutritional and were acceptable by a taste panel. These products could prove to be beneficial to a population that experience health problems as do a great number in the state of Louisiana. Plans are underway to conduct nutritional intervention studies using products emanating from this study.

Researchers at the University are investigating kenaf as a potential forage crop for small animal production. Preliminary results indicate that kenaf can be harvested like alfalfa up to three times per growing season for livestock feed. When goats were fed 100 percent kenaf, no significant difference in growth performance was observed. These research results if adopted by producers could substantially affect the cost of production. Livestock farmers in the state of Louisiana are encouraged to utilize kenaf as a forage crop. Further studies will assess its acceptability and economic impact.

Additionally, research with rabbits reveal certain hormonal interaction with milk production and nest building behavior. These preliminary findings have the potential to significantly impact the profit margin in rabbit production.

The research generated from research activities described under national goal 1 has been disseminated in professional and scientific journals. A number of presentations have been made by scientists at regional and national meetings. Abstracts of presentations are published in associations annual meeting proceedings.

**National Goal 1:** To achieve an agricultural production system that is highly competitive in the globaleconomy

## **Overview**

Under National Goal 1, fiscal year 2000 accomplishments and results of four research projects are reported according to guidelines established by CSREES. These projects are: 1) utilization of crawfish waste, 2) hormonal control of rabbits, 3) value-added product development, and 4) evaluation of kenaf crops. All projects were supported by CSREES formula funds.

## **II Research Results (Output Indicators)**

**Utilization of Crawfish Waste:** Scientists conducting this research reported some findings in technical publications and presentations at professional meetings and conferences. Two abstract presentations are published in the *Proceedings of the Association of Research Director's Biennial Symposium in 1997*. Some results are presented on Southern University Crawfish Program Industrial Agriculture-USA Clearinghouse Website [WWW:l.a.usa.org/ko129htm](http://www.la.usa.org/ko129htm)

**Hormonal Control of Rabbits:** No publications have been generated by scientists. However, preliminary results indicate that B-endorphin and prolactin have no direct effect on nest building in rabbits. Prolactin, however has a significant effect on milk production; and estradiol and progesterone appear to influence nest building behavior in rabbits.

**Value-Added Product Development:** Scientists involved in this study have published and presented their work in scientific journals and at professional meetings and conferences. Four articles appear in the *Journal of Muscle Foods* and the *Journal of Food Sciences*. Three abstracts were in the *Proceedings of the Annual meeting of the Food Expo*. Two abstracts were presented in the

*Proceedings of the Association of Agricultural Sciences*; and one abstract was presented in the *Proceedings of the Association of Research Director's Biennial Symposium* and the *Proceedings of the Institute of Food Technologist* respectively.

**Evaluation of Kenaf Crops:** The findings emanating from this study appeared in journals and proceedings of professional meetings and conferences. Research abstracts are presented in the *Journal of Animal Science* and the *Journal of Agronomy*. Abstracts of presentations are presented in the *Proceedings of the Louisiana Plant Protection Association* and the *Louisiana Association of Agronomists*. Presentations were made at the *Agricultural Research Scientists Annual meeting* and at the *Association of Agricultural Research Director's Biennial Symposium*. Abstracts appear in the Proceedings.

#### IV Successes (Outcome Indicators)

**Utilization of Crawfish Waste:** Research results indicate that feeding livestock crawfish meal ration does appreciably impact growth. Evidence further suggests that composted crawfish waste has tremendous potential as a soil amendment. Greenhouse experiments revealed that the addition of crawfish waste meal does raise soil p<sup>H</sup>. On the otherhand it was observed that acidic soils can be corrected by application of crawfish waste meal.

**Value-added Product Development:** Value-added patties, sausage and nuggets have been produced from nontraditional products (goat and rabbit meat). These products were found to be nutritionally sound and highly acceptable and have the potential to impact nutritional status of residence of the state of Louisiana.

**Evaluation of Kenaf Crops:** The cultural practices of kenaf have been improved under Louisiana condition. The research findings reveal that kenaf can be harvested (cut) like alfalfa up to three times for livestock feed before it is killed by frost. Optimum dates of planting kenaf is mid-May. The highest yield occurs with 70kg/ha of nitrogen fertilizer levels. Kenaf has the potential to be a good and economical forage for goats and other small animals. Kids raised on 100 percent kenaf forage performed well in terms of growth performance and carcass evaluation.

