

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Food Systems and Food Safety

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
304	Animal Genome			10%	15%
307	Animal Management Systems			10%	15%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals			10%	0%
501	New and Improved Food Processing Technologies			20%	15%
503	Quality Maintenance in Storing and Marketing Food Products			10%	10%
504	Home and Commercial Food Service			5%	5%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources			10%	15%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins			20%	20%
723	Hazards to Human Health and Safety			5%	5%
	<b>Total</b>			100%	100%

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

1. Actual amount of FTE/SYs expended this Program

**Auburn University**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	13.0	8.0
<b>Actual Paid</b>	0.0	0.0	8.6	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

**Alabama A&M University**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	13.0	8.0
<b>Actual Paid</b>	0.0	0.0	0.0	3.8
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

**Tuskegee University**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	13.0	8.0
<b>Actual Paid</b>	0.0	0.0	0.0	3.1
<b>Actual Volunteer</b>	0.0	0.0	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	352710	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	352710	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	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	205747
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	322067
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	200000
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	183817
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**

Specific areas of research include reducing the incidence of food-borne illness and provide a safer food supply; eliminating causes of microbial contamination and antimicrobial resistance; educating consumer and food safety professionals; developing food processing technologies to improve food safety; development of technologies for tracing the sources of food production; development of technologies for rapid analysis and identification of food including seafood; development of technologies for rapid detection of biological and chemical contamination such as antibiotics, pesticides, and other contaminants. This priority is aligned with the USDA research priority area of Food Safety and with the needs of Alabama to ensure the safety and well-being of its citizens, and with the economic interest of Alabama in the global economy. Alabama A&M University is undertaking studies on the survival and transmission of food borne pathogens in some plant models.

In 2014, AU Food Systems Institute has been active in integrating all research, education, and outreach activities in food safety and food systems. For example, AUFSI works with the university's aquaculture program, the National Center for Asphalt Technology, the Detection and Food Safety Center, and even the Auburn University hotel and restaurant program to address food system concerns. Communicating researchers' food-related findings through proper training and outreach are also part of AUFSI's plan.

AUFISI strives to maximize Auburn's existing internal strengths in the food systems arena as well as facilitate external collaborations with industry and government agencies. The Auburn University Food System Institute organized the core faculty who are a part of working groups consisting of researchers from different disciplines. Core faculty members share common interests pertinent to food systems and communicate their respective research to one another. Some of the highlights of AU Food Systems Institute include:

- Established Virtual Food Systems Training Consortium (VFSTC) Advisory Board;
- Established IACET (International Association for Continuing Education and Training) committee to complete accreditation process for AUFISI to become IACET provider;
- Established partnerships with three universities through collaborative grant efforts;
- Expanded core faculty membership, who attended and/or presented at numerous conferences(ranging from regional to international) and established HAACP, AFDO, and AF-DOSS connections;
- Established social networking avenues: web page, Twitter, Facebook;
- Developed training needs assessment and administered assessment to state inspectors in four states;
- Became partner in FDA-approved lab and entrepreneur food-testing lab;

Efforts at Tuskegee University continue in identifying weak strains of Salmonella that can be used as possible vaccine candidates against salmonella infections. Studies are also being conducted on

**2. Brief description of the target audience**

Researchers, educators, producers, food processors, super markets, consumers, and the general public.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	30000	150000	50000	200000

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2014</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	5	130	135

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Publications

<b>Year</b>	<b>Actual</b>
2014	135

**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.
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.

Not Reporting on this Outcome Measure

**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 Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	1

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

New technologies for food safety is needed to ensure that our food is safe. Effective education need to be conducted with the general public and citizens of the state to allow them to understand food safety related issues and procedures to reduce food poisoning and food- related illness. Technologies need to be transferred to increase the level of food safety and detection of food related sources of infection or incidents. Producers particularly, limited resource producers need to be aware of the pre- and post-harvest food safety issues and concerns.

**What has been done**

Auburn University has established an Institute of Food Systems. This institute was established on the basis of the AU Food Safety Initiative. Food Systems faculty was established to conduct more effective education, research, and outreach. Molecular studies to detect genes in weaker salmonella strains were conducted at Tuskegee University. In Addition, education of limited resource producers on good agricultural practices and development of instructional materials for

food safety and GAP certification for limited resource producers were undertaken.

### **Results**

AU has designed a series of food safety programs aiming at educating and training of FDA food inspectors, food processors, and managers of the food industries. At Tuskegee University, Yghc genes were detected in weaker strains of salmonella that could be used as possible candidates for vaccine development.

Farmers trained in GAP and food safety practices have been certified and are able to supply fresh vegetables to large grocery markets including Walmart.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
304	Animal Genome
503	Quality Maintenance in Storing and Marketing Food Products
504	Home and Commercial Food Service
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety

### **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**

<b>Year</b>	<b>Actual</b>
2014	45

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Workforce need to be trained in the area of food processing, food safety, and food security.

**What has been done**

The food science program was added to the Department of Poultry Science. Students are enrolling in degree programs. Continuous training of limited resource farmers on GAP and food safety techniques.

**Results**

Students are trained, and they are prepared for jobs in the food industries. Limited resource farmers are certified and are able to supply produce to wider grocery markets directly.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
304	Animal Genome
307	Animal Management Systems
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
504	Home and Commercial Food Service
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety

**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**

The major issue is lack of research funding.

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

Food safety is a priority program at Auburn University. Starting with AU Food Safety Initiative five years ago, Auburn has developed this initiative into a broader initiative of AU Food Systems Initiative. Under this initiative, researchers are working on research, training, and extension. Good results have been achieved in the initial phase of this program. Dr. Pat Curtis was appointed as the first Director for the AU Food Systems Initiative, with the intention to further develop this program with the goal for the establishment of a Food Systems Institute at Auburn. At Tuskegee University, food safety is central and very critical as we develop and build the new Food processing facility for limited resource producers.

### **Key Items of Evaluation**

Auburn University Food Systems Institute was established in 2012 with the focus of food safety research, training, technology development and outreach. This Institute has made major progress by obtaining of \$6.5 million grant from FDA. Very recently, NIFA made an Award of \$4.8 million to a group of scientists including TU led by Dr. Christy Bratcher. Various virtual training modules are being developed with the goal of becoming a training hub in southern US for food safety.