#### IV Benefits

**Utilization of Crawfish Waste:** The adoption and use of refracted crawfish meal in the diets of livestock have the potential to reduce the overall cost of feed, thus increasing the profit margins to farmers. Similarly, the adoption and use of crawfish meal as a soil amendment have the potential to affect soil fertility, enhance plant growth and crop yields. These findings also have the potential to impact on economic development in the state of Louisiana while alleviating environmental hazards.

**Value-added Product Development:** The nutritional products developed from goat and rabbit meat have the potential to enhance the health status of individuals with high incidence of obesity and other chronic diseases. The introduction of these products into the market place could potentially enhance the production and food processing industries.

**Evaluation of Kenaf Crops:** Kenaf as a proven feed for small animal production could potentially enhance the profitability of the livestock industry by decreasing the cost of feed for production of these animals.

#### IV **Assessment of Accomplishments**

Based on the results that we have thus realized on the above-referenced projects, the College is confident that the performance goals as outlined in the Five Year Plan of Work will be accomplished in a timely manner. It is premature at this time to present a full assessment of performance goals by projects.

##### **Key theme: New Uses for Agricultural Products**

###### **A. Brief Description of Activity:**

More than \$50 million are generated from the sale of approximately 100 million pounds of crawfish in the state of Louisiana annually. Of this amount, only 15 percent is consumable, leaving approximately 85 million pounds as waste which creates a potential for an environmental problem in the state. Researchers are exploring ways to utilize crawfish waste materials. Their research seeks to assess the effect of feeding refracted crawfish meal in conjunction with flavoring agents in swine and goat diets. It also assesses the effect of crawfish waste as a soil amendment in plant growth.

###### **a. Impact**

Effectively utilizing crawfish meal as a protein supplement could reduce the cost of feeding livestock. The major protein source in livestock ration is soybean. It sells for approximately \$270 per ton, while crawfish meal can be generally obtained for 50 percent less. This project could provide short and long term economic benefits to the livestock and crawfish industries.

**b. Source of Funding: Evans-Allen Formula funds**

**c. Scope of Impact: State specific**

**Key theme: Animal Production Efficiency**

**a. Brief Description of Activity:**

Researchers are engaged in a study to understand the hormonal control of nest building behavior in rabbits. Profiles for estradiol, progesterone, prolactin, and  $\beta$ -endorphin have been generated. The profiles for estradiol is currently being studied further. Simultaneous behavioral observations were made and will be correlated with the hormonal profiles.

**b. Impact**

While no impact has not yet been quantified, results indicate that  $\beta$ -endorphin and prolactin have no direct effect on nest building behavior. However, prolactin does have a significant effect on milk production. Estradiol and progesterone appear to influence nest building behavior.

**c. Source of Funds - - Evans-Allen Formula Funds**

**d. Scope of Impact - - State specific**

**Key theme: Adding Value to new Agricultural Products**

**a. Brief Description of Activity**

Scientists are conducting research to develop high quality value-added products from goat and rabbit meat. Processing of rabbits, goats and beef hearts into defatted muscle proteins and meat products may increase the utilization of these nontraditional meats. The research involves formulation and development of value-added healthy meat products with different stabilizers and defatted muscle proteins.

**b. Impact**

Thus far, goat and rabbit meat were combined with oat gum and oatin ( effective binders with hypocholestermic properties ) and formulated into traditional meat products– patties, sausage and nuggets. The formulated products were found to be texturally enhanced, nutritionally sound ( low fat, low cholesterol, and high protein ) and were highly accepted by a consumer panel. The products have great potential. They offer a healthier alternative than some popular meat products that are formulated with fat and are common in the marketplace. Furthermore, the economic potential of these products to the small-scale producers will be enhanced once these products are stabilized in the market. Studies are underway to address the safety and regulatory measures before products are fully put on the market.

c. **Source of Funding** –Evans - Allen Formula Funds

d. **Scope of Impact** – State specific.

**Key theme : Plant Production Efficiency**

**a. Description of Activity**

Researchers at Southern University have studied kenaf as an alternative forage crop for small animal production. In this study, emphasis was placed on assessing the agronomic characteristics of kenaf and its potential for a source animal feed.

**b. Impact**

The research findings clearly reveal that kenaf has the potential as an alternative feed for livestock and as a soil amendment. Adoption of this crop by agricultural producers could reduce the cost of feed while enhancing production efficiency.

**c. Source of Federal Funds –Evan - Allen Formula Funds**

**d. Scope of Impact – State specific**

**National Goal 3:** To achieve a healthier, more nourished population

### **Executive Summary**

To achieve this national goal, two research projects: 1) obesity in African-American young women, and 2) development of textile materials for environmental compatibility and human health safety were conducted by Southern University scientists. These activities were planned around critical issues recognized among the population the University has traditionally served. Obesity, a leading cause of death, affects 30 percent of women, 15 percent of men and 25 percent of adolescents, with highest rates observed among low income and minority groups. Nearly 50 percent of African-American women are overweight. Louisiana is among the top states in the United States with obesity problems among the population. On-going research is examining the relationship between obesity and fat

patterning and the development of the risk factors for certain diseases of African-American women. Nutritional interventions are being used to address health problems associated with nutritional deficiencies.

There is a need to create and market value-added products to achieve economically viable production systems. The textile study being conducted at Southern University involves development of fabrics from kenaf which also is being evaluated for its potential as a feed source among livestock. Ongoing research in textile has the potential to impact health care.

### **National Goal 3: To achieve a healthier, more nourished population**

#### **Overview**

Under this national goal, fiscal year 2000 accomplishments and results of two research activities are reported according to guidelines established by CSREES. These activities are: 1) obesity among African-American young women, and 2) development of textile materials for environmental compatibility and human health safety. Both activities are supported by CSREES formula funds.

#### **a. Research Results (Output Indicators)**

Researchers involved in the obesity research have published an abstract in the year 2000 entitled: **“Quality of Life Factors for an American Collegiate Population.”** A number of workshops and seminars were conducted within the state as part of intervention strategies. Research results were presented in these venues.

A national survey has been completed as part of the textile research effort. Preliminary results indicate that respondents in the study were unfamiliar with nontraditional biodegradable fibers such as kenaf, and jute. Their pro-environmental attitudes were slightly positive. The respondents did not feel that textiles contributed significantly to environmental pollution. Respondents involved in the study had slightly negative pro-environmental behavior. When asked to indicate if they considered the biodegradation

potential of textiles in purchasing textile products, they indicated that they rarely did. The national study provided background information needed for further success of the research.

**a. Successes (Outcome Indicators)**

Nutritional interventions are being conducted with several groups to address obesity problems in an effort to reduce the incidence of nutritionally related problems in the state of Louisiana. Further, the Southern University scientist conducting textile studies has developed doctor scrubs from Exxaire fabric. The development of this product has much promise in the medical field.

**b. Benefits**

A large segment of the Louisiana population could benefit from this study by participating in intervention strategies that could impact their health.

**c. Assessments of Accomplishments**

The immediate performance goals have not been fully met. The projects are in data collection and analysis stages. The textile project has the potential to produce new and alternative use of raw material such as kenaf to benefit the textile industry.

**Key theme: Human Health and Nutrition**

**a. Brief Description of Activity**

Obesity continues to be one of the most pervasive, and persistent health problems in America. Obesity affects 20-50 percent of adults in the U.S. African American women have twice the rate of obesity than Caucasian women. Research clearly supports the multiple adverse health consequences of obesity. It is a major risk factor for a variety of chronic diseases and is associated with various psychological consequences. The health consequences of obesity are many and varied, ranging from

an increased risk of premature deaths to a variety of non-fatal but debilitating health problems that impact the quality of life. Weight gain in early adulthood increases health risks in later life.

This research is studying the relationship between obesity, fat patterning and the development of the risk factors for certain diseases in African American women. Relative disease risk for type 2 diabetes, hypertension and cardiovascular disease based on body mass index and waist circumference was high for this population.

Quality of life factors were evaluated in collegiate African American women. These results were derived from a health, lifestyle, and quality of life instrument completed by women. Selected questions focused on whether subjects had experienced selected events during a seven day period. Differences were found in the perceptions based on body mass index. Obese participants perceived

their general health to be poorer than normal weight participants. Lower energy levels were reported by obese participants compared to normal weight participants.

Assessment of emotional well-being and potential psychological barriers to change are important in implementing lifestyle modifications. Adoption of lifestyle intervention strategies, group support, and increased activity are effective for weight loss and yield health benefits in young African American women. Deterrents to the implementation of nutrition intervention program in this population related to the time availability including class and work schedules.

This study increases the understanding of the factors determining the distribution of fat and the consequences in young adult women. Findings from this study contribute useful information for planning strategies to reduce the overall prevalence of obesity in this population.

**b. Impact**

Adoption of lifestyle intervention strategies, group support and increased activity are effective for weight loss and yield health benefits in young African American women.

**c. Source of Federal Funds:** Evans-Allen Formula Funds

**d. Scope of Impact:** State specific

**Key theme: Textile Development and Health Care**

**a. Brief Description of Activity**

The U.S. Public increasingly recognizes the need to reduce waste and develop products that have enhanced bio-degradation potential. There is a need to create and market value-added products from agricultural products to achieve economically viable production systems. A study is being conducted at Southern University and A&M College that involves the development of newer textile materials (value-added products) and processes that will improve existing textiles and polymeric materials. The scientist at Southern University is involved in market research and field-testing of the value-added textile products.

**b. Impact**

Environmental compatibility of products to be produced from kenaf or alternative forms of fabric is a major selling point for many products. It is hypothesized that bio-degradable fiber will increase in popularity over time. This study has the potential to develop new textile products from nontraditional sources.

**c. Source of Federal funds - Evans-Allen Formula Funds**

**d. Scope of Impact - Eleven universities are involved as follows:**

Southern University and A&M College  
Mississippi State University  
Louisiana State University  
University of Nebraska  
University of Kentucky  
Kansas State University  
Purdue University  
University of Wisconsin-Madison  
Auburn University  
University of Tennessee - Knoxville  
University of Arkansas - Fayetteville

**National Goal 4:** To achieve greater harmony (balance) between agriculture (production activities) and (stewardship and protection of) the environment

### **Executive Summary**

Three projects were planned and are being conducted as part of this national goal. They are: 1) biotechnological approaches in urban tree propagation, 2) analysis of the nature of community urban forestry programs, and 3) biological responses of selected urban tree species. Micropropagation research has been extensively done in the areas of agriculture and horticulture but is very limited in forestry and urban forestry. One of the limiting factors has been the complexity and more exacting requirements of urban trees for their regeneration and propagation. Micropropagation is a rapid

technique for the multiplication of superior families identified with desirable traits such as vigor, shape/form, and resistance to pests and diseases, drought, flooding and other environmental stresses. Micropropagation would overcome problems associated with sexual as well as traditional asexual propagation of urban trees.

Research emphasis will continue in the area of natural resource management and the protection of urban forest health. The Southern University scientists are hoping to generate useful research information relating to natural resource management systems. Information generated will assist the public in better understanding the global problems that threaten the quality of air, water and soil resources.

**National Goal 4: To achieve greater harmony (balance) between agriculture (production activities) and (stewardship and protection of) the environment**

**Overview**

**a. Research Results (Output Indicators)**

Research involving a community forest project led to the publication of one refereed paper in the *Journal of Arboriculture*, November 2000 issue. The title of the article is “Assessing Resident Willingness -to-Pay to Preserve the Community Urban Forest: a Small City, Case Study.” One technical paper was published in the *Proceedings of the American Foresters Convention 1999*.

Three presentations were made at the *Association of Research Director's Biennial Symposium* in, 1999.

Studies involving “*Biological Responses of Selected Urban Tree Species*,” and “*Biotechnological Approachers in Urban Tree Propagation*” have not generated any publishable results. Delay in progress is due primarily to the fact that the tissue culture laboratory has not been fully operational. Most equipment to furnish the lab has been purchased. The primary hold up has been the installation of case work and related facilities.

**b. Successes (Outcome Indicators)**

Successes in two of the projects have been delayed for reasons cited above. However, efforts are underway to remedy the situation.

**c. Benefits**

These projects have the potential to generate significant benefits to the environment.

**d. Assessments of Accomplishments**

Accomplishments have been hampered by our inability to equip a tissue culture laboratory in a timely manner.

**Key theme: Biotechnological Propagation**

**a. Brief Description of Activity**

Micropropagation research has been extensively done in the areas of agriculture and horticulture but very limited in forestry and urban forestry. One of the limiting factors has been the complexity and more exacting requirements of urban trees for their regeneration and propagation. Micropropagation is a rapid technique for the multiplication of superior families identified with desirable traits such as virgo,

shape, form, and resistance in pests and diseases, drought, flooding and other environmental stresses. Micropropagation would overcome problems associated with sexual as well as traditional asexual propagation of urban trees.

The research involves in vitro germination, embryo culture, ovule culture, floral culture, tip, bud and leaf cultures and micro cuttings. Several surface-sterilization and media protocols in combination with growth regulators are assessed for effectiveness. Morphological features of the shooting/rooting process are examined using light and electron microscope. Photosynthesis, respiration, transpiration, stomatal conductance and distribution of in vitro plantlets are evaluated.

**b. Impact**

Significant results of this project have not yet been realized. However, the project intends to establish specific propagation techniques for the species that are not readily propagated through conventional methods. It also will resolve the problem associated with micropropagation.

**c. Source of Federal Funds - - Evan-Allen Formula Funds**

**d. Scope of Impact - - State specific**

**Key theme: Other (Community Forestry)**

**a. Brief Description of Activity**

Despite all the benefits, the public remains less supportive of conservation, protection and establishment of urban forests. The concern is being addressed in a study involving community forest educational and training programs. The project specifically identifies indicators for measuring the effectiveness of

education programs in forestry; to develop a compendium of educational programs in urban and community forestry, and to measure and evaluate the public's perception for preserving urban forests.

**b. Impact**

Research products generated and presented will serve as a guide to the private sector and the local and state governments in the formulation of effective community forestry programs. The project develops models to infer the intrinsic values of urban trees and forests and to explain how educational programs have influenced the value people place on the urban forest. A survey will identify unique programs within states, cities or municipalities and provide opportunities for other states, cities municipalities to compare and share their information.

**c. Source of Federal Funds - -Evan-Allen Formula Funds**

**d. Scope of Impact- State Specific**

**Key theme: Forest Crops**

**a. Brief Description of Activity**

The research was designed 1) to identify and quantify biological adaptation of cherrybark oak (*Quercus falcata*) and water oak (*Quercus nigra*) species to flooding and a range of soil compaction, and 2) evaluate the effect of flooding and soil compaction in soil properties.

Two-year old saplings of Cherrybark Oak (*Quercus falcata*) and Willow Oak (*Quercus phellos*) were randomly planted in 24 plots (three of each species per plot). Trees were allowed to establish in the ground for three weeks. The experimental tree species were randomly subjected to a combination of cyclic flooding and soil depth treatments (0", 6", 12", and 18"). Soil depth was correlated with soil compaction (bulk density). Flooding cycles were simulated using an underground piping system and imposed every 9 days for a 5-day duration. Measurements of leaf-level gas exchange are being made, before, during, and after each flooding cycle using a portable photosynthesis system (PP System Inc.). Leaves of similar maturity are used. Leaf area is measured using a Delta-T-Scan system. Leaf moisture potential is measured using a thermocouple psychrometer. Leaf samples from each species are being examined under an electron microscope for detection of any ultrastructural changes. Tree height and stem diameter are also measured periodically. Soil pH, chemical composition, redox potential, and moisture potential are also being measured periodically. Data acquisition and compilation will continue as planned.

**b. Impact**

This study is a newly established project and data collection and analysis are underway.

**c. Source of Federal Funds: Evans-Allen Formula Funds**

**d. Scope of Impact: State specific**

**National Goal 5:** To enhance economic opportunities and the quality of life for Americans

## **Executive Summary**

Many critical issues can be cited as a framework and need for research related to marketing non-traditional food products. Today, consumers select from a vast array of conveniently prepared food products, and a wide variety of ethnic and other exotic food products. Researchers feel that the demand and supply of new and exotic foods will continue into the future. However, there are three main issues that support this type of research. Firstly, geographic, socioeconomic and demographic factors of the U.S. food consumption patterns are changing. The largest consumers of goat meat in the United States usually have strong ties to Africa, the Middle East, and Caribbean, while rabbit meat consumers are mainly of European descent. Secondly, real food expenditures per capita have increased, and thirdly, USDA production and consumption data on the selected nontraditional enterprises are either aggregated or undocumented.

The project described under this goal is designed to provide data to assess the marketing outlook for nontraditional meat and their by products. Specifically, it examined whether viable markets currently exist or will exist in the future for goat meat, goat cheese, goat milk, rabbit meat, rabbit roast, rabbit nuggets, and rabbit patties. Data were compiled from a national telephone survey of 1,421 primary grocery shoppers/meal preparers in 13 southern states - - Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia. The survey provided fine data bases.

Based on empirical analyses conducted, the most likely consumers to use products studied were men, older consumers, college graduates, and those household of at least \$50,000. This marketing information is being disseminated through professional and scientific journals and through research presentations at regional and national meetings and conferences. Additionally, the research has

broadened the U.S. Department of Agriculture's database, because its data on these products are aggregated making it more difficult to analyze regional differences in consumption or interest in consuming the selected products.

**National Goal 5:** To enhance opportunities and quality of life for Americans

### **Overview**

#### **a. Research Result (Output Indicators)**

The scientist involved in this research has published one journal article and four abstracts. Presentations of results were made at professional meetings and conferences. One presentation was made at the *Food Distributors Research Society 2000 Annual* meeting and two presentation were made at the *Association of Research Directors' 2000 Biennial Symposium*. In the year 2000, a poster presentation was made at the *Annual Meeting of the American Agricultural Economics Association*. Four manuscripts have been prepared and submitted for review by scientific journals. And finally, a master's thesis is being developed from portions of the data generated.

#### **b. Successes (Outcome Indicators)**

The research results reveal that the most the likely consumers to utilize nontraditional food products such as goat and rabbit are men, older consumers, college graduates, and those with household incomes of at least \$50,000. The research has broadened the U.S. Department of Agriculture's database on nontraditional food consumption patterns.

#### **a. Benefits**

Stakeholders in the agricultural industry could benefit from results of this research. With a potential increase in the consumption of goat and rabbit meat by a growing and diverse population, the food processing and production industries could be enhanced, affecting job opportunities, economic and community development across the southern region.

**a. Assessment of Accomplishments**

The Southern University and A&M College Research Program has met the immediate performance goals. However, increased activity in the food processing and production industries have not been made as a result of this research effort.

**Key theme: Community Development**

**a. Description of Activity**

This project was designed to provide data to assess the marketing outlook for nontraditional meat and their byproducts. Specifically, it examined whether viable markets currently exist or will exist in the future for goat meat, goat cheese, goat milk, rabbit meat, rabbit roasts, rabbit nuggets, and rabbit patties. Data were compiled from a random telephone survey of 1,421 primary grocery shoppers/meal preparers in 13 southern state (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia) in 1998. The survey provided a rich database on the following:

**Behavioral Patterns:**

Overall Health Consciousness; Use of Food Labels; Use of Salt; Perceptions of Food Sufficiency

**Decision Process**

Milk Purchases; Cheese Purchases; Meat Purchases; Experience with Speciality Foods

**Rabbit and Goat Meat**

Incidences of previous purchases; purchase patterns; likelihood of future purchases  
Likelihood to try (free samples at grocery stores or as menus at local restaurants); motivations to buy (roasts, patties, nuggets, if meats were packaged with recipes or in marinade)

**Goat Milk and Goat Cheese**

Incidences of previous purchases; purchase patterns; likelihood of future purchases; motivations to buy (goat milk and goat cheese packaged with recipes for desserts or salads, respectively)

### **Socioeconomic and Demographic Factors**

Number of hours worked outside the home; respondents' age; household size and composition (number of children in the household); educational levels; marital status; religion; household income; race; food stamp participation

### **Impact (Results)**

To date, the following activities have been completed

- a. Two papers were presented at the 2000 Association of Research Directors Symposium
- b. A poster was presented at the 2000 Annual Meeting of the American Agricultural Economics Association
- c. A paper presented at the 2000 Annual Meeting of the Food Distribution Research Society
- d. Four abstracts and a journal article have been published
- e. Four manuscripts were submitted for review by scientific journals
- f. One master's thesis is being developed from the milk data

### **c. Sources of Funding: Evans-Allen Formula Funds**

- d. **Scope of Impact:** Thirteen southern states including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, and Tennessee.